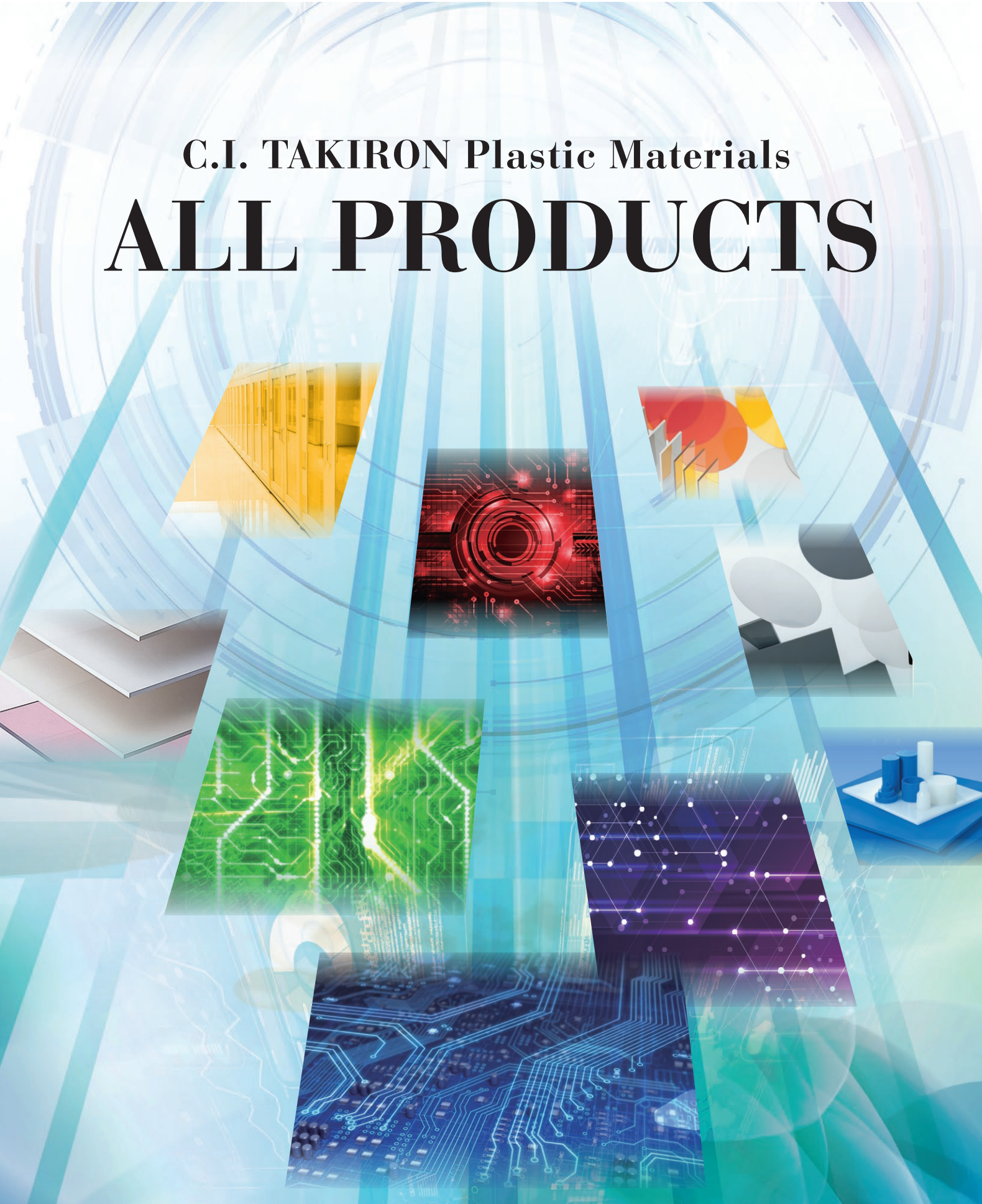


C.I. TAKIRON Corporation

C.I. TAKIRON Plastic Materials

ALL PRODUCTS



C.I. TAKIRON Plastic Materials

ALL PRODUCTS

We transform the potential of plastics into everyday convenience.

Our materials accelerate the development of next-generation industries.

Through the development of our macromolecular technologies, we have continuously created products that boast great quality, excellent performance, and high added value in the market for state-of-the-art industrial materials. Takiron Plates will continue to represent the cornerstone of our industrial society in the future as a series of environmentally friendly materials and products for cutting-edge industries and other fields.

CONTENTS

| | |
|--|-----|
| Applications by Industry | 2 |
| List of Available Materials | 4 |
| Materials for Rigid PVC Plates | 8 |
| High Functional Products | 21 |
| Non-PVC Materials | 34 |
| Takiron Polymer Products | 47 |
| Applications | 64 |
| Physical Properties of Takiron Plates | 71 |
| Chemical Resistance of Takiron Plates | 88 |
| Specification Tables for All Product Types | 98 |
| Additional Information | 121 |
| Processing Methods and Precautions for Use | 127 |

Solutions without Limits

Takiron Plates are here to enrich your living environment.

For all industries. For all purposes.

Takiron Plates are used for various purposes across a broad range of industries.

Cleanliness

Clean Room Equipment

We provide high-performance anti-static plastics that offer protection against static electricity, dust, and dirt. With these materials, you can create clean environments for a broad range of industries such as microelectronics and biotechnology.

Formability

Equipment for the Production of Semiconductors and Liquid Crystal Panels

Our materials are used in high-precision production equipment, which requires a high level of reliability. Their strength, heat resistance, chemical resistance, fire safety, and other superior characteristics represent the backbone of the high-tech industry.

Fire Safety

Flame-Retardant Materials

They reduce damage caused by fire accidents that can occur at manufacturing plants. We use these materials for our flame-retardant plastic plates.

Prevention

Chemical Processing Equipment

Chemical processing represents a series of tasks that are indispensable in the production of semiconductors and electronic devices. We provide chemical-resistant plastics with consistent quality.

Global Environment Protection

Our Contribution to a Low-Carbon Society

We provide plant-based bioplastics and PET materials that do not emit any toxic gases when burning.

Shielding

Wavelength (Light) Block

We offer transparent materials that block UV radiation, laser light, electromagnetic waves, and other wavelengths (light) affecting humans or equipment.

Applications by Industry

Equipment and Instruments for the Production of Semiconductors and Liquid Crystal Panels

Draft chambers, etching equipment, automatic cleaning equipment, equipment for quartz tube cleaning, wafer processing equipment, spin dryers, clean benches, clean boxes, desiccators, carrier boxes, etc.

Equipment for the Production of PCBs

Etching machines, regenerators for iron (III) chloride solutions, material stripping equipment, pre-treatment equipment, post-treatment equipment, etc.

Clean Room Equipment

Clean room partitions, hanging partition walls, door materials, observation windows, clean tunnels, clean booths, louvers, louver vents, etc.

Laboratory Instruments

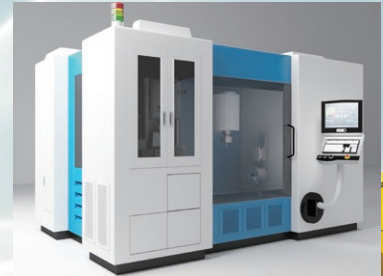
Clean benches, clean boxes, desiccators, gloveboxes, film processors, laboratory sinks, storage equipment, etc.

Plating Equipment

Electrolytic tanks for metals, plating tanks, pickling tanks, plating barrels, liquid chemical tanks, tank linings, equipment for processing waste liquids, equipment for processing exhaust gases, chemical fans, chemical pumps, etc.

Air-Conditioning Equipment

Air supply/discharge ducts, scrubbers, air filters, cooling towers, eliminators, etc.



Environmental Protection

Air-Conditioning Equipment

Our chemical-resistant and environmentally friendly materials are used in a wide range of facilities such as ventilation ducts, odor control ducts, and scrubbers.

Protection

Observation Windows for Machine Tools and Covers for Vending Machines

PC plates are made from a type of transparent plastic that boasts exceptional impact strength. They are used for a variety of purposes including safety equipment for machine tools or vehicles, security equipment for vending machines, and much more.

Covers

Machine Covers, Line Covers for Production Equipment, and Housings for Industrial Equipment

We provide anti-static and insect-proof transparent plastics that block various wavelengths (light). Due to their wide range of features, they are suitable for machine covers used on production lines for home appliances and food products.

Transportation

Conveying Equipment

Conveyor Pallet Materials and Linings

Heat resistance, anti-static properties, chemical resistance, wear resistance, lightness, moldability, and other characteristics of our materials used in conveyor pallets and linings for production equipment can boost labor-saving efforts at manufacturing plants.

Weight Reduction

Vehicle Equipment

The materials we provide are used to reduce the weight and improve the safety of railroad cars, automobiles, and various industrial vehicles. Their impact resistance, flame retardancy, transparency, moldability, and other characteristics help boost the development of traffic and transportation technologies.

Preservation

Tanks and Related Equipment

Due to their excellent chemical resistance, heat resistance, and other properties, our plastics are used for a broad range of purposes in industrial equipment tanks and various liquid chemical tanks.

Mechanical and Electric Parts

Machine covers, gauge covers, housings, distribution boards, gauge panels, insulating plates, resistor cases, indicator front plates, etc.

Conveying Equipment

Conveyor covers, conveyor pallets, chutes, hoppers, etc.

Equipment for Water Purification Plants and Sewage Processing Facilities

Tilted plates for sedimentation systems, troughs, overflow plates, baffle plates, deodorizing ducts, deodorizing equipment, wastewater processing equipment, water supply and sewage processing machinery, etc.

Chemical Equipment

Reaction towers, reaction tanks, storage tanks, centrifuges, pharmaceutical tanks, chemical fans, chemical pumps, waste liquid tanks, etc.

Store Equipment

POP equipment, product display shelves, showcases, signs, signboards, etc.

Other

Cultivation tanks for the agricultural and fishery industries, hatching tanks, boxes for shipping seafood, chlorella culture towers, hold linings for ships, gratings, head tanks, storage linings for refrigerated cargo ships, etc.

Railroad Cars, Airplanes, and Ships

Railroad car spacers and parts, interior parts for airplanes, pleasure boat windows for shipbuilding industry

List of Available Materials

Polyvinyl Chloride (PVC) Materials for Takiron Plates

| Types | Hues | Features | | | | | | | | | | | Manufacturing Methods | | | Processing Methods | | | | | Product Names | | | | | |
|-------------------------|------------------------------------|---------------------------------|-----------------|-------------------|--|----------------|------------------|-----------|-----------------------------|--------------------------------|---|---------------------|-----------------------|--------------------------|--------------------------------|--------------------|-----------|------------------|---------|----------|---------------|----------|----------------|---------------|----------------|---------------|
| | | Corrosion (chemical) resistance | Heat resistance | Impact resistance | High transparency (total light transmittance: 80% or higher) | Smooth surface | Flame retardancy | | Static-dissipative material | Electromagnetic wave shielding | Compliance with the Food Sanitation Act (Public Notice No. 201) | Metal-free material | Weather resistance | Openings (punched holes) | Compliance with RoHS and REACH | Press lamination | Extrusion | Continuous press | Welding | Grooving | Machining | Adhesion | Vacuum forming | Product types | Product number | Catalog Pages |
| | | | | | | | UL | FM | | | | | | | | | | | | | | | | | | |
| Non-transparent | Gray | ✓ | | | — | ✓ | V-0 | | | | | | | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | | T | 938 | 10 | |
| | | ✓ | | | — | | V-0 | | | | | | | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | | ET | 1980 | 12 | |
| | Surface: Gray Inside: Dark gray | ✓ | ✓ | | — | ✓ | | | | | | | | ✓ | ✓ | | | ✓ | ✓ | | ✓ | | HTL | 958 | 14 | |
| | Gray | ✓ | | | — | | | | | | | | ✓ | ✓ | ✓ | | | ✓ | ✓ | | ✓ | | TFL | 9307A | 11 | |
| | | ✓ | | | — | | | | | | | | ✓ | ✓ | ✓ | | | ✓ | ✓ | | ✓ | | TFL | 9512A | 11 | |
| | | | | | — | | V-0 | | | | | | | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | EVX | 7980S | 17 | |
| | | | | | — | | V-0 | | | | | | | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | EVX | 7980T | 17 | |
| | Ivory | ✓ | | | — | ✓ | V-0 | | | | | | | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | | TSP | 338 | 10 | |
| | | ✓ | | ✓ | — | ✓ | V-0 | | | | | | | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | | THQ | 038 | 15 | |
| | | ✓ | | | — | ✓ | V-0 | | | | | | | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | | ETSP | 1388 | 12 | |
| | | ✓ | | | — | ✓ | V-0 | | | | | | | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | | RTSP | 133PE | 13 | |
| | | ✓ | | | — | ✓ | V-0 | | | | ✓ | ✓ | | △*4 | ✓ | | | ✓ | ✓ | ✓ | ✓ | | TMC | 60331 | 31 | |
| | Surface: Ivory Inside: Ivory | ✓ | ✓ | | — | ✓ | | | | | | | | ✓ | ✓ | | | ✓ | ✓ | | ✓ | | HTL | 358 | 14 | |
| | Ivory | | | | — | ✓ | V-0 | | ✓ | | | | | ✓ | ✓ | | | ✓ | ✓ | | ✓*1 | | TND | 77368 | 24,25 | |
| | | ✓ | | | — | ✓ | V-0 | FM listed | | | | | | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | | FMET | 4323 | 22 | |
| | | ✓ | ✓ | | — | ✓ | | FM listed | | | | | | ✓*2 | ✓ | | | ✓ | ✓ | ✓ | ✓ | | FMH | 5305 | 22 | |
| | | ✓ | | | — | | | | | | | | ✓ | ✓ | ✓ | | | ✓ | ✓ | | ✓ | | TFL | 3512A | 11 | |
| | | | | | — | | V-0 | | | | | | | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | EVX | 7300T | 17 | |
| | White | ✓ | | | — | ✓ | V-0 | FM listed | | | | | | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | | FMET | 4773 | 22 | |
| | | ✓ | ✓ | | — | ✓ | | FM listed | | | | | | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | | FMH | 5775 | 22 | |
| | | | | | — | | | | | | | | | ✓*3 | ✓ | | | ✓ | ✓ | | ✓ | | ES- | 9700A | 12 | |
| | Green | ✓ | | ✓ | — | ✓ | V-0 | | | | | | | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | | THQ | 048 | 15 | |
| | Dark gray | ✓ | | ✓ | — | ✓ | V-0 | | | | | | | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | | THQ | 098 | 15 | |
| | | ✓ | | ✓ | — | | | | | | | | | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | | EQ | 009 | 15 | |
| | | ✓ | ✓ | | — | ✓ | V-0 | | | | | | | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | | HT | 928 | 14 | |
| | Black | | | | — | ✓ | | | ✓ (Conductive) | | | | | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓*1 | | TND | CV930 | 25 | |
| | | | | | — | ✓ | | | | | | | | ✓ | ✓ | | | ✓ | ✓ | | ✓ | | S | 912 | 11 | |
| | | | | | — | | V-0 | | | | | | | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | EVX | 7900S | 17 | |
| | | | | | — | | V-0 | | | | | | | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | EVX | 7900T | 17 | |
| | Opal cool (semi-transparent) | | | | — | ✓ | V-0 | | | | | | | ✓ | ✓ | | | ✓ | ✓ | | ✓ | | S | 704 | 11 | |
| Opal (semi-transparent) | | | | — | ✓ | | | | | | ✓ | | ✓ | ✓ | | | ✓ | ✓ | | ✓ | | S | 700 | 11 | | |
| Olive gray | | | | — | | V-0 | | | | | | | ✓ | | ✓ | | ✓ | ✓ | | ✓ | ✓ | EVX | 7350S | 17 | | |

*1: The adhesion strength decreases by approximately 20%.

*2: Products manufactured from April 2019 onwards comply with the RoHS Directive and REACH Regulations.

*3: Products manufactured from April 2019 onwards comply with the RoHS Directive and REACH Regulations. (500kg pallet packaging unit is applicable from September 2020.)

*4: It is not compliant only with REACH.

Note 1: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.

*1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)

Note 2: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials.

(As of April 30, 2022)

| Types | Hues | Features | | | | | | | | | | | Manufacturing Methods | | | Processing Methods | | | | | Product Names | | | | | |
|----------------|------------|---------------------------------|-----------------|-------------------|--|----------------|------------------|-----------|-----------------------------|--------------------------------|-----------------|---|-----------------------|--------------------|--------------------------------|--------------------|-----------|------------------|---------|----------|---------------|----------|----------------|---------------|----------------|---------------|
| | | Corrosion (chemical) resistance | Heat resistance | Impact resistance | High transparency (total light transmittance: 80% or higher) | Smooth surface | Flame retardancy | | Static-dissipative material | Electromagnetic wave shielding | Laser shielding | Compliance with the Food Sanitation Act (Public Notice No. 201) | Metal-free material | Weather resistance | Compliance with RoHS and REACH | Press lamination | Extrusion | Continuous press | Welding | Grooving | Machining | Adhesion | Vacuum forming | Product types | Product number | Catalog Pages |
| | | | | | | | UL | FM | | | | | | | | | | | | | | | | | | |
| Transparent | Clear | ✓ | | | ✓ | | V-0 | | | | | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | TS | 608A | 10 | |
| | | ✓ | | | ✓ | | | | | | | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | TS | 608 | 10 |
| | | ✓ | | | | | V-0 | | | | | | | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ESA | 9810 | 13 |
| | | ✓ | | | | | V-0 | | | | | | | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ESA- | 9810 | 13 |
| | | ✓ | | | | | V-0 | | | | | | | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ESS | 8800A | 13 |
| | | ✓ | | | ✓ | | V-0 | | | | | | | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | RTS | 110PE | 12 |
| | | ✓ | | | | | | | | | | | | | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | | NESA | 1110 | 12 |
| | | ✓ | | ✓ | | | ✓ | V-0 | | | | | | | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | | TSHI | 601HI | 15 |
| | | ✓ | | | ✓ | | ✓ | V-0 | | | | ✓ | ✓ | | △*2 | ✓ | | | ✓ | ✓ | ✓ | ✓ | | TMC | 60601 | 31 |
| | | | | | | | | V-0 | | ✓ | ✓ | | | | | ✓ | ✓ | | ✓ | ✓ | | | | TEND | 57600 | 30 |
| | | | | | ✓ | | ✓ | V-0 | | ✓ | | | | | | ✓ | ✓ | | ✓ | ✓ | | ✓*1 | | TND | 77665 | 24,25 |
| | | ✓ | | | ✓ | | | V-0 | | ✓ | | | | | | ✓ | | ✓ | | ✓ | | | | ESND | 47800 | 25 |
| | | ✓ | | | ✓ | | | V-0 | | ✓ | | | | | | ✓ | | ✓ | | ✓ | | | | ESND | 47802 | 25 |
| | | ✓ | | | | | | | FM listed | | | | | | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | FMRTS | 4605 | 22 |
| | | ✓ | ✓ | | | | ✓ | V-0 | FM listed | | | | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | FMHS | 6650 | 22 |
| | | | | | | ✓ | V-0 | FM listed | ✓ | | | | | | △*2 | ✓ | | ✓ | ✓ | | ✓*1 | | FMND | 7605 | 22 | |
| | | | | | | | | FM listed | ✓ | | | | | | | | ✓ | | ✓ | | | | FMND- | 74605 | 22 | |
| | | | | | | | | FM listed | ✓ | | | | | | | | ✓ | | ✓ | | | | FMND- | 74602 | 22 | |
| | | | | | | | V-0 | | | | | | | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | EVC- | 8600 | 17 | |
| | Red | | | ✓ | | ✓ | V-0 | | | | ✓ | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | TSLA | W102 | 32,33 | |
| | | | | ✓ | | ✓ | V-0 | | ✓ | | ✓ | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓*1 | | TSLAND | N102 | 32,33 | |
| | Orange | | | | | ✓ | V-0 | | ✓ | | | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓*1 | | TND | 77285 | 25 | |
| | | | | | | ✓ | | | | | | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | S | 202 | 10 | |
| | | | | ✓ | | ✓ | V-0 | | | | ✓ | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | TSLA | W202 | 32,33 | |
| | Yellow | | | | | ✓ | V-0 | | ✓ | | | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓*1 | | TSLAND | N202 | 32,33 | |
| | | | | | | | V-0 | | ✓ | | | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓*1 | | TND | 77385 | 25 | |
| | | | | | | | V-0 | | ✓ | | | | | | ✓ | | ✓ | | ✓ | ✓ | ✓ | | ESND | 47300 | 25 | |
| | | | | | | | V-0 | | ✓ | | | | | | ✓ | | ✓ | | ✓ | ✓ | ✓ | | ESND | 47302 | 25 | |
| Blue | | | | | ✓ | | | | | | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | S | 506 | 10 | | |
| | | | | | ✓ | | | | | | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | S | 581 | 10 | | |
| | | | ✓ | | ✓ | V-0 | | | | ✓ | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | TSLA | W502 | 32,33 | | |
| | | | | | ✓ | V-0 | | ✓ | | ✓ | | | | ✓ | ✓ | | ✓ | ✓ | ✓*1 | | TSLAND | N502 | 32,33 | | | |
| Green | | | | | ✓ | | | | | | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | S | 403 | 10 | | |
| | | | ✓ | | ✓ | V-0 | | | | ✓ | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | TSLA | W402 | 32,33 | | |
| | | | ✓ | | ✓ | V-0 | | ✓ | | ✓ | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓*1 | | TSLA | N402 | 32,33 | | |
| | | | ✓ | | ✓ | V-0 | | ✓ | | ✓ | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | TSLA | W4066*3 | 32,33 | | |
| Smoky brown | ✓ | ✓ | | | ✓ | V-0 | | | | | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | TSHI | 801HI | 15 | | |
| | | | | | ✓ | V-0 | | ✓ | | | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓*1 | | TND | 77885 | 25 | | |
| | | | | | ✓ | | | | | | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | S | 802 | 10 | | |
| | | | | | ✓ | | | | | | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | S | 881 | 10 | | |
| Smoky | | | | | ✓ | V-0 | | ✓ | | | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓*1 | | TND | 77001 | 25 | | |
| | | | | | ✓ | | | | | | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | S | 981 | 10 | | |
| Smoky gray | | | | | ✓ | V-0 | | ✓ | | | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓*1 | | TND | 77002 | 25 | | |
| With wire mesh | ✓ | | | | ✓ | | | | | | | | | ✓ | ✓ | | ✓ | | ✓ | ✓ | | SAK | K608 | 11 | | |
| Foamed | Black | | | | | | | | | | ✓ | | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | Foam PVC | 900 | 16 | | |
| | Off-white | | | | | | | | | | ✓ | | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | Foam PVC | 713 | 16 | | |
| | Light gray | | | | | V-0 | | | | | ✓ | | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | Foam PVC | 915 | 16 | | |

*1: The adhesion strength decreases by approximately 20%.

*2: It is not compliant only with REACH.

*3: This model is only going to remain available while stocks last. However, we are currently planning a new product to replace it.

Note 1: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.

(1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)

Note 2: "Note 1" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials.

(As of April 30, 2022)

List of Available Materials

Polypropylene (PP) Materials for Takiron Plates

| Types | Hues | Features | | | | | | | | | | Manufacturing Methods | | | Processing Methods | | | | Product Names | | Catalog Pages |
|-----------------|-----------|---------------------------------|-----------------|-------------------|----------------|------------------|----|---|---|--------------------------------|--------------------|-----------------------|-----------|------------------|--------------------|----------|-----------|----------|---------------|----------------|---------------|
| | | Corrosion (chemical) resistance | Heat resistance | Impact resistance | Smooth surface | Flame retardancy | | Compliance with the Food Sanitation Act (Public Notice No. 201) | Compliance with the Food Sanitation Act (Public Notice No. 201) | Compliance with RoHS and REACH | Weather resistance | Press lamination | Extrusion | Continuous press | Welding | Grooving | Machining | Adhesion | Product types | Product number | |
| | | | | | | UL | FM | | | | | | | | | | | | | | |
| Non-transparent | Natural | ✓ | ✓ | | ✓ | | | | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | PP | 1300 | 35,36 | |
| | | ✓ | ✓ | | ✓ | | | | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | RPP | 1350 | 35,36 | |
| | | ✓ | ✓ | | | | | | ✓ | ✓ | | | | | ✓ | ✓ | ✓ | PPE | P310A | 35,36 | |
| | | ✓ | ✓ | | | | | | ✓ | ✓ | | | | | ✓ | ✓ | ✓ | PP | P370 | 56 | |
| | Dark gray | ✓ | ✓ | | ✓ | | | | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | PP | 1905 | 35,36 | |
| | | ✓ | ✓ | | ✓ | | | | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | RPP | 1950 | 35,36 | |
| | | ✓ | ✓ | | | | | | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | PPE | P915A | 35,36 | |
| | | ✓ | ✓ | | | | | | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | PP | P921 | 58 | |
| | Ivory | ✓ | ✓ | | | | | | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | RPP | 1333 | 35,36 | |
| | White | ✓ | ✓ | | ✓ | | | V-0 | | ✓ | | | | ✓ | ✓ | ✓ | ✓ | RPPN | PN303 | 36 | |

Polyethylene Terephthalate (PET) Materials for Takiron Plates

| Types | Hues | Features | | | | | | | | | | Manufacturing Methods | | Processing Methods | | | | | | Product Names | | Catalog Pages | | | |
|-----------------|-------------|--|--------------|------------------|------------------|----|---|--------------------------------|-----------------------------|--------------------|---------------|-----------------------|-----------------------|--------------------|-----------|---------|----------|-----------|----------|----------------|----------|---------------|---------------|----------------|-------|
| | | High transparency (total light transmittance: 80% or higher) | Matte finish | Foaming material | Flame retardancy | | Compliance with the Food Sanitation Act (Public Notice No. 201) | Compliance with RoHS and REACH | Static-dissipative material | Scratch resistance | UV protection | Insect-proof material | Biomass certification | Press lamination | Extrusion | Welding | Grooving | Machining | Adhesion | Vacuum forming | Punching | | Product types | Product number | |
| | | | | | UL | FM | | | | | | | | | | | | | | | | | | | |
| Transparent | Transparent | ✓ | | | HB/V-2 | | ✓ | ✓ | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PET- | 6010 | 38,39 | | |
| | | ✓ | | | V-2 | | ✓ | ✓ | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PET- | 6010A | 38,39 | |
| | | ✓ | | | HB | | ✓ | ✓ | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PETA- | 6020 | 39 | |
| | | ✓ | | | HB | | ✓ | ✓ | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PETND- | 76600 | 26,40 |
| | | ✓ | | | HB | | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PETND | MRG60 | 26,40 |
| | Orange | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PET- | 6025 | 40 | |
| Yellow | | | | HB | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PETND | MRG30 | 26,40 | | |
| Smoky brown | | | | | | ✓ | ✓ | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PET- | 6820 | 38,39 | | |
| Non-transparent | White | | | | | | ✓ | ✓ | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PET- | 6710 | 38,39 | | |

Polycarbonate (PC) Materials for Takiron Plates

| Types | Hues | Features | | | | | | | | | | Manufacturing Methods | | Processing Methods | | | | Product Names | | Catalog Pages | | | | | | |
|-------------|-------------|--|--------------|--------------------|----------------------------|--------|--------------------|-----------------------------|--------------------------------|-------------------|----------------|-----------------------|-------------------------|---|--------------------------------|---|------------------|---------------|---------|---------------|----------|------------|------------|---------------|----------------|---------------------|
| | | Appearance | | | Flame retardancy | | Weather resistance | Static-dissipative material | Electromagnetic wave shielding | Anti-glare finish | Hard coating | Optical grade | Multiple PC/PMMA layers | Compliance with the Food Sanitation Act (Public Notice No. 201) | Compliance with RoHS and REACH | Compliance with the Food Sanitation Act (Public Notice No. 995) | Press lamination | Extrusion | Welding | | Grooving | Machining | Adhesion | Product types | Product number | |
| | | High transparency (total light transmittance: 80% or higher) | Matte finish | Figured glass look | Matte frosted glass finish | UL | | | | | | | | | | | | | | | | | | | | Low-stroke material |
| Transparent | Clear | ✓ | | | | HB | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PC-/PC | 1600 | 41,42 | | |
| | | ✓ | | | | HB | | ✓ (Both sides) | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PCSP-/PCSP | 660T | 41,42 | |
| | | ✓ | | | | HB | | | ✓ | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PCNDL | 78610 | 27 | |
| | | ✓ | | | | HB | | | ✓ | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PCEND | 57610 | 30 | |
| | | ✓ | | | | | | | | | ✓ (Both sides) | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PCMRMS | 61600 | 43 |
| | | ✓ | | | | V-0 | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PCMU | PY620 | 43 |
| | | ✓ | | | | V-0 *1 | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PCMU | PZ620 | 43 |
| | | ✓ | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PCP | 1609A | 43 |
| | | ✓ | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PCAA | BA600 | 44 |
| | | ✓ | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PCSM | PS610 | 45 |
| | ✓ | | | | | | HB *2 | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PCMA | K3250 | 45 | |
| | ✓ | ✓ (Both sides) | | | | | | ✓ (Both sides) | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PCSP | R6600 | 41,42 | |
| | ✓ | ✓ (One side) | | | | | | ✓ (Both sides) | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PCSP | K6600 | 41,42 | |
| | ✓ | | ✓ (One side) | | | | | ✓ (Both sides) | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PCSP | 36600 | 41,42 | |
| | ✓ | | | ✓ (Both sides) | | | | ✓ (Both sides) | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PCSP | F6600 | 41,42 | |
| | Smoky gray | | | | HB | | ✓ (Both sides) | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PCSP-/PCSP | 692T | 41,42 | |
| | | ✓ (Both sides) | | | | HB | | ✓ (Both sides) | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PCSP | R6920 | 41,42 | |
| | | | | | HB | | | ✓ (Both sides) | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PCNDL | 78910 | 27 | |
| | Smoky brown | | | | | HB | | ✓ (Both sides) | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PCSP-/PCSP | 693T | 41,42 | |
| | | ✓ (Both sides) | | | | HB | | ✓ (Both sides) | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PCSP | R6930 | 41,42 | |
| White | | | | | HB | | | ✓ | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PCNDL | 78810 | 27 | | |
| Black | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PCSP | 1700 | 41,42 | | |
| | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PCSP | 1900 | 41,42 | | |
| Glass color | ✓ | | | ✓ (Both sides) | | | ✓ (Both sides) | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PCSP | F6400 | 41,42 | | |
| | ✓ | | | | HB | | ✓ (Both sides) | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PCSP | 642T | 41,42 | | |
| | ✓ | | ✓ (One side) | | | HB | | ✓ (Both sides) | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PCSP | 36400 | 41,42 | | |
| Opaque | | | | | HB | | ✓ (Both sides) | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PCSP-/PCSP | 677T | 41,42 | | |

*1: The 2.0 mm PCMU PZ620 type is made from a UL-certified material.
*2: 0.8 mm or more

Note 1: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.
*1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)

Note 2: "Note 1" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials.

(As of April 30, 2022)

Engineering Plastics for Takiron Plates

| Types | Hues | Features | | | | | Manufacturing Methods | | Processing Methods | | | | Product Names | | Catalog Pages |
|-------|---------|---------------------------------|-----------------|-------------------|---|--------------------------------|-----------------------|------------------|--------------------|---------|----------|-----------|---------------|---------------|---------------|
| | | Corrosion (chemical) resistance | Heat resistance | Impact resistance | Compliance with the Food Sanitation Act (Public Notice No. 201) | Compliance with RoHS and REACH | Weather resistance | Press lamination | Extrusion | Welding | Grooving | Machining | Adhesion | Product types | |
| PVDF | Natural | ✓ | ✓ | | | ✓ | ✓ (20 mm or more) | ✓ (Under 20 mm) | ✓ | ✓ | ✓ | | FMPVDF | F300 | 37 |

Products Related to Takiron Plates (Rods, Angles, and Frame Covers)

| Materials/Products | Hues | Features | | | | | Manufacturing Methods | Processing Methods | | | | Product Names | | Catalog Pages | |
|--------------------|-------------------|---------------------------------|-----------------|-------------------|---|---|-----------------------|--------------------------------|--------------------|-----------|---------|--------------------|-----------|---------------|----------|
| | | Corrosion (chemical) resistance | Heat resistance | Impact resistance | Compliance with the Food Sanitation Act (Public Notice No. 201) | Compliance with the Food Sanitation Act (Public Notice No. 595) | | Compliance with RoHS and REACH | Weather resistance | Extrusion | Welding | Grooving | Machining | | Adhesion |
| PVC rods | Gray | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | Rods | 938A | 18,106 |
| | Dark gray | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | HT rods | 928 | 18,106 |
| | Ivory | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | NC rods | | 18,106 |
| PVC angles | Gray | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | Angles | 1980 | 18,106 |
| | Ivory | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | Angles | 1330 | 18,106 |
| | Transparent | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | Angles C | 600 | 18,106 |
| | Dark gray | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | Angles HQ | 098 | 18,106 |
| PVC channels | Gray | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | Channels | 1980 | 18,106 | |
| PVC frame covers | Ivory | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | Frame covers L/C | 1330 | 18,107 | |
| PVC rail materials | Ivory | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | Rail materials A/B | 1330 | 18,107 | |
| PP rods | Natural | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PP rods | 370 | 54 | |
| PVDF rods | Natural | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | PVDF rods | F2 | 61 | |
| Flange covers | Ivory/Transparent | ✓ | | | | ✓ | Molding | | ✓ | ✓ | — | Flange covers | | 20 | |

Metallic Composites for Takiron Plates

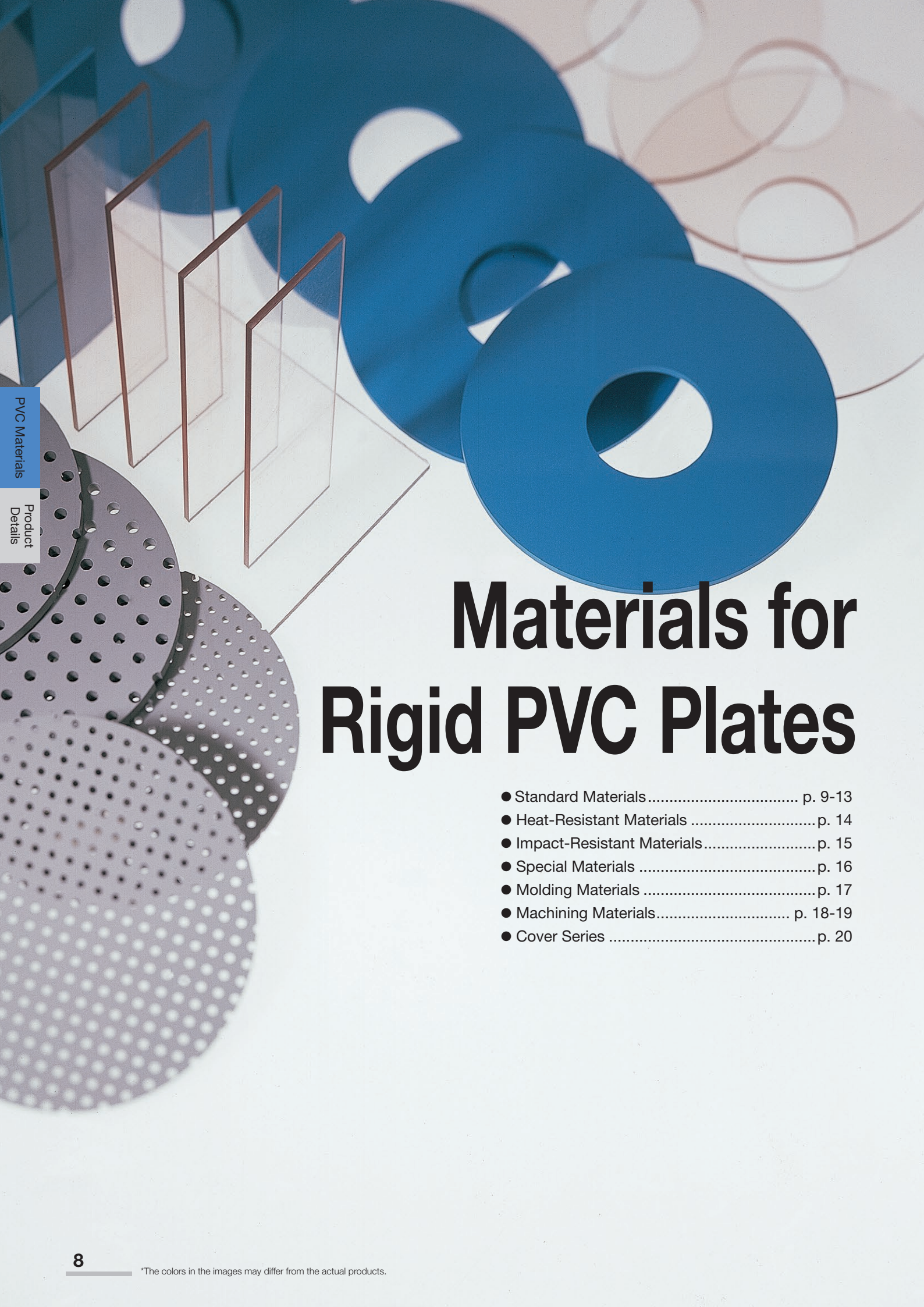
| Types | Hues | Core Materials | Features | | | | | Processing Methods | | | | Product Names | | Catalog Pages | |
|---------------------|---|---------------------|-----------------------|-----------------|--|----------------------|-----------------------------|--------------------------------|---------|----------|-----------|---------------|-----------------------------|----------------|----------------|
| | | | Glossy/matte surfaces | Usable surfaces | Compliance with the Act on Promoting Green Procurement | Suitable environment | Static-dissipative material | Compliance with RoHS and REACH | Welding | Grooving | Machining | Adhesion | Product types | | Product number |
| Aluminum composites | Silver | Black low-foamed PE | Matte | Both sides | | Outdoor | | ✓ | | | ✓ | | Aluminum composite plates L | 002L | 46 |
| | White (Glossy on both sides) | White low-foamed PE | Glossy | Both sides | | Outdoor | | ✓ | | | ✓ | | Aluminum composite plates L | 772L | 46 |
| | White (Glossy on one side and matte on the other) | White low-foamed PE | Glossy Matte | Both sides | | Outdoor | | ✓ | | | ✓ | | Aluminum composite plates L | 772LR | 46 |
| | White (Glossy on one side) | White low-foamed PE | Glossy | One side | | Outdoor | | ✓ | | | ✓ | | Aluminum composite plates L | 778L | 46 |
| Steel composites | White | Black low-foamed PE | Glossy | One side | ✓ | Indoor | | ✓ | | | ✓ | | Steel composite plates ST | 700GR 700GL | 46 |

Note 1: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.

* (1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)

Note 2: "Note 1" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials.

(As of April 30, 2022)



Materials for Rigid PVC Plates

- Standard Materials..... p. 9-13
- Heat-Resistant Materialsp. 14
- Impact-Resistant Materials.....p. 15
- Special Materialsp. 16
- Molding Materialsp. 17
- Machining Materials..... p. 18-19
- Cover Seriesp. 20

PVC Plates

Standard Materials

Rigid PVC Plates Suitable for a Wide Range of Applications

Our company has a solid track record of over half a century since the start of production in 1954, being one of the first to focus on remarkable workability, chemical resistance, and low costs for rigid vinyl chloride. During this period, we have made cumulative improvements in quality and developed functional products, and have released superior products with highly heat-resistant, chemical-resistant, flame-retardant, and impact-resistant properties onto the market. As a company with extensive experience and a track record of accomplishments, we offer a product line of countless high-quality, highly functional products.

● Superb Chemical Resistance

This product provides consistent resistance to acids, alkalis, salts, and oils.

● Consistent Mechanical Strength

Providing excellent mechanical properties such as tensile and flexural elasticity, the product can be used as stable parts in chemical equipment.

● Superb Workability

This product can be easily processed by machines for cutting or drilling, and allows easy thermal bending and welding.

● Lightness

With a specific gravity that is 1/5th to 1/6th that of iron, the weight of chemical equipment can be greatly reduced, enabling easy handling during transportation and construction.

● Superb Insulation Properties

This product provides outstanding insulation compared to metal products, and reduces heat radiation from equipment.

● Excellent Electrical Insulation

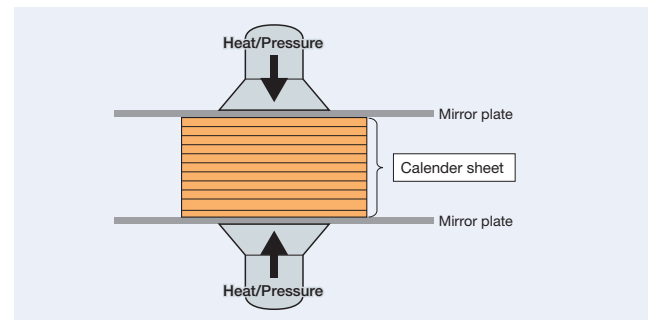
On par with phenol resin, the product has electricity-insulating properties, and is suitable for use as parts in electrical equipment.

● Superb Flame Resistance

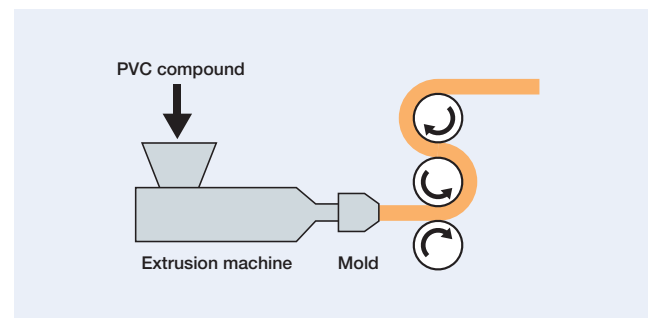
It is self-extinguishing and does not burn itself.

Production Methods of Takiron Plates

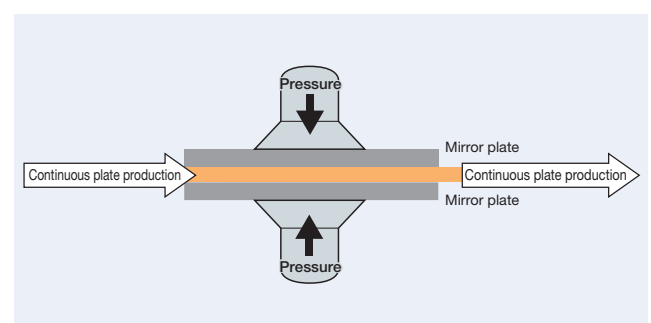
■ Press Lamination



■ Extrusion



■ Continuous Press



| Advantages of This Product | Production Methods | | |
|--|--------------------|-----------|------------------|
| | Press Lamination | Extrusion | Continuous Press |
| Obtain products with a good outward appearance | ☆☆☆ | ☆ | ☆☆☆ |
| Retain length and width when exposed to heat expansion and contraction | ☆☆☆ | — | ☆☆☆ |
| Can be manufactured with custom lengths | — | ☆☆☆ | ☆☆☆ |
| Tend to maintain original texture despite heat | — | ☆☆ | ☆☆☆ |

Rigid PVC Plates Suitable for a Wide Range of Applications

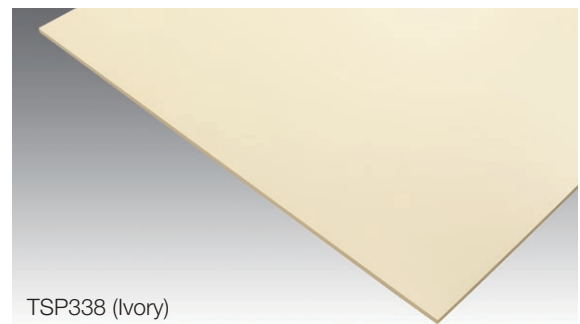
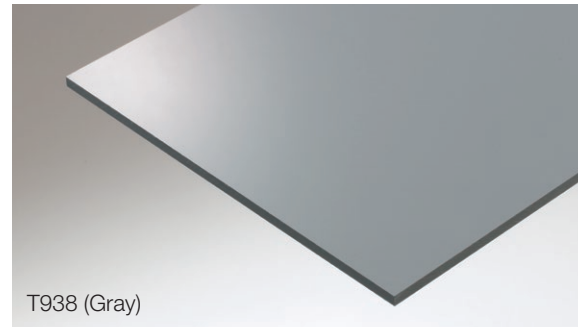
Press Laminated Plates

Standard Rigid PVC Plates

The calender press method provides excellent outward appearance and low internal stress. The varied thicknesses enable these products to be used for a wide range of industrial fields as a chemically resistant material. The product line of non-transparent products with thicknesses of up to 110 mm are particularly suited for application as machined parts.

⚠ Caution

Press laminated plate gray/T938 products of 60 mm or more have property values that are different from products of less than 60 mm. Specifically, the temperature limit of the heat resistance is lower. Be aware of this fact before use.



Specifications for Each Product Type

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------|----------------|--------------------------------|---------------|----------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|-------|-----|-----|-----|
| | | | | Size (mm) | | 0.5 | 1.0 | 1.5 | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 8.0 | 10.0 | 12.0 | 14.0 | 15.0 | 16.0 | 18.0 | 20.0 | 25.0 | 30.0 | 35.0 | 40.0 | 45.0 | 50.0 | 60.0 | 70.0 | 80.0 | 90.0 | 100.0 | 110.0 | | | |
| T | 938 | ✓ | Gray | 500x1,000 | | | | | | | | | | | | | | | | | | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | | | |
| | | | | 1,000x1,000 | | | | | | | | | | | | | | | | | | * | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | |
| | | | | 1,000x2,000 | | * | * | * | (6) | (4) | (3) | (3) | (2) | (1) | (1) | (1) | * | (1) | (1) | * | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) |
| | | | | 1,212x2,424 | | | | | (4) | (3) | (2) | (2) | (2) | (1) | (1) | | | (1) | | | | | | | | | | | | | | | | | | |
| TSP | 338 | ✓ | Ivory | 1,000x2,000 | | | | | * | * | * | * | * | * | * | | | * | | | (1) | (1) | (1) | | (1) | | | | | | | | | | | |
| | | | | 1,212x2,424 | | | | | | * | | * | | * | * | | | | | | | | | | | | | | | | | | | | | |

* symbol: Made-to-order product. Please contact us for more information about production lots.
 • If you wish to use a non-standard thickness or hue, contact us.
 • Type T938 with a thickness of less than 60 mm and type T938 with a thickness of 60 mm or more have different physical properties. Please be aware of these differences before use.
 • For the delivery times of the sizes 500 x 1,000 and 1,000 x 1,000, check with one of our representatives.

Standard Transparent PVC Plates

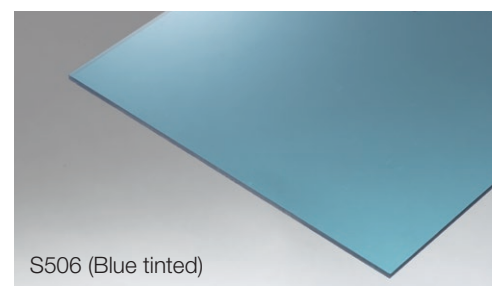
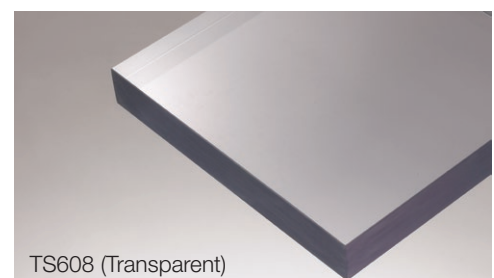
Its outstanding mechanical strength and chemical resistance make this product suitable for use as an observation window for various types of covers, basins, or tanks, or as a transparent part for ducts.

Specifications for Each Product Type

Transparent and Colored Transparent

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------|----------------------|--------------------------------|---------------|----------------|--|------|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|--|--|--|--|--|--|--|--|--|--|--|--|--|-----|-----|-----|
| | | | | Size (mm) | | 1.0 | 1.5 | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 8.0 | 10.0 | 15.0 | 20.0 | 25.0 | 30.0 | 40.0 | | | | | | | | | | | | | | | | |
| TS | 608A ^{Note} | ✓ | Transparent | 1,000x2,000 | | (12) | (8) | (6) | (4) | * | (3) | * | (1) | (1) | (1) | | | | | | | | | | | | | | | | | | | | |
| | | | | 1,212x2,424 | | | | | (4) | (3) | * | (2) | * | (1) | (1) | | | | | | | | | | | | | | | | | | | | |
| | 608 | ✓ | Transparent | 500x1,000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | (1) | (1) | |
| | | | | 1,000x1,000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | (1) |
| | | | | 1,000x2,000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | (1) | (1) | |
| S | 202 | ✓ | Orange tinted | 1,000x2,000 | | | | | | (4) | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 403 | ✓ | Green tinted | 1,000x2,000 | | | | | | (4) | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 506 | ✓ | Blue tinted | 1,000x2,000 | | | | | | (4) | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 581 | ✓ | Blue tinted | 1,000x2,000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 881 | ✓ | Smoky brown | 1,000x2,000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 802 | ✓ | Smoky brown | 1,000x2,000 | | | | | | (6) | (4) | | | | | | | | | | | | | | | | | | | | | | | | |
| 981 | ✓ | Smoky | 1,000x2,000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

* symbol: Made-to-order product. Please contact us for more information about production lots.
 Note: Production will end at the end of March 2023, and the product will be discontinued as soon as the stock runs out.
 • For the delivery times of the sizes 500 x 1,000 and 1,000 x 1,000, check with one of our representatives.



Note 1: Standard products are marked with a check mark (✓). The number in brackets is the number of products in one case.
 Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive*. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.
 *(1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)
 Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials. (As of April 30, 2022)

Press Laminated Plates

Specifications for Each Product Type

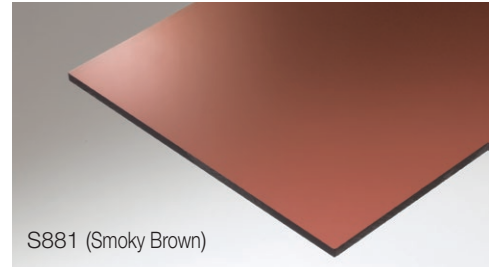
Semi-transparent (Opaque)

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | |
|---------------|----------------|--------------------------------|---------------|----------------|-----|-----|-----|-----|
| | | | | Size (mm) | 1.0 | 2.0 | 3.0 | 5.0 |
| S | 704 | ✓ | Opal cool | 1,000×2,000 | * | | | |
| S | 700 | ✓ | Opal | 1,000×2,000 | | (6) | (4) | (3) |

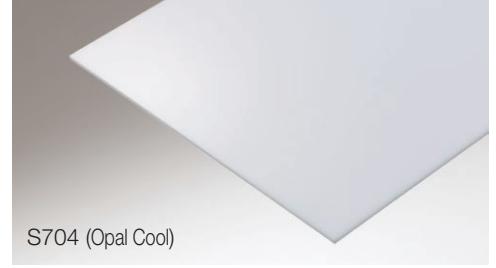
* symbol: Made-to-order product. Please contact us for more information about production lots.

Non-transparent

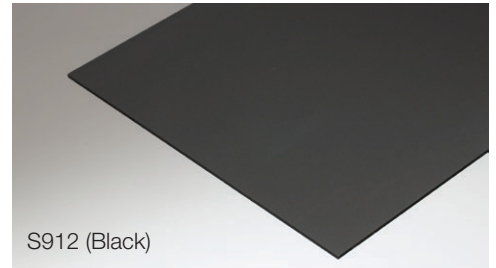
| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | |
|---------------|----------------|--------------------------------|---------------|----------------|-----|-----|-----|
| | | | | Size (mm) | 2.0 | 3.0 | 5.0 |
| S | 912 | ✓ | Black | 1,000×2,000 | (6) | (4) | (3) |



S881 (Smoky Brown)



S704 (Opal Cool)



S912 (Black)

Rigid PVC Plates for Special Applications

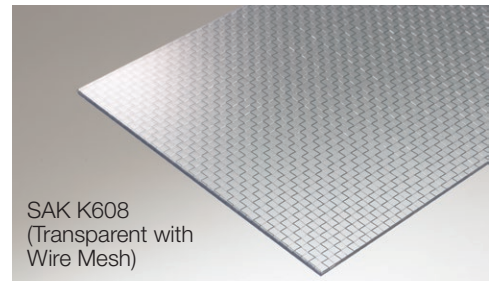
Transparent PVC Plates with Wire Mesh (Shatter-Resistant)

It is transparent, chemical resistant, and has a wire mesh sandwich in the center. This product has wire mesh sandwiched in its center. Its superior mechanical strength significantly lowers the probability that the full surface will shatter in case the plate breaks. This makes it suitable for use as a partition or a machine cover.

Specifications for Each Product Type

Transparent PVC Plates with Wire Mesh

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | |
|---------------|----------------|--------------------------------|----------------------------|----------------|-----|
| | | | | Size (mm) | 3.0 |
| SAK | K608 | ✓ | Transparent with wire mesh | 1,000×2,000 | (4) |



SAK K608
(Transparent with Wire Mesh)

Filter Plates

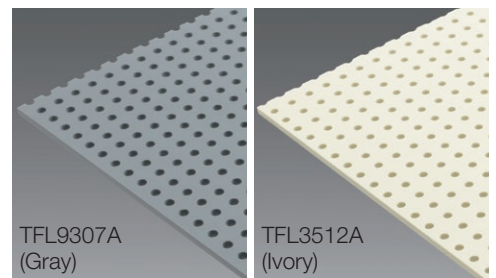
Rigid Porous PVC Plates That Do Not Require Drilling

Our filter plates are rigid porous PVC plates that remove the burden of a drilling process. They are suitable as a water drain or filter for barrels of automatic plating equipment, water processing equipment, drying furnaces, medical instruments, and more.

Specifications for Each Product Type

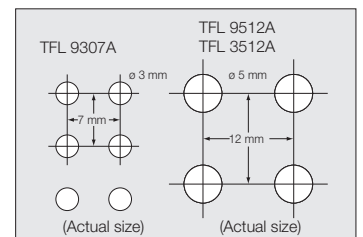
Filter Plates

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | Open Area Rate (%) |
|-----------------------|----------------|--------------------------------|---------------|----------------|-----|-----|--------------------|
| | | | | Size (mm) | 3.0 | 5.0 | |
| TFL (Filter plate) | 9307A | ✓ | Gray | 1,000×2,000 | (4) | | 14.4 |
| | 9512A | ✓ | Gray | 1,000×2,000 | | (3) | 13.6 |
| | 3512A | ✓ | Ivory | 1,000×2,000 | | (3) | 13.6 |



TFL9307A
(Gray)

TFL3512A
(Ivory)



Note 1: Standard products are marked with a check mark (✓). The number in brackets is the number of products in one case.

Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.

* (1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)

Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials.

(As of April 30, 2022)

Continuous Pressed Rigid PVC Plates That Maintain an Excellent Outward Appearance and High-Quality Properties

Continuous Pressed Plates (Transparent)

Continuous Pressed Plates (Ivory)

Continuous pressed plates are rigid PVC plates produced by using continuous press, a manufacturing technique developed at our company that combines the calender press and extrusion methods. These plates combine the best characteristics of both press laminated plates and extruded plates.

● Superb Appearance (Gloss, Smoothness)

The continuous press method developed at our company allows for the creation of products with a good outside appearance.

● Superb Transparency (RTS)

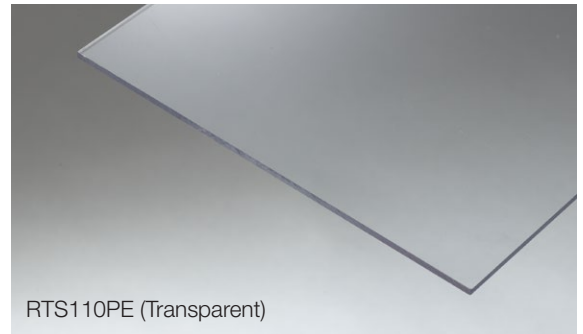
RTS provides transparency that is superior to extruded transparent plates.

● Excellent Secondary Workability

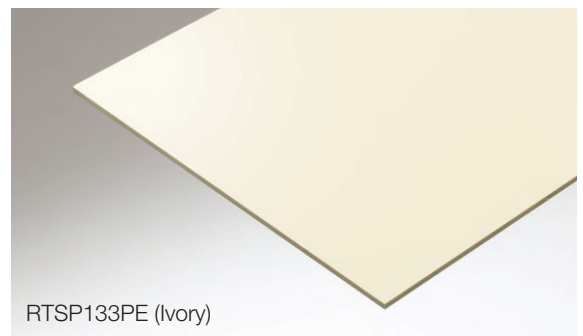
The original texture is maintained during welding and thermal bending, and the surface of the heated parts remains intact.

● Horizontal and Vertical Dimensional Changes by Heat Treatment Are Low

Compared to extruded plates and press laminated plates, the rate of dimensional change by heat treatment is low.



RTS110PE (Transparent)



RTSP133PE (Ivory)

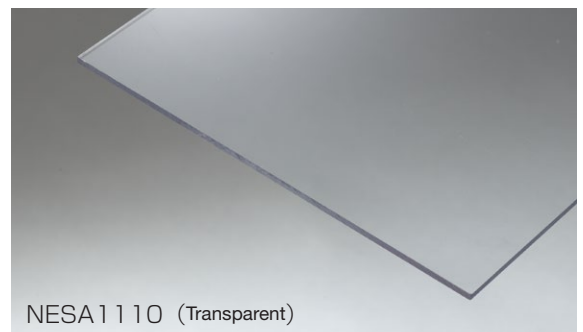
Specifications for Each Product Type

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | | | | | | |
|---------------|----------------|--------------------------------|---------------|----------------|-----|-----|-----|-----|-----|------|------|------|--|
| | | | | Size (mm) | 3.0 | 4.0 | 5.0 | 6.0 | 8.0 | 10.0 | 15.0 | 20.0 | |
| RTS | 110PE | ✓ | Transparent | 1,000×2,000 | (4) | (3) | (3) | (2) | (1) | (1) | (1) | (1) | |
| | | | | 1,212×2,424 | (3) | (2) | (2) | (2) | (1) | (1) | (1) | (1) | |
| RTSP | 133PE | ✓ | Ivory | 1,000×2,000 | (4) | (3) | (3) | (2) | (1) | (1) | (1) | (1) | |
| | | | | 1,212×2,424 | (3) | (2) | (2) | (2) | (1) | (1) | (1) | (1) | |

New Extrusion Molding Transparency

High appearance quality and high transparency PVC plate by extrusion new molding method.

Compared to conventional transparent PVC plates, it has a superior in a transparency and appearance.



NESA1110 (Transparent)

Specifications for Each Product Type

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | | | |
|-----------------------------------|----------------|--------------------------------|---------------|----------------|-----|-----|-----|-----|-----|------|
| | | | | Size (mm) | 3.0 | 4.0 | 5.0 | 6.0 | 8.0 | 10.0 |
| NESA (New Method of Extrusion) | 1110 | ✓ | Transparent | 1,000×2,000 | (4) | (3) | (3) | (2) | (1) | (1) |
| | | | | 1,212×2,424 | (3) | (2) | (2) | (2) | (1) | (1) |

Note 1: Standard products are marked with a check mark (✓). The number in brackets is the number of products in one case.

Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive*. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.

* (1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)

Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials.

(As of April 30, 2022)

Rigid PVC Plates Suitable for a Wide Range of Applications

Extruded Plates

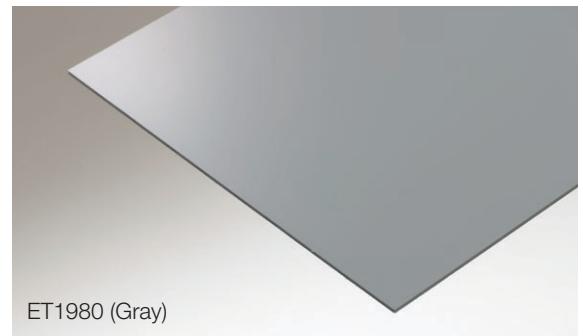
Standard Rigid PVC Plates

This is the first successful product produced using the T-die method in Japan. Even during heat treatment, the surface tends to maintain its original texture and gloss. It is also possible to produce long sizes.

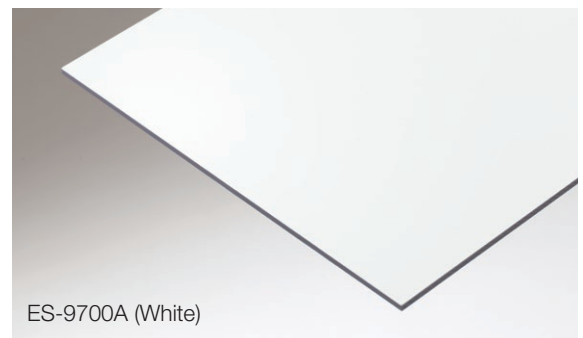
The product can be used for plating equipment, etching equipment, or as an all-purpose industrial material for a wide range of applications.

⚠ Caution

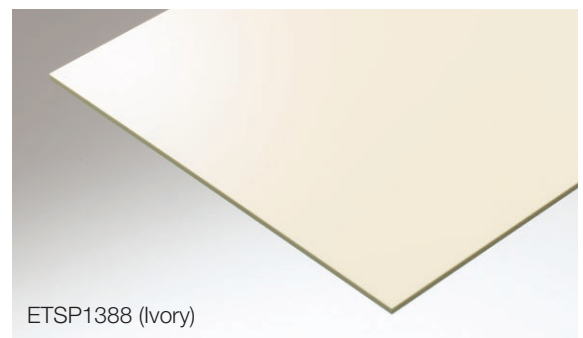
Depending on the thickness, the surface condition of type ET1980 may differ. Contact us for more information.



ET1980 (Gray)



ES-9700A (White)



ETSP1388 (Ivory)

Specifications for Each Product Type

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | | | | | | | | | | | | | |
|---------------|---------------------------|--------------------------------|---------------|----------------|------|------|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|--|--|
| | | | | Size (mm) | 0.8 | 1.0 | 1.5 | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 8.0 | 10.0 | 12.0 | 15.0 | 18.0 | 20.0 | | |
| ET | 1980 | ✓ | Gray | 1,000×2,000 | | (12) | (8) | (6) | (4) | (3) | (3) | (2) | (1) | (1) | (1) | (1) | (1) | (1) | | |
| | | | | 1,212×2,424 | | | (4) | (3) | (2) | (2) | (2) | (1) | (1) | (1) | (1) | | (1) | | | |
| | | | | 1,500×2,000 | | | | | | (1) | * | (1) | (1) | * | | * | | | | |
| ETSP | 1388 | ✓ | Ivory | 1,000×2,000 | | | | (6) | (4) | (3) | (3) | | (1) | (1) | | (1) | | (1) | | |
| | | | | 1,220×2,440 | | | | (3) | (2) | (2) | | (1) | (1) | | (1) | | (1) | | | |
| ESA | 9810 <small>Note1</small> | ✓ | Transparent | 1,000×2,000 | | | | | (4) | | (3) | | (1) | (1) | | | | | | |
| 1,212×2,424 | | | | | | | | (3) | | (2) | (1) | (1) | | | | | | | | |
| 1,000×2,000 | | | | | | | | | | | | | | | | (1) | | (1) | | |
| 1,212×2,424 | | | | | | | | | | | | | | | | (1) | | (1) | | |
| ESS | 8800A | ✓ | Transparent | 910×1,820 | (15) | (12) | (8) | (6) | (4) | (3) | (3) | | | | | | | | | |
| | | | | 1,000×2,000 | | (12) | (8) | (6) | (4) | (3) | (3) | (2) | | | | | | | | |
| | | | | 1,212×2,424 | | | | | (3) | | (2) | | | | | | | | | |
| ES- | 9700A | ✓ <small>Note2</small> | White | 910×1,820 | | (12) | (8) | (6) | (4) | | (3) | | | | | | | | | |
| | | | | 1,000×2,000 | | (12) | (8) | (6) | (4) | | (3) | | | | | | | | | |

* symbol: Made-to-order product. Please contact us for more information about production lots.

Note1: ESA9810 and ESA-9810 (continuous press) will be stopped production at the end of December 2022, and will be discontinued as soon as the stock runs out.

Note2: Compliant with RoHS and REACH since April 2020.

Note 1: Standard products are marked with a check mark (✓). The number in brackets is the number of products in one case.

Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive*. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.

* (1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)

Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials.

(As of April 30, 2022)

Rigid PVC Plates That Are Highly Resistant to Heat and Suitable for Use in High-Temperature Environments

These heat-resistant plates are rigid PVC plates whose heat-resisting properties have been enhanced, making them suitable for use in fields that require heat resistance that conventional industrial plates cannot provide.

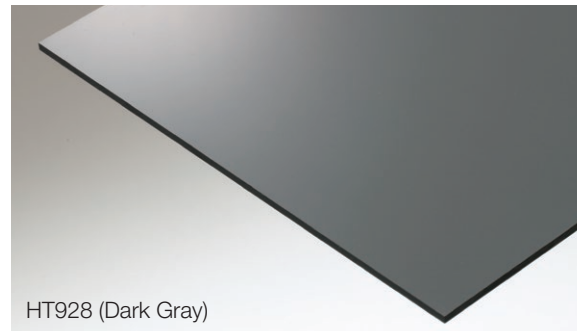
Heat-Resistant Plates

Highest Heat Resistance among PVC Materials

These are laminated plates created by the calender press method using heat-resistant chlorinated polyvinyl chloride (C-PVC). Providing superior mechanical strength, these plates can be used in temperature environments that are about 20°C hotter than the environments in which standard rigid PVC plates can be used.

Caution

The continuous operating temperature is determined by the shape of the equipment and the load stress. Please verify the design for each condition.



HT928 (Dark Gray)

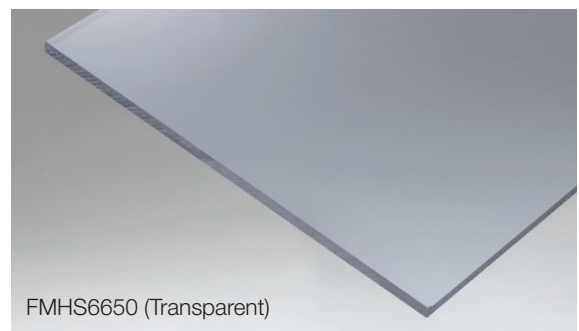
Heat-Resistant Transparent Plates (FM 4910 Listed Materials*)

Transparent Plates with Remarkable Heat Resistance

These heat-resistant plates can resist temperatures that are about 20°C higher than the heat-resistance limit of standard transparent plates. These plates can be used in heat-resistant industrial fields where transparency is required.

Caution

Refrain from using this product for applications where chemicals are mixed with detergents such as surfactant.

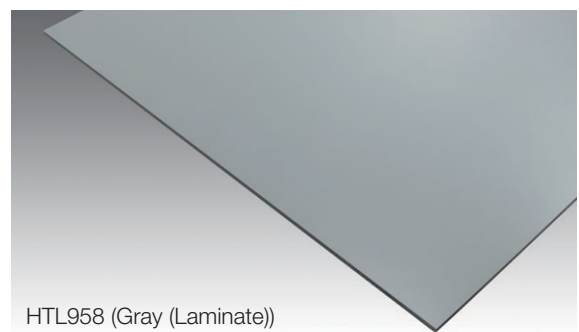
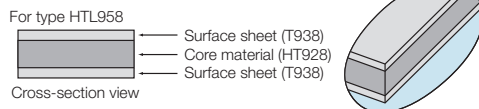


FMHS6650 (Transparent)

HT Laminate

Combining Superior Chemical Resistance and High-Temperature Rigidity

HT Laminate is a material that combines the excellent chemical resistance of a standard PVC plate with the high-temperature rigidity of heat-resistant PVC plates. Heat-resistant PVC plates sometimes react differently to certain chemicals than standard PVC plates, and this may cause problems. However, HT Laminate uses a standard PVC sheet as the surface that makes contact with chemicals, resulting in a plate that has the same chemical resistance as standard PVC and can also be used in the temperature environments in which heat-resistant PVC can be used.



HTL958 (Gray (Laminate))

Specifications for Each Product Type

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) Size (mm) | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 8.0 | 10.0 | 12.0 | 15.0 | 20.0 | 25.0 | 30.0 | 35.0 | 40.0 | 50.0 | 60.0 |
|------------------------|----------------|--------------------------------|---------------|-----------------------------|-----|-----|-----|-----------|-----------|-----|------|------|------|------|------|------|------|------|------|------|
| | | | | | HT | 928 | ✓ | Dark gray | 500×1,000 | | | | | | | | | | | |
| | | | | 1,000×1,000 | | | | | | | | | | (1) | (1) | (1) | (1) | (1) | (1) | (1) |
| | | | | 1,000×2,000 | (6) | (4) | (3) | (3) | (2) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) |
| | | | | 1,212×2,424 | | | | (2) | | (1) | (1) | | (1) | | | | | | | |
| HTL | 958 | ✓ | Gray | 1,000×2,000 | | | | (3) | | (1) | (1) | | | | | | | | | |
| | | | | 1,212×2,424 | | | | * | | * | (1) | | | | | | | | | |
| | 358 | ✓ | Ivory | 1,000×2,000 | | | | (3) | | (1) | (1) | | | | | | | | | |
| | | | | 1,212×2,424 | | | | (2) | | (1) | (1) | | | | | | | | | |
| FMHS (Press laminated) | 6650 | ✓ | Transparent | 1,000×2,000 | | (4) | | (3) | | (1) | (1) | * | | | | | | | | |
| | | | | 1,212×2,424 | | (3) | | (2) | | (1) | (1) | * | | | | | | | | |

* symbol: Made-to-order product. Please contact us for more information about production lots.
 •The production of the HTS625 heat-resistant plate (transparent) has been discontinued as of the last day of March, 2019.
 •As an alternative, use type FMHS 6650 (p. 22).
 •The thickness of the surface sheet of type HTL is 1.0 mm, and is combined as shown in the table on the right.

| Product Number | Surface Types | Core Materials |
|----------------|---------------|----------------------|
| 958 | T938 | HT928 |
| 358 | TSP338 | Heat-resistant ivory |

Note 1: Standard products are marked with a check mark (✓). The number in brackets is the number of products in one case.
 Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.
 *(1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)
 Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials.

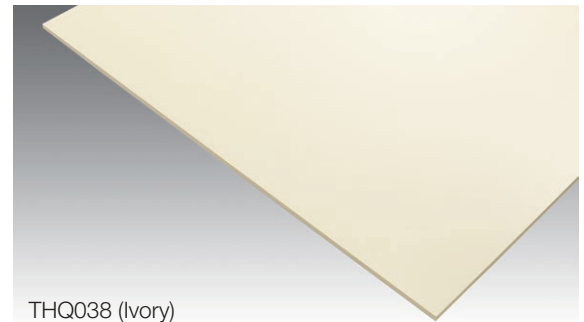
Rigid PVC Plates with Resistance to Impact

These impact-resistant plates provide an impact resistance equal to that of polycarbonate plates.

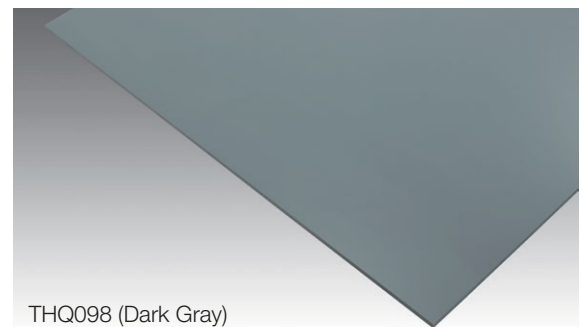
Impact-Resistant Plates

■ PVC Plates with the Highest Impact Resistance among Rigid PVC Materials

This product is carefully balanced to combine the top-notch impact resistance among rigid PVC materials with superior mechanical strength. It is particularly suited for applications that require toughness, such as external panels for large production equipment or large plating equipment.



THQ038 (Ivory)

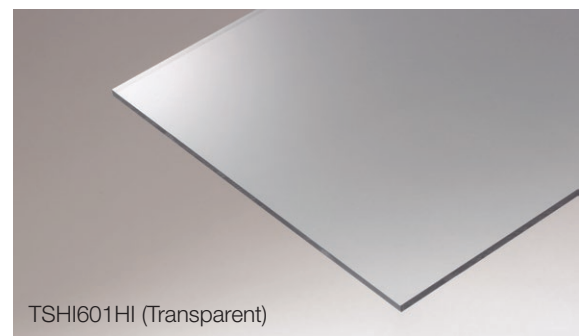


THQ098 (Dark Gray)

Impact-Resistant Plates (Transparent)

■ Transparent Plates Providing Impact Resistance

Impact-resistant plates (transparent) are made from a well-balanced transparent material that combines the impact resistance of a polycarbonate plate and the chemical resistance close to that of a rigid PVC plate. Impact-resistant plates (transparent) can be used for machine covers or in various other fields.



TSHI601HI (Transparent)

Specifications for Each Product Type

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | | | | | | | |
|---------------|----------------|--------------------------------|---------------|----------------|-----|-----|-----|-----|-----|-----|------|------|------|--|
| | | | | Size (mm) | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 8.0 | 10.0 | 15.0 | 20.0 | |
| THQ | 048 | ✓ | Green | 1,000×2,000 | | * | * | * | * | * | * | | | |
| | | | | 1,212×2,424 | | * | | * | | * | | | | |
| | 098 | ✓ | Dark gray | 1,000×2,000 | * | (4) | (3) | (3) | (2) | (1) | (1) | (1) | (1) | |
| | | | | 1,212×2,424 | | (3) | (2) | (2) | (2) | (1) | (1) | | | |
| | 038 | ✓ | Ivory | 1,000×2,000 | | | | (3) | | | | (1) | | |
| | | | | 1,212×2,424 | | | | (2) | | | | (1) | | |
| TSHI | 601HI | ✓ | Transparent | 1,000×2,000 | (6) | (4) | | (3) | | * | | | | |
| | | | | 1,212×2,424 | | (3) | (2) | | | | | | | |
| EQ | 009 | ✓ | Dark gray | 1,000×2,000 | | (4) | | (3) | | * | * | | | |

* symbol: Made-to-order product. Please contact us for more information about production lots.

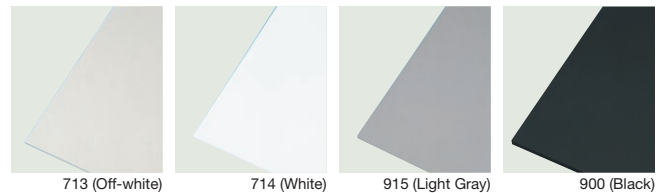
Note 1: Standard products are marked with a check mark (✓). The number in brackets is the number of products in one case.
 Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive*. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.
 *(1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)
 Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials. (As of April 30, 2022)

Rigid PVC Plates for Special Applications

Foam PVC

Light-Weight Low-Foamed Rigid PVC Plates

Foam PVC is a low-foamed rigid PVC plate. Besides having the characteristics of PVC plates, these plates are light (half of a PVC plate) and heat-insulated. Secondary processing is easy and the plates are optimally suited for fields that require light components such as light ducts, chemical-resistant partitions, and pallets. Their characteristics also meet the standards of the Food Sanitation Act.



Specifications for Each Product Type

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | | | | |
|---------------|----------------|--------------------------------|---------------|----------------|------|------|-----|-----|-----|------|------|
| | | | | Size (mm) | 1.0 | 2.0 | 3.0 | 5.0 | 8.0 | 10.0 | 15.0 |
| Foam PVC | 713 | ✓ | Off-white | 910×1,820 | (20) | (10) | (6) | (4) | (2) | (2) | |
| | | | | 1,000×2,000 | (20) | (10) | (6) | (4) | (2) | (2) | (1) |
| | 714 | | White | 910×1,820 | (20) | (10) | (6) | (4) | | | |
| | | | | 1,000×2,000 | | | (6) | | | | |
| | 915 | | Light gray | 1,000×2,000 | | (10) | (6) | (4) | (2) | (2) | * |
| 900 | Black | 1,000×2,000 | | (10) | (6) | (4) | | | | | |

- * symbol: Made-to-order product. Please contact us for more information about production lots.
- The foaming ratio is approximately x2.
- Contact us for more information about made-to-order 115 (red), 415 (green), or 515 (blue).

Foam PVC HI Boards (laminated products composed of foam PVC and polyethylene)

| Product Types | Product Number | Compliance with RoHS and REACH | Nominal Thickness (mm) | Size (mm) | Packaging |
|--------------------|----------------|--------------------------------|------------------------|-----------|-----------|
| Foam PVC HI boards | 1000H | ✓ | 10.0 | 910×1,820 | (5) |
| | 1500H | ✓ | 15.0 | 910×1,820 | (4) |
| | 2000H | ✓ | 20.0 | 910×1,820 | (3) |
| | 3000H | ✓ | 30.0 | 910×1,820 | (2) |
| | 5000H | ✓ | 50.0 | 910×1,820 | (1) |

- Note: Sales will end at the end of March 2023.
- Packaging: Cardboard Store in a location not exposed to direct sunlight.

Note 1: Standard products are marked with a check mark (✓). The number in brackets is the number of products in one case.
 Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.
 *(1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)
 Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials. (As of April 30, 2022)

Rigid PVC Plates for Creating Original Designs

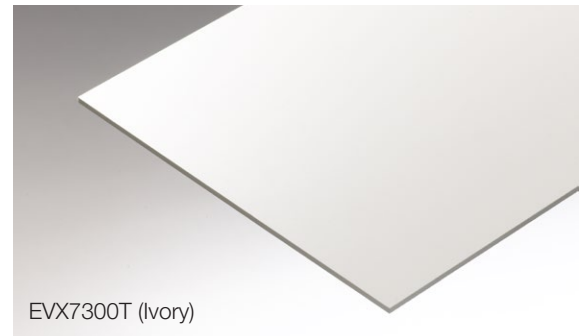
Rigid PVC for Vacuum Forming

Molding Plates with Excellent Shape Reproducibility

The excellent shape reproducibility enables extreme deep-draw molding, resulting in a finish that is equal to injection-molded products. This product also has superior chemical resistance and impact resistance characteristics.

Applications

Peripheral equipment for office automation, machine covers for industries, displays, etc.



Specifications for Each Product Type

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Grain No. | Thickness (mm) | | | | | |
|---------------|----------------|--------------------------------|---------------|-----------|----------------|-----|-----|---|-----|---|
| | | | | | Size (mm) | | | | | |
| EVX | 7300T | ✓ | Ivory | 31 | 1,000×2,000 | * | (3) | * | (2) | * |
| | 7350S | ✓ | Olive gray | 30 | | * | (3) | | * | |
| | 7350T | ✓ | | 31 | | | * | | | |
| | 7700T | ✓ | White | 31 | | (5) | (3) | * | (2) | |
| | 7900S | ✓ | Black | 30 | | * | (3) | * | | |
| | 7900T | ✓ | | 31 | | * | (3) | * | (2) | |
| | 7980S | ✓ | Gray | 30 | | * | * | * | * | |
| | 7980T | ✓ | | 31 | | * | (3) | | * | |
| EVC- | 8600 | ✓ | Transparent | – | 1,000×2,000 | (5) | (3) | | (2) | |

* symbol: Made-to-order product. Lot: 1,000 kg

• Product numbers ending in T indicate coarse-grained products (matte particles on the surface), and product numbers ending in S indicate fine-grained products (matte particles on the surface).

Lots and Ranges of Made-to-Order Products

| Number | Product Types | Specifications | Thickness (mm) | Width (mm) | Length (mm) | Order Lots |
|--------|---------------|-------------------------|----------------|----------------|----------------|---|
| (1) | EVX | | 1.8 to 6.0 | 550 to 1,000 | 550 to 3,820 | 1 color, 1 thickness, 1 size 1,000 kg or more |
| ☆ | EVX, EVD | Width: 1,500 | 5.0 to 7.0 | 1,300 to 1,500 | 1,200 to 3,000 | 1 color, 1 thickness, 1 size 3,000 kg or more |
| (2) | EVD- | | 1.8 to 6.0 | 550 to 1,000 | 550 to 3,820 | 1 color, 1 thickness, 1 size 1,000 kg or more |
| (3) | EVC- | Transparent | 1.8 to 6.0 | 600 to 1,000 | 550 to 3,820 | 1 color, 1 thickness, 1 size 2,000 kg or more |
| (4) | EVH- | Heat-resistant | 2.0 to 6.0 | 600 to 1,000 | 550 to 3,820 | 1 color, 1 thickness, 1 size 2,000 kg or more |
| (5) | EVG- | High-gloss | 2.0 to 6.0 | 600 to 1,000 | 550 to 3,820 | 1 color, 1 thickness, 1 size 2,000 kg or more |
| (6) | EVND | Static-dissipative | 2.0 to 6.0 | 600 to 1,000 | 550 to 3,820 | 1 color, 1 thickness, 1 size 2,000 kg or more |
| (7) | EVW- | Heavy weather-resistant | 2.0 to 5.0 | 600 to 1,000 | 550 to 3,820 | 1 color, 1 thickness, 1 size 1,000 kg or more |

☆ Types EVX and EVD with a width of 1,500 are only available as flat products.

Note 1: Standard products are marked with a check mark (✓). The number in brackets is the number of products in one case.

Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive*. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.

* (1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)

Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials.

(As of April 30, 2022)

Supporting Materials for Plate Processing That Widen the Application Range ①

Rod/Angle/Channel/Rail Materials

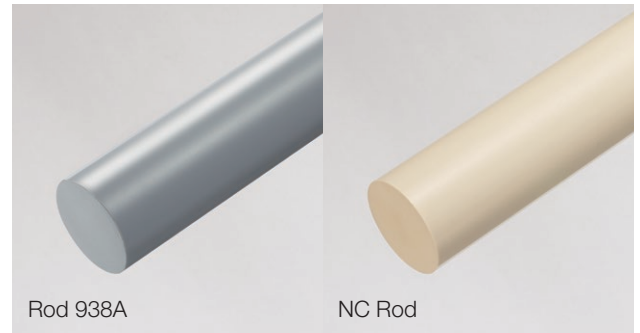
Rods

Supporting Materials with Outstanding Machining Workability and Dimensional Stability

Used for parts such as flanges, these materials are easy to cut and drill, and provide remarkable dimensional stability when compared to other resins.

⚠ Caution

It has been observed that the welding strength of HT rods tends to diminish. Contact us for more information.



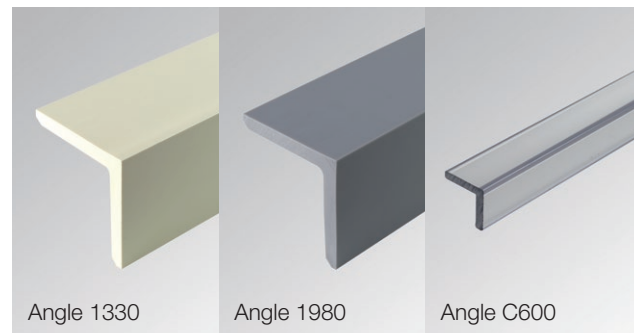
Rod 938A

NC Rod

Angles

Supporting Materials

These are typical supporting materials used when reinforcement is required for separate use of PVC plates of limited strength in various equipment.



Angle 1330

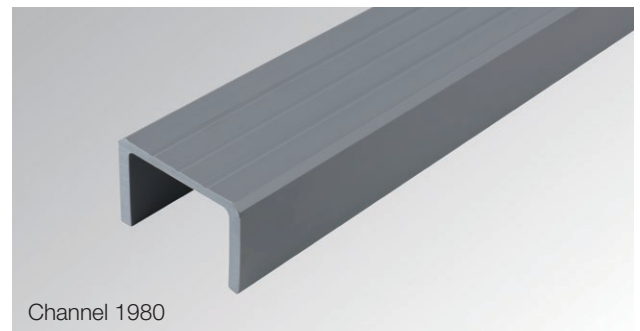
Angle 1980

Angle C600

Channels

Supporting Materials Providing Excellent Reinforcing Effects

Similar to angles, channels are used as a supporting material in various base materials used to build equipment. They provide stronger reinforcing effects than angles.

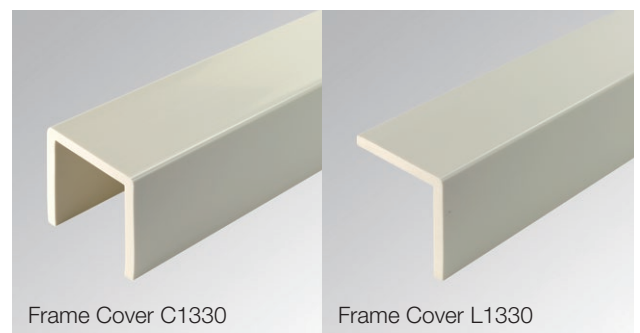


Channel 1980

Frame Covers

Contributing to Labor Saving in Manufacturing and Construction

These are contour-extruded products made from rigid vinyl chloride resin that cover metal frames in semiconductor production equipment and similar machinery.



Frame Cover C1330

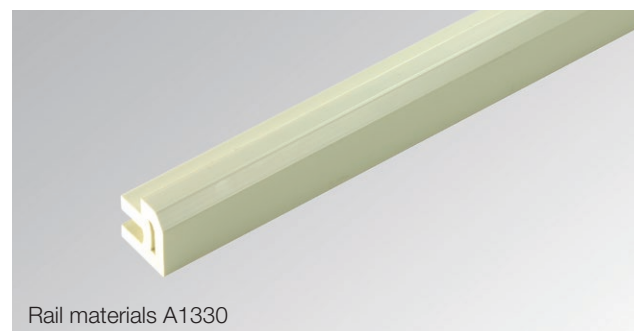
Frame Cover L1330

Rail materials

Rail Materials That Contribute to Labor Saving in Manufacturing and Construction

These are contour-extruded products made from rigid vinyl chloride resin for use as rails around the working openings in semiconductor production equipment and similar machinery.

*For the standards regarding the rods, angles, and channels, refer to the Specification Tables for All Product Types (p. 106).



Rail materials A1330

Supporting Materials for Plate Processing ②
That Widen the Application Range

Welding Rods

Outstanding Processing Effectiveness

Used for welding operations on various types of equipment that incorporate plates, this product provides excellent chemical resistance and is an indispensable supporting material in industrial fields. As we provide a wide variety of shapes, color tones, and grades, you can choose the properties that are most suitable for your type of plate.

*For the standards regarding welding rods, refer to the Specification Tables for All Product Types (p. 107 to 109). For selection, refer to the List of Plates and Corresponding Recommended Welding Rods (p. 126).

Adhesive Rods

Increased Reinforcing Properties for Adhesion Processes

*For the standards regarding adhesive rods, refer to the Specification Tables for All Product Types (p. 109).

Adhesive for Our Products

Various Adhesives Suitable for a Wide Range of Applications

Adhesive No. 200 For rigid PVC
 No. 600 For metal-free plates
 No. 700 For super PET plates (surface adhesion)
 No. 750 For super PET plates (edge adhesion)
 (Quick-drying type)

| Adhesives | Components (Other Names) | Content (m/m%) | CAS No. | (Chemical Substances Control Law) MITI No. |
|------------------------------|---|-------------------|----------|--|
| Adhesive 200 Adhesive 600 | Tetrahydrofuran (Diethylene oxide) | Approx. 80% | 109-99-9 | 5-53 |
| | Methyl ethyl ketone (2-Butanone) | Approx. 20% | 78-93-3 | 2-542 |
| | Isopropyl alcohol (Sec-Propyl alcohol) | Less than 1% | 67-63-0 | 2-207 |
| Adhesive 700 | Methyl ethyl ketone (2-Butanone) | Approx. 70% | 78-93-3 | 2-542 |
| | Acetone (2-Propanone) | Approx. 30% | 67-64-1 | 2-542 |
| Adhesive 750 | Methyl ethyl ketone (MEK, 2-Butanone) | Approx. 14% | 78-93-3 | 2-542 |
| | Toluene (Methylbenzene) | Approx. 42% | 108-88-3 | 3-2 |
| | Acetone (Dimethyl ketone, 2-Propanone) | Approx. 44% | 67-64-1 | 2-542 |

*For the standards regarding adhesives, refer to the Specification Tables for All Product Types (p. 109).

Anti-static Agent

Anti-static Agent That Does Not Easily Accumulate Dust

When the plastic of rigid PVC plates is electrified, dust tends to stick to it. However, by using anti-static agent, this dust-accumulating property is eliminated.

Warning

Be particularly careful with fire when handling this product.

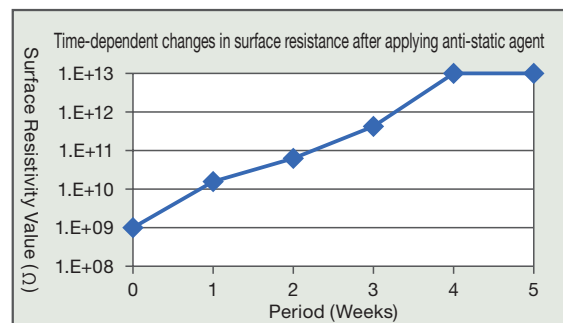
Welding Rods/Adhesives



Warning

As all adhesives contain flammable solvents, be particularly careful with fire and ventilation when handling these products.

In order to export Adhesive No. 700, you need to obtain an export permit from the government of Japan (based on an export permit application submitted to the Ministry of Economy, Trade and Industry) in accordance with the Foreign Exchange and Foreign Trade Act.



*This is an effect that occurs when the product is left statically. Its durability differs depending on the actual usage conditions. When the product is wiped with water or alcohol, it will lose its anti-static properties.



Note: The anti-static functionality lasts for two to three weeks (depending on the usage conditions and environment).

Processed PVC Products

Cover Series

Covers Providing High Workability and Low Cost

Cover Series

Covers for Liquid Chemical Piping

Useful for Protection of People and Buildings and Implementation of Environmental Measures

(Leakage detection covers/for welding flanges and TS flanges <made-to-order product>)

In any type of production factory, measures to protect the environment are an important issue. When accidental leakage occurs in a pipeline junction (flange part) for chemicals used at production factories, flange covers for leakage detection play an important role as devices for early detection and protection. They contribute to environmental protection by limiting soil pollution and bodily injury caused by liquid chemical leakage to a minimum.

Easy Installation

As plastic molded products are lightweight, this product can be easily installed on existing piping in high places.

Extensive Product Line to Match Any Pipe Diameter

We offer sizes optimally suited for various flange connections.

Low Cost

As this is a standardized product, the price is lower than that of existing hand-processed products.

Easy Detection of Liquid Chemical Leakage

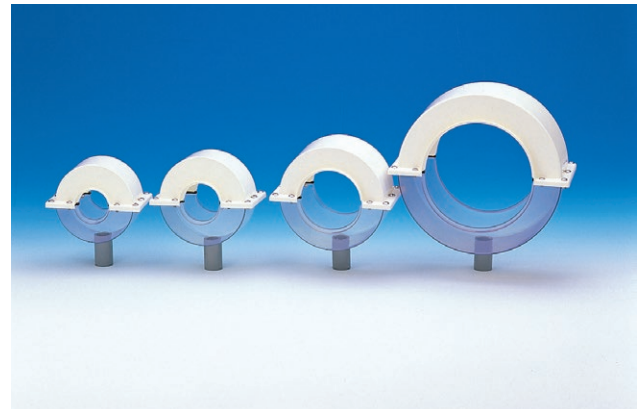
As the cover bottom is transparent (for type TS, both the top and bottom are transparent), the location of leaks can be detected at an early stage.

Excellent Chemical Resistance

The body is made of rigid PVC for vacuum forming, which provides an outstanding balance between impact resistance and chemical resistance.

Caution

This product is designed for the detection of leakage. Be aware that it has no storage functionality for leaked chemicals.



For welding flanges



For TS flanges (made-to-order products)

Specifications for Each Product Type

For Welding Flanges

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Size (mm) | | | | | | Nominal Diameter | Name |
|---------------|----------------|--------------------------------|------------------------|-----------|-----|-----|-----|-----|----|------------------|------|
| | | | | ∅ A | ∅ B | C | D | E | F | | |
| Flange cover | F25 | ✓ | Upper side Ivory | 130 | 40 | 80 | 165 | 115 | 10 | 25A | 25A |
| | F40 | ✓ | | 155 | 53 | 80 | 190 | 115 | 10 | 25A | 40A |
| | F50 | ✓ | | 170 | 65 | 80 | 205 | 115 | 10 | 25A | 50A |
| | F65 | ✓ | | 190 | 80 | 80 | 225 | 115 | 10 | 25A | 65A |
| | F80 | ✓ | | 200 | 95 | 80 | 235 | 115 | 10 | 25A | 80A |
| | F100 | ✓ | | 225 | 130 | 100 | 260 | 135 | 10 | 25A | 100A |
| | F125 | ✓ | Lower side Transparent | 265 | 140 | 115 | 300 | 150 | 10 | 25A | 125A |
| | F150 | ✓ | | 295 | 175 | 125 | 330 | 160 | 10 | 25A | 150A |
| | F200 | ✓ | | 340 | 225 | 125 | 375 | 160 | 10 | 25A | 200A |
| | F250 | ✓ | | 410 | 280 | 135 | 445 | 170 | 10 | 25A | 250A |
| | F300 | ✓ | | 455 | 335 | 135 | 490 | 170 | 10 | 25A | 300A |

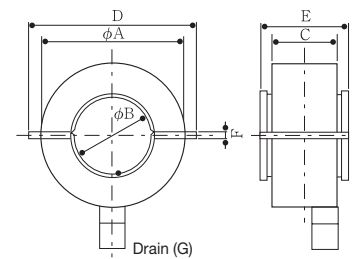
* A cover set for welding flanges includes cover top, cover bottom, two packings, ten small truss screws, ten flat washers, ten spring washers, ten nuts, and one to three backup materials. The number between brackets is the amount.

For TS Flanges (Made-to-Order Products)

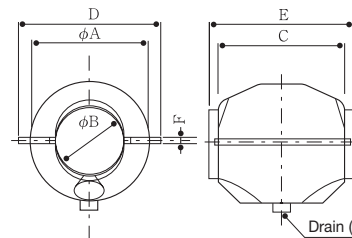
| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Size (mm) | | | | | | Nominal Diameter | Name |
|---------------|----------------|--------------------------------|---------------|-----------|-----|-----|-----|-----|----|------------------|------|
| | | | | ∅ A | ∅ B | C | D | E | F | | |
| Flange cover | TS25 | ✓ | Transparent | 140 | 48 | 130 | 173 | 170 | 10 | 25A | 25A |
| | TS40 | ✓ | | 155 | 64 | 135 | 188 | 175 | 10 | 25A | 40A |
| | TS50 | ✓ | | 170 | 76 | 155 | 203 | 195 | 10 | 25A | 50A |
| | TS65 | ✓ | | 190 | 92 | 170 | 223 | 210 | 10 | 25A | 65A |
| | TS80 | ✓ | | 200 | 106 | 180 | 233 | 220 | 10 | 25A | 80A |
| | TS100 | ✓ | | 225 | 130 | 220 | 258 | 260 | 10 | 25A | 100A |
| | TS125 | ✓ | | 265 | 156 | 265 | 298 | 305 | 10 | 25A | 125A |
| | TS150 | ✓ | | 295 | 181 | 335 | 328 | 375 | 10 | 25A | 150A |
| | TS200 | ✓ | | 345 | 232 | 345 | 378 | 385 | 10 | 25A | 200A |

Note: Sales will end at the end of March 2023.

Flange Covers for Fluid Leak Checks <Shape Drawing>



For welding flanges (Material: PVC)



For TS flanges (made-to-order products) (Material: PVC)

Note 1: Standard products are marked with a check mark (✓). The number in brackets is the number of products in one case.

Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.

* (1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)

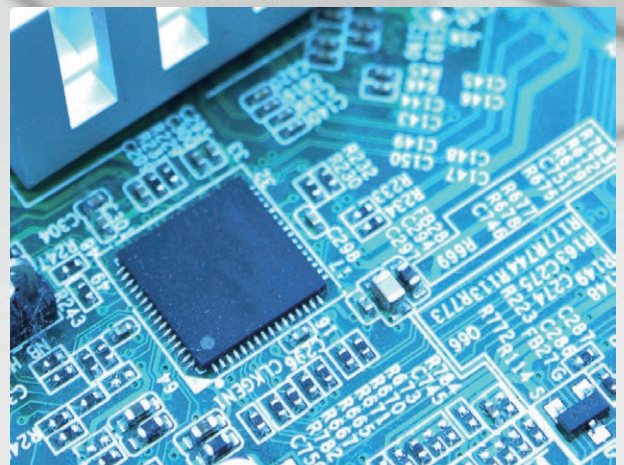
Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials.

Note 4: Although type F125 does not require backup materials, no backup materials are included.

(As of April 30, 2022)

High Functional Products

- FM Plates p. 22-23
- Static-Dissipative Plates p. 24-29
- Electromagnetic Wave Shielding Plates p. 30
- Metal-Free Plates p. 31
- Laser-Shielding Plates p. 32-33



Contributing to Fire Safety in Semiconductor Factories (FM 4910 Listed Materials)

About the FM 4910 Standard

The FM 4910 standard is a flame-retardation standard for clean room materials (effective as of October 1997) established by the U.S. non-life insurance company FM Global with the aim of preventing fire.

- (1) **Fire Propagation Index:** Value that determines the level of fire propagation in case of fire (FPI: Fire Propagation Index) ≤ 6
- (2) **Smoke Damage Index:** Value that determines the level of pollution caused by smoke (SDI: Smoke Damage Index) ≤ 0.4

The standard value for each index is specified in the FM 4910 standard.

PVC FM Plates

● Superb Ignition Resistance and Fire Propagation Resistance

This material does not ignite easily, and if it does ignite, it does not spread fire easily.

● Low Smoke Emission after Ignition

In case of fire, this material emits a lower amount of smoke compared to other plastics.

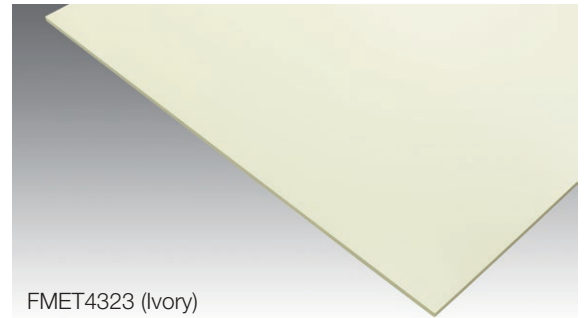
● Superb Workability

This product offers a workability for processes such as welding, adhesion, and thermal bending that is nearly equal to conventional PVC plates.

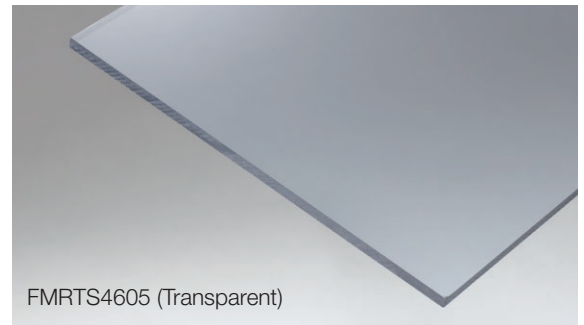
● Superb Chemical Resistance

This product offers a chemical resistance against various types of acids and alkalis that is nearly equal to conventional PVC plates.

Note: Compared to non-transparent plates, transparent plates may be more easily affected by solvent atmospheres and surfactant solutions. Be sure to check the conditions in which it is going to be used in advance.



FMET4323 (Ivory)



FMRTS4605 (Transparent)



(FM approval label)

Specifications for Each Product Type

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | | | | | | | | Grades | |
|-----------------------------|-------------------------|--------------------------------|---------------|----------------|-----|-----|-----|------|------|------|------|------|------|------|---------------------------------------|----------------|
| | | | | Size (mm) | 3.0 | 5.0 | 8.0 | 10.0 | 12.0 | 15.0 | 20.0 | 25.0 | 30.0 | 40.0 | | |
| FMET (Continuous press) | 4323 | ✓ | Ivory | 1,000×2,000 | (4) | (3) | (1) | (1) | | | (1) | (1) | (1) | (1) | (1) | Standard |
| | | | | 1,212×2,424 | (3) | (2) | (1) | (1) | | | | | | | | |
| FMET- (Press Lamination) | 4773 | ✓ | White | 500×1,000 | | | | | | | | | | (1) | | Standard |
| | | | | 1,000×2,000 | (4) | (3) | (1) | (1) | | (1) | (1) | (1) | (1) | (1) | | |
| FMRTS (Continuous press) | 4605 | ✓ | Transparent | 1,000×2,000 | (4) | (3) | (1) | (1) | | | | (1) | (1) | (1) | (1) | Standard |
| | | | | 1,212×2,424 | (3) | (2) | (1) | (1) | | | | | | | | |
| FMH (Press Lamination) | 5305 ^{Note 4} | ✓ | Ivory | 1,000×2,000 | (4) | (3) | (1) | (1) | | | (1) | (1) | (1) | (1) | (1) | Heat-resistant |
| | | | | 1,212×2,424 | | (2) | (1) | (1) | | | | | | | | |
| | 5775 | ✓ | White | 1,000×1,000 | | | | | | | | | | (1) | | |
| | | | | 1,000×2,000 | (4) | (3) | (1) | (1) | | (1) | (1) | (1) | (1) | (1) | | |
| FMHS (Press Lamination) | 6650 | ✓ | Transparent | 1,000×2,000 | (4) | (3) | (1) | (1) | * | | | | | | Heat-resistant/ Static-dissipative | |
| | | | | 1,212×2,424 | (3) | (2) | (1) | (1) | * | | | | | | | |
| FMND (Press Lamination) | 7605 | △ | Transparent | 1,000×2,000 | (4) | (3) | (1) | (1) | | | | | | | Heat-resistant/ Static-dissipative | |
| | | | | 1,212×2,424 | (3) | (2) | (1) | (1) | | | | | | | | |
| FMND- (Continuous press) | 74605 ^{Note 5} | ✓ | Transparent | 1,000×2,000 | * | * | | | | | | | | | Static-dissipative | |
| | | | | 1,212×2,424 | * | * | | | | | | | | | | |
| | 74602 ^{Note 6} | ✓ | Transparent | 1,000×2,000 | (4) | (3) | (1) | (1) | | | | | | | | |
| | | | | 1,212×2,424 | (3) | (2) | (1) | (1) | | | | | | | | |

△: It is not compliant only with REACH.
 * symbol: Made-to-order product. Please contact us for more information about production lots.
 Note 4: Products manufactured from April 2019 onwards comply with the RoHS Directive and REACH Regulations.
 Note 5: Orders will cease at the end of September 2022.
 Note 6: From June 2022, FMND-74602 will be the standard product.
 • The continuous press method is used for FMET plates that are 3 mm to 10 mm thick. The press lamination method is used for FMET plates that are 15 mm to 40 mm thick.

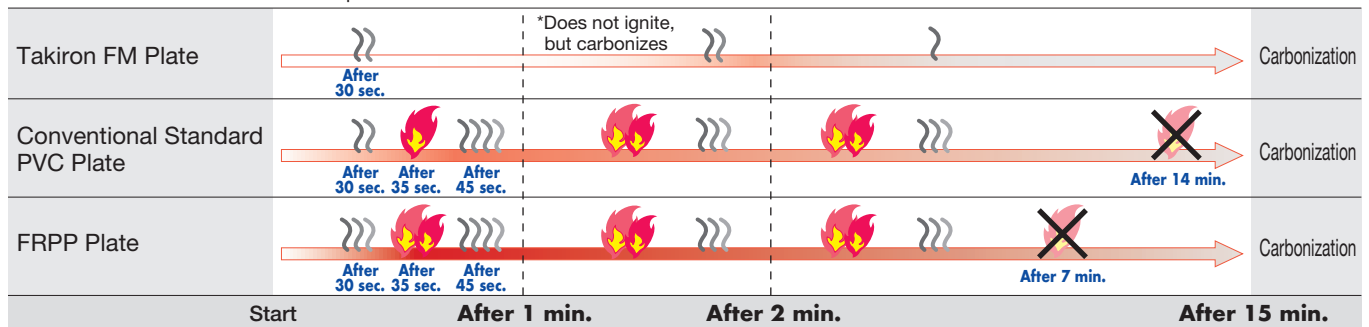
Note 1: Standard products are marked with a check mark (✓). The number in brackets is the number of products in one case.
 Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive*. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.
 *(1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)
 Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials. (As of April 30, 2022)

FM Plate Series

Fire Safety Evaluation of FM 4910 Listed Materials (Compared to Standard PVC and Flame-Retardant PP (FRPP))

Combustion Test Using a Cone Calorimeter (Compliant with International Standards Including ISO 5660 and ASTM E 1354)

Illustration of the combustion process of various materials : Ignition : Fire dies out : Amount of smoke



● The degree to which FM plates burn differs depending on the product type.

Takiron FM Plate

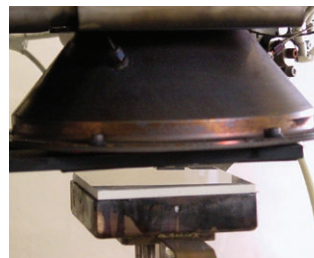


Ignited using a 10,000 V electric spark.



The material carbonizes without igniting.

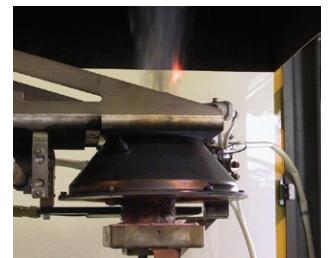
Start of test



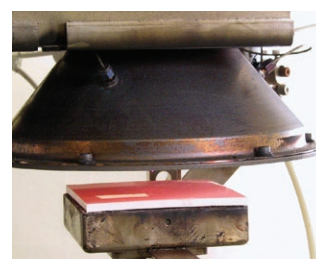
After 35 sec.



After 5 min.



Standard PVC Plate



FRPP Plate
(UL94 V-0)

Sample size: 100 mm x 100 mm x 5 mm (thickness) Measured at 50 kW/m² of radiant heat

Cone Calorimeters

A cone calorimeter is a measuring device for evaluating and analyzing the burning mechanisms of fire and materials. Its use enables researchers to understand the time-dependent changes of a material by minutely observing the entire burning process of the material as it changes along with the fire.

Using this combustion-assessment device, researchers can conduct quantitative and comprehensive evaluations of various combustion parameters, such as changes in the oxygen concentration during burning, and obtain data correlating to fire tests on actual products.

*The colors in the images may differ from the actual products.

Providing Consistent Static-Dissipative Functionality under Various Conditions

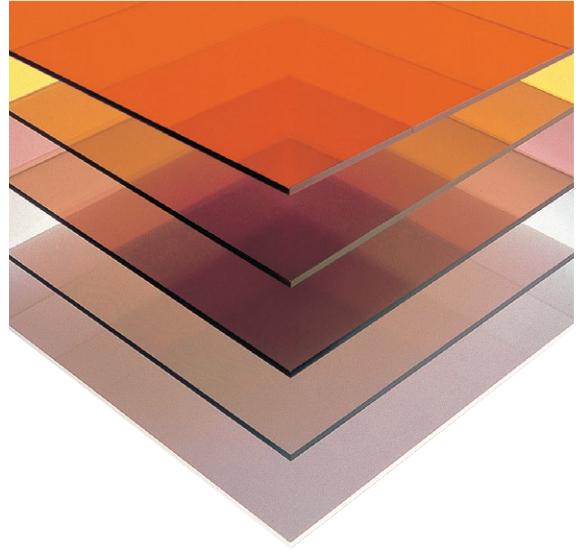
Static-Dissipative Plate Series

This material offers excellent anti-static properties with a surface resistivity of 10^6 to $10^9 \Omega/\square$, and can be used for various industrial fields, particularly fields involving semiconductors and liquid crystal. Offering circuit board materials from rigid PVC to polycarbonate and PET, we use our company's unique technology to make sure that none of the physical properties are lost in the creation of static-dissipative circuit boards. The material is also resistant to humidity and friction, and provides consistent static-dissipative functionality under various conditions.

Applications

This product is suitable for various types of manufacturing that require a clean environment, and can be used across a wide range of fields, particularly those involving semiconductor production equipment and related equipment, and electronics, electricity, and precision equipment. It is ideally suited for components that require anti-static properties, such as containers and clean room-related equipment.

- **Equipment for Producing Semiconductors/Liquid Crystal Panels and Related Equipment**
Clean benches, draft chambers, various cleaning equipment, wafer carrier boxes, parts boxes, desiccators, clean storage equipment, various cases, various covers, partition plates, clean ducts
- **Clean Room-Related**
Clean tunnels, windows, partitions, hanging partition walls, various covers, louvers, louver vents
- **Other**
Meter covers, machine covers, displays, various observation windows, various equipment housings, parts boxes

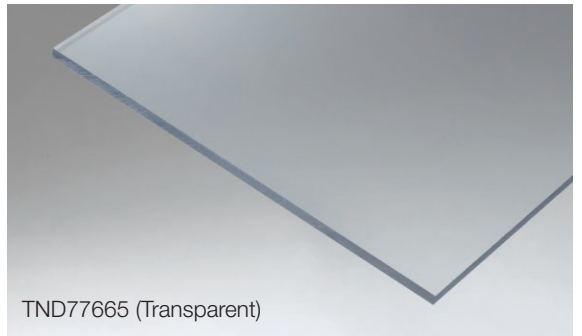


Static-Dissipative Plate Lineup

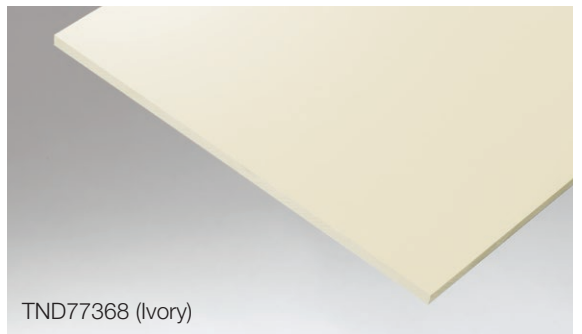
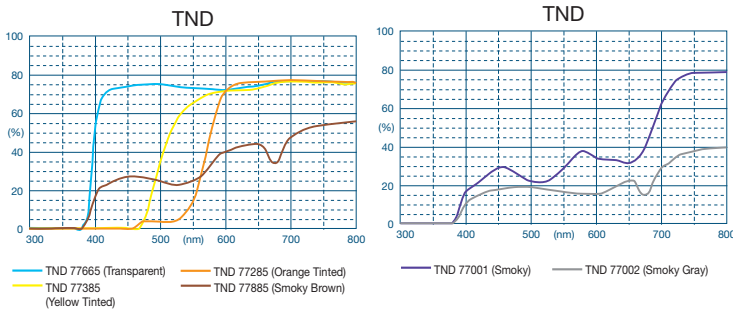
We offer the following Takiron static-dissipative plate product types.

| Base Materials | Product Types |
|--------------------------------|----------------|
| Rigid polyvinyl chloride (PVC) | TND/FMND/ESND |
| Amorphous polyester (PETG) | PETND/PETND MR |
| Polycarbonate (PC) | PCNDL |

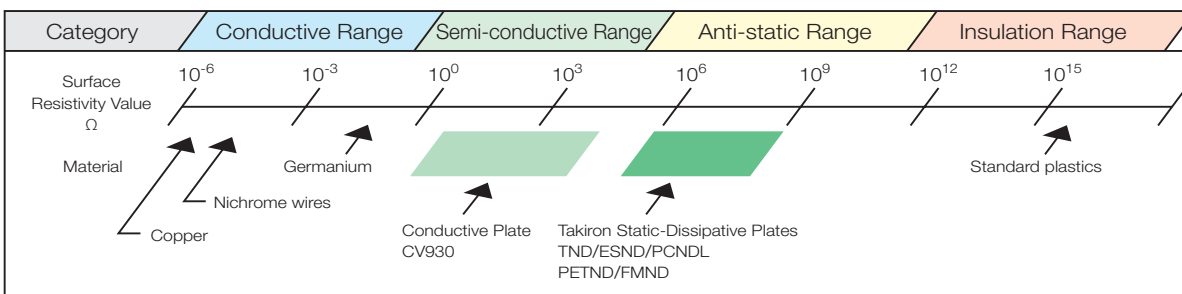
*Type FMND is an FM 4910 listed material.



Transmittance Curve by Wavelength



General Electrical Properties



PVC Static-Dissipative Plates That Offers Remarkable Transparency, Chemical Resistance, and Workability

PVC Static-Dissipative Plates

● Low Humidity Dependence

The characteristics are not readily affected by humidity.

● Superb Physical Properties

This product offers superior mechanical strength, chemical resistance, and workability.

● Other

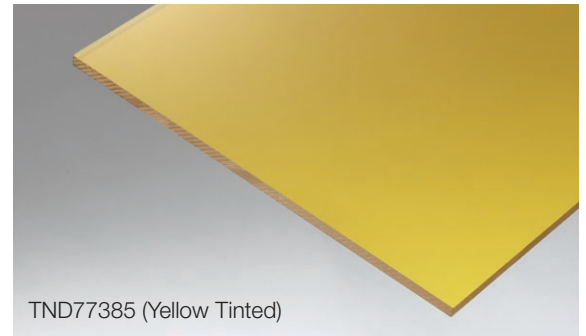
This material complies to the UL standard (94V-0) for all grades.

| Standard Names | Corresponding Product Number |
|----------------------|--|
| UL-certified product | TND77665* (Colored transparent, Ivory) |

*Type TND77665 of 3.0 mm or more are 5VA-compliant as well.

Applications

Assembly workbenches, anti-static covers, workbench covers, and transportation and storage box of parts that are sensitive to dust and waste



TND77385 (Yellow Tinted)

PVC Conductive Plates

● Machinable

This product can be machined since it is kneading type.

● Mechanical Properties

Providing enhanced impact resistance (compared to our other products), this material is not easily damaged or cracked by vibrations and other impacts.

● Environmentally Friendly

This product is an environmentally friendly, lead-free plate.



TND CV930 (Black)

Specifications for Each Product Type

| | Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | 1.0 | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 8.0 | 10.0 | | |
|------------------------|---------------|-------------------------|--------------------------------|---------------|----------------|-------------|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|
| | | | | | Size (mm) | | | | | | | | | | | |
| Static-dissipative PVC | TND | 77665 | ✓ | Transparent | 1,000×2,000 | | | (6) | (4) | (3) | (3) | (2) | (1) | (1) | | |
| | | 77285 | ✓ | Orange tinted | 1,212×2,424 | | | | (3) | (2) | (2) | (2) | (1) | (1) | | |
| | | 77385 | ✓ | Yellow tinted | 1,000×2,000 | | | | | (4) | | (3) | | | | |
| | | 77885 | ✓ | Smoky brown | 1,212×2,424 | | | | | | | (2) | | | | |
| | | 77368 ^{Note 4} | ✓ | Ivory | 1,000×2,000 | | | | | (4) | | (3) | | (1) | (1) | |
| | | | | | | 1,212×2,424 | | | | | | (3) | | (2) | (1) | (1) |
| | | 77001 | ✓ | Smoky | 1,000×2,000 | | | | | (4) | | (3) | | (1) | (1) | |
| | | 77002 | ✓ | Smoky gray | 1,212×2,424 | | | | | | | (2) | | | | |
| | ESND | 47800 ^{Note 5} | ✓ | Transparent | 1,000×2,000 | | | | | (4) | | (3) | | (1) | (1) | |
| | | | | | | 1,212×2,424 | | | | | (3) | | (2) | (1) | (1) | |
| | | 47802 ^{Note 6} | ✓ | Transparent | 1,000×2,000 | | | | | (4) | | (3) | | (1) | (1) | |
| | | | | | | 1,212×2,424 | | | | | (3) | | (2) | (1) | (1) | |
| | | 47300 ^{Note 5} | ✓ | Yellow tinted | 1,000×2,000 | | | | | (4) | | (3) | | | | |
| | | | | | | 1,212×2,424 | | | | | | * | | | | |
| Conductive PVC | TND | CV930 | ✓ | Black | 1,000×2,000 | (12) | (6) | (4) | | | (3) | | (1) | (1) | | |
| | | | | | 1,212×2,424 | | | | | * | | | | | | |

* symbol: Made-to-order product. Please contact us for more information about production lots.

Note 4 : 77368 is the successor of 77348.

Note 5: Production will end at the end of September 2022, and the product will be discontinued as soon as the stock runs out.

Note 6: ESND 47802, ESND 47302 has been the standard product since June 2022.

From October 2022, ESND-47800 ⇒ ESND-47802 and ESND-47300 ⇒ ESND-47302.

Note 1: Standard products are marked with a check mark (✓). The number in brackets is the number of products in one case.

Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive*. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.

* (1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)

Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials.

(As of April 30, 2022)

Anti-static PETG Plates with Remarkable Environmental Adaptability and Transparency

Static-Dissipative PET Plates

Static-dissipative PET plates are high-performance anti-static plates that combine the best properties of Takiron super PET plates with anti-static capabilities.

Besides the anti-static capabilities, type MR also has scratch resistance.

«Common Characteristics of PETND-76600 and PETND MR»

● Excellent Transparency

This material provides clear transparency with little haze.

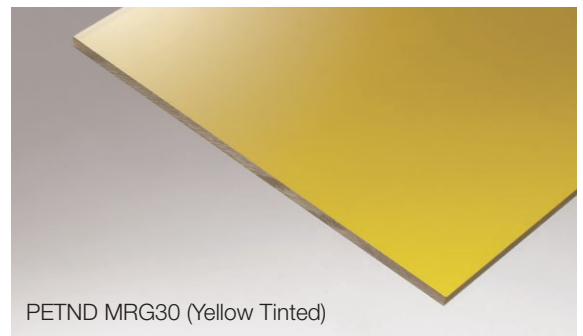
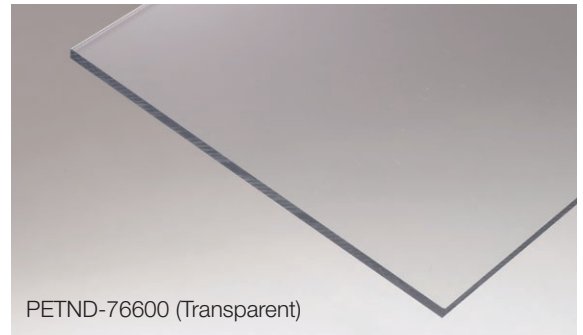
● Suitable for All Environments

The material does not contain any halogen compounds and is environmentally friendly.

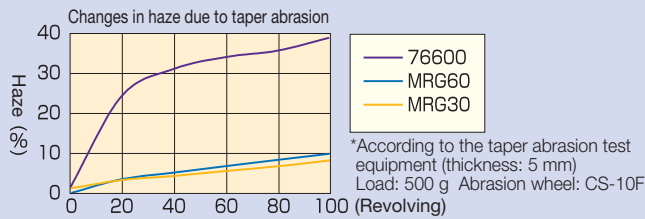
«Characteristics of PETND MR»

● Superb Scratch Resistance

Hard coat treatment of the surface provides better protection against scratches when compared to standard PET plates, so the material can be used for a long time.



Scratch Resistance



● Superb Chemical Resistance

Hard coat treatment of the surface enhances the solvent resistance, surpassing that of standard PET plates.

● UV Protection

Yellow tinted type MRG30 blocks ultraviolet rays of specific wavelength ranges, and can be expected to have an anti-sensitization effect.

*Type PETND MR cannot be used for adhesion, welding, or thermal bending.

Specifications for Each Product Type

| | Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | | | |
|------------------------|---------------------|----------------|--------------------------------|---------------|----------------|-----|-----|-----|-----|-----|------|
| | | | | | Size (mm) | 3.0 | 4.0 | 5.0 | 6.0 | 8.0 | 10.0 |
| Static-dissipative PET | PETND- | 76600 | ✓ | Transparent | 1,000×2,000 | (4) | | (3) | | (1) | (1) |
| | | | | | 1,220×2,440 | (4) | (2) | (2) | (2) | | |
| | PETND (Hard coated) | MRG60 | ✓ | Transparent | 1,000×2,000 | (4) | | (3) | | | |
| | | MRG30 | ✓ | Yellow tinted | 1,000×2,000 | (4) | | (3) | | | |

Note 1: Standard products are marked with a check mark (✓). The number in brackets is the number of products in one case.

Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.

*(1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)

Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials.

(As of April 30, 2022)

Anti-static PC Plates with Outstanding Impact-Resisting Strength

Static-Dissipative PC Plates

Static-dissipative polycarbonate plates are high functional anti-static plates that combine the best properties of polycarbonate plates (*) with anti-static capabilities.

These plates are suitable for use in various industries that require clean environments, particularly in semiconductor and other high-tech fields.

They can be used for conventional partitions and covers, as well as for parts trays, carrier boxes, and transportation devices.

*For the advantages of polycarbonate, refer to p. 41.

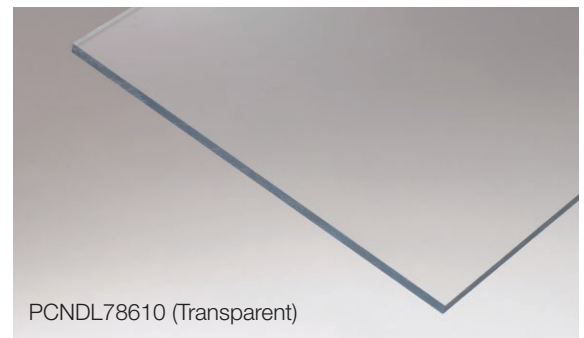
- Impact Resistance
- Transparency
- Thermal Conductivity
- Heat and Cold Resistance
- Electrical Insulation

UL-Certified Products

Type PCNDL is a UL94 HB-class product. We also offer 94V-0 (5 mm thick) and 94V-1 (3 mm thick) (PCNDU: made-to-order product) class products.

Compliant with the Food Sanitation Act

Type PCNDL is compliant with the Food Sanitation Act (Public Notice of the Ministry of Health, Labour and Welfare No. 595 of 2012).



Optical Properties of Static-Dissipative Polycarbonate Plates

| Items | Unit | Product Names and Numbers | | Testing Methods |
|---------------------------|------|---------------------------|--|-----------------|
| | | PCNDL 78610 | | |
| Total light transmittance | % | 86 | | JIS K 7361-1 |
| Haze | % | 1.3 | | JIS K 7136 |

*The above data are a series of test results for a 5 mm thick specimen and given here without guarantee. (Test temperature: 23°C)

Specifications for Each Product Type

| | Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | |
|-----------------------|---------------|----------------|--------------------------------|---------------|----------------|-----|-----|
| | | | | | Size (mm) | 3.0 | 5.0 |
| Static-dissipative PC | PCNDL | 78610 | ✓ | Transparent | 1,000×2,000 | (4) | (3) |
| | | 78810 | ✓ | Smoky brown | 1,220×2,440 | (4) | (2) |
| | | 78910 | ✓ | Smoky gray | 1,000×2,000 | (4) | (3) |

Note 1: Standard products are marked with a check mark (✓). The number in brackets is the number of products in one case.

Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive*. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.

* (1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)

Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials.

(As of April 30, 2022)

High Functional Products

Static-Dissipative Plates

Chemical Resistance

Stain resistance test (Surface-dripping test: Left for 24 hours at 23°C and 50% RH)

| | Names of Chemicals | Concentration | Static-Dissipative Capability | | | | | | Changes in Appearance | | | | | |
|------------------|--------------------|---------------|-------------------------------|---------------------|----------------------------|-------|-------|----------|-----------------------|----------------------------|-------|-------|----------|---|
| | | | TND | ESND | FMND (Press lamination) | PCNDL | PETND | PETND MR | TND | FMND (Press lamination) | PCNDL | PETND | PETND MR | |
| Acids/Alkalis | Hydrochloric acid | 36% | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | | 20% | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | Sulfuric acid | 97% | ✓ | × ^{Note 1} | ✓ | × | × | × | ✓ | × Yellowing | × | × | × | × |
| | | 60% | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | × | |
| | Nitric acid | 60% | ✓ | ✓ | ✓ | ✓ | ✓ | × | ✓ | ✓ | × | × | × | |
| | | 40% | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | × | × | × | |
| | Phosphoric acid | 85% | ✓ | △ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | Acetic acid | 95% | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | × | × | ✓ | |
| | Hydrofluoric acid | 46% | ✓ | ✓ | ✓ | ✓ | — | ✓ | ✓ | ✓ | ✓ | — | × | |
| | | 10% | ✓ | ✓ | ✓ | ✓ | — | ✓ | ✓ | ✓ | ✓ | — | ✓ | |
| | Hydrogen peroxide | 10% | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | Sodium hydroxide | 50% | ✓ | × ^{Note 1} | ✓ | ✓ | × | ✓ | ✓ | ✓ | ✓ | × | × | |
| Ammonia water | 25% | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| Organic Solvents | Methanol | 100% | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | Ethanol | 100% | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | △ Rough surface | ✓ | ✓ | ✓ | |
| | Isopropanol | 100% | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | Butanol | 100% | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | △ Rough surface | ✓ | ✓ | ✓ | |
| | Ethylene glycol | 100% | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | Acetone | 100% | ✓ | ✓ | × | ✓ | ✓ | ✓ | × | × | × | × | ✓ | |
| | Toluene | 100% | ✓ | ✓ | × | ✓ | ✓ | ✓ | × | × | × | × | ✓ | |
| Other | Saline water | 30% | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | Ammonium fluoride | 50% | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | Potassium chloride | 10% | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | Neutral detergent | 10% | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |

Evaluation: ✓ No change △ Slight change × Significant change

*These results are dripping test results (short-term) of single chemicals under circumstances without any stress loads. The results may differ when the materials are exposed to long-term dripping.

The results may also differ because of the conditions under which the material is used. Be sure to take sufficient precautions, such as by conducting preliminary examinations.

Note 1: Compared to type TND, the reaction of type ESND differs when used in an environment that contains concentrated sulfuric acid or sodium hydroxide.

Electrical Properties of Static-Dissipative Plates

- Saturated charge voltage: Low (almost no electrification)
- Effect of temperature/humidity: Stable
- Effect of friction: Negligible (static-dissipative capability is maintained)

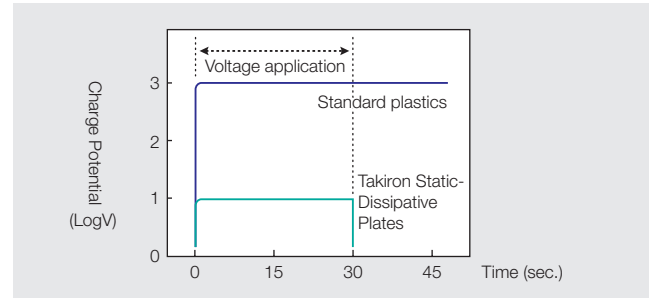
| Items | Unit | Takiron Static-Dissipative Plates | Standard Plastics | Measurement Methods |
|--------------------------|------------------|-----------------------------------|---------------------|---------------------|
| Surface resistivity | Ω/\square | 10^6 to 10^9 | 10^{16} or more | JIS K6911 |
| Volume resistivity | $\Omega \cdot m$ | 10^{17} to 10^{18} | 10^{18} or more | JIS K6911 |
| Saturated charge voltage | V | 10 or less | 3,000 | * |
| Half life | sec | 1 or less | Long period of time | * |

*According to the Static Honestmeter

Voltage (+) of 10,000 V was applied for 30 sec.

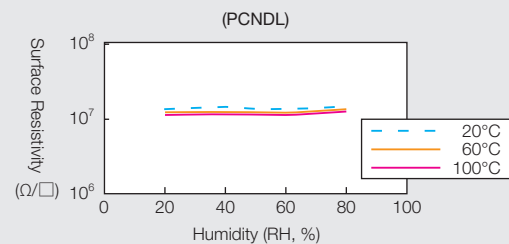
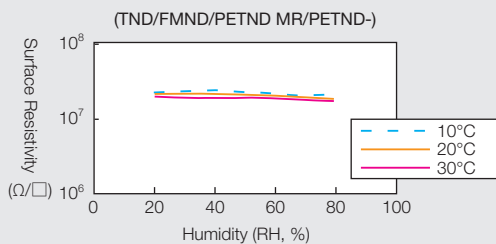
After voltage application, the charge potential and decay time were measured (at 23°C and 50% RH).

The distance between the voltage source and testing samples was 20 mm.



Effects of Temperature and Humidity

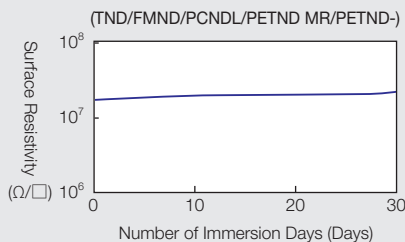
Changes in temperature and humidity do not result in significant changes in the static-dissipative capability, and the superior capabilities remain stable.



Measurement method: JIS K6911 (at 23°C and 50% RH)

Effects of Water

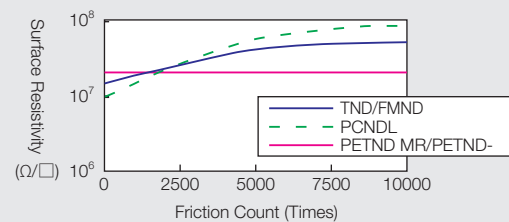
The material provides good water resistance; hardly any effect was observed when exposed to water.



Test conditions: Static immersion at room temperature
Measurement method: JIS K6911 (at 23°C and 50% RH)

Effects of Friction

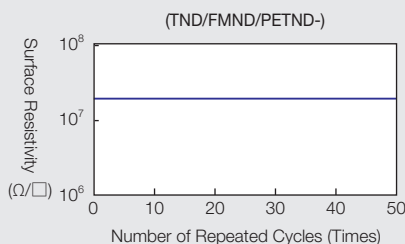
Friction on the surface had negligible effects and the superior static-dissipative capability remained intact.



Test conditions: JIS L0849 friction test equipment type II Load 500 g, friction caused by nylon cloth
Measurement method: JIS K6911 (at 23°C and 50% RH)

Effects of Cold-Heat Cycles

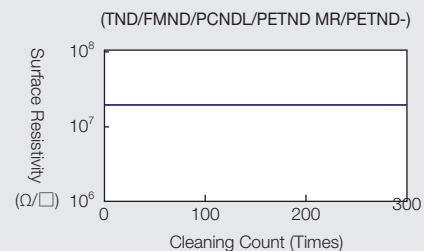
Even when exposed to harsh temperature changes, the static-dissipative capability is only slightly affected and remains stable.



Test conditions:
Continuous cycle testing with one cycle ranging from -20°C (30 min.) to +60°C (30 min.)
Measurement method: JIS K6911 (at 23°C and 50% RH)

Effects of Surface Cleaning

No changes caused by isopropyl alcohol (IPA) were observed.



Measurement method: JIS K6911 (at 23°C and 50% RH)

Plastic Materials for Preventing Electromagnetic Interference

The electromagnetic wave shielding plate series is a revolutionary plastic material that protects against a wide frequency range of electromagnetic waves.

Easy Grounding Static-Dissipative Plate

● Superb Electromagnetic Wave Protection Properties

PVC/PC electromagnetic wave shielding plates maintain electric field shielding of about 60 dB across a wide frequency band.

● Easy Grounding

PVC/PC electromagnetic wave shielding plates feature conductive mesh that is pressure bonded onto the surface (surface resistivity of $1 \Omega/\square$ or lower). This enables you to easily ground equipment by establishing contact with metal housing, conductive tape, or gaskets.

● Superb Heat Resistance and Impact Resistance

PC electromagnetic wave shielding plate provides the high heat resistance and impact resistance of polycarbonate.

● Superb Anti-static Functionality

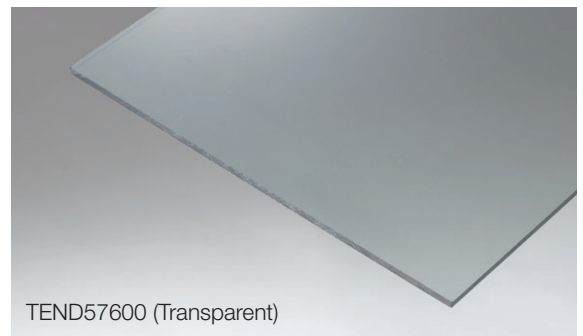
The conductive mesh surface and the opposite surface provide anti-static properties with a surface resistivity of 10^6 to $10^9 \Omega/\square$.

● Easy Secondary Processing

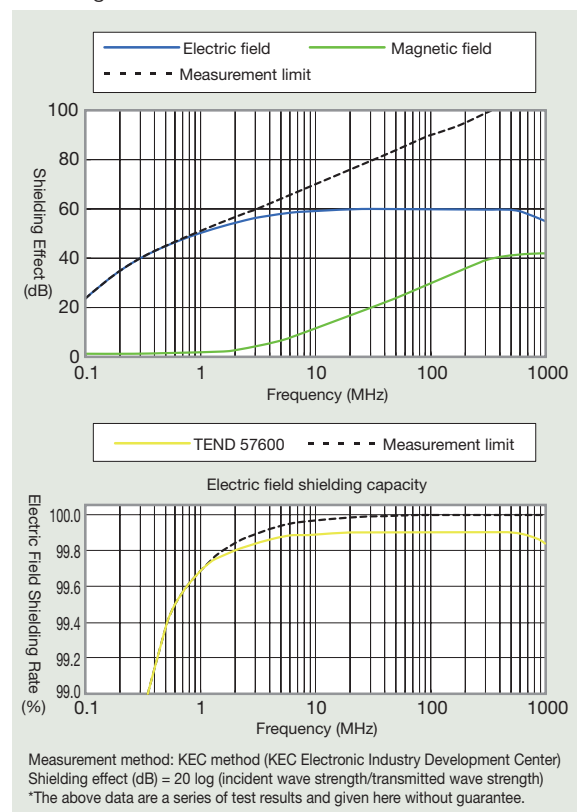
This material can be easily cut, drilled, or bent. (When bending, make sure that the conductive mesh ends up on the inside.)

Applications

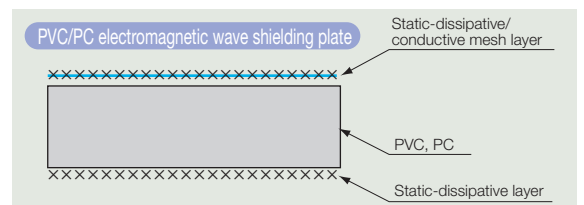
Covers for computers and office automation equipment, covers for semiconductor production equipment, observation windows, various production line partitions, areas where electromagnetic waves emitted by electronic equipment are thought to negatively affect other equipment



Shielding Effect



● Cross-Section View



Specifications for Each Product Type

| | Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Nominal Thickness (mm) | | |
|---|---------------|----------------|--------------------------------|---------------|------------------------|-----|-----|
| | | | | | Size (mm) | 3.0 | 5.0 |
| PVC electromagnetic wave shielding plate | TEND | 57600 | ✓ | Transparent | 1,000×2,000 | (4) | (3) |
| PC electromagnetic wave shielding plate ^{Note} | PCEND | 57610 | ✓ | Transparent | 1,000×2,000 | (4) | (3) |

• Actual thickness of type TEND: Nominal thickness + 0.25 mm
 • Actual thickness of type PCEND: Nominal thickness + 0.15 mm
 Note : Production will end at the end of March 2023, and the product will be discontinued as soon as the stock runs out.

Note 1: Standard products are marked with a check mark (✓). The number in brackets is the number of products in one case.
 Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive*. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.
 *(1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)
 Note 3: *Note 2* applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials. (As of April 30, 2022)

PVC Plates for Applications That Require High Material Purity

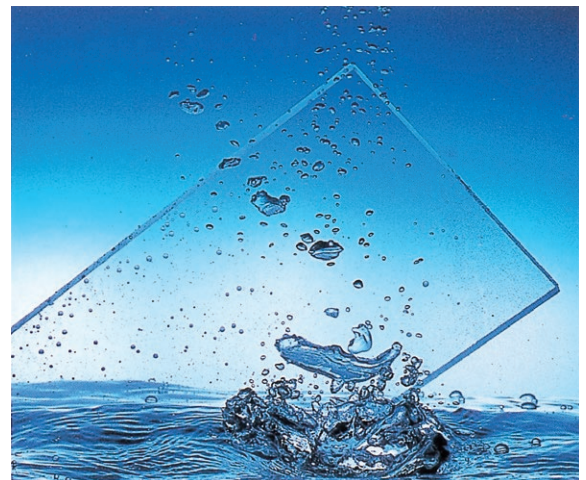
Metal-Free Plates

■ Metal-Free and Chemical-Resistant Materials for Semiconductors and Laboratory Applications

Our metal-free plates are not treated with any kind of metallic stabilizer and are made from materials that contain minimum amounts of metallic components. These plates are ideal for semiconductor production equipment, where metal elution can cause issues, laboratory instruments, where metallic components often lead to malfunctions, medical instruments, and similar equipment.

- **Ultralow Metal Content (Lead, Tin, Calcium, Etc.)**
- **Ultralow TOC and Metal Elution Amounts**
- **Chemical Resistance Level Equivalent to Standard PVC Plates**
- **Superb Mechanical Properties and Workability**
- **Excellent Transparency**
- **Compliant with the Food Sanitation Act**

(Public Notice of the Ministry of Health, Labour and Welfare No. 201 of 2006)
(Public Notice of the Ministry of Health, Labour and Welfare No. 267 of 2002)



TMC60601 (Transparent)

Applications

- Equipment for the production of semiconductors and other related instruments
Clean benches, draft chambers, various cleaning equipment, cleaning tanks, liquid chemical tanks, receptacles for tanks, etc.
- Laboratory instruments
Chemical-resistant test equipment, desiccators, analytical equipment, etc.
- Medical instruments
- Food production machinery
- Other general industrial applications

Metal Content in Metal-Free Products

(Unit: ppm)

| Samples | Metallic Elements | Pb | Sn | Ca | Zn | Mg | Cd | Fe | Ti | Al | Na | Cu |
|---------------------------------|-------------------|----|------|-----|-----|-----|-----|-----|------|-----|----|-----|
| Metal-free plates (transparent) | TMC 60601 | ND | ND | ND | ND | ND | ND | 4.6 | ND | 2.7 | ND | 0.6 |
| Metal-free plates (ivory) | TMC 60331 | ND | ND | 1.2 | ND | ND | ND | 3.0 | 4.0 | 4.0 | 3 | 0.5 |
| Rigid PVC plates (transparent) | TS608 | ND | 6700 | 0.6 | ND | ND | ND | 2.6 | ND | 1.4 | 3 | 0.9 |
| Pipes for ultrapure water (PVC) | | ND | 950 | 340 | 16 | 1.3 | ND | 0.9 | 1200 | 20 | — | — |
| PVDF plates (natural) | | ND | ND | ND | ND | ND | ND | 0.2 | ND | ND | — | — |
| Minimum detection threshold | | 1 | 2 | 0.1 | 0.5 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 1 | 0.2 |

Notes 1: Pb and Sn were analyzed by atomic absorption spectrometry and other substances were analyzed by inductively coupled plasma atomic emission spectroscopy.
2: "ppm" stands for parts per million (µg/g). 3: All values below the minimum detection threshold are marked as ND (not detected). 4: Unanalyzed substances are marked with a line (—). 5: The above data are a series of test results and given here without guarantee.

Specifications for Each Product Type

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | |
|---------------|----------------|--------------------------------|---------------|----------------|-----|-----|-----|------|
| | | | | Size (mm) | 3.0 | 5.0 | 8.0 | 10.0 |
| TMC | 60601 | △ ^{Note} | Transparent | 1,000×2,000 | (4) | (3) | (1) | (1) |
| | 60331 | △ ^{Note} | Ivory | 1,000×2,000 | (4) | (3) | (1) | (1) |

Note: It is not compliant only with REACH.

Note 1: Standard products are marked with a check mark (✓). The number in brackets is the number of products in one case.
Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive*. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.
* (1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)
Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials. (As of April 30, 2022)

High Functional Products

Laser-Shielding Plates

Safety-Ensuring Material That Is Particularly Suited to Prevent Eye (Retina) Damage

Laser Shielding Plates

● Shielding Laser Beams of All Wavelengths

The shielding capacity against laser beams has an optical density (OD value) between 4 and 6.

● High Impact Resistance

With a Charpy notched impact strength of 60 kJ/m², this material offers an impact strength that is extremely high compared to standard transparent PVC plates (approx. 2.0 kJ/m²).

● High Flame Retardation

Offering high flame retardation, the material is UL94 V-0-certified for all grades.

● Environmentally Friendly

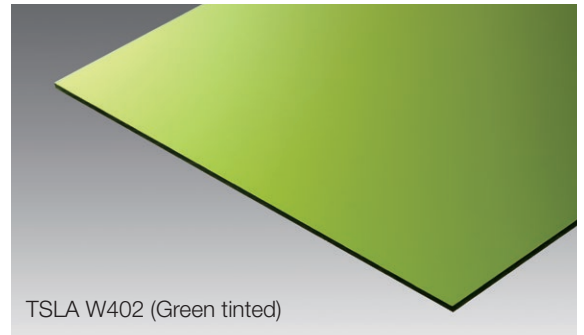
This product complies with the European Union RoHS directive and other environmental standards, and does not contain substances that place a burden on the environment.

● Superb Anti-static Functionality

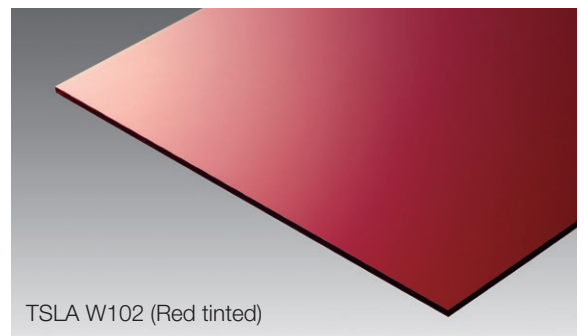
This material offers superior anti-static properties with a surface resistivity of 10⁸ to 10⁹ Ω/□. It is also resistant to humidity and friction, and provides consistent static-dissipative functionality. (Static-dissipative types)

Applications

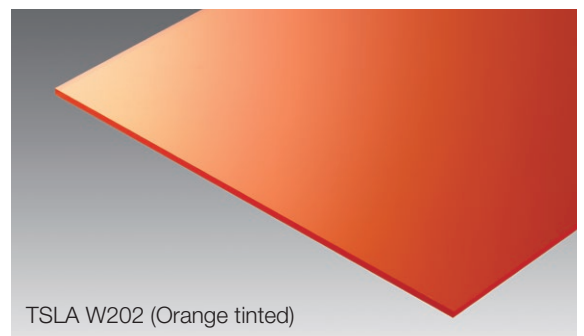
Covers for processing equipment that uses wavelength lasers



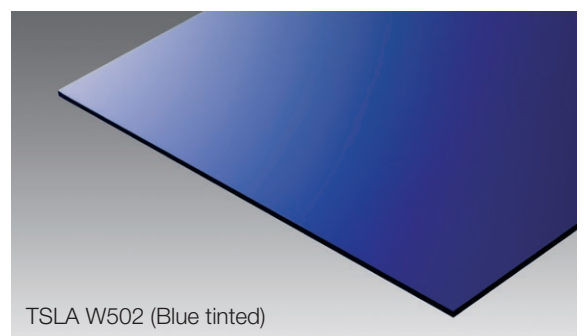
TSLA W402 (Green tinted)



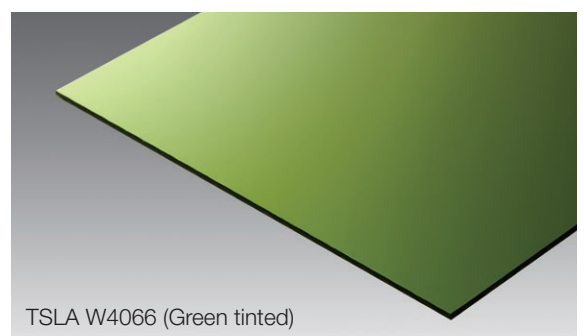
TSLA W102 (Red tinted)



TSLA W202 (Orange tinted)

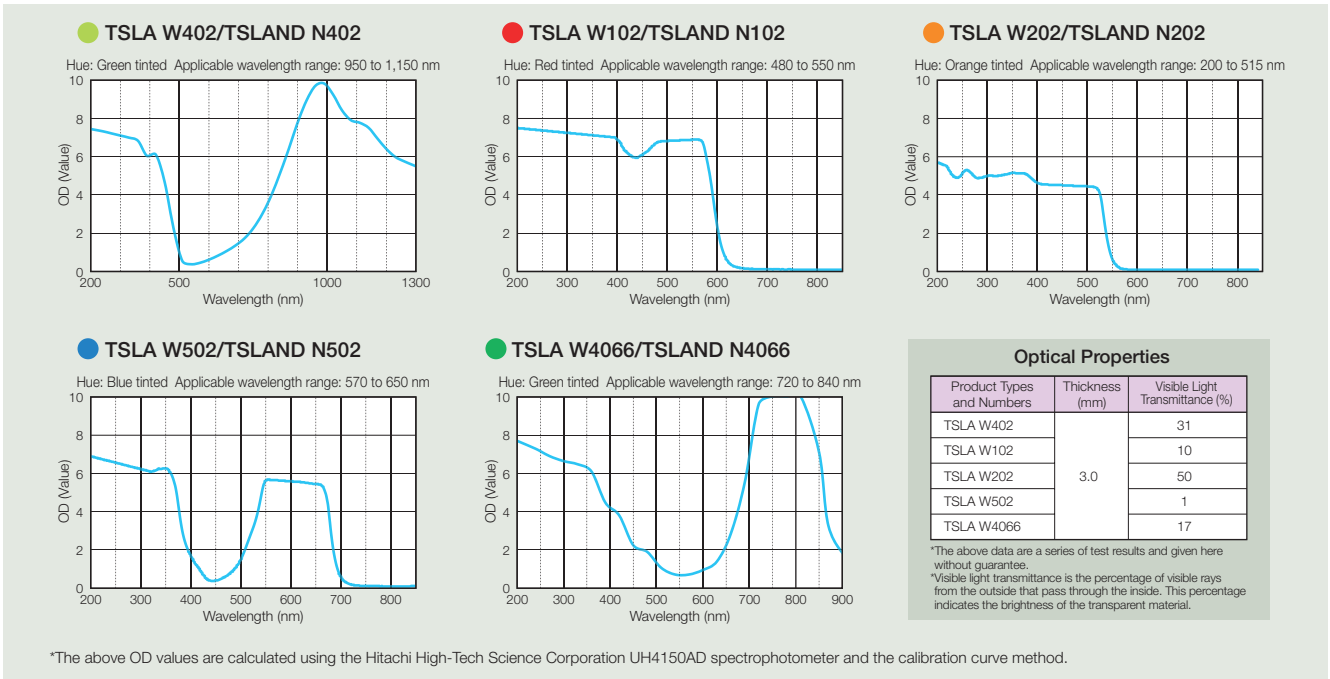


TSLA W502 (Blue tinted)



TSLA W4066 (Green tinted)

Shielding Capabilities



⚠️ Precautions for Use

- There is no guarantee that the use of this product removes the possibility of eye damage or bodily harm. Be sure to thoroughly read the instruction manual before use, and to use the product correctly.
- Conduct an evaluation in advance while taking into account the conditions under which the product will be used, including the temperature, the environment (presence of chemicals), the influence of ultraviolet rays, and external stress loads, and then choose the material and design accordingly.
- During the designing phase, do not only rely on strength calculations and other theoretical data, but also take into account the actual characteristics of processing surfaces and other similar factors.

⚠️ Safety Precautions

- Do not use this product for laser shielding against wavelengths other than those indicated in the specifications.
- Do not use this product as safety goggles on people.
- Do not directly expose the laser-shielding plate to high-output laser beams. When plastics are exposed to high irradiance for an extended period of time, the material may start to melt or evaporate, potentially causing it to ignite or burn.
- If you notice any melting or other abnormality on the surface, refrain from further use and replace the product to ensure safety.
- We recommend that you do not bend this product, as this may result in the loss of adequate optical density.

Specifications for Each Product Type

| | Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Applicable Wavelength Range (nm) | Optical Density (OD) | Thickness (mm) | |
|------------------------------------|---------------|----------------|--------------------------------|---------------|----------------------------------|----------------------|----------------|----------|
| | | | | | | | Size (mm) | 3.0 |
| For YAG lasers For fiber lasers | TSLA | W402 | ✓ | Green tinted | 950 to 1150 | 6 < | 1,000×2,000 | (1) G |
| | | W102 | ✓ | Red tinted | 480 to 550 | 6 < | 1,000×2,000 | (1) G |
| W202 | | ✓ | Orange tinted | 200 to 515 | 4 < | 1,000×2,000 | (1) G | |
| W502 | | ✓ | Blue tinted | 570 to 650 | 5 < | 1,000×2,000 | (1) G | |
| W4066 ^{Note} | | ✓ | Green tinted | 720 to 840 | 6 < | 1,000×2,000 | △ △ | |
| For argon-ion lasers | | | | | | | | |
| For semiconductor lasers | | | | | | | | |

G: Cut size available
 * symbol: The smallest and largest available sizes are 50 x 50 and 1,000 x 2,000 respectively.
 Note: The triangle symbol (△) means that the corresponding model is only going to remain available while stocks last. However, we are currently planning a new product to replace it.

Static-Dissipative Type

| | Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Applicable Wavelength Range (nm) | Optical Density (OD) | Thickness (mm) | |
|------------------------------------|---------------|----------------|--------------------------------|---------------|----------------------------------|----------------------|----------------|----------|
| | | | | | | | Size (mm) | 3.5 |
| For YAG lasers For fiber lasers | TSLAND | N402 | ✓ | Green tinted | 950 to 1150 | 6 < | 1,000×2,000 | (1) G |
| | | N102 | ✓ | Red tinted | 480 to 550 | 6 < | 1,000×2,000 | (1) G |
| N202 | | ✓ | Orange tinted | 200 to 515 | 4 < | 1,000×2,000 | (1) G | |
| N502 | | ✓ | Blue tinted | 570 to 650 | 5 < | 1,000×2,000 | (1) G | |
| N4066 ^{Note} | | ✓ | Green tinted | 720 to 840 | 6 < | 1,000×2,000 | △ △ | |
| For doubled YAG lasers | | | | | | | | |
| For argon-ion lasers | | | | | | | | |
| For semiconductor lasers | | | | | | | | |

G: Cut size available
 * symbol: The smallest and largest available sizes are 50 x 50 and 1,000 x 2,000 respectively.
 Note: The triangle symbol (△) means that the corresponding model is only going to remain available while stocks last. However, we are currently planning a new product to replace it.

Note 1: Standard products are marked with a check mark (✓). The number in brackets is the number of products in one case.
 Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive*. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.
 *(1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)
 Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials. (As of April 30, 2022)

Environmentally Friendly Product Range

Non-PVC Materials

Corrosion-Resistant Plates

- PP Plates p. 35-36
- PVDF Plates p. 37

Transparent Plates

- Super PET Plates p. 38-40
- Polycarbonate Plates p. 41-44

Other

- Aluminum Composite Plates p. 45
- Plates for Signboards p. 45

Materials That Provide Resistance against Heat and Chemicals

PP Standard Plates

Materials with Remarkable Heat Resistance and Chemical Resistance for the Chemical Industry

Takiron PP Plates (polypropylene) can resist high temperatures, generally up to 120°C, and offer excellent chemical resistance. This material is ideal for use in fields where PVC plates cannot be used to provide heat resistance.

Superb Heat Resistance

PP plates can be used in a wider range of temperatures than rigid PVC plates.

Excellent Chemical Resistance

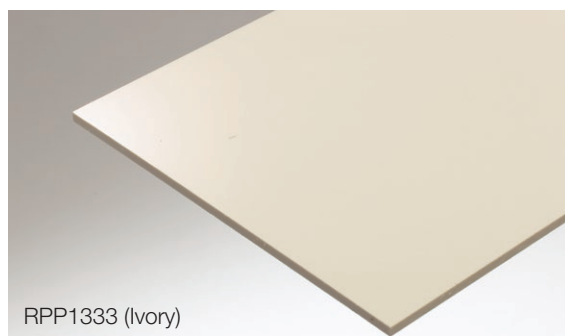
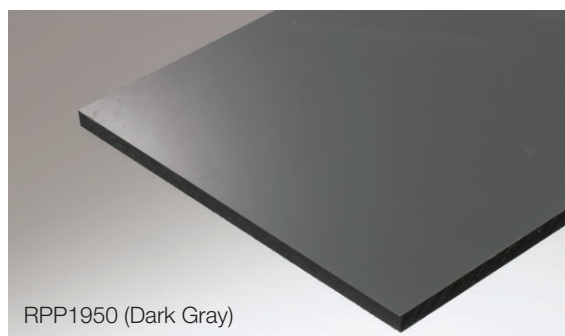
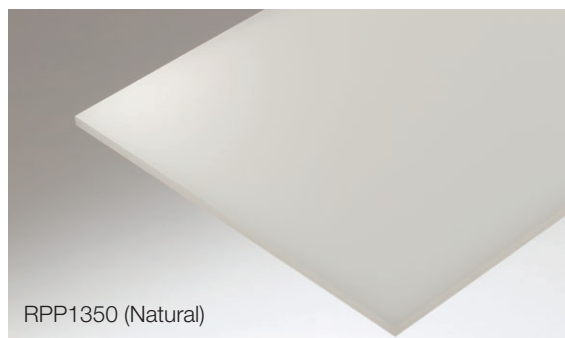
Whether it's acids, alkalis, or gases, this product consistently provides superior chemical resistance against a wide range of chemicals.

Lightness

This material has a comparatively low specific gravity among plastics, making it possible to reduce the weight of equipment.

Compliant with the Food Sanitation Act

Types RPP1350 (natural) and RPP1950 (dark gray) are compliant with the Public Notice of the Ministry of Health, Labour and Welfare No. 201.



FMPP Plates

FM 4910 Listed PP Material

This product is FM 4910-listed and contributes to fire safety.

*For FM standards, refer to p. 22 and 23.

Type FMPP3750 (made-to-order product) cannot be used for acidic liquid chemicals. Contact us for specific information about the use of this product.

Specifications for Each Product Type

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 8.0 | 10.0 | 15.0 | 20.0 |
|---------------------------|----------------|--------------------------------|---------------|----------------|------|-----|-----|-----|-----|-----|-----|------|------|------|
| | | | | Size (mm) | | | | | | | | | | |
| RPP (Continuous press) | 1350 | ✓ | Natural | 1,000×2,000 | | | (6) | (5) | (4) | (3) | (2) | (2) | (1) | (1) |
| | | | | 1,212×2,424 | | | | | | | (1) | | | |
| | 1950 | ✓ | Dark gray | 1,000×2,000 | | | (6) | (5) | (4) | (3) | (2) | (2) | (1) | (1) |
| | | | | 1,212×2,424 | | | | | | | (1) | | | |
| | 1333 | ✓ | Ivory | 1,000×2,000 | | | (6) | | (4) | | (2) | (2) | (1) | (1) |
| | | | | 1,212×2,424 | | | | | (2) | | (1) | | | |
| PPE (Extrusion) | P310A | ✓ | Natural | 1,000×2,000 | (10) | | | | | | | | | |
| | | | | 1,400×2,000 | | (4) | | (3) | (2) | | | | | |
| | P915A | ✓ | Dark gray | 1,400×2,000 | | (4) | | (3) | | | | | | |

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 Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive*. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.
 *(1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)
 Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials. (As of April 30, 2022)

Materials That Provide Resistance against Heat and Chemicals

Flame-Retardant PP Plates

● UL94 V-0

This material has been approved according to UL standard 94 V-0, reduces the problematic inflammability of PP plates (standard grade), and has been made flame-retardant.

● Superb Heat Resistance

While PP plates (standard grade) can resist deflection temperatures under loading of 125°C, this material raises that limit with about 15°C, allowing it to be used in environments with higher temperatures.

● High Rigidity

This material has about three times the flexural elasticity of PP plates (1,500 MPa) (standard grade), providing various advantages with regard to design and workability.

● Excellent Workability

This material provides virtually the same workability as standard PP plates.

! The chemical resistance of flame-retardant PP plates is inferior to standard products. Therefore, be sure to take sufficient precautions before using this material in liquid chemical tanks or other similar equipment.



Specifications for Each Product Type

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | |
|---|----------------|--------------------------------|---------------|----------------|-------------|
| | | | | Size (mm) | |
| RPPN (Continuous press) (Flame-retardant) | PN303 | ✓ | White | 1,212×2,424 | 5.0 10.0 |
| | | | | | (2) (1) |

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Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.

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(As of April 30, 2022)

Chemically-Resistant Materials with Well-Balanced Plastic Qualities

FM PVDF Plates

■ Providing Superior Characteristics for Applications That Require Heat Resistance and Chemical Resistance

PVDF plates are engineering plastics made from vinylidene fluoride resin. This type of material approximates the excellent workability of generic resin without losing the consistent thermal and chemical qualities of fluoropolymers. This ground-breaking industrial material provides enhanced mechanical strength, and can be used for a wide range of purposes, from chemical-resistant material to electric material and weather-resistant material.

● FM 4910 Listed Material (F300)

Type F300 is listed by the FM 4910 standard and contributes to fire safety.

*For FM standards, refer to p. 22 and 23.

● Superb Processing Properties Unlike Any Other Fluoropolymers

Not only can this material be machined, but it can also be welded with a hot jet gun just as easily as conventional PVC materials.

● Superb Mechanical Strength

Providing a tensile strength several times that of conventional fluoropolymers at temperatures around 100°C, this material shows high values for bending and compressive strength. This material does not only offer high impact resistance, it is also creep-resistant and provides superior wear resistance.

● Excellent Heat Resistance

This material can be used within a wide temperature range of up to about 100°C.

● Superb Chemical Resistance

Although it may not be compatible with certain chemicals, the material fully utilizes all the advantages of fluoropolymers.

● Superb Weather Resistance and Radiation Resistance

This product offers outstanding weather resistance against visible and ultraviolet rays in an outdoor environment. The strength of the material does not deteriorate even when exposed to 100-megarad beta rays.

Specifications for Each Product Type

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | | | | | | | |
|---------------|----------------|--------------------------------|---------------|----------------|--|-----|-----|-----|------|------|------|------|------|------|
| | | | | Size (mm) | | 3.0 | 5.0 | 8.0 | 10.0 | 15.0 | 20.0 | 25.0 | 30.0 | 50.0 |
| FMPVDF | F300 | ✓ | Natural | 490×1,000 | | | | | | | (1) | (1) | (1) | (1) |
| | | | | 1,000×2,000 | | (4) | (3) | (1) | (1) | (1) | | | | |

• Type FMPVDF F300 can be shipped from 1 sheet.

• The press lamination method is used for types that are 25 mm thick or thicker. However if you want to use the plate surface for processed products in its original state, keep in mind that the surface conditions are different compared to press laminated PVC plates.

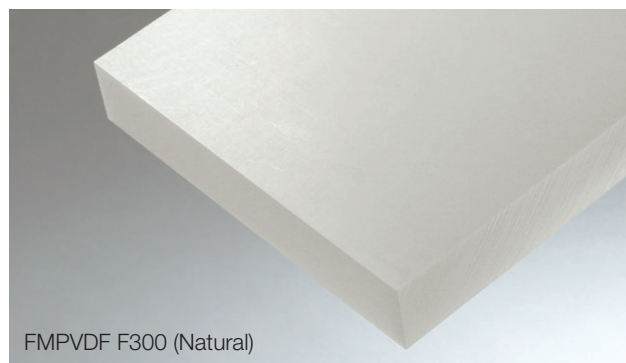
Note 1: Standard products are marked with a check mark (✓). The number in brackets is the number of products in one case.

Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive*. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.

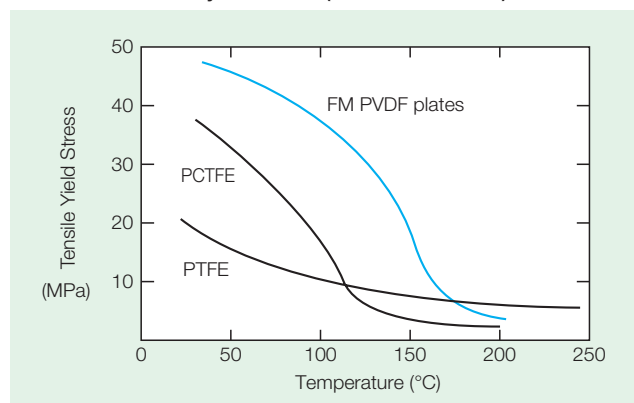
* (1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)

Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials.

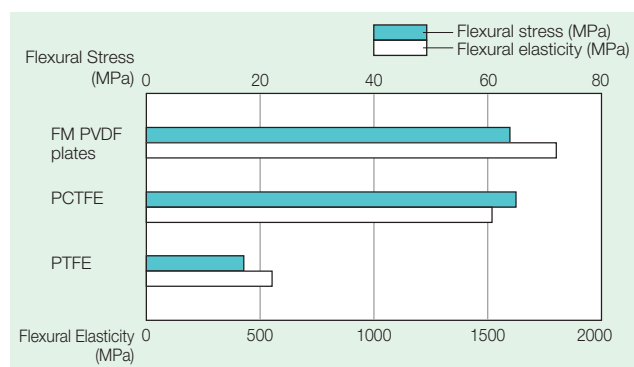
(As of April 30, 2022)



Tensile yield stress (JIS K 7162-1B/50)



Flexural stress and flexural elasticity (JIS K 7171)



High Functional Grade Suitable for Application in Electronics and Food Production **Super PET Plates**

We were the first company in Japan to start the sale of amorphous polyester resin plates, and after that we used our unique technology to add various functionality. From POP, displays, and other fields related to shop decoration, to industrial-application fields such as machine covers, we offer the best lineup for every industry to meet the needs of various fields and applications.

PET Plates

● Environmentally Friendly

When burnt, the material does not emit any toxic halogen gases, and its combustion calorie level remains low compared to other plastics.

● Impact Resistance

When calculated according to Charpy impact strength, the initial strength of super PET plates is about five times that of standard acrylic. Their thickness can be reduced beyond the conventional limits to meet various needs.

● Flame Resistance

While acrylic suffers from ignition propensity, super PET plates have self-extinguishing properties.

● Secondary Workability

This material does not whiten even when cold-bended, enabling you to punch out material with thicknesses down to 1.5 mm, a feat that cannot be performed on acrylic.

● Vacuum/Pressure Formability

This material can be molded into shape at temperatures lower than those required for acrylic, and the short heating process enables cost reduction.

● Transparency

Super PET plates provide excellent transparency due to their high-level total light transmittance and haze quality that rivals acrylic (0.3%: test result). The glossy surface gives these transparent plates a high-quality feel.

● Excellent Transparency Even in Thick Plates

● Quality Printing

This material allows for high-quality printing using standard ink or painting material for PET and polyester.

● Compliant with the Food Sanitation Act

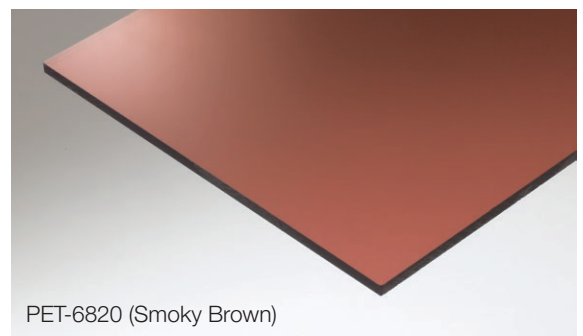
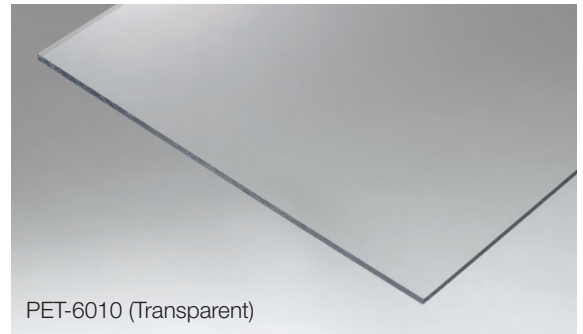
Super PET plates are compliant with the Public Notice of the Ministry of Health, Labour and Welfare No. 201 of 2006 (applicable product types: PET-6010, 6010A, 6710, 6820, 6025, PETND-76600, PETND MRG60).

● Suitable for Sterilization Purposes

Showing little deterioration when exposed to γ (gamma) rays and EOG (ethylene oxide gas), this material can be used for sterilization purposes.

● Gas-Barrier Properties

This material provides well-balanced gas-barrier properties.



High Functional Grade Suitable for Application in Electronics and Food Production

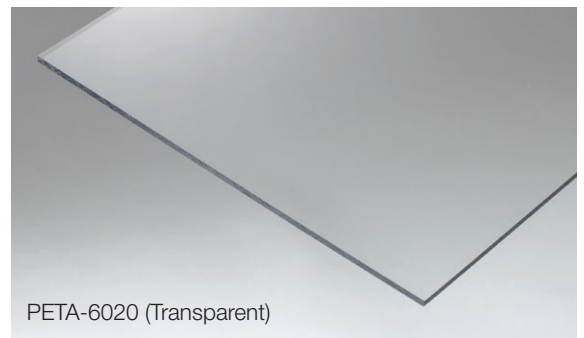
PET Plates (Bio PET)

«Bio (Plant-Based) PET»

● Contributing to a Low-Carbon Society with a Biomass Content of 30%

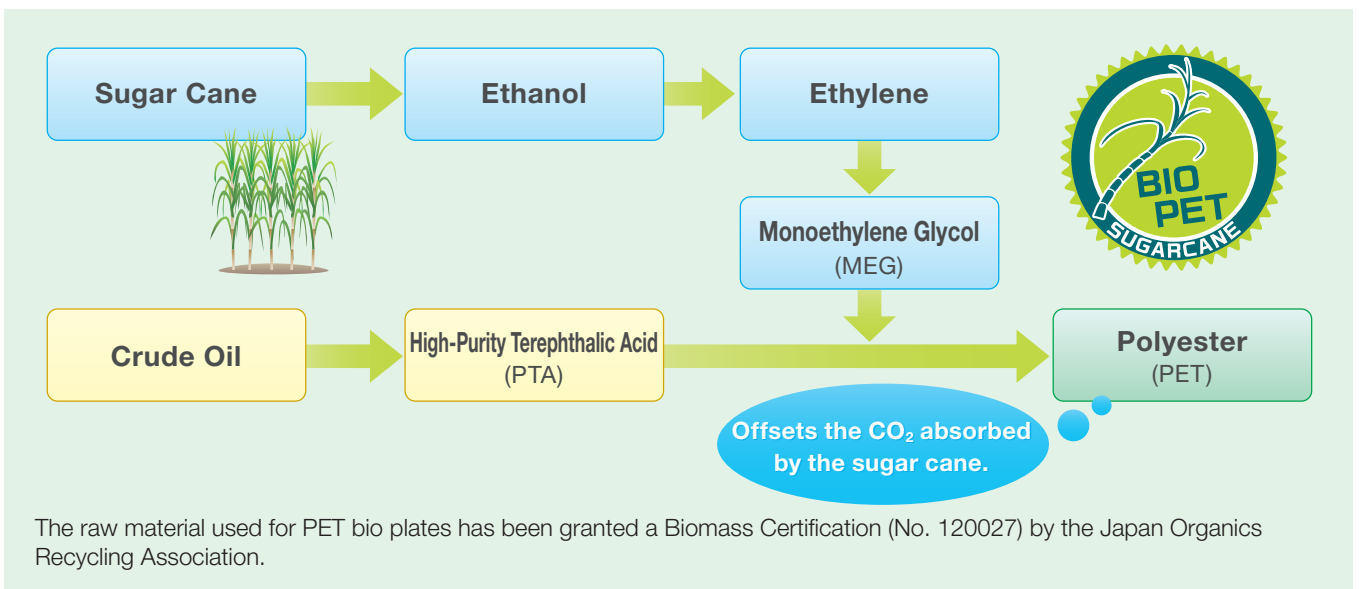
While the CO₂ output during the production of standard APET is 2,380 kg per 1 ton of resin, the output of Bio PET is limited to 1,786 kg per 1 ton of resin*, reducing the greenhouse gas CO₂ by about 25%.

*Value measured by Environmental Resources Management (ERM) before the shipping of raw materials



Make the right choice now to create a bright future.

Raw Materials of Bio (Plant-Based) PET



The raw material used for PET bio plates has been granted a Biomass Certification (No. 120027) by the Japan Organics Recycling Association.

Specifications for Each Product Type

| Product Types | Features | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | | | | | | | |
|---------------|--------------------------------------|----------------|--------------------------------|---------------|----------------|------|------|-----|-----|-----|-----|-----|-----|-----|------|
| | | | | | Size (mm) | 0.8 | 1.0 | 1.5 | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 8.0 | 10.0 |
| PET- | | 6010 | ✓ | Transparent | 915x1,830 | (15) | (10) | (8) | (6) | (4) | (3) | (3) | | | |
| | | | | | 1,000x2,000 | (15) | (10) | (8) | (6) | (4) | (3) | (3) | | | |
| | | | | | 1,220x2,440 | | | | | (4) | | (2) | | | |
| | For industrial purposes | 6010A | ✓ | Transparent | 1,000x2,000 | | | | | | | | (2) | (1) | (1) |
| | | | | | 1,220x2,440 | | | | | | | * | (1) | (1) | |
| | PET- PET guards (Insect-proof) | 6710 | ✓ | White | 915x1,830 | | (10) | (8) | (6) | (4) | | | | | |
| 1,000x2,000 | | | | | | (10) | (8) | (6) | (4) | | (3) | | | | |
| 1,000x2,000 | | | | | | | | | (4) | | (3) | | | | |
| 6820 | ✓ | Smoky brown | 1,000x2,000 | | | | | (4) | | (3) | | | | | |
| | | | 1,220x2,440 | | | | | (4) | | (3) | | | | | |
| 6025 | ✓ | Orange tinted | 1,000x2,000 | | | | | (4) | | (3) | | | | | |
| | | | 1,220x2,440 | | | | | (4) | | (2) | | | | | |
| PETA- | Bio | 6020 | ✓ | Transparent | 915x1,830 | | (10) | (8) | (6) | | | | | | |

* symbol: Made-to-order product Please contact us for more information about production lots.

Note 1: Standard products are marked with a check mark (✓). The number in brackets is the number of products in one case.
 Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive*. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.
 *(1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)
 Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials. (As of April 30, 2022)

High Functional Grade Suitable for Application in Electronics and Food Production

PET Plates (PET Guards)

«Insect-Proof Type Characteristics»

● Insect-Proof Properties

This material blocks the light range of cursorial insect-attracting ultraviolet rays and short wavelengths (520 nm or less). This material can be used as an insect-proof measure for food machine covers, food factories, or partitions, doors, observation windows, and other similar equipment for precision machine factories where it is necessary to prevent insects (particularly flying ones) from entering as foreign objects.

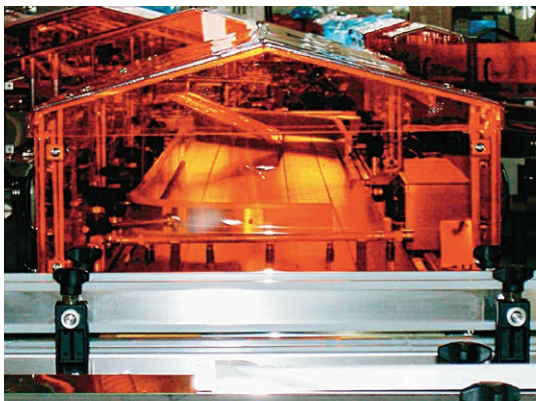
PET Guard Insect-Proof Type Capabilities

| | Insect-Proof Orange Tinted PET-6025 |
|------------------------------------|-------------------------------------|
| Flying Insect Containment Rate (%) | 92.7 |
| Total Light Transmittance (%) | 45 |

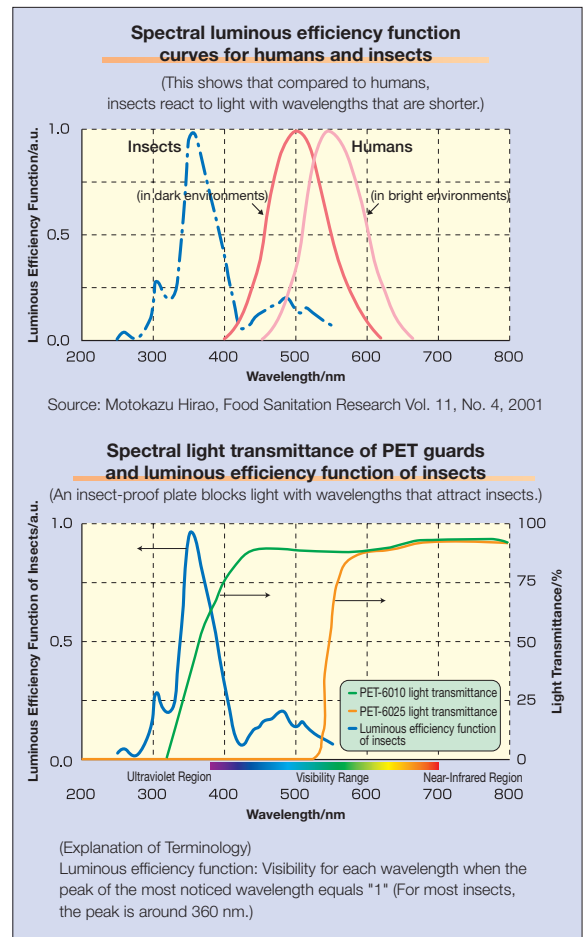
*The total light transmittance is a test result for a 5 mm thick specimen.

● Suitable for Food-Related Applications

This material is compliant with the Public Notice of the Ministry of Health, Labour and Welfare No. 201 of 2006.



Example application of PET guard insect-proof type Food production line cover (PET-6025)



Static-Dissipative PET Plates

■ Environmentally Friendly Static-Dissipative PET Plates with Outstanding Anti-static Functionality

We offer static-dissipative PET plates. More information is provided on p. 26.

■ Specifications for Each Product Type

■ Super PET Plates (High Functional Products)

| Product Types | Features | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | | | | |
|---------------|--------------------------------|----------------|--------------------------------|---------------|----------------|--|-----|-----|-----|-----|-----|------|
| | | | | | Size (mm) | | 3.0 | 4.0 | 5.0 | 6.0 | 8.0 | 10.0 |
| PETND- | Static-dissipative | 76600 | ✓ | Transparent | 1,000×2,000 | | (4) | | (3) | | (1) | (1) |
| | | | | | 1,220×2,440 | | (4) | (2) | (2) | (2) | | |
| PETND | Static-dissipative Hard coated | MRG60 | ✓ | Transparent | 1,000×2,000 | | (4) | | (3) | | | |
| | | MRG30 | ✓ | Yellow tinted | 1,000×2,000 | | (4) | | (3) | | | |
| PET- | Insect-proof | 6025 | ✓ | Orange tinted | 1,000×2,000 | | (4) | | (3) | | | |
| | | | | | 1,220×2,440 | | (4) | | (2) | | | |

Note 1: Standard products are marked with a check mark (✓). The number in brackets is the number of products in one case.

Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive*. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.

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Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials.

(As of April 30, 2022)

Providing Superior Impact Strength and the Transparency of Glass

PC Plates

Polycarbonate plates stand out among plastics due to their high impact resistance. Combined with a transparency that rivals that of glass, this plastic challenges the traditional idea that transparent materials easily break. Its other superb qualities include heat resistance, cold resistance, mechanical strength, and electrical properties, making this a product that is used for a wide range of applications. In addition, at Takiron we use special techniques to add static-dissipative, flame-retardant, and light reflection-preventive functionality to our polycarbonate plates. Besides colored and transparent plates, we also offer smoky, opaque, and glass varieties whose thickness ranges from 0.5 to 30 mm to create a product line that answers your needs for a wide range of industrial applications.

● Impact Resistance

Providing about 40 times the impact strength of acrylic and about 20 times that of rigid PVC, this material has the highest impact strength among transparent plastics.

● Transparency

When used in a transparent plate with a thickness of 5 mm, the superb light transmittance of this material surpasses 85%, meaning it is as transparent as high-quality plate glass.

● Thermal Conductivity

With a thermal conductivity 1/5th that of glass, this material provides excellent heat retention and insulating qualities.

● Heat and Cold Resistance

With a temperature range for actual use between -40°C and $+120^{\circ}\text{C}$, this product can be used in a wide variety of environments.

● Electrical Insulation

This material can resist high voltages of 20,000 V at a thickness of 1 mm. This means it provides more than twice the resistance of Bakelite, making it optimally suited for use as an electrical insulation material.

● Weather Resistance

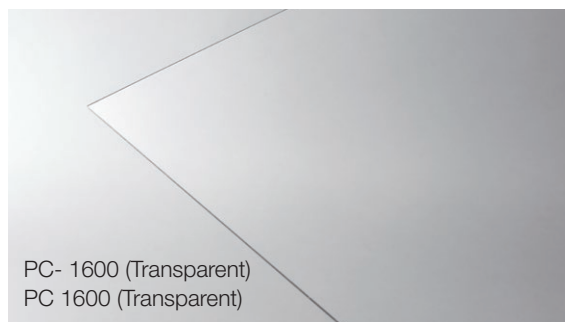
Unlike other plastics, this product is not easily affected by direct sunlight, weather, and temperature and also has a weather-resistant grade that reduces yellow discoloring. It allows you to choose a material quality that optimally suits the intended application.

● Processing Properties of Polycarbonate

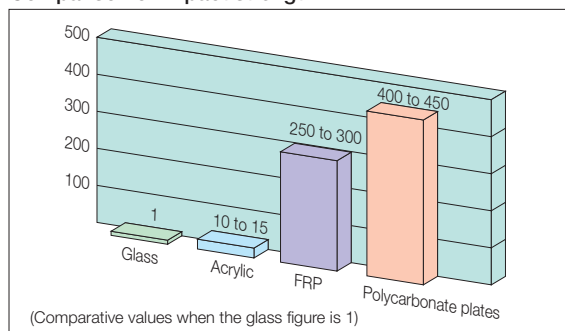
1. Does not deform easily due to load (creep), and is easy to cut, drill, and machine.
2. Can be thermal-bended and vacuum-formed.
3. Can be cold-formed to bend into curved surfaces at room temperature.

● Compliant with Various Standards

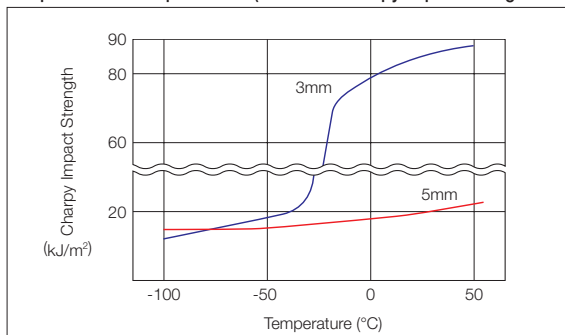
Food Sanitation Act/UL94-certified



Comparison of impact strength



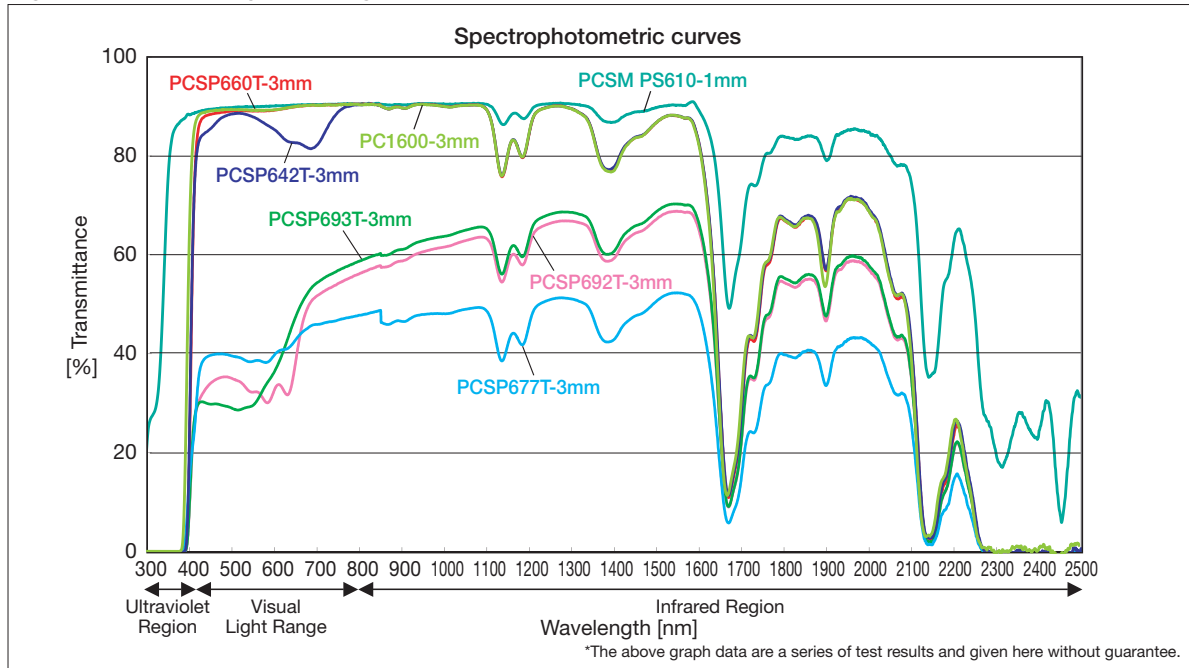
Temperature and impact value (Results of Charpy impact strength test)



Non-PVC Materials

Polycarbonate Plates

Light transmittance by wavelength



Specifications for Each Product Type

Standard Plates

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | | | | | | | |
|---------------|----------------|--|--|----------------|-----|-----|-----|-----|-----|------|------|------|--|--|
| | | | | Size (mm) | | | | | | | | | | |
| | | | | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 8.0 | 10.0 | 12.0 | 15.0 | | |
| PC- | 1600 | ✓ | Transparent | 910×1,820 | (6) | (4) | (3) | (3) | | | | | | |
| | | | | 1,000×2,000 | (6) | (4) | (3) | (2) | (1) | (1) | (1) | | | |
| | | | | 1,220×2,440 | (6) | (4) | | (2) | (2) | (1) | (1) | | | |
| | | | | 1,220×3,000 | G | | | | | | | | | |
| PC | | | | 2,000×3,000 | | G | G | G | G | G | G | | | |
| | | | | 1,000×2,000 | | G | | G | | | | | | |
| PCSP | 1700 | ✓ | White | 1,000×2,000 | | G | | G | | | | | | |
| PCSP | 1900 | ✓ | Black | 1,000×2,000 | | G | | G | | | | | | |
| PCSP | 660T | ✓ | Transparent, weather-resistant on both sides | 1,000×2,000 | | (4) | | (3) | | | | | | |
| | | | | 1,000×3,500 | G | | | | | | | | | |
| | | | | 1,220×2,000 | | | | | | | G | G | | |
| | | | | 2,000×3,000 | | | | | | G | G | | | |
| PCSP | 642T | ✓ | Transparent glass color, weather-resistant on both sides | 2,000×4,000 | | G | | G | | | | | | |
| | | | | 2,000×3,000 | | G | | G | | | | | | |
| | | | | 1,000×2,000 | (6) | (4) | | (3) | | | | | | |
| PCSP | 692T | ✓ | Smoky gray, weather-resistant on both sides | 1,000×3,500 | G | | | | | | | | | |
| | | | | 2,000×4,000 | | G | | G | | | | | | |
| | | | | 1,000×2,000 | (6) | (4) | | (3) | | | | | | |
| PCSP | 693T | ✓ | Smoky brown, weather-resistant on both sides | 1,000×3,500 | G | | | | | | | | | |
| | | | | 2,000×3,000 | | | | | | G | | | | |
| | | | | 2,000×4,000 | | G | | G | | | | | | |
| PCSP | 677T | ✓ | Opaque, weather-resistant on both sides | 1,000×2,000 | (6) | (4) | | (3) | | | | | | |
| | | | | 1,000×3,500 | G | | | | | | | | | |
| | | | | 2,000×4,000 | | G | | G | | | | | | |
| PCSP | K6600 | ✓ | Transparent, weather-resistant on both sides, matte on one side | 1,000×3,500 | G | | | | | | | | | |
| | | | | 1,250×3,000 | | G | | G | | | | | | |
| | R6600 | ✓ | Transparent, weather-resistant on both sides, matte on both sides | 1,250×3,000 | | G | G | G | G | G | G | | | |
| | | | | 1,070×3,000 | G | G | G | G | | | | | | |
| | F6600 | ✓ | Transparent, weather-resistant on both sides, matte frosted glass finish on both sides | 1,000×3,500 | G | | | | | | | | | |
| | | | | 1,250×3,000 | | G | | G | | | | | | |
| | K6920 | ✓ | Smoky gray, weather-resistant on both sides, matte on one side | 1,000×3,500 | G | | | | | | | | | |
| | | | | 1,250×3,000 | | G | | G | | | | | | |
| | K6930 | ✓ | Smoky brown, weather-resistant on both sides, matte on one side | 1,000×3,500 | G | | | | | | | | | |
| | | | | 1,250×3,000 | | G | | G | | | | | | |
| | R6920 | ✓ | Smoky gray, weather-resistant on both sides, matte on both sides | 1,250×3,000 | | G | | G | | | | | | |
| | | | | 1,250×3,000 | | G | | G | | | | | | |
| R6930 | ✓ | Smoky brown, weather-resistant on both sides, matte on both sides | 1,250×3,000 | | G | | G | | | | | | | |
| | | | 1,070×3,000 | G | G | G | G | | | | | | | |
| F6400 | ✓ | Glass color, weather-resistant on both sides, matte frosted glass finish on both sides | 1,070×3,000 | G | G | G | G | | | | | | | |
| | | | 1,250×3,000 | | G | | G | | | | | | | |
| 36600 | ✓ | Transparent, weather-resistant on both sides, figured glass look | 1,250×3,000 | | G | | G | | | | | | | |
| | | | 1,250×3,000 | | G | | G | | | | | | | |
| 36400 | ✓ | Green tinted, weather-resistant on both sides, figured glass look | 1,250×3,000 | | G | | G | | | | | | | |
| | | | 1,250×3,000 | | G | | G | | | | | | | |

G: Cut size available. If you require plates that are 3,000 mm long or longer, contact us.

Polycarbonate Welding Rods

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Shapes | Nominal Designation (mm) | Length (mm) | Packing specification per case | No. of Units per Case (Estimated No. of Units) | Inner Packaging |
|----------------|----------------|--------------------------------|---------------|----------|--------------------------|-------------|--------------------------------|--|---------------------|
| Welding rod PC | 9061 | ✓ | Transparent | Single o | 3.0 | 1,000 | (1 kg x4 bags) 4kg | Approx. 470 | Transparent PE bags |

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Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.

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Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials. Bisphenol A, which was added to the 16th SVHC list based on the REACH Regulations, is a material used in polycarbonate resins. Thus, all polycarbonate plates contain traces of bisphenol A (less than 1,000 ppm). (As of April 30, 2022)

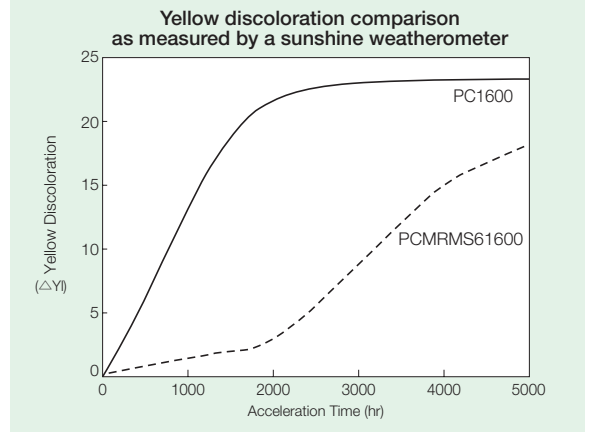
PC Plates (Hard Coated Type)

These plates do not only offer the best qualities of polycarbonate, such as impact resistance, transparency, and heat resistance, they also provide enhanced resistance to surface scratching.

- Excel in both surface hardness and resistance to scratches.
- Highly transparent with a glossy finish.
- Provide excellent resistance to staining.

| Test Items | | Testing Methods | PCMRMS 61600 For indoor use | PC1600 |
|-----------------------|-------------------------------------|--|--------------------------------|--------|
| Hardness | Taber Abrasion | JIS K6735 CS-10F, 500 g 100 revolutions, type 4 (ΔHaze) | 5.8 | 36.6 |
| | Scratch Hardness (Pencil Method) | JIS K5600-5-4 | HB to F | 4B |
| Weather Resistance | Accelerated Exposure Test | Sunshine weatherometer (5,000 hrs, yellow discoloration: ΔYI) | 19.5 | 24.0 |

*The above data are a series of test results for a 5 mm thick specimen and given here without guarantee.



Specifications for Each Product Type

■ Hard Coating Types

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | |
|---------------|----------------|--------------------------------|---------------------------------|----------------|-----|-----|
| | | | | Size (mm) | 3.0 | 5.0 |
| PCMRMS | 61600 | ✓ | Transparent (For indoor use) | 1,000×2,000 | (4) | (3) |

Static-Dissipative PC Plates

We offer static-dissipative polycarbonate plates. More information is provided on p. 27 and 30.

PC Plates (for Machining)

Providing superior mechanical strength, these plates are optimally suited for machining to create precise machine parts and prototypes.

- Highly Consistent Dimensions after Machining
- Highly Transparent Colors

PC Plates (Flame-Retardant Type Compliant with UL94 V-0)

- This product can be used for internal parts of electrical equipment that require electrical insulation.
- The product is UL94 V-0-certified.
- Non-bromine and non-phosphorus flame-retardant material is used.

| Items | Unit | PCMU PZ620 | | PCMU PY620 | | PC1600 | | Testing Methods |
|---------------------------|------|--------------|------|------------|------|--------|-----|-----------------|
| | | 2mm | 3mm | 3mm | 5mm | 3mm | 5mm | |
| Total Light Transmittance | % | 88.4 | 87.4 | 85.4 | 89.5 | 89.1 | | JIS K7361-1 |
| Haze | % | 0.6 | 0.8 | 1.7 | 0.1 | 0.1 | | JIS K7136 |
| Flammability | — | V-0 (Note 1) | | | | HB | | UL94 |

Note 1: PCMU PZ620 2.0mm is not a product approved by UL, however, is being produced with UL approved raw materials.

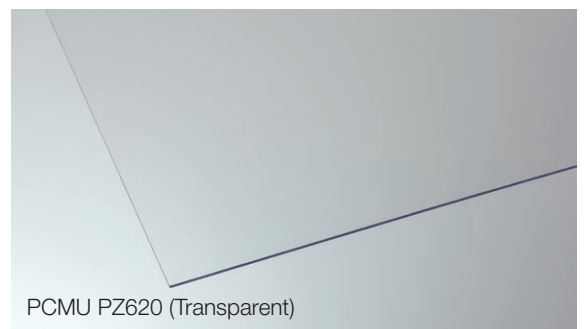
Note 2: The above data are a series of test results and given here without guarantee.

Specifications for Each Product Type

■ For Machining

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | |
|---------------|----------------|--------------------------------|---------------|----------------|------|------|------|------|
| | | | | Size (mm) | 15.0 | 20.0 | 25.0 | 30.0 |
| PCP | 1609A | ✓ | Transparent | 1,000×1,000 | (1) | (1) | (1) | (1) |
| | | | | 1,000×2,000 | (1) | (1) | (1) | (1) |

* For the delivery times of the size 1,000 x 1,000, check with one of our representatives.



Specifications for Each Product Type

■ Flame-Retardant Types

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | |
|-----------------|----------------|--------------------------------|---------------|----------------|-----|-----|-----|-----|
| | | | | Size (mm) | 2.0 | 3.0 | 4.0 | 5.0 |
| PCMU (UL94 V-0) | PZ620 | ✓ | Transparent | 1,000×2,000 | (6) | | | |
| | PY620 | ✓ | | 1,000×2,000 | | (4) | * | (3) |

* symbol: Made-to-order product Lot: 2,000 kg (Contact us for more information.)

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Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials. Bisphenol A, which was added to the 16th SVHC list based on the REACH Regulations, is a material used in polycarbonate resins. Thus, all polycarbonate plates contain traces of bisphenol A (less than 1,000 ppm). (As of April 30, 2022)

Non-PVC Materials

Polycarbonate Plates

Optical Type

This product is ideal for applications that require a highly polished look (for indoor use).

PC Plates (Monolayer)

Plates for Nameplates and Faceplates

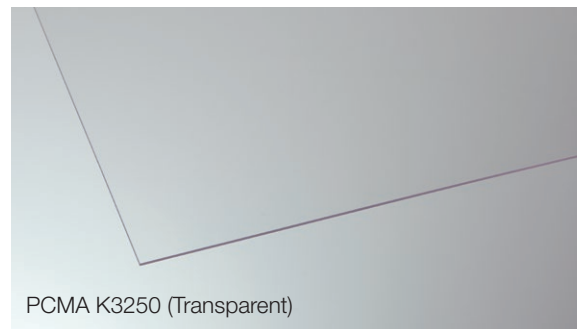
These are thin plates with an excellent outward appearance.

PC Plates (Multilayer)

Polyca/Acrylic Multilayer Plates

These optical plates have an exceptionally hard surface and a multi-layered structure that consists of PC on one side and PMMA on the other.

This is a made-to-order product. Contact us for more information about thicknesses and sizes.



PCMA K3250 (Transparent)

| Types | | | | PC Monolayer Plate | PC/PMMA Multilayer Plate | |
|----------------------------------|---|---------------|--|------------------------|--------------------------|---|
| Product Types | | | | PCSM | PCMA | |
| Product Number | | | | PS610 | K3250 | |
| Surface Treatment | | | | PC plates | PMMA/PC plates | |
| Thickness | | | | 1.0mm | 1.0mm | |
| Basic Physical Properties | Total Light Transmittance | % | JIS K7361-1 (ISO 13468-1) | 90.7 | 91.9 | |
| | Haze | % | JIS K7136 (ISO 14782) | 0.08 | 0.03 | |
| | Colors D65/2 Transmittance Measurement | L* | JIS Z8781-4 | 96.0 | 96.5 | |
| | | a* | | -0.2 | -0.2 | |
| | | b* | | 0.5 | 0.5 | |
| | | YI | JIS K7373 | 1.13 | 0.94 | |
| | Adhesion (Crosscut Method) | - | JIS K5600-5-6 (ISO 2409) | - | 0 ^{Note 1} | - |
| Scratch Hardness (Pencil Method) | - | JIS K5600-5-4 | 4B | H ^{Note 1} | 4B ^{Note 2} | |
| Taber Abrasion Test (ΔHz) | 100 rot. | JIS K7204 | 36.1 | 27.3 ^{Note 1} | 36.1 ^{Note 2} | |
| | 500 rot. | | 44.1 | 34.1 ^{Note 1} | 44.1 ^{Note 2} | |
| Weather Resistance | Ultra-accelerated Weathering Test with an Eye Super UV Tester | 24 h | ΔYI | 13.5 | 0.9 ^{Note 1} | - |
| Reliability | Boiling Test (60 min) | - | Adhesion check (Crosscut method) | - | 0 ^{Note 1} | - |
| | High Temperature and Humidity 80°C, >90% RH, 300 hrs | - | Our company's own method • Outward appearance • Dimensions | - | No change | |
| | High Temperature 85°C, 300 hrs | - | | - | No change | |
| | Low Temperature -40°C, 300 hrs | - | | - | No change | |

*The above data are a series of test results and given here without guarantee.

Note 1: Test results for the PMMA layer side

Note 2: Test results for the PC layer side

Specifications for Each Product Type

Thin Optical Plates

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Width (mm) | Thickness (mm) Length (mm) | 0.5 | 0.8 | 1.0 | 1.2 | 1.5 | 2.0 |
|---------------|----------------|--------------------------------|---|----------------|-------------------------------|------|------|------|-----|-----|-----|
| | | | | | | (20) | (12) | (10) | * | * | * |
| PCSM | PS610 | ✓ | Transparent (for nameplates) | 915 | 1,830 | (20) | | (10) | | | |
| | | | | 1,000 | 2,000 | (20) | (12) | (10) | | (8) | (6) |
| PCMA | K3250 | ✓ | Transparent (PC/PMMA multilayer plates) | 1,000 to 1,040 | 1,500 to 2,400 | | * | * | * | * | * |

* symbol: Made-to-order product Lot: 2,000 kg

• Contact us for more information about thicknesses and sizes that are not included here.

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Non-PVC Materials

Aluminum Composite Plates

Light and Durable Aluminum Composite Plates with a Great Outward Appearance

Aluminum Composite Plates

These are aluminum composite plates constructed from three layers, including an aluminum surface and a plastic foam core. They are suitable for various designs, are lightweight, and provide high rigidity and durability.

● Lightness

The core material consists of lightweight plastic, enabling easy handling and transportation.

● Rigidity

The sandwich construction of aluminum, stainless steel, and steel gives these plates remarkable flexibility and impact resistance.

● Water Resistance

This material is significantly more resistant to water than iron or wood, making it suitable for use in wet areas.

● Durability

A special baking coating is applied to the surface, resulting in a beautiful color tone and high durability.



● Workability

This product can easily be altered by cutting, drilling, machining, V-cut bending, or other techniques.

Applications

Signs, sign plates, direction boards, whiteboards

Specifications for Each Product Type

| Product Types | Product Number | Compliance with RoHS and REACH | Surface Specifications | Top Layer Materials | Core Materials | Thickness (mm) | |
|--|-----------------------|--|--|---------------------|---------------------|----------------|------|
| | | | | | | Size (mm) | 3.0 |
| Aluminum composite plates L | 002L | ✓ | Silver Glossy on both sides | Aluminum | Black low-foamed PE | 910×1,820 | (5) |
| | 772L | ✓ | White Glossy on both sides | | White low-foamed PE | 910×1,820 | (10) |
| | | | | | | 1,000×2,000 | (5) |
| | | | | | | 1,220×2,440 | (5) |
| | | | | | | 910×1,820 | (10) |
| | 772LR | ✓ | White Glossy on one side Matte on one side | | 1,000×2,000 | (5) | |
| | | | | | 1,220×2,440 | (5) | |
| | | | | | 1,000×3,000 | (3) | |
| | | | | | 1,220×3,000 | (3) | |
| | | | | | 910×1,820 | (10) | |
| 1,000×2,000 | | | | (5) | | | |
| 778L | ✓ | White Glossy on one side (One-sided) | 1,220×2,440 | (5) | | | |
| | | | 1,000×3,000 | (3) | | | |
| | | | 1,220×3,000 | (3) | | | |
| | | | 1,220×3,000 | (3) | | | |
| Steel composite plates ST (For whiteboards) | 700GR | ✓ | White Glossy on one side (One-sided) | Steel | Black low-foamed PE | 910×1,820 | (5) |
| | 700GL ^{Note} | | | | | 1,205×2,400 | (2) |

- Steel composite plates ST comply with the Act on Promoting Green Procurement.
 - Be sure to only use steel composite plates ST indoors.
 - The finish of the cut ends of the shipped product differs. Aluminum composite plates L and steel composite plates ST 700GR: Serrated/Steel composite plates ST 700GL: Sheared
- Note: 700GL and 700GR have different white color tone of the surface coating color. Please check with a sample book.

Channel Plates (Heavy Weather-Resistant)

Plates That Combine an Acrylic Plate with Polyolefin Foam

This labor-saving sign material is a combination of an acrylic plate surface and polyolefin foam. It can be cut out in its original state to create beautiful sign letters in a short period of time. The acrylic plate that makes up the surface is highly weather-resistant, and is optimally suited for use as a large sign or decoration in outdoor environments.

Specifications for Each Product Type

| Product Types | Product Number | Hues (Colors) | Thickness (mm) | Size (mm) | Packaging |
|------------------------|----------------|---------------|----------------|-----------|-----------|
| SCHA15 ^{Note} | CH760 | Super white | 15.0 | 910×1,820 | (2) |
| SCHA30 ^{Note} | | | 30.0 | | (1) |
| SCHA50 ^{Note} | | | 50.0 | | (1) |

- Type CH760 is a laminated product consisting of an acrylic front plate that is 2.0 mm thick and a PVC back plate that is 0.45 mm thick, covering the main body made from the aforementioned foaming material.
- Note: Production will end at the end of March 2023, and the product will be discontinued as soon as the stock runs out.



Note 1: Standard products are marked with a check mark (✓). The number in brackets is the number of products in one case.
 Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive*. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.
 *(1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)
 Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials. (As of April 30, 2022)

MEMO

A series of horizontal dashed lines for writing.

Takiron Polymer Products

Monomer Cast Nylon

- Super Cast Nylon p. 48
- Super Cast Nylon (Sliding Grade)..... p. 49

Polyacetal (Copolymer)

- POM Plates and Rods (TS Grade)..... p. 50

Polyethylene Terephthalate

- Polyethylene Terephthalate Plates and Rods ... p. 51

Ultra-High Molecular Weight Polyethylene

- UHMW Plates and Rods..... p. 52
- Low-Friction Grade UHMW Plates
<EX Glide>..... p. 52

Polyethylene (HDPE)

- HDPE Plates and Rods..... p. 53
- High-Density Polyethylene Plates with
10% Boron p. 53

Vinylidene Fluoride

- PVDF Plates and Rods p. 54
- PVDF Plates (Low-Distortion Grade) p. 54

PMP (Polymethylpentene)

- PMP (Polymethylpentene) Plates p. 55

Polypropylene

- Machining PP Plates and Rods (TS Grade)..p. 56

- Thick PP Plates and Large-Diameter PP

Rods p. 57

- PP Plates (Dark Gray) p. 57

Polyether Ether Ketone

- PEEK Plates and Rods p. 58

Poly Phenylene Sulde

- PPS Plates p. 59

Polycarbonate

- Machining PC Plates (TS Grade) p. 60

- PC/ABS Plates (TS Grade) p. 60

Reinforced Materials with Glass Fillers

(Polypropylene/Polycarbonate)

- Reinforced PP Plates with Glass Fillers
(TS Grade) p. 61

- Reinforced PC Plates with Glass Fillers p. 61

Conductive Materials (Nylon 6 (Polyamide 6)/

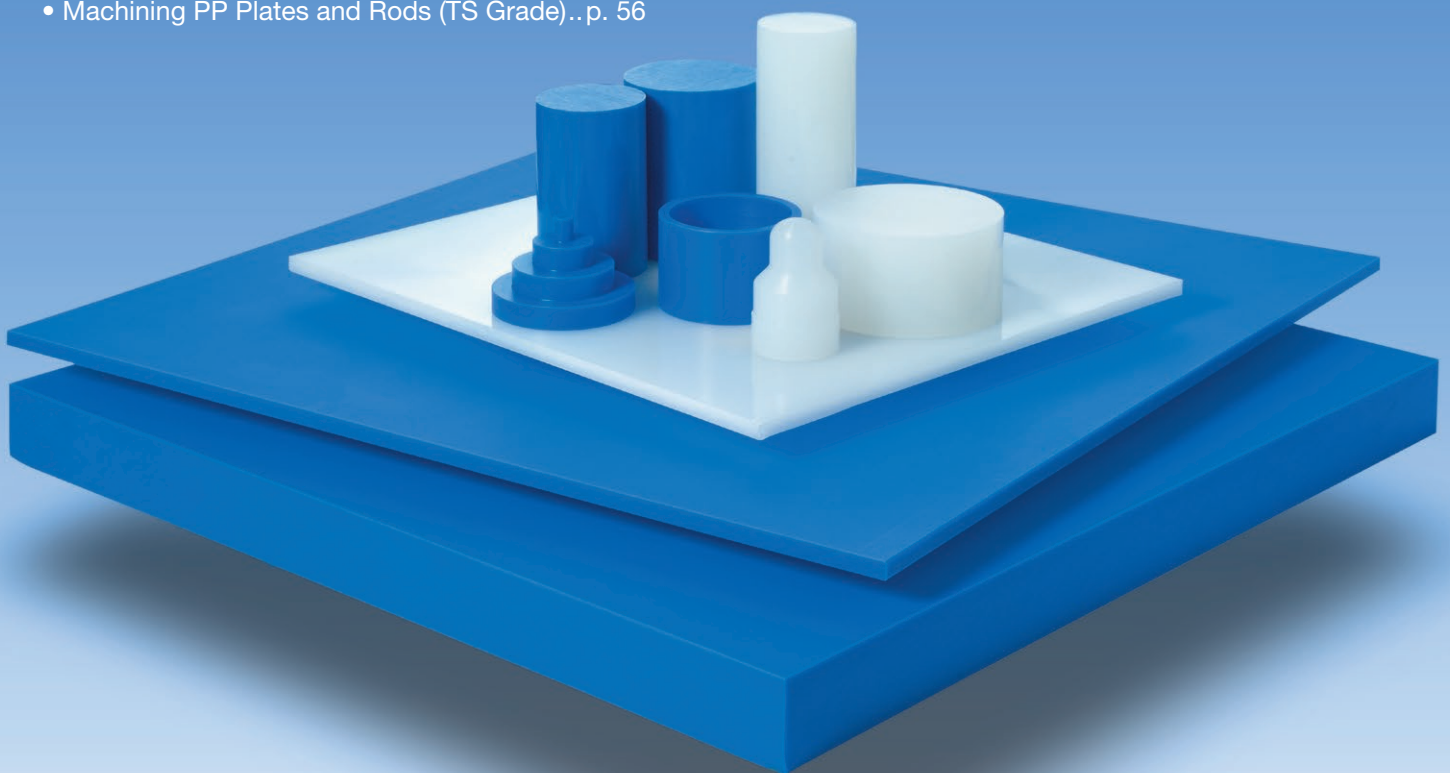
Polypropylene)

- Conductive Nylon Plates p. 62

- Conductive PP Plates..... p. 62

Anti-Static Products/Conductive Machining

- Materials p. 63



Sales Service for Takiron Polymer Products

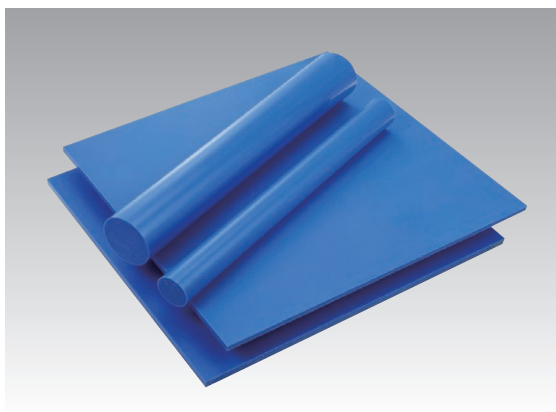
<Sales Service (Inquiries)>

Takiron Polymer Co., Ltd.

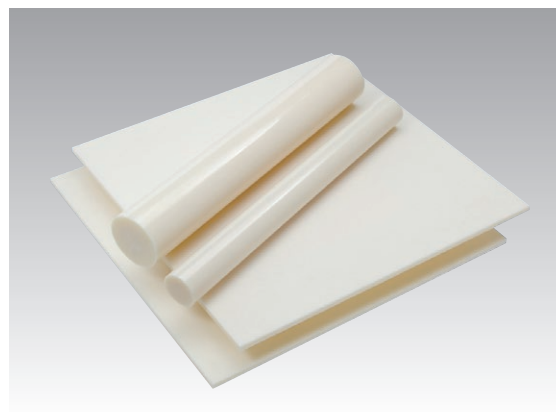
| | | |
|--------------------|--|-------------------------------------|
| Tokyo Sales Office | Shinagawa Intercity Tower A, 2-15-1 Konan, Minato-ku, Tokyo 108-6031 | TEL: 03-6711-3734 FAX: 03-6711-3732 |
| Osaka Sales Office | North Gate Building, 3-1-3 Umeda, Kita-ku, Osaka 530-0001 | TEL: 06-6453-3958 FAX: 06-6453-3956 |
| Yame Head Office | 437-1 Imabuku, Yame-shi, Fukuoka 834-0061 | TEL: 0943-24-9151 FAX: 0943-24-9154 |

Super Cast Nylon

Product type and number: **MCN N550/MCN Rod 550 (Blue)**
MCN N350/MCN Rod 350 (Natural)



MCN N550 (Plate)
MCN Rod 550 (Rod)



MCN N350 (Plate)
MCN Rod 350 (Rod)

Characteristics

Super cast nylon is a type of high-performance nylon resin with high degrees of polymerization and crystallization, which can be achieved when monomers are cast through the processes of direct polymerization and molding.

Superb physical properties

Compared to extruded nylon 6, this type of nylon offers more mechanical strength, better heat resistance, and superior chemical properties.

Superb wear resistance

As a self-lubricating material, it is exceptionally resistant to wear.

Excellent workability

A high level of hardness and low viscosity make this an ideal material to machine.

Applications

Various types of rollers, star-wheels, screws, bearings, linings, guides, gears, etc.

Standard dimensions

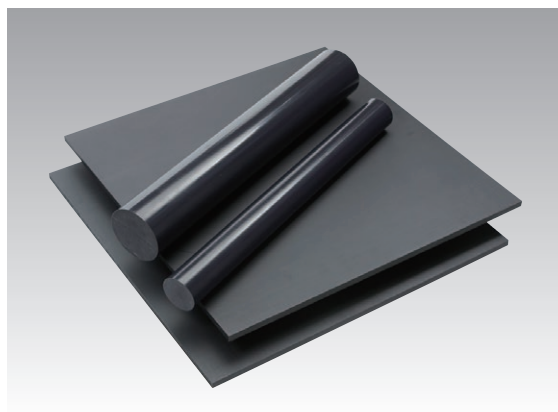
| Plates | MCN N550 | | MCN N350 | |
|--------|----------------|------------------------------|----------------|-----------------------------|
| | Size | Thickness | Size | Thickness |
| | 500×1,000 mm | 5 mm to 80 mm | 500×1,000 mm | 5 mm to 80 mm |
| | 600×1,200 mm | 5 mm to 120 mm | 600×1,200 mm | 90 mm to 100 mm |
| | 1,000×1,000 mm | 5 mm to 80 mm | 1,000×1,000 mm | 5 mm to 80 mm |
| | 1,000×2,000 mm | 5 mm to 60 mm | 1,000×2,000 mm | 5 mm to 50 mm |
| Rods | MCN Rod 550 | | MCN Rod 350 | |
| | Length | Nominal diameter | Length | Nominal diameter |
| | 1,000 mm | 10 mm to 200 mm in diameter | 1,000 mm | 30 mm to 200 mm in diameter |
| | 500 mm | 100 mm to 400 mm in diameter | | |

For more information, refer to the specification table on p. 116.

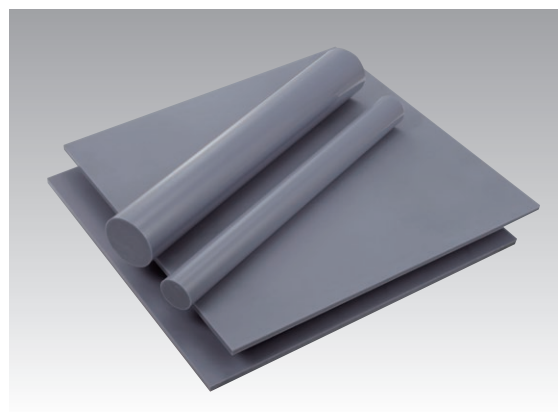
For more information, refer to the specification table on p. 116.

Super Cast Nylon (Sliding Grade)

Product type and number: **MCN N950/MCN Rod 950 (Black)**
MCN N050/MCN Rod 050 (Gray)



MCN N950 (Plate)
MCN Rod 950 (Rod)



MCN N050 (Plate)
MCN Rod 050 (Rod)

Characteristics

Superb wear resistance

Type 950 (black) contains molybdenum disulfide, whereas type 050 (gray) contains a special lubricant compound. Both types are much more wear-resistant than similar standard products.

Applications

Sliding parts that require above-average sliding performance, etc.
*Type N050 (gray) has a lower friction coefficient, which makes it more resistant to wear.

Standard dimensions

| Plates | MCN N950 | | MCN N050 | |
|--------|----------------|--|----------------|----------------|
| | Size | Thickness | Size | Thickness |
| | 500×1,000 mm | 5 mm to 30 mm | 500×1,000 mm | 25 mm to 50 mm |
| | 600×1,200 mm | 5 mm to 80 mm <small>(made-to-order product)</small> | 600×1,200 mm | 5 mm to 50 mm |
| | 1,000×1,000 mm | 5 mm to 30 mm | 1,000×1,000 mm | 10 mm to 20 mm |
| | 1,000×2,000 mm | 5 mm to 30 mm | | |

| Rods | MCN Rod 950 | | MCN Rod 050 | |
|------|-------------|-----------------------------|-------------|----------------------------|
| | Length | Nominal diameter | Length | Nominal diameter |
| | 1,000 mm | 30 mm to 200 mm in diameter | 1,000 mm | 20 mm to 50 mm in diameter |

For more information, refer to the specification table on p. 116.

Takiron Polymer Products
Monomer Cast Nylon

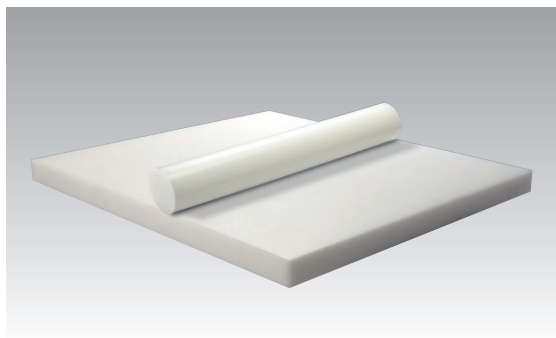


Super Cast Nylon
Precautions for use

- Nylon resins tend to absorb water, which can alter their dimensions and strength properties. When designing a product, be sure to properly evaluate the conditions in which it is going to be used.
- If the material is going to be used in highly humid environments or in water for prolonged periods of time, its dimensions may get enlarged due to water absorption. Therefore, be sure to carry out water absorption treatment beforehand.
- If you wish to use the material in products that come into direct contact with food or drinks, please contact us beforehand.
- Please keep in mind that nylon is generally not very acid-resistant and that acids can damage it even at low concentrations.
- Drilling holes in a large-diameter rod can distort the material inside, which can cause the rod to break in certain conditions. Be sure to properly adjust the drill feed and take other precautions when processing the material.
- This product is very slippery. Be sure to store it on a flat surface to prevent it from collapsing.

POM Plates and Rods (TS Grade)

Product type and number: **POM 760/POM Rod 760 (Natural)**



POM 760 (Plate)
POM Rod 760 (Rod)



Excellent machining workability

This material offers outstanding workability with few burrs and little warping.

Superb wear resistance

A low friction coefficient ensures great self-lubricating performance.

Compliant with the Food Sanitation Act

The material meets the requirements stipulated in the Public Notice of the Ministry of Health, Labour and Welfare No. 595 and is therefore suitable for manufacturing utensils, containers, packaging, and similar products in the food industry.

FDA-approved and PIM-compliant

The material complies with all the relevant standards.



Parts for standard machinery, parts for food production machinery, sliding parts, etc.



| Plates | |
|----------------|--|
| Size | Thickness |
| 500×1,000 mm | 10 mm to 100 mm |
| 600×1,200 mm | 10 mm to 100 mm |
| 1,000×1,000 mm | 10 mm to 50 mm |
| | : 60 mm to 100 mm <small>(made-to-order product)</small> |

Rods

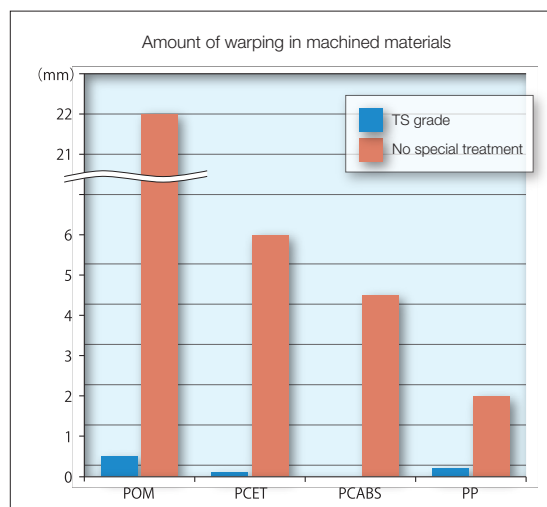
| Length | Nominal diameter |
|----------|-----------------------------|
| 1,000 mm | 30 mm to 100 mm in diameter |

For more information, refer to the specification table on p. 117.

TS grade is a term we use for machining materials that meet our internal criteria, boasting low distortion levels and superb dimensional stability after machining.

TS Grade Materials

| Materials | Shapes | Product Types | Product Number | Thickness/ Diameter (mm) |
|---------------|--------|---------------------------------|----------------|-----------------------------|
| Polyacetal | Plate | POM | 760 | 10 to 100 |
| Polycarbonate | Plate | PCET | 1600 | 10 to 200 |
| | | | 1900 | 10 to 60 |
| PC alloy | Plate | PCABS | 2900 | 5 to 100 |
| Polypropylene | Plate | PP | P370 | 10 to 100 |
| | | | P975 | 10 to 100 |
| | Rod | PP rod | 370 | 15 to 300 |
| | Plate | Reinforced PP with glass filler | 90G30 | 20, 50, 100 |



Polyacetal Precautions for use

- Do not use this material in hot water because it has low resistance to hydrolysis.
- When heated, the material generates formaldehyde, which can cause skin or mucous membrane irritation. Exercise caution when handling it.

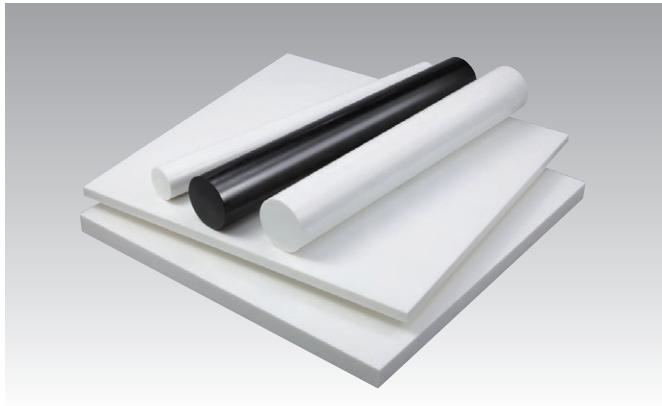
Polyethylene Terephthalate

Continuous operating temperature: Max. 100°C

Physical Properties ▶ p. 80-81

Polyethylene Terephthalate Plates and Rods

Product type and number:
PEX C777 (White)
PEX Rod 777/778 (White)
PEX Rod 977 (Black)



PEX C777 (Plate)
 PEX Rod 777/778 (Rod)
 PEX Rod 977 (Rod)

Characteristics

This is a type of machining PET molded and processed with our own unique material.

Superb physical properties

This highly cost-efficient material strikes a perfect balance between linear expansion, water absorption, mechanical strength, wear resistance, heat resistance, electric strength, and other properties.

Suitable for all environments

When burnt, the material does not emit any toxic halogen gases, and its combustion calorie level remains low compared to other plastics.

Compliant with the Food Sanitation Act

The material meets the requirements stipulated in the Public Notice of the Ministry of Health, Labour and Welfare No. 201 and is therefore suitable for manufacturing utensils, containers, packaging, and similar products in the food industry. Also, the white color of its natural grade structure gives it a clean look.

Applications

Parts for food production machinery, parts for medical instruments, parts for semiconductor production equipment, sliding parts such as bearings and guides

Standard dimensions

| Plates | Size | Thickness |
|--------|--------------|-----------|
| | 610×1,000 mm | : |

| Rods | Length | Nominal diameter | |
|------|----------|------------------|------------------------------|
| | 1,000 mm | : | 30 mm to 100 mm in diameter |
| | | : | 120 mm to 200 mm in diameter |

For more information, refer to the specification table on p. 117.



Precautions for use

- This material has different physical properties compared to amorphous transparent polyethylene terephthalate (PET-G).
- Due to the high notch sensitivity of this material, make sure the corners on products made from it are properly rounded in order to prevent breakage.
- When machining this material, be sure to pay attention to cutting depth and other processing conditions in order to avoid any cracking or chipping issues.
- Please keep in mind that PET is generally not very alkali-resistant and that alkalis can damage it even at low concentrations.

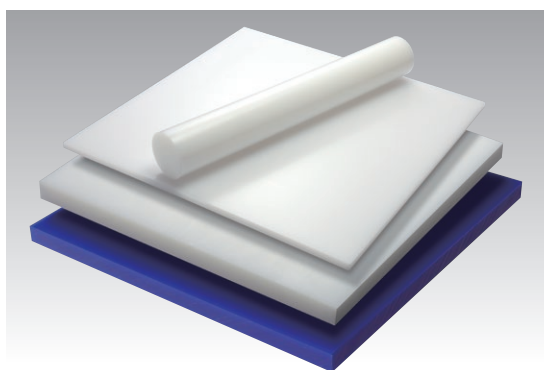
Ultra-High Molecular Weight Polyethylene

Continuous operating temperature: -100°C to 80°C

Physical Properties ▶ p. 80-81

UHMW Plates and Rods

Product type and number: **UP 140 (Natural)/UP Rod 140 (Natural)**
UP 542 (Blue)



UP 140 (Plate) UP 542 (Plate)
UP Rod 140 (Rod)



Superb wear resistance

This material maintains its outstanding wear resistance compared to other plastics, which is why it is suitable for use in harsh environments.

Excellent sliding properties

It has the second lowest friction coefficient after PTFE and boasts incredible self-lubricating and anti-adhesion qualities.

Impact resistance

The material maintains its high impact resistance even in temperatures as low as -100°C.

Compliant with the Food Sanitation Act

It meets the requirements stipulated in the Public Notice of the Ministry of Health, Labour and Welfare No. 201 and is therefore suitable for manufacturing utensils, containers, packaging, and similar products in the food industry. Type UP 542 is made from a material that complies with FDA regulations and PIM standards.



Parts for food production machinery, parts for standard machinery, sliding parts such as bearings and guides



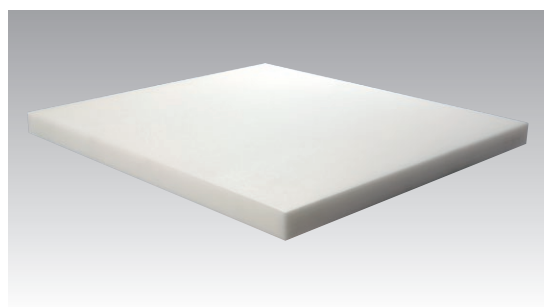
| Plates | UP 140 | | UP 542 | |
|--------|----------------|--|----------------|---|
| | Size | Thickness | Size | Thickness |
| | 1,000×1,000 mm | 10 mm to 70 mm | 1,000×1,000 mm | 8 mm to 30 mm |
| | 600×1,200 mm | 80 mm to 120 mm | | 40 mm to 50 mm <small>(made-to-order product)</small> |
| | 1,000×2,000 mm | 1 mm to 50 mm : 55 mm to 70 mm <small>(made-to-order product)</small> | 1,000×2,000 mm | 8 mm to 50 mm |
| | 1,000×2,000 mm | 10 mm to 20 mm [Thick finish] : 25 mm to 30 mm <small>(made-to-order product)</small> | | |

| Rods | |
|------------|-----------------------------|
| UP Rod 140 | |
| Length | Nominal diameter |
| 1,000 mm | 10 mm to 200 mm in diameter |

For more information, refer to the specification table on p. 117 to 118.

Low-Friction Grade UHMW Plates <EX Glide>

Product type and number: **UP 143SL (Natural)**



UP 143SL (Plate)



Low-friction grade material with a special filler compound

The low friction properties of this material remain stable over a long period of time.

Noise reduction

The material reduces friction to suppress any creaking or rubbing sounds.

Reducing the amount of abrasion powder

The product reduces the amount of abrasion powder, which often tends to cause friction.



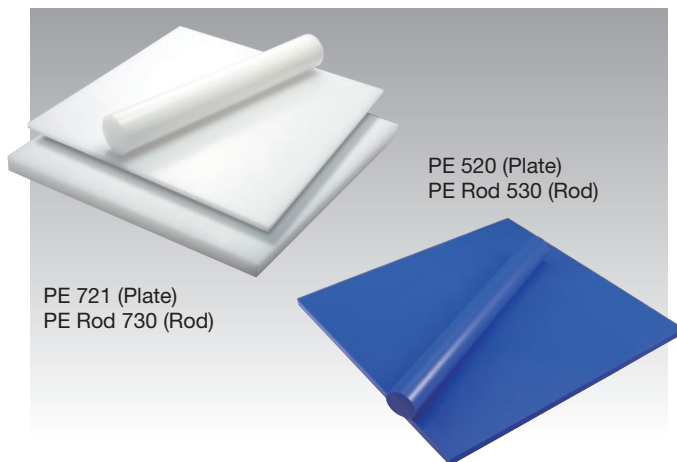
| Plates | |
|----------------|----------------|
| Size | Thickness |
| 1,000×2,000 mm | 10 mm to 50 mm |

For more information, refer to the specification table on p. 118.

HDPE Plates and Rods

Product type and number:
PE 721 (Natural)
PE Rod 730 (Natural)

PE 520 (Blue)
PE Rod 530 (Blue)



Compliant with standards for food products

This material complies with the Food Sanitation Act, FDA regulations, and PIM standards.



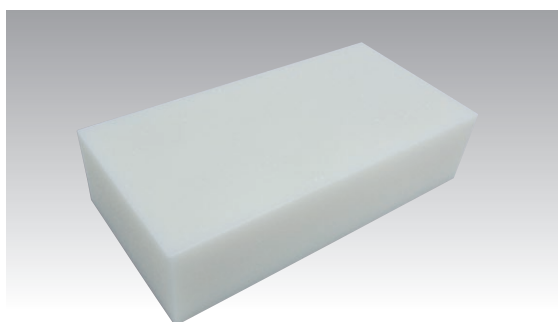
| Plates | PE 721 | | PE 520 | |
|--------|----------------|-----------------------------|----------------|-----------------------------|
| | Size | Thickness | Size | Thickness |
| | 500×1,000 mm | 10 mm to 100 mm | 1,000×1,000 mm | 10 mm to 100 mm |
| | 1,000×1,000 mm | 10 mm to 100 mm | 1,000×2,000 mm | 10 mm to 40 mm |
| | 1,000×2,000 mm | 10 mm to 100 mm | | |
| Rods | PE Rod 730 | | PE Rod 530 | |
| | Length | Nominal diameter | Length | Nominal diameter |
| | 1,000 mm | 20 mm to 200 mm in diameter | 1,000 mm | 40 mm to 120 mm in diameter |

For more information, refer to the specification table on p. 118.

High-Density Polyethylene Plates with 10% Boron

Product type and number:
PE B770 (Natural)

Made-to-order product



Molded products made from high-density polyethylene with 10% diboron trioxide (B₂O₃)

We have added high-purity B₂O₃ to the high-density polyethylene.

Stable dispersibility

By using a unique compounding technique, we make sure B₂O₃ is dispersed across the surface of each plate as equally as possible.



Plates used to block neutron beams that are generated from nuclear facilities and facilities that manage radiation, such as hospitals



Plates

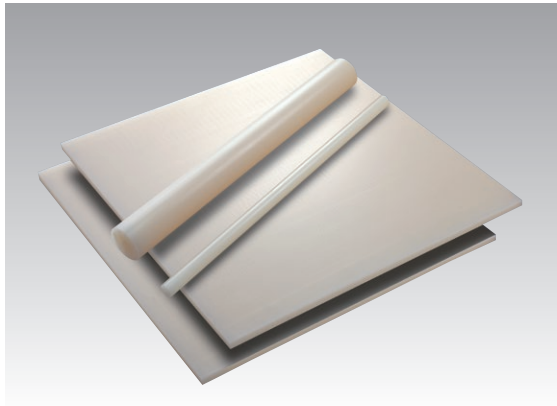
Made-to-order product

Contact us for more information about size availability.

Vinylidene Fluoride

PVDF Plates and Rods

Product type and number: **PVDF F2 (Natural)**
PVDF Rod F2 (Natural)



PVDF F2 (Plate)
PVDF Rod F2 (Rod)



Excellent machining workability

This material offers superb machining workability with few burrs and little warping.

Superb chemical resistance

Although it may not be compatible with certain chemicals, the material fully utilizes all the advantages of fluoropolymers.



Plates

PVDF F2

| Size | Thickness |
|-------------|---|
| 500×1,000mm | 10 mm to 50 mm : 70 mm, 85 mm <small>(made-to-order product)</small> |

Rods

PVDF Rod F2

| Length | Nominal diameter |
|---------|-----------------------------|
| 1,000mm | 10 mm to 150 mm in diameter |

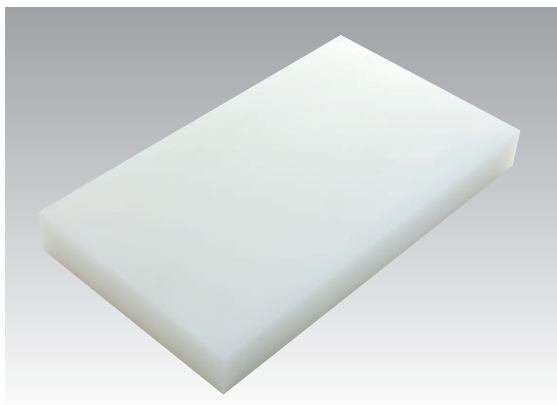
For more information, refer to the specification table on p. 118.



Parts for semiconductor production equipment, plating equipment, liquid chemical pumps, valves, and other machinery parts

PVDF Plates (Low-Distortion Grade)

Product type and number: **PVDF F10 (Natural)**



PVDF F10 (Plate)



Excellent machining workability

Because of a special processing technique, this new material is even less prone to machining deformations than the previous type F2.

Hue (Color)

Compared to the previous type F2, the hue of this new product contains much less yellow and more white.

Chemical resistance

Since it does not contain fillers or any other similar substances, the material is extremely resistant to acids, alkalis, organic solvents, and other substances.



Plates

PVDF F10

| Size | Thickness |
|-------------|----------------|
| 500×1,000mm | 10 mm to 50 mm |

For more information, refer to the specification table on p. 118.



Parts for semiconductor production equipment, plating equipment, liquid chemical pumps, valves, and other machinery parts

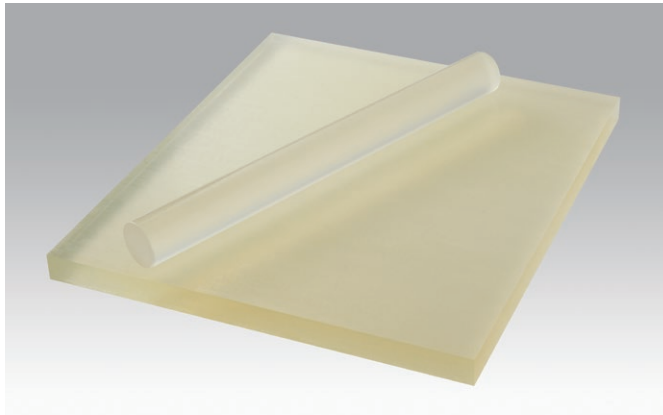
PMP (Polymethylpentene)

Continuous operating temperature: Max. 115°C

Physical Properties ▶ p. 82-83

PMP (Polymethylpentene) Plates

Product type and number: **PMP (Polymethylpentene) M600 (Transparent)**
PMP (Polymethylpentene) Rod 600 (Transparent)



PMP (Polymethylpentene) M600 (Plate)
 PMP (Polymethylpentene) Rod 600 (Rod)

Characteristics

| | |
|---|---|
| Heat resistance | Since its melting point is at 240°C, this material can be exposed to higher temperatures compared to polypropylene. |
| Steam resistance | The material does not hydrolyze even when immersed in boiling water, which is why it is suitable for steam sterilization. |
| Superb chemical resistance | With the exception of some organic solvents, such as toluene or trichloroethylene, the material is very resistant to acids and alkalis. |
| Superb electrical properties | The dielectric properties are as low as those seen in PTFE. (The dielectric constant is 2.1, and the dissipation factor is 0.0008 (@10 GHz).) |
| Compliant with standards for food products | This material complies with the Food Sanitation Act, FDA regulations, and PIM standards. |

Applications

Laboratory instruments, food containers, medical instruments, etc.

Standard dimensions

| Plates | | Rods | |
|------------------------------|-----------|--------------------------------------|------------------|
| PMP (Polymethylpentene) M600 | | PMP (Polymethylpentene) Rod 600 | |
| Size | Thickness | Length | Nominal diameter |
| 500×1,000 mm : 30 mm | | 1,000 mm : 50 mm, 100 mm In diameter | |

For more information, refer to the specification table on p. 119.
 *Contact us for more information about other sizes.



PMP (Polymethylpentene) Precautions for use

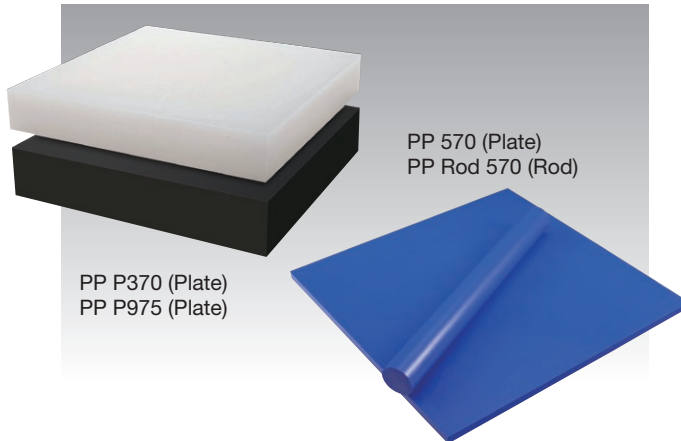
- Exercise caution when exposing this material to heavy loads in environments that reach 120°C or more because its flexural rigidity is low.
- Since its surface is not smooth, be sure to polish it if you need it to be more transparent in order to create see-through elements such as observation windows.
- After machining the surface, you can also buff it to give it a more transparent finish.
- Over the years, the material may change color because of its structure.
- Not recommended for use in optical applications such as lenses.

Polypropylene

PP Plates and Rods for Machining (TS Grade)

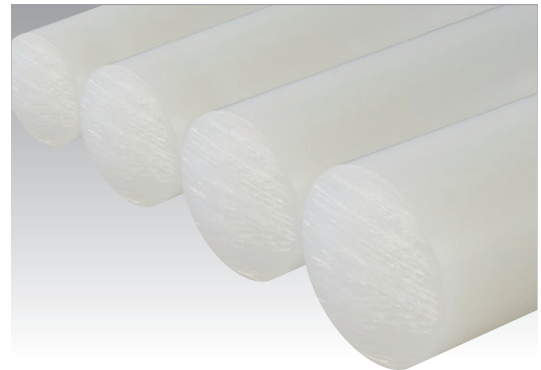
Product type and number:
PP P370 (Natural)
PP 570 (Blue)
PP P975 (Black)

PP Rod 370 (Natural)
PP Rod 570 (Blue)



PP P370 (Plate)
PP P975 (Plate)

PP 570 (Plate)
PP Rod 570 (Rod)



PP Rod 370 (Rod)

Characteristics

| | |
|--|---|
| Excellent machining workability | This material offers superb machining workability with few burrs and little warping. |
| Excellent hue (Natural) | The material is a lot less prone to discoloration at an early stage and hue changes (yellowing) that occur over time compared to standard machining PP materials. |
| Compliant with the Food Sanitation Act | It meets the requirements stipulated in the Public Notice of the Ministry of Health, Labour and Welfare No. 201 and is therefore suitable for manufacturing utensils, containers, packaging, and similar products in the food industry. |
| FDA-approved and PIM-compliant (Natural/Blue) | The material complies with all the relevant standards. |

Applications

Semiconductor production equipment, plating equipment, liquid chemical pumps, valves, food production machinery, laboratory instruments, prototypes, etc.

Standard dimensions

| Plates | PP P370 | | PP 570 | |
|--------|----------------|-----------------------------|--------------|-----------------------------|
| | Size | Thickness | Size | Thickness |
| | 500×1,000 mm | 10 mm to 100 mm | 500×1,000 mm | 10 mm to 50 mm |
| | 1,000×1,000 mm | 10 mm to 100 mm | PP P975 | |
| | 1,000×2,000 mm | 10 mm to 100 mm | Size | Thickness |
| | | | 500×1,000 mm | 10 mm to 100 mm |
| Rods | PP Rod 370 | | PP Rod 570 | |
| | Length | Nominal diameter | Length | Nominal diameter |
| | 1,000 mm | 15 mm to 300 mm in diameter | 1,000 mm | 50 mm to 230 mm in diameter |

For more information, refer to the specification table on p. 119.

For more information, refer to the specification table on p. 119.

Thick PP Plates and Large-Diameter PP Rods

Product type and number: **PP 301 (Natural)**
PP Rod 301 (Natural)



PP Rod 301 (Rod)



Rods with one of the largest diameters available in Japan



Semiconductor production equipment, plating equipment, liquid chemical pumps, valves, laboratory instruments, etc.



Plates

| Size | Thickness |
|--------------|-----------|
| 600×1,200 mm | : 150 mm |

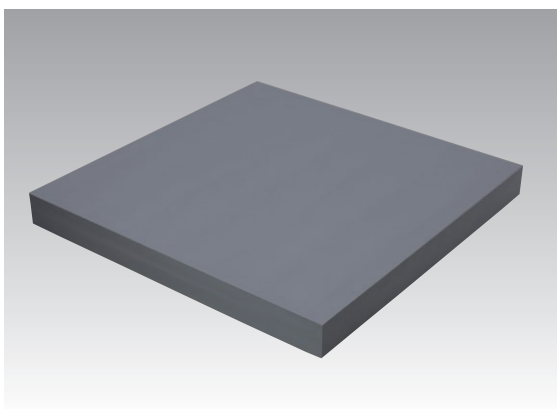
Rods

| Length | Nominal diameter |
|----------------|-----------------------------|
| 40 to 2,000 mm | : 320 mm/445 mm in diameter |

For more information, refer to the specification table on p. 119.

PP Plates (Dark Gray)

Product type and number: **PP 922 (Dark Gray)**



PP P922 (Plate)



High rigidity

Its flexural elasticity is about 1.5 times that of type PP P370, which is ideal for the production of thin products or high-precision machining processes.

High heat resistance

The deflection temperature under load of this material is about 30°C higher compared to type PP P370, allowing you to design products that are both heat-resistant and cost-efficient.



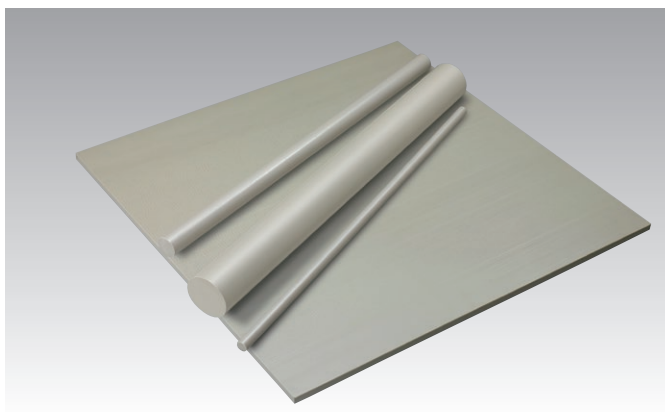
Plates

| Size | Thickness |
|----------------|------------------|
| 1,000×1,000 mm | : 25 mm to 50 mm |
| 1,000×2,000 mm | : 25 mm to 50 mm |

For more information, refer to the specification table on p. 119.

PEEK Plates and Rods

Product type and number: **PEEK 810 (Beige)**
PEEK Rod 810 (Beige)



PEEK 810 (Plate)
PEEK Rod 810 (Rod)

Characteristics

High heat resistance

With its maximum continuous operating temperature at 260°C, this is the best-performing thermoplastic resin.

High strength

Due to its high mechanical strength and toughness, this material can be used to replace metals.

Superb chemical resistance

With the exception of concentrated sulfuric acid, concentrated nitric acid, and some other types of strong acids, the material is highly resistant to chemicals.

FDA-approved and PIM-compliant

The material complies with all the relevant standards.

Applications

Parts for semiconductor and liquid crystal production equipment, electric and electronic devices, vehicle parts, food production equipment, medical instruments, etc.

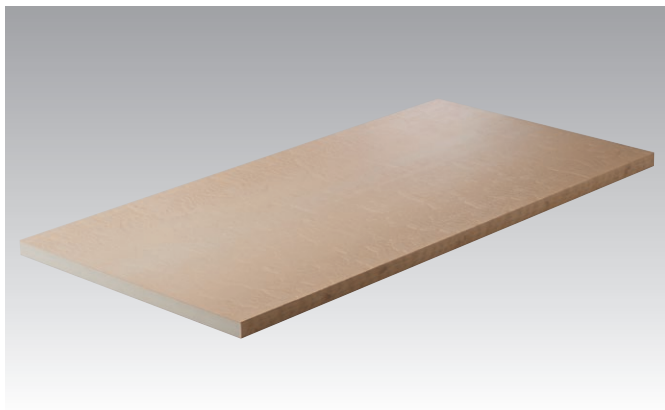
Standard dimensions

| Plates | Size | Thickness |
|--------------|---|------------------------------|
| | 500 × 1,000 mm | : 8 mm to 50 mm |
| 500 × 500 mm | : 8 mm to 50 mm (semi-standard product) | |
| 500 × 245 mm | : 8 mm to 50 mm (semi-standard product) | |
| 245 × 245 mm | : 8 mm to 50 mm (semi-standard product) | |
| Rods | Length | Nominal diameter |
| | 1,000 mm | : 6 mm to 140 mm in diameter |
| 495 mm | : 30 mm to 140 mm in diameter (semi-standard product) | |

For more information, refer to the specification table on p. 119 to 120.

PPS Plates

Product type and number: **PPS 800 (Natural)**



PPS 800 (Plate)

Characteristics

Excellent machining workability

Excellent dimensional stability after cutting.

Superb chemical resistance

Excellent resistance to acids, alkalis, organic solvents, etc., without using fillers.

High Heat Resistance

Excellent high temperature properties with continuous use temperature of 220°C.

*Using the product in high-load environment requires attention.

Applications

Automotive parts, electrical and electronic parts, etc.

Standard dimensions

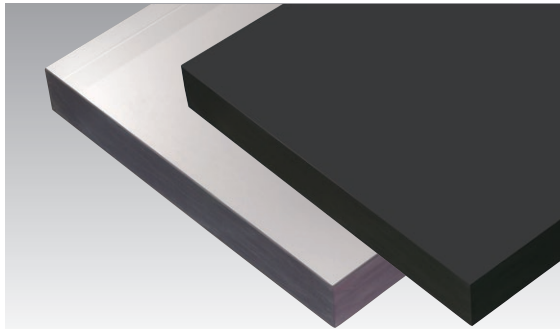
| Plates | Size | Thickness |
|--------|--------------|--|
| | 250 × 500 mm | : 10 mm to 50 mm |
| | 250 × 250 mm | : 10 mm to 50 mm (semi-standard product) |

For more information, refer to the specification table on p. 120.

PC Plates for Machining (TS Grade)

Standard

Product type and number: **PCET 1600 (Transparent)/
PCET 1900 (Black)**



PCET 1600 (Plate)

PCET 1900 (Plate)



Continuous operating temperature: Max. 120°C

Excellent machining workability

This material offers superb machining workability with few burrs and little warping.

Excellent hue (PCET 1600)

The material has an icy tone that is not prone to initial discoloration anomalies (yellowing).

Superb light-shielding properties (PCET 1900)

The material maintains its total light transmittance level at 0% when cut up to 0.5 mm deep.

Material with a UL flammability rating of V-2 (PCET 1900)

This product has a UL flammability rating of V-2.

*Contact us for more information about applicable thickness specifications.



High-precision machinery parts, prototypes, etc.



Plates

PCET 1600

| Size | Thickness |
|----------------|---|
| 500×1,000 mm | 10 mm to 100 mm |
| 1,000×1,000 mm | 10 mm to 25 mm <small>(made-to-order product)</small> |
| 500× 500 mm | 200 mm |

PCET 1900

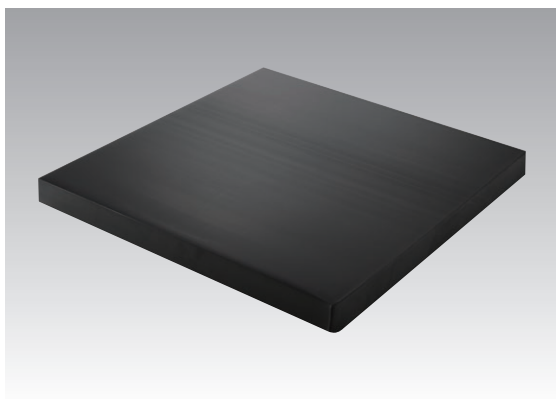
| Size | Thickness |
|----------------|---|
| 500×1,000 mm | 10 mm to 60 mm |
| 1,000×1,000 mm | 10 mm to 25 mm <small>(made-to-order product)</small> |

For more information, refer to the specification table on p. 120.

PC/ABS Plates (TS Grade)

Flame-retardant

Product type and number: **PCABS 2900 (Black)**



Continuous operating temperature: Max. 80°C

Excellent machining workability

This material offers remarkable dimensional stability after machining.

Superb light-shielding properties

The material maintains its total light transmittance level at 0% when cut up to 0.5 mm deep.

Material with a UL flammability rating of V-0

This product has a UL flammability rating of V-0.

Treated with non-halogenated flame retardant

The material is environmentally safe since it is treated with a type of non-halogenated flame retardant.



Plates

| Size | Thickness |
|--------------|----------------|
| 500×1,000 mm | 5 mm to 100 mm |

For more information, refer to the specification table on p. 120.



Prototypes, etc.



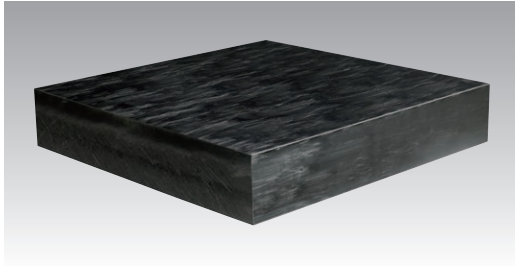
Polycarbonates Precautions for use

- Avoid using this material in locations where coatings or solvents are present because such substances can corrode or crack the surface.
- If the surface gets contaminated, wash it with a 1/200 dilution of a neutral detergent and wipe it dry with a soft cloth.
- Since the surfaces of transparent products are not smooth, you need to polish them first if you need to create see-through elements such as observation windows.
- Not recommended for use in optical applications such as lenses.

Reinforced PP Plates with Glass Fillers (TS Grade) Universal

Product type and number: **PP 90G30 (Black)**

Continuous operating temperature: Max. 100°C



PP 90G30 (Plate)



Molded PP product with 30% glass

This product contains 30% glass, which is equally dispersed through the polypropylene material.

Low anisotropy

Physical properties are very consistent regardless of the extrusion or vertical directions.

Improved physical properties

Compared to standard PP, the flexural elasticity level of this material is about twice as high, its deflection temperature under load is about 10°C higher, and its linear thermal expansion coefficient is 30% lower.

Excellent machining workability

This product reduces the twisting and warping anomalies that typically occur in standard materials with glass fillers during machining.



Materials for vehicle part prototypes, etc.



Plates

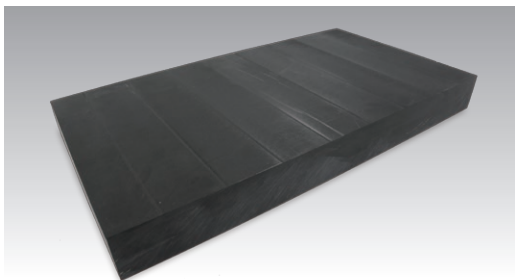
| Size | Thickness |
|--------------|----------------------|
| 500×1,000 mm | 20 mm, 50 mm, 100 mm |

For more information, refer to the specification table on p. 120.

Reinforced PC Plates with Glass Fillers Engineering Plastics Flame-retardant

Product type and number: **PCET GF20/91G20 (Black)**

Continuous operating temperature: Max. 120°C



PCET 91G20 (Plate)



Molded PC product with 20% glass

These are polycarbonate plates that contain 20% glass filler.

Low anisotropy

20 mm to 60 mm are products with little difference in physical properties in the extrusion and vertical directions. 10 mm and 15 mm are general grades.

Improved flexural elasticity and mechanical strength

The flexural elasticity and stress of this material are more than 1.5 times higher compared to standard polycarbonates.

Excellent machining workability

20 mm to 60 mm has less anisotropy in vertical and horizontal direction, which reduces the occurrence of twisting and warping during cutting. 10 mm and 15 mm are general grade.

Double-sided milling finish

Each plate is processed with a maximum thickness error of less than 0.5 mm, which reduces the amount of machining work.

Material with a UL flammability rating of V-0

This product has a UL flammability rating of V-0.



Materials for office automation equipment prototypes, etc.



Plates

| PCET GF20 | |
|--------------|--------------|
| Size | Thickness |
| 500×1,000 mm | 10 mm, 15 mm |

| PCET 91G20 | |
|--------------|----------------|
| Size | Thickness |
| 500×1,000 mm | 20 mm to 60 mm |

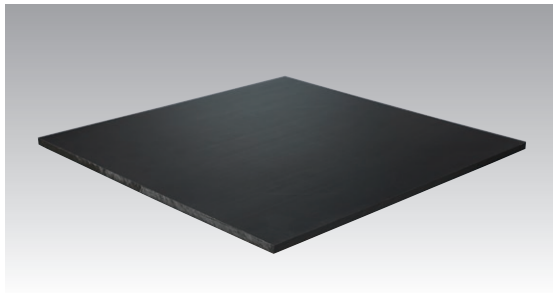
For more information, refer to the specification table on p. 120.

Conductive Nylon Plates

Engineering
Plastics

Product type and number: **PA 910CV (Black)**

Continuous operating temperature: Max. 100°C



PA 910CV (Plate)



Excellent conductivity

The volume resistivity level of this material is between 10^3 and $10^5 \Omega \cdot m$, which ensures stable conductivity performance after the machining process is finished.



Plates

| Size | Thickness |
|--------------|-----------------|
| 600×1,200 mm | : 5 mm to 30 mm |

For more information, refer to the specification table on p. 120.



Conveying equipment, jigs, assembly workbenches, covers, and other equipment that requires anti-static treatment



Caution

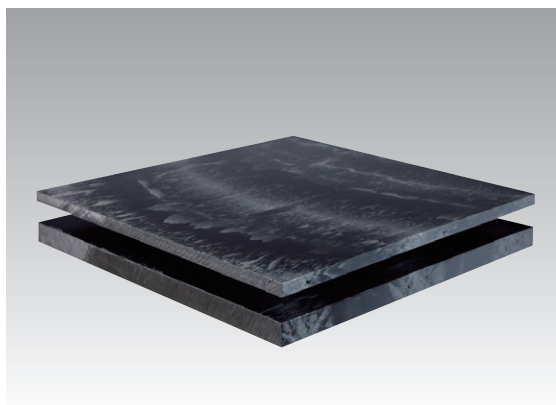
When machining this material, be sure to pay attention to feeding speed and other processing conditions in order to avoid any cracking or chipping issues.

Conductive PP Plates

Universal

Product type and number: **PP P973CV (Black)**

Continuous operating temperature: Max. 100°C



PP P973CV (Plate)



Excellent conductivity

The volume resistivity level of this material is between 10^0 and $10^2 \Omega \cdot m$, which ensures stable conductivity performance after the machining process is finished.

Excellent wear resistance

With this product, the conductive material is much less likely to fall off due to friction compared to standard kneaded products containing conductive carbon.

Lightness

Compared to materials with a specific gravity of 1.0 or higher, this material enables you to create a product that is lighter and easier to work with.



Plates

| Size | Thickness |
|--------------|------------------|
| 600×1,200 mm | : 10 mm to 30 mm |

For more information, refer to the specification table on p. 120.



Conveying equipment, jigs, assembly workbenches, covers, and other equipment that requires anti-static treatment

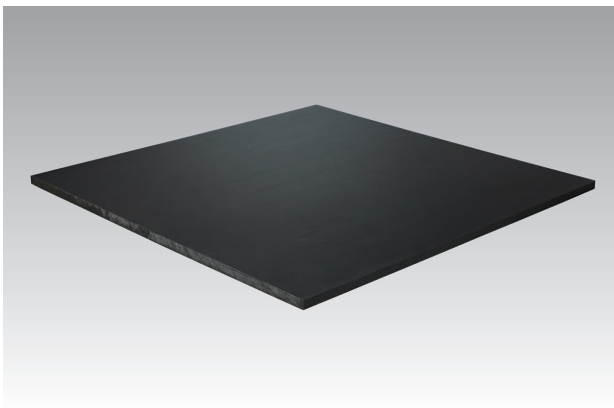


This is a type of conductive material with a uniform amount of special carbon kneaded into its structure.

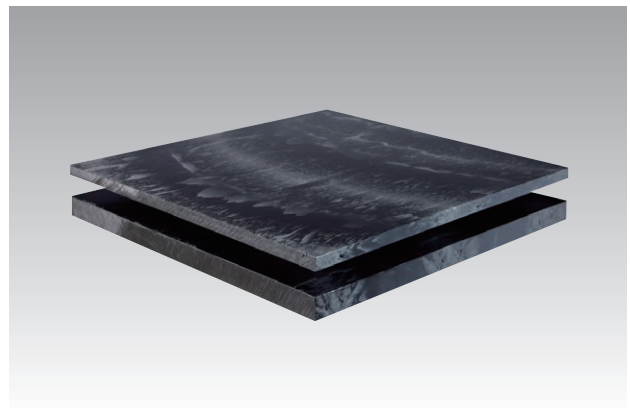
The material ensures stable conductivity performance after the machining process is finished.

It complies with the RoHS 2 Directive.

The material structure can be customized according to your needs.

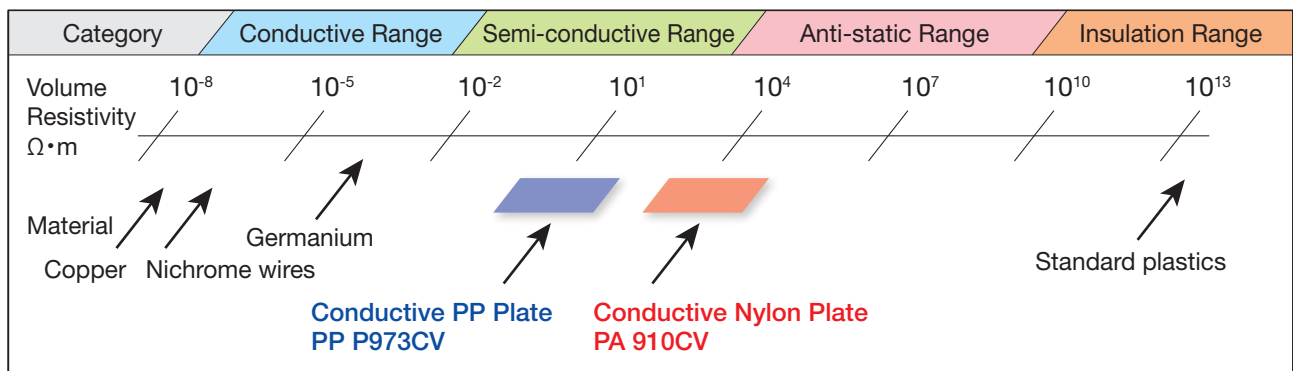


PA 910CV (Conductive Nylon Plate)



PP P973CV (Conductive PP Plate)

■ General electrical properties



■ Material characteristics

| Materials | Product Type and Number | Volume Resistivity ($\Omega \cdot m$) | Characteristics | Product Size | Thickness |
|----------------------|-------------------------|---|--|--------------|------------|
| Nylon 6 | PA 910CV | 10^3 to 10^5 | Mechanical strength Heat resistance Sliding performance | 600x1,200mm | 5 to 30mm |
| Polypropylene | PP P973CV | 10^0 to 10^2 | Lightness Chemical resistance Weak pollutant (carbon-free) | | 10 to 30mm |

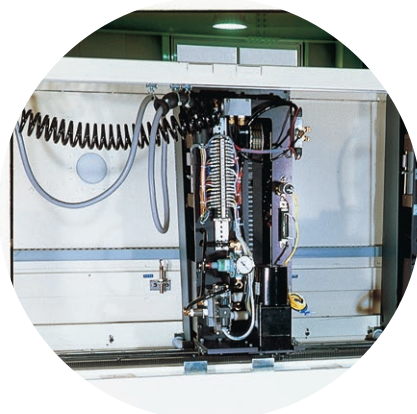
Contact us for more information.

Applications

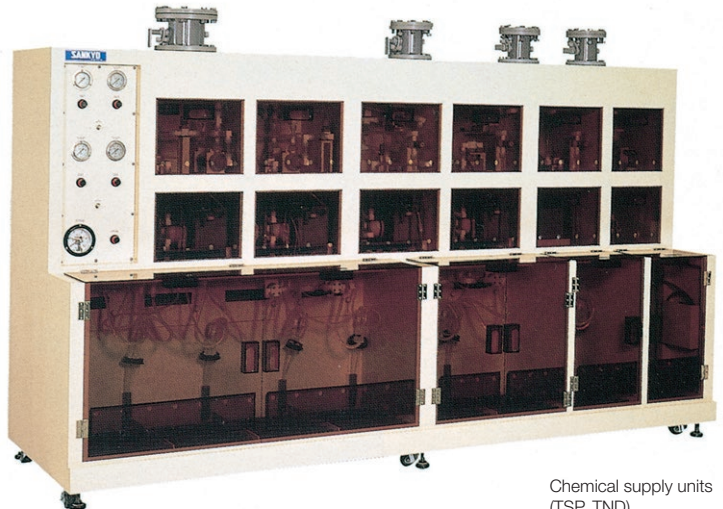
Equipment and Instruments for the Production of Semiconductors



Equipment for the production of 300 mm semiconductor wafers (FMH)



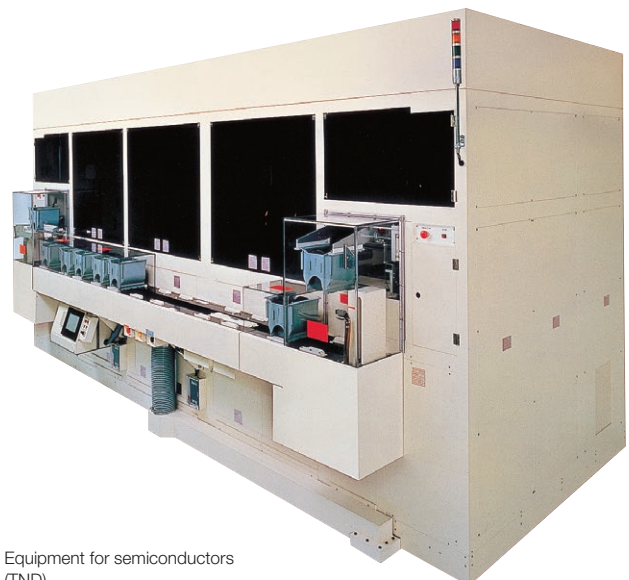
Cascade tanks for pure water used in automatic light etching equipment (TMC)



Chemical supply units (TSP, TND)



Fully automated wet wafer cleaning equipment (TND)



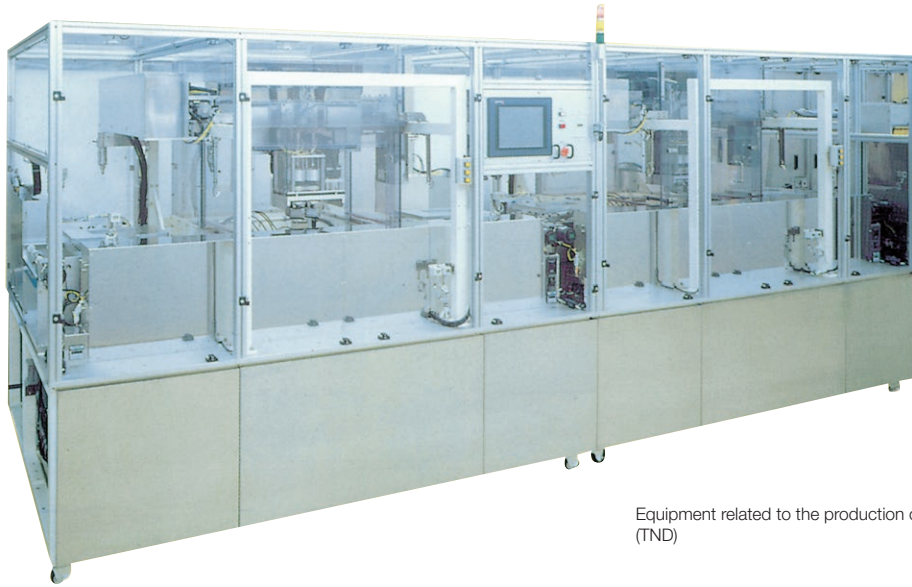
Equipment for semiconductors (TND)



(TEND)



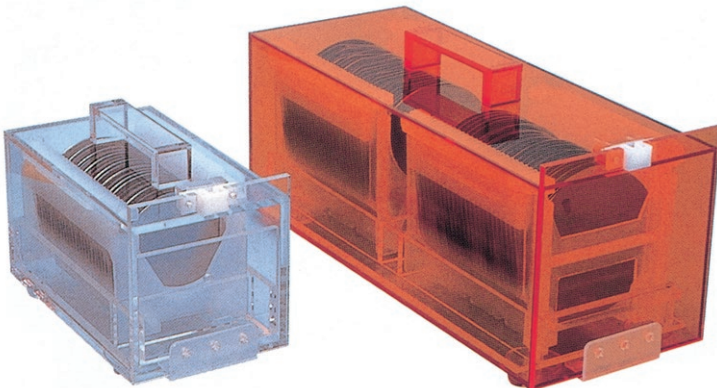
Equipment for the production of liquid crystal panels (TND)



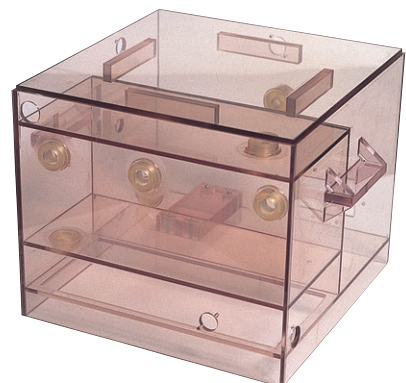
Equipment related to the production of liquid crystal panels (TND)

Applications

Parts for semiconductors



Carrying boxes (TND)



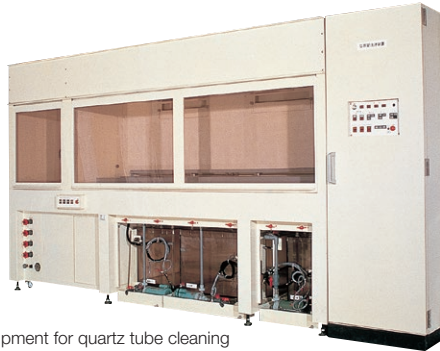
Wafer hollowing equipment (TMC)

Applications

Equipment for the Production of PCBs



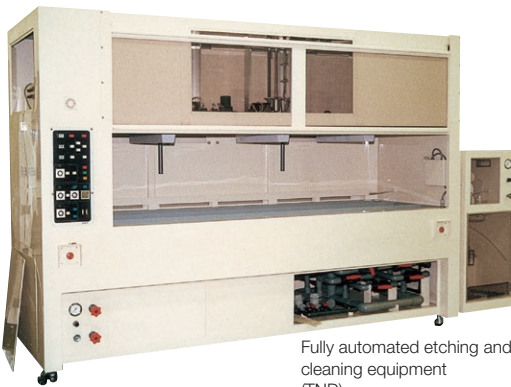
Automatic equipment for quartz tube cleaning (TSP, TS)



Equipment for quartz tube cleaning (RTSP, RTS)



Etching lines (RTSP, RTS)



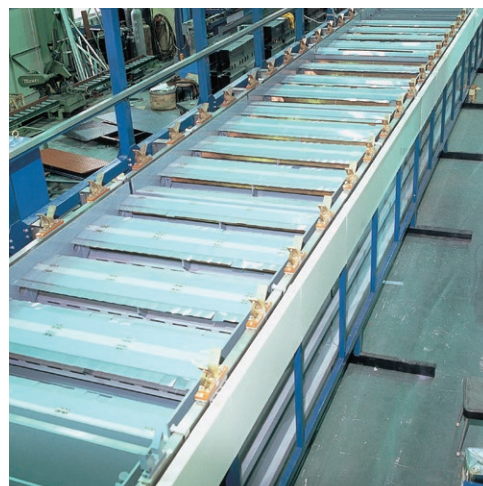
Fully automated etching and cleaning equipment (TND)



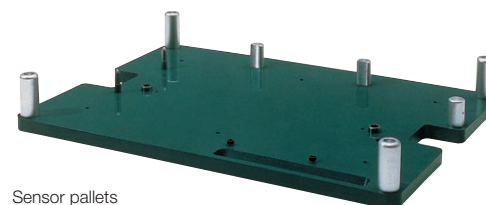
Automatic equipment for quartz tube cleaning (RTSP)



Equipment for the production of PCBs (HT)



Pattern plating lines for PCBs (THQ)



Sensor pallets (THQ)

Clean Room Equipment



Clean room partitions (TND)



Clean benches (TND)

Laboratory Instruments



Gloveboxes (TSP)



Medical film processors (TSP)

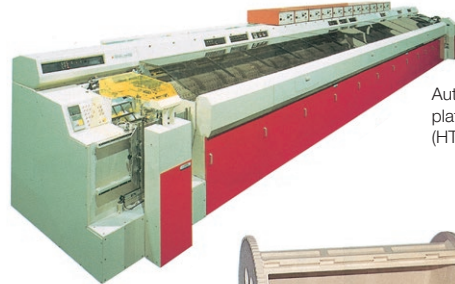
Windows for Equipments



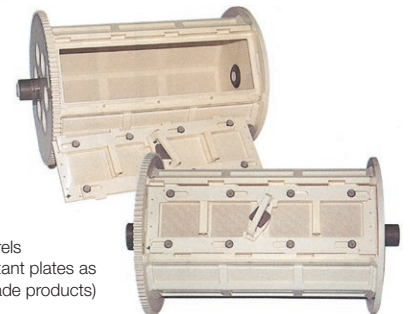
Windows for precision machining equipment (PC)



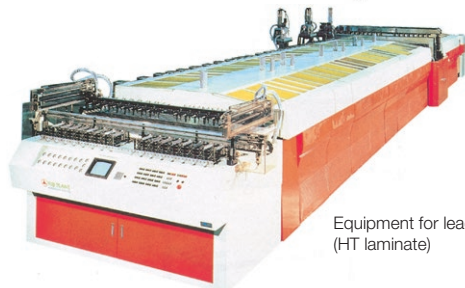
Plating Equipment



Automatic soldering and plating equipment (HT laminate)



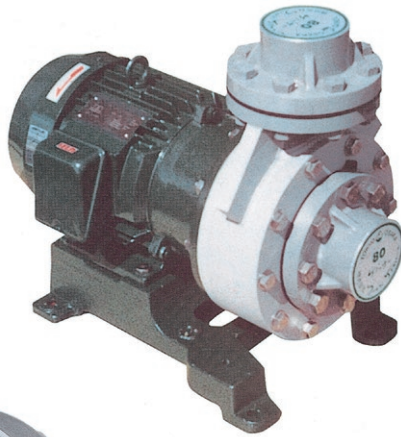
Plating barrels (Heat-resistant plates as custom-made products)



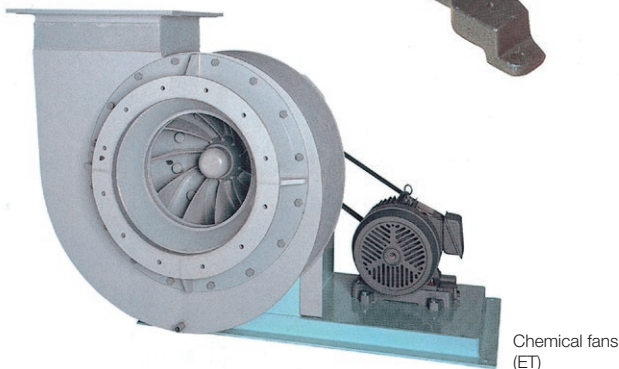
Equipment for lead frame plating (HT laminate)

Applications

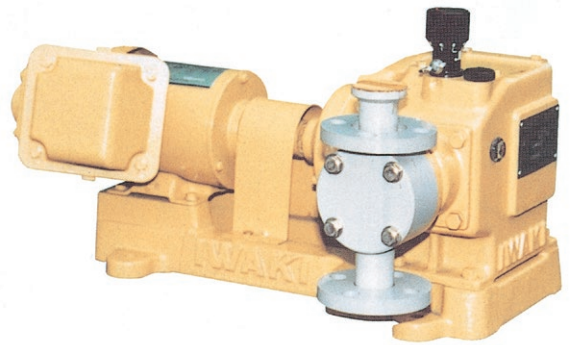
Chemical Pumps and Fans



Chemical pumps
(T)



Chemical fans
(ET)



Metering injection pumps for liquid chemicals
(T)

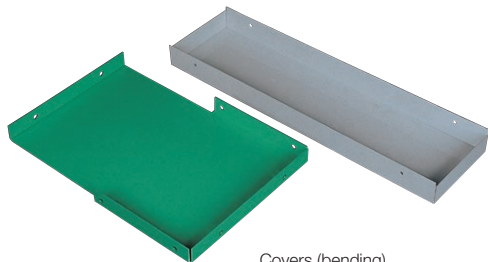
Products for Machinery and Electronic Devices



Covers for office automation
equipment (pressure forming)
(EVX)



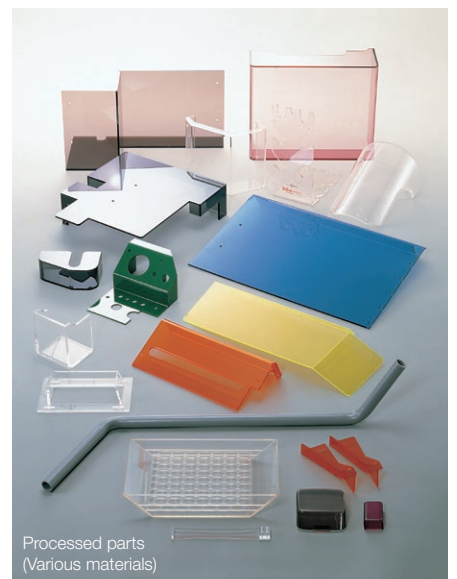
Machine covers (thermal bending)
(TS)



Covers (bending)
(EVX custom color, T)



Molded parts for vehicles



Processed parts
(Various materials)

Waste Gas Treatment System



Scrubbers
(T)

Conveying Equipment



Conveyor line covers
(EVX)

Products for Water Supply and Sewage Processing Facilities



Ventilation and odor control ducts at sewage processing facilities
(ET)



Ventilation and odor control ducts at sewage processing facilities
(ET)



Scrubbers
(ET)



Tilted plates with hooks for water supply systems, sedimentation separators
(ET, EQ)



(Hooks)

Applications

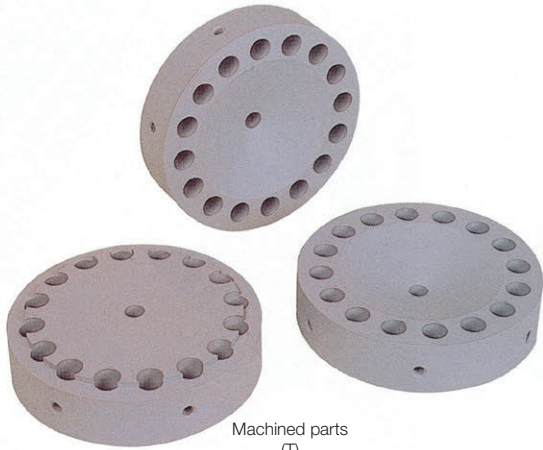
Machined Parts



Machined parts
(PP)



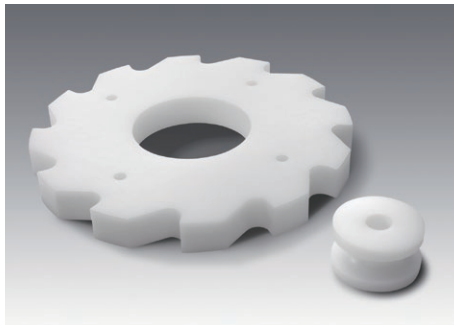
Filters for brewing presses
(PP)



Machined parts
(T)



Machined parts
(T)



Machined parts
(UP)



Machined parts
(PP)



Parts processed from machining materials
(MCN, PEX, PP)

Physical Properties and Chemical Resistance of Takiron Plates

- Physical Properties of PVC Plates..... p. 72-74
- Physical Properties of PVC Products (Rod, Accessories)..... p. 75
- Physical Properties of High Functional Materials..... p. 76-77
- Physical Properties of Non-PVC Plates (PP, PVDF, PC, PET)... p. 78-79
- Physical Properties of Takiron Polymer Products..... p. 80-83
- Physical and Thermal Properties..... p. 84-87
- Chemical Resistance of PVC Plates..... p. 88-93
- Chemical Resistance of PVDF Plates and Rods..... p. 94-97

Physical Properties

Chemical Resistance

Physical Properties

PVC Materials

Physical Properties of PVC Plates

| Evaluation Items | | Product Types Unit | | Standard PVC Plates | | | | | | |
|--------------------------------------|-------------------------------------|------------------------------------|----------------------------|-----------------------|-------------------------|-------------|---------|-----------|----|--|
| | | | | Press lamination | | | | Extrusion | | |
| | | | | T938 | | TSP338 | TS 608A | ET 1980 | | |
| | | | | Under 60 mm thickness | 60 mm thickness or more | | | | | |
| Physical Properties | Specific Gravity | – | 1.41 | 1.41 | 1.41 | 1.40 | 1.45 | | | |
| | Rockwell Hardness | M Scale | 63 | 63 | 63 | 80 | 61 | | | |
| | | R Scale | 117 | 117 | 117 | 120 | 113 | | | |
| Mechanical Properties | Tensile Yield Stress | MPa | 60 | 65 | 60 | 75 | 60 | | | |
| | Nominal Tensile Strain at Break | % | 12 | 7 | 12 | 8 | 12 | | | |
| | Tensile Elasticity | MPa | 3000 | 3100 | 3000 | 3400 | 2800 | | | |
| | Charpy Notched Impact Strength | KJ/m ² | 7.0 | 5.6 | 7.0 | 2.1 | 5.9 | | | |
| | Flexural Stress | MPa | 81 | 88 | 81 | 107 | 87 | | | |
| | Flexural Elasticity | MPa | 2800 | 3200 | 2800 | 3600 | 3100 | | | |
| | Compressive Yield Stress | MPa | 76 | 80 | 76 | 89 | 70 | | | |
| | Compressive Elasticity | MPa | 2200 | 2300 | 2200 | 2800 | 2400 | | | |
| | Shear Fracture Stress ^{*1} | MPa | 65 | 62 | 65 | 64 | 60 | | | |
| | Thermal Properties | Deflection Temperature under Load | °C | 1.8MPa | 74 | 63 | 74 | 63 | 72 | |
| Vicat Softening Temperature | | °C | Method B (50 N) | 80 | 70 | 80 | 71 | 78 | | |
| Dimensional Change on Heating | | % | Vertical | –3 | –3 | –3 | –5 | –2 | | |
| | | | Horizontal | –2 | –2 | –2 | –1 | 0 | | |
| Linear Thermal Expansion Coefficient | | ×10 ⁻⁵ ·K ⁻¹ | | 6.5 | 6.9 | 6.5 | 6.6 | 7.1 | | |
| Thermal Conductivity | | W/m·K | | 0.20 | 0.20 | 0.20 | 0.17 | 0.19 | | |
| Specific Heat Capacity | | J/g·K | | 1.11 | 1.20 | 1.11 | 1.10 | 1.12 | | |
| Flame Resistance | – | | Self-extinguishing | | | | | | | |
| Electrical Properties | Surface Resistivity | Ω/□ | – | | | | | | | |
| | Volume Resistivity | Ω·m | 10 ¹³ Ω or more | | | | | | | |
| | Breakdown Strength | MV/m | 17 | 18 | 17 | 17 | 16 | | | |
| | Permittivity (1 MHz) | – | 3 | 3 | 3 | 3 | 3 | | | |
| | Dissipation Factor (1 MHz) | – | 0.015 | 0.014 | 0.015 | 0.014 | 0.016 | | | |
| Optical Properties | Water Absorption | % | 0.013 | 0.015 | 0.013 | 0.011 | 0.022 | | | |
| | Total Light Transmittance | % | – | – | – | 85 | – | | | |
| | Hue (Color) | – | Gray | | Ivory | Transparent | Gray | | | |

• The above data are a series of test results for a 5 mm thick specimen and given here without guarantee (values marked *1 refer to a test specimen that is 3 mm thick).

*2: For test specimens that are 5 mm or 8 mm thick, this value is 1.52, and for test specimens that are 10 mm thick, the value is 1.53.

| | Standard PVC Plates | | | | Heat-Resistant PVC Plates | | Testing Methods |
|--|----------------------------|-------------|------------------|-------------|---------------------------|-------------------|--------------------|
| | Extrusion | | Continuous Press | | Press lamination | | |
| | ETSP1388 | ESS8800A | RTSP133PE | RTS110PE | HT928 | HTL958 HTL358 | |
| | 1.45 | 1.40 | 1.45 | 1.40 | 1.55 | 1.50 ² | ISO 1183-1 and -2 |
| | 61 | 70 | 63 | 84 | 79 | 68 | JIS K 7202 |
| | 113 | 119 | 117 | 123 | 121 | 118 | |
| | 60 | 67 | 58 | 74 | 64 | 64 | JIS K 7161-2-1B/50 |
| | 12 | 8 | 20 | 8 | 28 | 21 | |
| | 2800 | 3100 | 3100 | 3200 | 2900 | 3000 | JIS K 7161-2-1B/1 |
| | 5.9 | 1.7 | 3.5 | 1.8 | 5.0 | 6.0 | JIS K 7111-1 1epA |
| | 87 | 100 | 83 | 104 | 84 | 86 | JIS K 7171 |
| | 3100 | 3300 | 3000 | 3500 | 2900 | 3000 | |
| | 70 | 83 | 73 | 90 | 83 | 83 | JIS K 7181-B/5 |
| | 2400 | 2500 | 2400 | 2800 | 2500 | 2400 | JIS K 7181-A/1 |
| | 60 | 60 | 68 | 65 | 69 | Unmeasurable | JIS K 7214 |
| | 72 | 65 | 75 | 62 | 94 | 86 | JIS K 7191 |
| | 78 | 67 | 81 | 70 | 106 | Unmeasurable | JIS K 7206 |
| | -2 | -4 | -2 | -2 | -5 | -4 | JIS K 6745 |
| | 0 | -1 | -1 | -1 | -1 | -1 | |
| | 7.1 | 7.5 | 6.1 | 6.5 | 6.5 | 6.7 | JIS K 7197 |
| | 0.19 | 0.20 | 0.19 | 0.17 | 0.19 | Unmeasurable | Laser flash method |
| | 1.12 | 1.20 | 1.12 | 1.08 | 1.05 | Unmeasurable | JIS K 7123 |
| | Self-extinguishing | | | | | | JIS K 6911 |
| | - | | | | | | JIS K 6911 |
| | 10 ¹³ Ω or more | | | | | | JIS K 6911 |
| | 16 | 19 | 13 | 17 | 18 | Unmeasurable | JIS K 6911 |
| | 3 | 3 | 3 | 3 | 3 | Unmeasurable | JIS K 6911 |
| | 0.016 | 0.012 | 0.019 | 0.012 | 0.010 | Unmeasurable | JIS K 6911 |
| | 0.022 | 0.023 | 0.032 | 0.017 | 0.023 | 0.012 | JIS K 7209 |
| | - | 75 | - | 86 | - | - | JIS K 7361-1 |
| | Ivory | Transparent | Ivory | Transparent | Dark gray | Gray Ivory | - |

Physical Properties of PVC Plates

| Evaluation Items | Product Types | | Impact-Resistant PVC Plates | | | | Low-Foamed PVC | Testing Methods | |
|-----------------------|--------------------------------------|------------------------------------|-----------------------------|------------------|--|-------------------------------|----------------|--------------------|--------------------|
| | Unit | THQ098 THQ038 | TSHI601HI | Press lamination | | Extrusion | | | |
| | | | | EQ009 EQ004 | Rigid PVC for vacuum forming Various colors | Foam PVC Various colors | | | |
| Physical Properties | Specific Gravity | – | 1.35 | 1.32 | 1.35 | 1.35 | 0.72 | ISO 1183-1 and -2 | |
| | Rockwell Hardness | M Scale | 37 | 47 | 41 | 40 | –*2 | JIS K 7202 | |
| R Scale | | 108 | 112 | 110 | 109 | –*2 | | | |
| Mechanical Properties | Tensile Yield Stress | MPa | 48 | 53 | 47 | 44 | 20 | JIS K 7161-2-1B/50 | |
| | Nominal Tensile Strain at Break | % | 74 | 15 | 23 | 45 | 8 | | |
| | Tensile Elasticity | MPa | 2300 | 2500 | 2200 | 2100 | –*2 | JIS K 7161-2-1B/1 | |
| | Charpy Notched Impact Strength | KJ/m ² | 80.0 | 58.0 | 87.0 | 79.0 | 1.5 | JIS K 7111-1 1epA | |
| | Flexural Stress | MPa | 61 | 73 | 66 | 60 | 32 | JIS K 7171 | |
| | Flexural Elasticity | MPa | 2200 | 2600 | 2300 | 2200 | 1300 | | |
| | Compressive Yield Stress | MPa | 64 | 64 | 56 | 51 | –*2 | JIS K 7181-B/5 | |
| | Compressive Elasticity | MPa | 2200 | 2100 | 2000 | 1800 | –*2 | JIS K 7181-A/1 | |
| | Shear Fracture Stress ^{*1} | MPa | 54 | 53 | 48 | 45 | –*2 | JIS K 7214 | |
| Thermal Properties | Deflection Temperature under Load | °C | 1.8MPa | 72 | 66 | 70 | 74 | 67 | JIS K 7191 |
| | Vicat Softening Temperature | °C | Method B (50 N) | 78 | 71 | 77 | 79 | –*2 | JIS K 7206 |
| | Dimensional Change on Heating | % | Vertical | –3 | –4 | –3 | –3 | –*2 | JIS K 6745 |
| | | | Horizontal | –2 | –2 | –2 | –1 | –*2 | |
| | Linear Thermal Expansion Coefficient | ×10 ⁻⁵ ·K ⁻¹ | | 8.0 | 7.7 | 8.4 | 8.2 | 6.9 | JIS K 7197 |
| | Thermal Conductivity | W/m·K | | 0.20 | 0.20 | 0.21 | 0.21 | Unmeasurable | Laser flash method |
| | Specific Heat Capacity | J/g·K | | 1.20 | 1.21 | 1.20 | 1.29 | Unmeasurable | JIS K 7123 |
| Flame Resistance | – | | Self-extinguishing | | | | | JIS K 6911 | |
| Electrical Properties | Surface Resistivity | Ω/□ | – | | | | | JIS K 6911 | |
| | Volume Resistivity | Ω·m | 10 ¹³ Ω or more | | | | | JIS K 6911 | |
| | Breakdown Strength | MV/m | 18 | 17 | 19 | 17 | 16 | JIS K 6911 | |
| | Permittivity (1 MHz) | – | 3 | 3 | 3 | 3 | 2 | JIS K 6911 | |
| | Dissipation Factor (1 MHz) | – | 0.023 | 0.014 | 0.024 | 0.031 | 0.010 | JIS K 6911 | |
| Water Absorption | % | | 0.018 | 0.015 | 0.046 | 0.051 | 0.051 | JIS K 7209 | |
| Optical Properties | Total Light Transmittance | % | – | 72 | – | – | – | JIS K 7361-1 | |
| | Hue (Color) | – | Dark gray Ivory | Transparent | Dark gray Green | – | – | – | |

* The above data are a series of test results for a 5 mm thick specimen and given here without guarantee (values marked *1 refer to a test specimen that is 3 mm thick).

*2: The value was not measured since this is a type of foaming material.

Physical Properties of PVC Products (Rod, Accessories)

| Evaluation Items | Product Types | Standard | | Impact-Resistant | Standard | Testing Methods |
|---------------------------------|-------------------|------------|-------------|------------------|--------------|--------------------|
| | | Angle 1980 | Angle C 600 | Angle HQ 098 | Channel 1980 | |
| | Unit | Gray | Transparent | Dark gray | Gray | |
| Lead-Free | | ✓ | ✓ | ✓ | ✓ | - |
| Tensile Yield Stress | MPa | 54 | 71 | 41 | 45 | JIS K 7161-2-1B/50 |
| Nominal Tensile Strain at Break | % | 20 | 20 | 109 | 45 | |
| Flexural Stress | MPa | 76 | 100 | 56 | 68 | JIS K 7171 |
| Flexural Elasticity | MPa | 3,000 | 3,600 | 2,100 | 3,000 | |
| Charpy Notched Impact Strength | kJ/m ² | 5 | 2 | 64 | 8.6 | JIS K 7111-1 1epA |
| Vicat Softening Temperature | °C (Method B) | 77 | 67 | 79 | 76 | JIS K 7206 |

| Evaluation Items | Product Types | Standard | | Heat-Resistant | Testing Methods |
|---------------------------------|-------------------|----------|--------|----------------|--------------------|
| | | Rod 938A | NC Rod | HT Rod 928 | |
| | Unit | Gray | Ivory | Dark gray | |
| Lead-Free | | ✓ | ✓ | ✓ | - |
| Tensile Yield Stress | MPa | 49 | 57 | 43 | JIS K 7161-2-1B/50 |
| Nominal Tensile Strain at Break | % | 24 | 10 | 10 | |
| Flexural Stress | MPa | 78 | 87 | 65 | JIS K 7171 |
| Flexural Elasticity | MPa | 3,300 | 3,400 | 2,600 | |
| Charpy Notched Impact Strength | kJ/m ² | 3 | 6 | 2 | JIS K 7111-1 1epA |
| Vicat Softening Temperature | °C (Method B) | 75 | 75 | 100 | JIS K 7206 |

| Evaluation Items | Product Types | Standard | | | Heat-Resistant | | | Testing Methods |
|---------------------------------|-------------------|-----------------------|---------------------------|------------------|-------------------------|-------------------------|---------------------|--------------------|
| | | Welding Rod 1980/938A | Welding Rod 338/1330/1388 | Welding Rod 8061 | Welding Rod HT 2091 | Welding Rod HT 928 | Welding Rod HT 2061 | |
| | Unit | Gray | Ivory | Transparent | Dark gray (color HT925) | Dark gray (color HT928) | Transparent | |
| Lead-Free | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - |
| Tensile Yield Stress | MPa | 68 | 68 | 62 | 66 | 66 | 68 | JIS K 7161-2-1B/50 |
| Nominal Tensile Strain at Break | % | 10 | 10 | 5 | 15 | 15 | 8 | |
| Charpy Notched Impact Strength | kJ/m ² | 2 | 2 | 2 | 2 | 2 | 2 | JIS K 7111-1 1epA |
| Vicat Softening Temperature | °C (Method B) | 71 | 71 | 71 | 100 | 100 | 100 | JIS K 7206 |

| Evaluation Items | Product Types | Impact-Resistant | | Metal-Free | | FM Heat-Resistant | PP | Testing Methods |
|---------------------------------|-------------------|--------------------|------------------|----------------------|----------------------|---------------------|--------------------------|--------------------|
| | | Welding Rod HQ 098 | Welding Rod 601S | Welding Rod TMC M331 | Welding Rod TMC M601 | Welding Rod HT 5305 | Welding Rod PP 7091/7031 | |
| | Unit | Dark gray | Transparent | Ivory | Transparent | Ivory | Dark gray/ Natural | |
| Lead-Free | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - |
| Tensile Yield Stress | MPa | 44 | 45 | 53 | 67 | 65 | 31 | JIS K 7161-2-1B/50 |
| Nominal Tensile Strain at Break | % | 25 | 13 | 5 | 5 | 10 | 45 | |
| Charpy Notched Impact Strength | kJ/m ² | 67 | 67 | 7 | 2 | 2 | 8 | JIS K 7111-1 1epA |
| Vicat Softening Temperature | °C (Method B) | 64 | 71 | 74 | 73 | 100 | *3 150 | JIS K 7206 |

[Remarks] (1) The above data are a series of test results for a 5 mm thick specimen and given here without guarantee.

(2) The figures for angles, rods, and channels represent product strength (base material strength). The figures for welding rods represent measurement values for roll-pressed material.

*3: The PP material was measured at 10 N (method A).

Physical Properties

High Functional Materials

Physical Properties of High Functional Materials

| Evaluation Items | Product Types | | Static-Dissipative Plates | | | Conductive Plates | Static-Dissipative and Electromagnetic Wave Shielding Plates | Metal-Free Plates | |
|-----------------------|--------------------------------------|------------------------------------|----------------------------|------------------------|---------------------------|--------------------------------|--|--------------------------|-------------|
| | | | Press lamination | | Continuous Press | Press lamination | Press lamination | Press lamination | |
| | Unit | TND77368 | TND77665 | ESND47802 ESND47302 | CV930 | TEND57600 | TMC60331 | TMC60601 | |
| Physical Properties | Specific Gravity | - | | 1.41 | 1.40 | 1.40 | 1.35 | 1.40 | 1.40 |
| | Rockwell Hardness | M Scale | 63 | 76 | 83 | 30 | 69 | 56 | 76 |
| | | R Scale | 117 | 122 | 123 | 88 | 119 | 116 | 122 |
| Mechanical Properties | Tensile Yield Stress | MPa | 60 | 74 | 73 | 35 | 72 | 57 | 75 |
| | Nominal Tensile Strain at Break | % | 8 | 7 | 7 | 19 | 8 | 20 | 7 |
| | Tensile Elasticity | MPa | 3000 | 3300 | 3200 | 2100 | 3100 | 2800 | 3500 |
| | Charpy Notched Impact Strength | KJ/m ² | 6.8 | 2.3 | 1.8 | 13.0 | 2.1 | 5.2 | 2.3 |
| | Flexural Stress | MPa | 81 | 98 | 104 | 50 | 91 | 79 | 102 |
| | Flexural Elasticity | MPa | 2800 | 3400 | 3500 | 2200 | 3300 | 2800 | 3600 |
| | Compressive Yield Stress | MPa | 81 | 90 | 90 | 45 | 90 | 69 | 90 |
| | Compressive Elasticity | MPa | 2300 | 2800 | 2800 | 1800 | 2800 | 2300 | 2900 |
| | Shear Fracture Stress ^{*1} | MPa | 55 | 65 | 65 | 47 | Unmeasurable | 53 | 65 |
| Thermal Properties | Deflection Temperature under Load | °C | 1.8MPa | 74 | 65 | 62 | 69 | 61 | 68 |
| | Vicat Softening Temperature | °C | Method B (50 N) | 80 | 72 | 70 | 76 | 71 | 77 |
| | Dimensional Change on Heating | % | Vertical | -3 | -6 | -2 | -5 | -5 | -6 |
| | | | Horizontal | -2 | -1 | -1 | -2 | -2 | -1 |
| | Linear Thermal Expansion Coefficient | ×10 ⁻⁵ ·K ⁻¹ | 6.9 | 6.7 | 6.7 | 8.4 | 7.0 | 8.0 | 6.5 |
| | Thermal Conductivity | W/m·K | 0.20 | 0.18 | 0.20 | 0.25 | 0.17 | 0.20 | 0.18 |
| | Specific Heat Capacity | J/g·K | 1.15 | 1.11 | 1.21 | 1.35 | 1.05 | 1.08 | 1.10 |
| Flame Resistance | - | Self-extinguishing | | | | | | | |
| Electrical Properties | Surface Resistivity | Ω/□ | 10 ^{6~9} | | | 10 ^{1~5} | 10 ^{6~9} | 10 ¹⁵ or more | |
| | Volume Resistivity | Ω·m | 10 ¹³ Ω or more | | | ² 10 ^{3~7} | 10 ¹³ or more | | |
| | Breakdown Strength | MV/m | 18 | 29 or more | 19 | Unmeasurable | Unmeasurable | 17 | 18 |
| | Permittivity (1 MHz) | - | 3 | 3 | 3 | Unmeasurable | Unmeasurable | 3 | 3 |
| | Dissipation Factor (1 MHz) | - | 0.144 | 0.026 | 0.014 | Unmeasurable | Unmeasurable | 0.024 | 0.016 |
| Optical Properties | Water Absorption | % | 0.015 | 0.016 | 0.010 | 0.035 | 0.010 | 0.030 | 0.023 |
| | Total Light Transmittance | % | - | 77 | 87 (transparent) | - | 51 | - | 83 |
| | Hue (Color) | - | Ivory | Transparent | Transparent Yellow tinted | Black | Transparent | Ivory | Transparent |

• The above data are a series of test results for a 5 mm thick specimen and given here without guarantee (values marked *1 refer to a test specimen that is 3 mm thick).

*2: Testing method: JIS K 7194

*3: These are a series of test results for products that are less than 15 mm thick.

| | FM Standard Plates | | FM Heat-Resistant Plates | | | FM Static-Dissipative Plates | FM Heat-Resistant and Static-Dissipative Plates | Testing Methods |
|--|--|------------------|--------------------------|---------|-------------|------------------------------|---|--------------------|
| | Continuous Press (FMET) Press lamination (FMET-) | Continuous Press | Press lamination | | | Continuous Press | Press lamination | |
| | FMET4323 FMET4773 | FMRTS4605 | FMH5305 | FMH5775 | FMHS6650 | FMND74602 | FMND7605 | |
| | 1.45 | 1.40 | 1.55 | 1.58 | 1.46 | 1.40 | 1.46 | ISO 1183-1 and -2 |
| | 67 | 76 | 80 | 79 | 83 | 76 | 86 | JIS K 7202 |
| | 118 | 120 | 123 | 121 | 123 | 121 | 124 | |
| | 58 | 68 | 63 | 64 | 74 | 68 | 72 | JIS K 7161-2-1B/50 |
| | 13 | 9 | 20 | 28 | 12 | 8 | 14 | |
| | 2900 | 3100 | 3000 | 2900 | 3300 | 3100 | 3000 | JIS K 7161-2-1B/1 |
| | 3.8 | 1.6 | 7.2 | 5.0 | 1.6 | 1.6 | 1.7 | JIS K 7111-1 1epA |
| | 78 | 87 | 88 | 84 | 99 | 87 | 93 | JIS K 7171 |
| | 2900 | 3100 | 3000 | 2900 | 3300 | 3100 | 3000 | |
| | 72 | 92 | 82 | 83 | 86 | 92 | 86 | JIS K 7181-B/5 |
| | 2600 | 2600 | 2500 | 2500 | 2500 | 2600 | 2500 | JIS K 7181-A/1 |
| | 60 | 64 | 69 | 69 | 68 | 63 | 68 | JIS K 7214 |
| | 73 | 63 | 86 | 94 | 85 | 63 | 85 | JIS K 7191 |
| | 81 | 71 | 97 | 106 | 94 | 71 | 94 | JIS K 7206 |
| | -2* ³ | -3 | -4 | -4 | -5 | -3 | -5 | JIS K 6745 |
| | -1* ³ | -1 | -1 | -1 | 1 | -1 | 1 | |
| | 6.7 | 6.4 | 6.5 | 6.5 | 6.1 | 6.4 | 6.1 | JIS K 7197 |
| | 0.24 | 0.21 | 0.21 | 0.19 | 0.16 | 0.21 | 0.16 | Laser flash method |
| | 1.27 | 1.12 | 1.24 | 1.05 | 1.06 | 1.12 | 1.06 | JIS K 7123 |
| | Self-extinguishing | | | | | | | JIS K 6911 |
| | 10 ¹⁵ or more | | | | | 10 ^{6~9} | | JIS K 6911 |
| | 10 ¹³ or more | | | | | | | JIS K 6911 |
| | 22 | 18 | 23 | 18 | 20 | 18 | 20 | JIS K 6911 |
| | 3 | 3 | 3 | 3 | 3 | 3 | 3 | JIS K 6911 |
| | 0.025 | 0.012 | 0.015 | 0.010 | 0.012 | 0.012 | 0.012 | JIS K 6911 |
| | 0.018 | 0.010 | 0.025 | 0.023 | 0.012 | 0.011 | 0.012 | JIS K 7209 |
| | - | 78 | - | - | 71 | 75 | 63 | JIS K 7361-1 |
| | Ivory white | Transparent | Ivory | White | Transparent | Transparent | Transparent | - |

Physical Properties

Non-PVC Materials

Physical Properties of Non-PVC Plates (PP, PVDF, PC, PET)

| Evaluation Items | | Product Types | | PP Plates | PVDF Plates | Polycarbonate Plates | |
|------------------------|---------------------------------------|-------------------------------|--------------------------|--------------------|-------------|------------------------|----------------------------------|
| | | | | Standard PP | FMPVDF | Standard Polycarbonate | Static-Dissipative Polycarbonate |
| | | Unit | RPP1350 | FMPVDF F300 | PC1600 | PCND L 78610 | |
| Physical Properties | Specific Gravity | | 0.91 | 1.78 | 1.20 | 1.20 | |
| | Rockwell Hardness | M Scale | 52 | 77 | 67 | 67 | |
| | | R Scale | 104 | 116 | 125 | 125 | |
| Mechanical Properties | Tensile Yield Stress | MPa | 33 | 53 | 63 | 63 | |
| | Nominal Tensile Strain at Break | % | 30 | 15 | 90 | 90 | |
| | Tensile Elasticity | MPa | 1500 | — | 2250 | 2250 | |
| | Charpy Notched Impact Strength | kJ/m ² | 6.6 | 10.0 | 13.0 | 13.0 | |
| | Flexural Stress | MPa | 42 | 64 | 91 | 91 | |
| | Flexural Elasticity | MPa | 1500 | 1800 | 2300 | 2300 | |
| | Compressive Yield Stress | MPa | 52 | 78 | 78 | 78 | |
| | Compressive Elasticity | MPa | 1200 | — | 1900 | 1900 | |
| Shear Fracture Stress | MPa | *2 32 | — | 65 | — | | |
| Thermal Properties | Deflection Temperature under Load | °C | 0.45MPa | 123 | 140 | — | — |
| | | °C | 1.80MPa | — | — | 139 | 139 |
| | Vicat Softening Temperature | °C | Method A (10 N) | 154 | 165 | — | — |
| | | °C | Method B (50 N) | 94 | — | 150 | 150 |
| | Rate of Dimensional Change on Heating | % | Vertical | — | — | 3.5 | — |
| | | | Horizontal | — | — | -0.2 | — |
| | Linear Thermal Expansion Coefficient | $\times 10^{-5} \cdot K^{-1}$ | | 11.1 | 13.0 | 6.5 | 6.5 |
| | Thermal Conductivity | W/m·K | | 0.21 | — | 0.19 | — |
| Specific Heat Capacity | J/g·K | | 2.05 | — | 1.30 | 1.30 | |
| Flame Resistance | — | | Flammable | Self-extinguishing | — | — | |
| Electrical Properties | Surface Resistivity | Ω/\square | 10 ¹⁵ or more | | | 10 ⁶⁻⁹ | |
| | Volume Resistivity | $\Omega \cdot m$ | 10 ¹³ or more | | | | |
| | Breakdown Strength | MV/m | 27 | — | 20 | 20 | |
| | Permittivity (1 MHz) | — | 2 | — | 3 | 3 | |
| | Dissipation Factor (1 MHz) | — | 0.001 | — | 0.009 | 0.060 | |
| Optical Properties | Stackability | | — | | | | |
| | Water Absorption | % | 0.001 | 0.008 | 0.240 | 0.150 | |
| | Total Light Transmittance | % | — | — | 89 | 86 | |
| | Haze | | — | — | — | — | |
| Hue (Color) | | | Natural | Natural | Transparent | Transparent | |

- The above data are a series of test results for a 5 mm thick specimen and given here without guarantee (values marked *1 refer to a test specimen that is 3 mm thick).

| | Super PET Plates | | | | PET Guards | Testing Methods |
|--|--------------------------|--------------------------|-------------------------------------|--------------------|--------------------------|--------------------|
| | Standard | For Industrial Purposes | Static-Dissipative Hardened Surface | Static-Dissipative | Insect-Proof | |
| | PET-6010 | PET-6010A | PETND MRG60 | PETND-76600 | PET-6025 | |
| | 1.27 | 1.27 | 1.27 | 1.27 | 1.27 | ISO 1183-1 and -2 |
| | 44 | 44 | 48 | 46 | 44 | JIS K 7202 |
| | 114 | 114 | 116 | 116 | 114 | |
| | 52 | 52 | 52 | 52 | 52 | JIS K 7161-2-1B/50 |
| | 28 | 28 | 28 | 28 | 28 | |
| | 2000 | 2000 | 2000 | 2000 | 2000 | JIS K 7161-2-1B/1 |
| | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | JIS K 7111-1 1epA |
| | 71 | 71 | 71 | 71 | 71 | JIS K 7171 |
| | 2000 | 2000 | 2000 | 2000 | 2000 | |
| | 60 | 60 | 60 | 60 | 60 | JIS K 7181-B5 |
| | 1800 | 1800 | 1800 | 1800 | 1800 | JIS K 7181-A1 |
| | ² 55 | ² 55 | ² 55 | ² 55 | ² 55 | JIS K 7214 |
| | — | | | | | JIS K 7191 |
| | 69 | 69 | 69 | 69 | 69 | |
| | — | | | | | JIS K 7206 |
| | 74 | 74 | 74 | 74 | 74 | |
| | — | | | | | JIS K 6735 |
| | — | | | | | |
| | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | JIS K 7197 |
| | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 | Laser flash method |
| | 1.35 | 1.35 | 1.35 | 1.35 | 1.35 | JIS K 7123 |
| | Self-extinguishing | | | | | JIS K 6911 |
| | 10 ¹⁵ or more | 10 ¹⁵ or more | 10 ⁶⁻⁹ | 10 ⁶⁻⁹ | 10 ¹⁵ or more | JIS K 6911 |
| | 10 ¹³ or more | | | | | JIS K 6911 |
| | 18 | 18 | — | — | — | JIS K 6911 |
| | 3 | 3 | 3 | — | — | JIS K 6911 |
| | 0.025 | 0.025 | 0.136 | — | — | JIS K 6911 |
| | — | | | | | JIS K 6745 |
| | 0.100 | 0.100 | 0.100 | — | — | JIS K 7209 |
| | 86 | 85 | 75 | 80 | 45 | JIS K 7361-1 |
| | 0.2 | 0.3 | 0.9 | 1.8 | 0.5 | JIS K 7136 |
| | Transparent | Transparent | Transparent | Transparent | Orange tinted | — |

Physical Properties

Takiron Polymer Products

Physical Properties of Takiron Polymer Products

| Evaluation Items | Material | | Monomer Cast Nylon | | | Nylon (PA) | POM | Crystalline PET TP-PEX | |
|----------------------------|--------------------------------------|------------------------------------|---|----------------------------|----------------------------|--------------------|----------------------------------|------------------------------------|--------------------------|
| | Grades | | Standard | Sliding | High sliding | Conductive | Standard | Standard | |
| | Product Number | Unit | MCN N550/ N350 MCN Rod 550/350 | MCN N950 MCN Rod 950 | MCN N050 MCN Rod 050 | PA 910CV | POM 760 POM Rod 760 | PEX C777 PEX Rod 777/778/977 | |
| Physical Properties | Specific Gravity | — | 1.16 | 1.17 | 1.13 | 1.26 | 1.41 | 1.41 | |
| | Rockwell Hardness | M Scale | 93 | 88 | 52 | — | 78 | 95 | |
| R Scale | | 119 | 116 | 107 | — | 118 | 123 | | |
| Mechanical Properties | Tensile Yield Stress | MPa | 90 | 85 | 59 | 61 | 65 | 91 | |
| | Nominal Tensile Strain at Break | % | 17 | 20 | 10 | 4 | 60 | 9 | |
| | Tensile Elasticity | MPa | 3800 | 3500 | 2800 | — | 3000 | 3600 | |
| | Charpy Impact Strength | KJ/m ² | 3.8 | 3.1 | 5.8 | 3.1 | 8.2 | 2.9 | |
| | Flexural Stress | MPa | 110 | 95 | 85 | 100 | 94 | 129 | |
| | Flexural Elasticity | MPa | 3300 | 2700 | 2400 | 3000 | 3000 | 3600 | |
| | Compressive Yield Stress | MPa | 96 | 87 | 68 | 79 | 78 | 111 | |
| | Compressive Elasticity | MPa | 3000 | 2700 | 1700 | 3200 | 2700 | 3100 | |
| Thermal Properties | Deflection Temperature under Load | °C | 0.45MPa | 218 | 218 | 218 | — | 164 | 210 |
| | | °C | 1.80MPa | 218 | 218 | 213 | 187 | 132 | 89 |
| | Vicat Softening Temperature | °C | Method A (10 N) | 218 | 218 | 216 | — | 166 | 243 |
| | | °C | Method B (50 N) | 218 | 218 | 204 | 200 | 152 | 204 |
| | Continuous Operating Temperature | °C | | 120 | 120 | 100 | 100 | 90 | 100 |
| | Linear Thermal Expansion Coefficient | ×10 ⁻⁵ ·K ⁻¹ | | 8.7 | 8.7 | 11.1 | — | 10.2 | 7.4 |
| | Thermal Conductivity | W/m·K | | 0.38 | 0.38 | 0.38 | — | 0.16 | 0.30 |
| | Specific Heat Capacity | J/g·K | | 1.81 | 1.81 | 1.81 | — | 2.21 | 0.77 |
| | Flame Resistance | — | | Self-extinguishing | Self-extinguishing | Self-extinguishing | Self-extinguishing | Flammable | Self-extinguishing |
| | Electrical Properties | Surface Resistivity | Ω/□ | | 10 ¹⁵ | 10 ¹⁵ | 10 ¹⁵ | 10 ⁵ ~10 ⁷ | 10 ¹⁵ or more |
| Volume Resistivity | | Ω·m | | 10 ¹³ | 10 ¹³ | 10 ¹³ | 10 ³ ~10 ⁵ | 10 ¹³ or more | 10 ¹³ or more |
| Breakdown Strength | | MV/m | | 17 | 17 | 17 | Unmeasurable | 21 | 14 |
| Permittivity (1 MHz) | | — | | 3.4 | 3.4 | 3.4 | Unmeasurable | 3.7 | 3.3 |
| Dissipation Factor (1 MHz) | | — | | 0.017 | 0.017 | 0.017 | Unmeasurable | 0.006 | 0.018 |
| Other | Water Absorption | % | | 0.30 | 0.32 | 0.47 | — | — | 0.04 |
| | Hue (Color) | — | | Blue/Natural | Black | Gray | Black | Natural | White/Black |

• The above data are a series of test results for a 5 mm thick specimen and given here without guarantee.

| | Ultra-High Molecular Weight Polyethylene Ulmolar | | | High-Density Polyethylene | | | Vinylidene Fluoride | | Testing Methods |
|--|---|--------------------------|--------------------------|---------------------------|--------------------------|--------------------------|---------------------------|--------------------------|--------------------|
| | Standard | For food production | Low friction | Standard | Standard | For food production | Standard | Standard | |
| | UP 140 UP Rod 140 | UP 542 | UP 143SL | PE 721 | PE Rod 730 | PE 520 PE Rod 530 | PVDF F2 PVDF Rod F2 | PVDF F10 | |
| | 0.94 | 0.94 | 0.94 | 0.97 | 0.97 | 0.97 | 1.78 | 1.78 | JIS K 7112 |
| | — | — | — | — | — | — | 71 | — | JIS K 7202 |
| | 62 | 57 | 57 | 80 | — | 69 | 116 | 118 | |
| | 23 | 20 | 20 | 31 | 30 | 30 | 57 | 58 | JIS K 7161-2-1B/50 |
| | 150 or more | 250 or more | 239 | 102 | 250 or more | 250 or more | 20 | 24 | |
| | 1000 | — | — | 2200 | — | 1500 | 2100 | — | JIS K7162-1B/1 |
| | No fracture | No fracture | No fracture | 47 | 42.6 | 17.0 | 7.8 | 16.4 | JIS K7111-1eA |
| | 23 | 19 | 21 | 38 | 33 | 31 | 67 | 72 | JIS K7171 |
| | 900 | 800 | 900 | 2100 | 1600 | 1600 | 2100 | 2000 | JIS K7171 |
| | 16 | 19 | 24 | 27 | — | 26 | 76 | 63 | JIS K 7181-B/5 |
| | 700 | 600 | 700 | 1000 | — | 1000 | 1400 | 1800 | JIS K 7181-A/1 |
| | 79 | 82 | 87 | 58 | — | 90 | 117 | — | JIS K 7191 |
| | 48 | 61 | 61 | 98 | — | 51 | 70 | 105 | |
| | 135 | 135 | 137 | 132 | — | 130 | 166 | 168 | JIS K 7206 |
| | 82 | 89 | 90 | 77 | 81 | 78 | 135 | 140 | |
| | 80 | 80 | 80 | 80 | 80 | 80 | 100 | 100 | — |
| | 15.5 | 17.5 | — | 12.2 | — | 12.6 | 12.9 | — | JIS K 7197 |
| | 0.39 | — | — | — | — | — | 0.21 | — | Laser flash method |
| | 2.28 | — | — | — | — | — | 1.41 | — | JIS K 7123 |
| | Flammable | Flammable | Flammable | Flammable | Flammable | Flammable | Self-extinguishing | Self-extinguishing | JIS K 6911 |
| | 10 ¹⁵ or more | 10 ¹⁵ or more | 10 ¹⁵ or more | 10 ¹⁵ or more | 10 ¹⁵ or more | 10 ¹⁵ or more | 10 ¹⁵ or more | 10 ¹⁵ or more | JIS K 6911 |
| | 10 ¹³ or more | 10 ¹³ or more | 10 ¹³ or more | 10 ¹³ or more | 10 ¹³ or more | 10 ¹³ or more | 10 ¹³ or more | 10 ¹³ or more | JIS K 6911 |
| | 24 | — | — | — | — | — | 15 | — | JIS K 6911 |
| | 2.0 | — | — | — | — | — | 6.3 | — | JIS K 6911 |
| | 0.001 | — | — | — | — | — | 0.160 | — | JIS K 6911 |
| | Under 0.01 | — | — | Under 0.01 | Under 0.01 | Under 0.01 | 0.01 | — | JIS K 7209 |
| | Natural | Blue | Natural | Natural | Natural | Blue | Natural | Natural | — |

Physical Properties

Takiron Polymer Products

Physical Properties of Takiron Polymer Products

| Evaluation Items | Material | | PMP | | Polypropylene | | | | |
|-----------------------|--------------------------------------|------------------------------------|-------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|----------------------------------|
| | Grades | | Standard | Standard | Standard | For food production | High heat-resistant | Conductive | |
| | Product Number | | PMP M600 PMP Rod 600 | PP P370 PP Rod 370 | PP 975 | PP 570 PP Rod 570 | PP 922 | PP P973CV | |
| | Unit | | | | | | | | |
| Physical Properties | Specific Gravity | — | 0.83 | 0.91 | 0.91 | 0.91 | 0.92 | 0.97 | |
| | Rockwell Hardness | M Scale | — | 62 | 62 | 62 | — | — | |
| | | R Scale | 97 | 103 | 103 | 103 | 112 | 97 | |
| Mechanical Properties | Tensile Yield Stress | MPa | 28 | 34 | 34 | 34 | 35 | 22 | |
| | Nominal Tensile Strain at Break | % | 24 | 33 | 33 | 33 | 31 | 6 | |
| | Tensile Elasticity | MPa | — | 1800 | 1800 | 1800 | — | 2800 | |
| | Charpy Impact Strength | KJ/m ² | 0.7 | 8.1 | 8.1 | 8.1 | 15.0 | 4.8 | |
| | Flexural Stress | MPa | 37 | 40 | 40 | 40 | 58 | 40 | |
| | Flexural Elasticity | MPa | 1300 | 1400 | 1400 | 1400 | 2200 | 2500 | |
| | Compressive Yield Stress | MPa | 44 | 54 | 54 | 54 | 57 | 52 | |
| | Compressive Elasticity | MPa | 1100 | 1200 | 1200 | 1200 | 2100 | 1200 | |
| Thermal Properties | Deflection Temperature under Load | °C | 0.45MPa | 203 | 129 | 129 | 129 | 159 | 159 |
| | | °C | 1.80MPa | 117 | 73 | 73 | 73 | 101 | 80 |
| | Vicat Softening Temperature | °C | Method A (10 N) | — | 143 | 143 | 143 | — | 163 |
| | | °C | Method B (50 N) | — | 99 | 99 | 99 | 121 | 105 |
| | Continuous Operating Temperature | °C | | 120 | 100 | 100 | 100 | 110 | 100 |
| | Linear Thermal Expansion Coefficient | ×10 ⁻⁵ ·K ⁻¹ | | 11.7 | 11.1 | 11.1 | 11.1 | — | — |
| | Thermal Conductivity | W/m·K | | — | 0.28 | 0.28 | 0.28 | — | — |
| | Specific Heat Capacity | J/g·K | | — | 2.05 | 2.05 | 2.05 | — | — |
| | Flame Resistance | — | | Flammable | Flammable | Flammable | Flammable | Flammable | Flammable |
| Electrical Properties | Surface Resistivity | Ω/□ | | 10 ¹⁵ or more | 10 ¹⁵ or more | 10 ¹⁵ or more | 10 ¹⁵ or more | 10 ¹⁵ or more | 10 ² ~10 ⁴ |
| | Volume Resistivity | Ω·m | | 10 ¹³ or more | 10 ¹³ or more | 10 ¹³ or more | 10 ¹³ or more | 10 ¹³ or more | 10 ⁰ ~10 ² |
| | Breakdown Strength | MV/m | | 32 | 24 | 24 | 24 | — | Unmeasurable |
| | Permittivity (1 MHz) | — | | 2.1 | 2.4 | 2.4 | 2.4 | — | Unmeasurable |
| | Dissipation Factor (1 MHz) | — | | Under 0.001 | 0.002 | 0.002 | 0.002 | — | Unmeasurable |
| Other | Water Absorption | % | | Under 0.01 | Under 0.01 | Under 0.01 | Under 0.01 | — | 0.05 |
| | Hue (Color) | — | | Transparent | Natural | Black | Blue | Dark gray | Black |

• The above data are a series of test results for a 5 mm thick specimen and given here without guarantee.

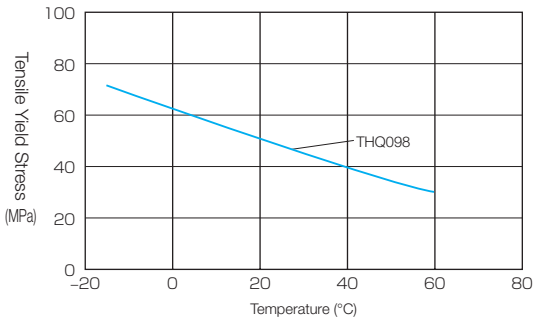
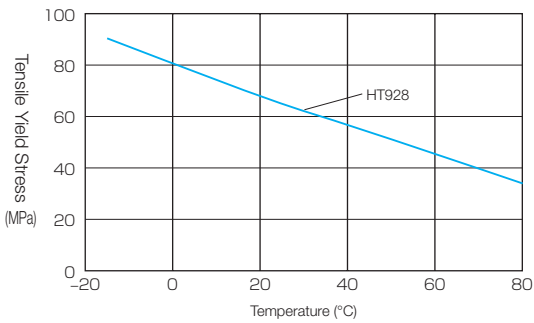
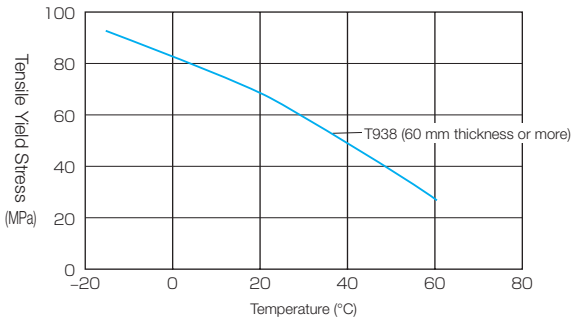
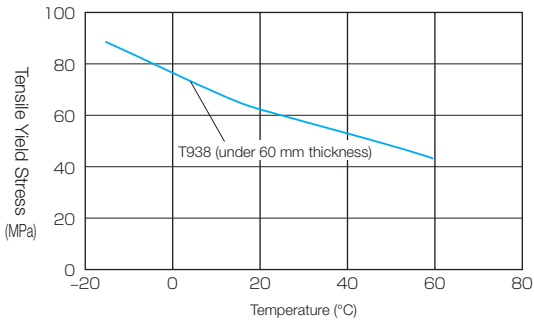
*: Specimen orientation (MD/TD)

| | Polypropylene | PEEK | PPS | Polycarbonate | | | PC/ABS | Testing Methods |
|--|--------------------------|--------------------------|----------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------|
| | 30% glass | Standard | Standard | Standard | 20% glass | 20% glass | Flame-retardant | |
| | PP 90G30 | PEEK 810 PEEK Rod 810 | PPS 800 | PCET 1600/1900 | PCET GF20 | PC 91G20 | PCABS 2900 | |
| | 1.13 | 1.32 | 1.34 | 1.20 | 1.34 | 1.34 | 1.18 | JIS K 7112 |
| | 52 | 102 | — | 67 | — | — | 75 | JIS K 7202 |
| | 108 | 126 | — | 125 | — | 123 | 120 | |
| | 34 | 107 | 80 | 70 | 59/96* | 65/84* | 55 | JIS K 7161-2-1B/50 |
| | 5 | 17 | 3 | 63 | 4/4* | 4/5* | 10 | |
| | — | — | 3400 | 2300 | 2700/3900* | — | 2900 | JIS K7162-1B/1 |
| | 4.5 | 4.1 | 2.7 | 12.0 | 4.6/5.9* | 3.3/7.0 | 3.4 | JIS K7111-1eA |
| | 57 | 162 | 133 | 93 | 93/136* | 122/130* | 105 | JIS K7171 |
| | 2800 | 3800 | 4300 | 2300 | 3800/6000* | 3600/3700* | 3000 | JIS K7171 |
| | — | 119 | 124 | 85 | 64/103* | 89/106* | 90 | JIS K 7181-B/5 |
| | — | 3500 | 3400 | — | 2600/3000* | 3100/3300* | 2060 | JIS K 7181-A/1 |
| | 139 | — | — | 154 | — | 141/141* | 100 | JIS K 7191 |
| | 84 | 163 | 130 | 151 | 137/140* | 140/140* | 96 | |
| | — | — | — | 157 | 150 | 156 | 105 | JIS K 7206 |
| | — | — | — | 152 | 143 | 145 | 104 | |
| | 100 | 260 | 220 | 120 | 120 | 120 | 80 | — |
| | 9.3 | 5.8 | — | 6.5 | 3.3/5.2* | 3.9/5.8* | 7.6 | JIS K 7197 |
| | — | — | — | 0.19 | — | — | — | Laser flash method |
| | — | — | — | 1.30 | — | — | 1.30 | JIS K 7123 |
| | Flammable | Self-extinguishing | — | Self-extinguishing | Self-extinguishing | Self-extinguishing | Self-extinguishing | JIS K 6911 |
| | 10 ¹⁵ or more | 10 ¹⁵ or more | — | 10 ¹⁵ or more | 10 ¹⁵ or more | 10 ¹⁵ or more | 10 ¹⁵ or more | JIS K 6911 |
| | 10 ¹³ or more | 10 ¹³ or more | — | 10 ¹³ or more | 10 ¹³ or more | 10 ¹³ or more | 10 ¹³ or more | JIS K 6911 |
| | — | 20 | — | 20 | — | — | 19 | JIS K 6911 |
| | — | 2.8 | — | 3.0 | — | — | 3.0 | JIS K 6911 |
| | — | 0.005 | — | 0.009 | — | — | 0.008 | JIS K 6911 |
| | — | — | — | 0.24 | — | — | 0.05 | JIS K 7209 |
| | Black | Beige | Natural | Transparent/ Black | Black | Black | Black | — |

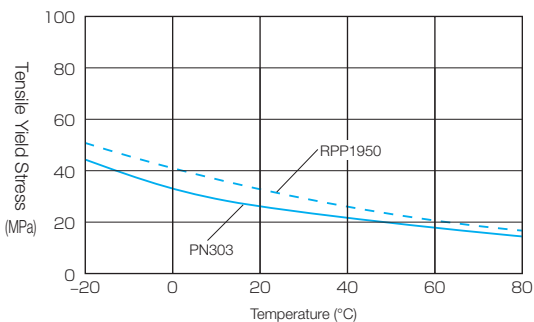
Physical Properties

Thermal Properties of Tensile Yield Stress

Physical and Thermal Properties of PVC Plates

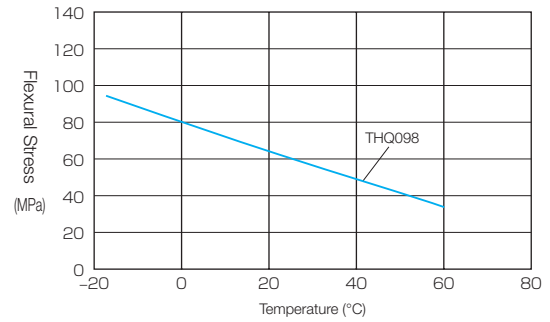
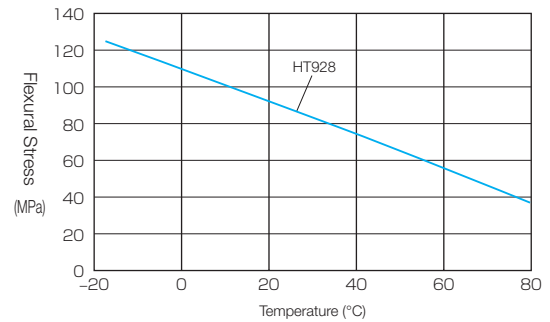
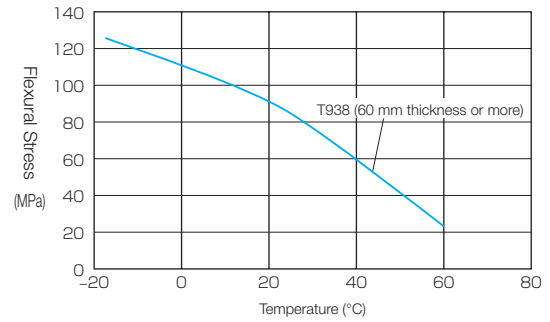
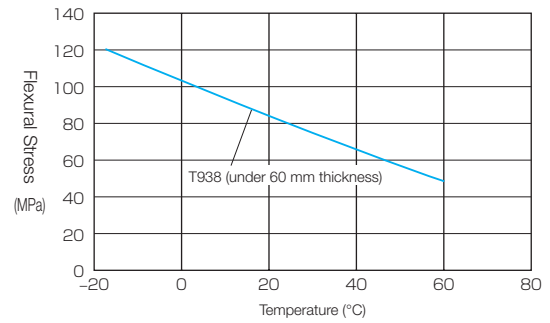


Physical and Thermal Properties of Non-PVC Plates (PP Plates)

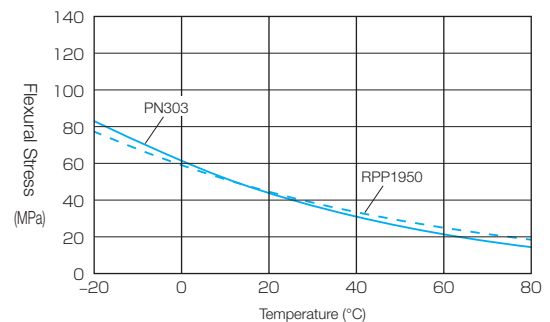


Thermal Properties of Flexural Stress

Physical and Thermal Properties of PVC Plates



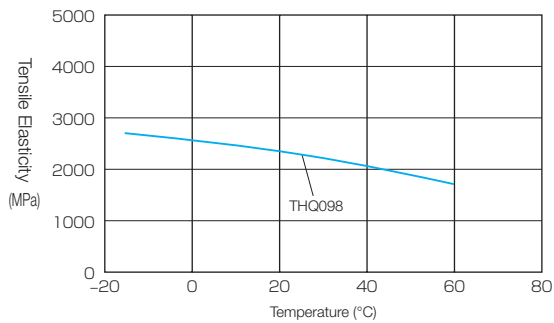
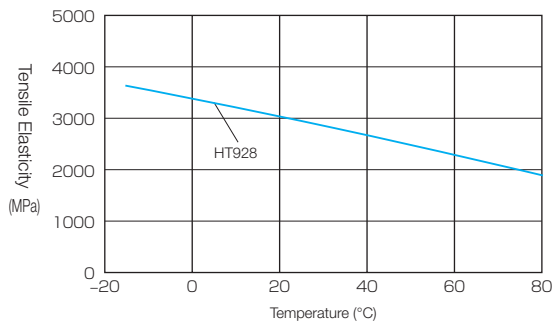
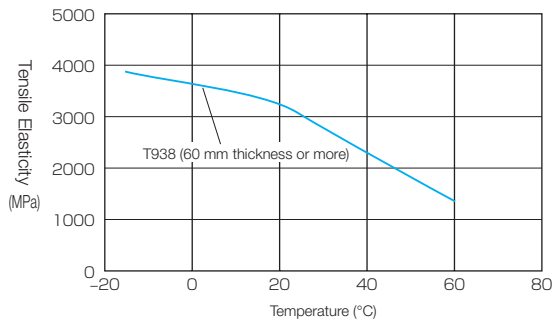
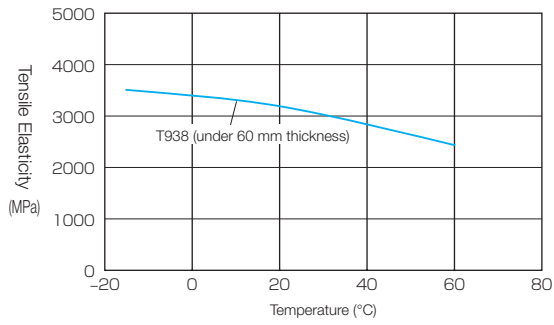
Physical and Thermal Properties of Non-PVC Plates (PP Plates)



*The above data are a series of test results for a 5 mm thick specimen and given here without guarantee.

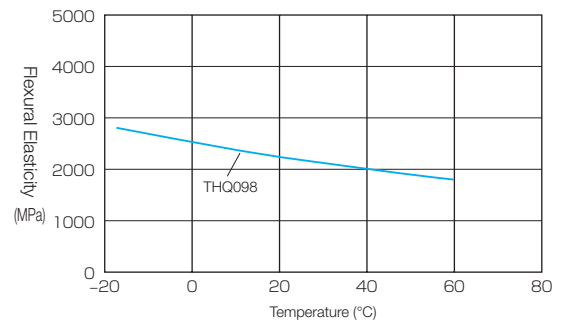
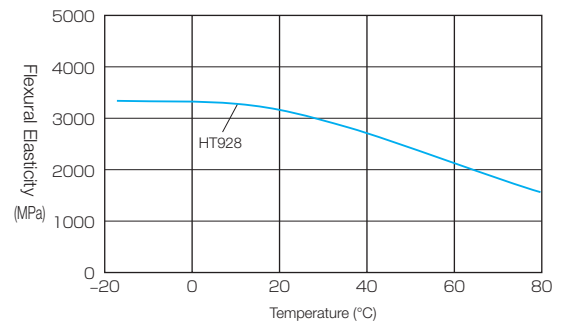
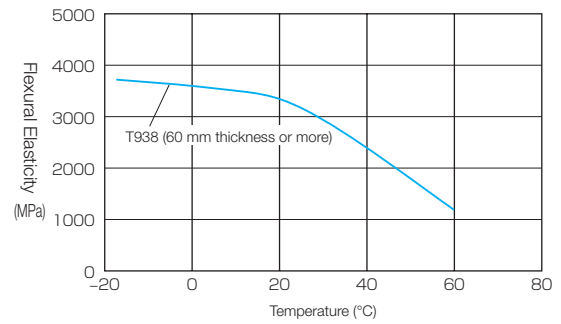
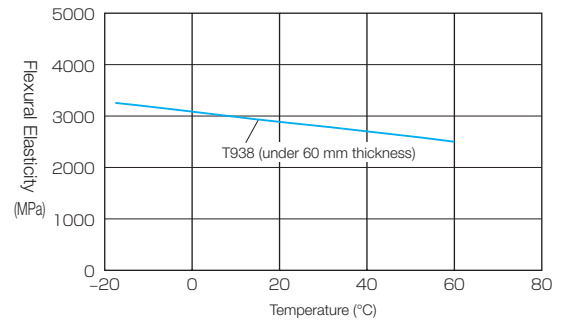
Thermal Properties of Tensile Elasticity

Physical and Thermal Properties of PVC Plates

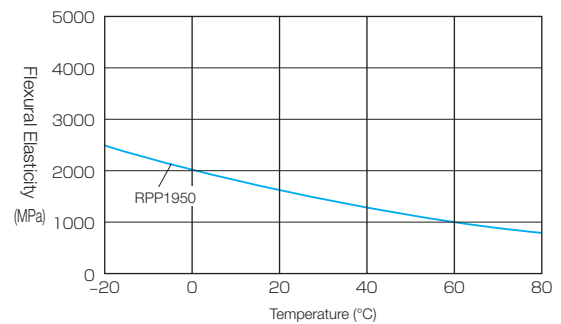


Thermal Properties of Flexural Elasticity

Physical and Thermal Properties of PVC Plates



Physical and Thermal Properties of Non-PVC Plates (PP Plates)

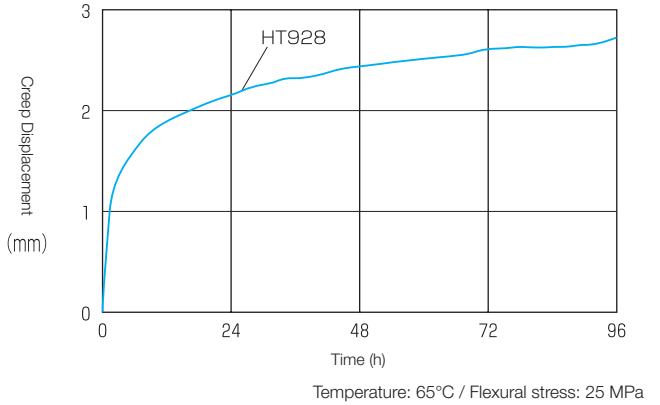
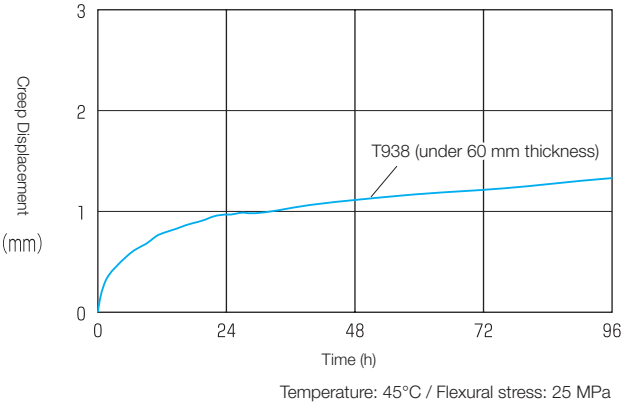
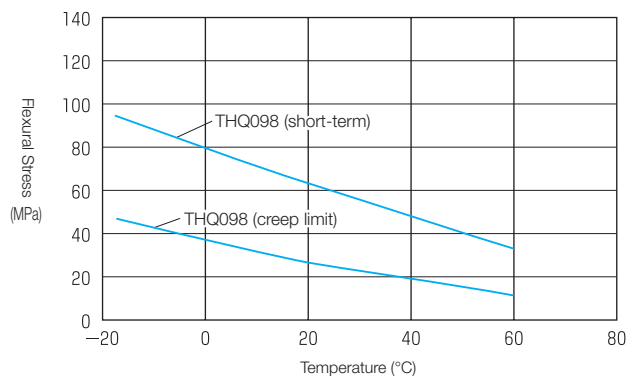
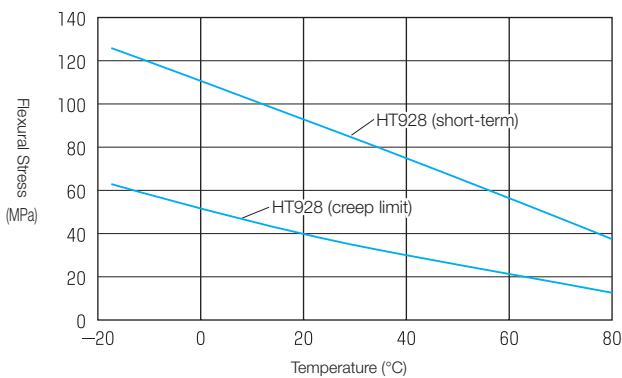
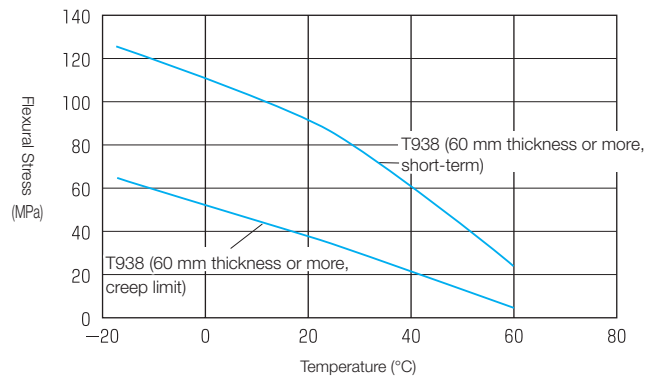
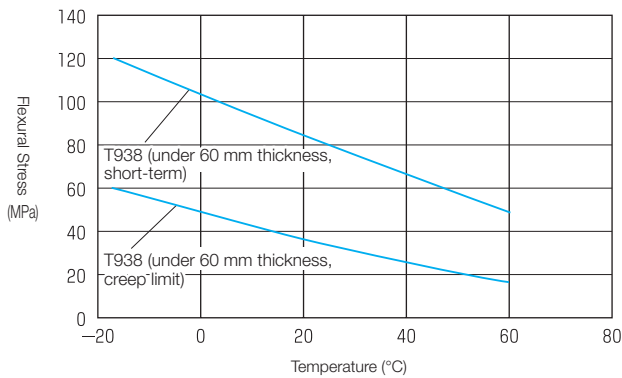


*The above data are a series of test results for a 5 mm thick specimen and given here without guarantee.

Physical Properties

Creep Properties

Physical and Thermal Properties of PVC Plates



*The above data are a series of test results for a 5 mm thick specimen and given here without guarantee.

Testing method for creep displacement

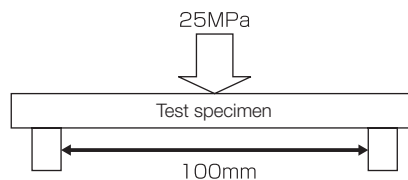
Temperature: 45°C (T938)

65°C (HT928)

Test specimen: 10 (W) x 120 (L) x 5 (H) mm

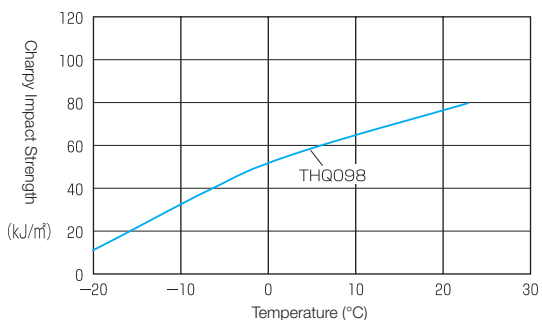
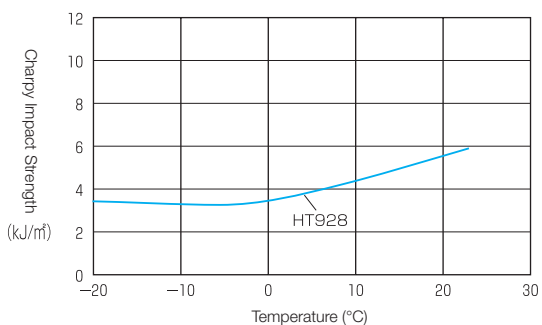
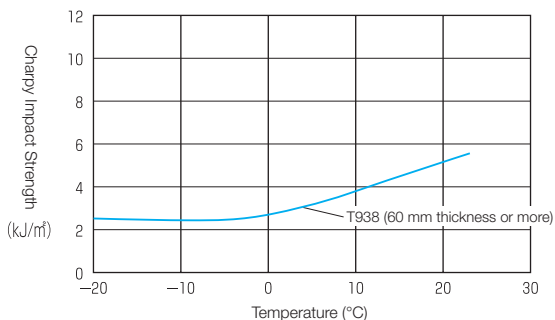
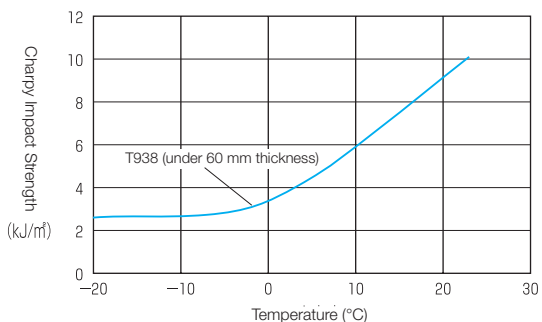
Distance between support points: 100 mm

Load stress: 25 MPa

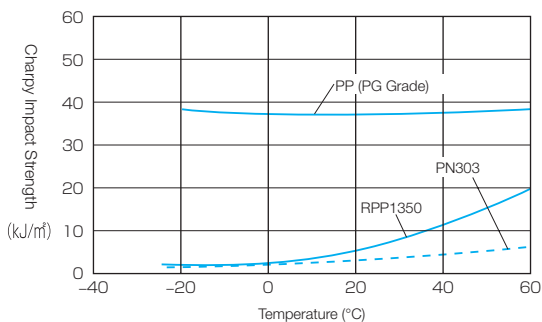


Thermal Properties of Impact Strength

Physical and Thermal Properties of PVC Plates



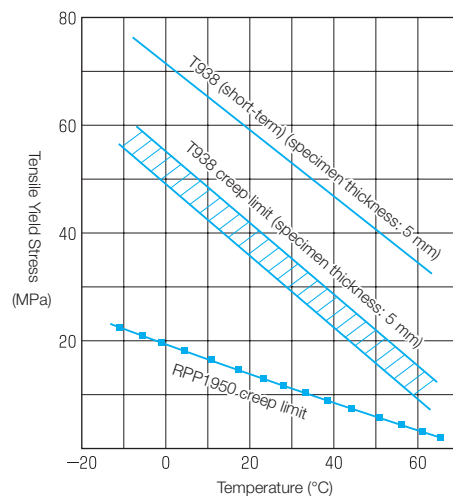
Physical and Thermal Properties of Non-PVC Plates (PP Plates)



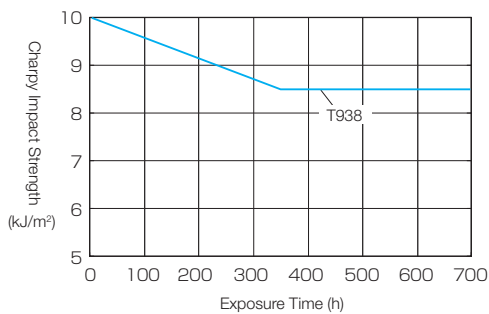
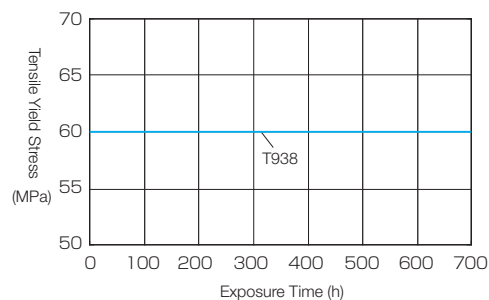
*The above data are a series of test results for a 5 mm thick specimen and given here without guarantee.

Other Thermal Properties

Creep Limits of PVC and PP Plates



Changes in Physical Properties of PVC Plates during Weathering test



*Accelerated weathering test equipment was used for exposure tests.
*The above data are a series of test results for a 5 mm thick specimen and given here without guarantee.



Chemical Resistance of PVC Plates (1)

Chemical Resistance of Takiron PVC Plates

The rigid PVC plates are one of the most chemical resistant anti-corrosion materials. They are resistant to most strong acids, weak acids, alkalis, salts, and vegetable or animal oils. However, ketone, ester, ether, or benzoyl organic solvents, chlorinated hydrocarbons, and similar elements can cause significant swelling damage on such plates. Their tensile strength and other aspects of durability performance can get compromised in a very short time. In some rare cases, those elements can even

cause the plates to melt, which is why they need to be handled with caution. This table provides general information about the chemical resistance of the plates. However, these figures are merely estimates for use under constant conditions, which means that the evaluation results may change drastically if the load increases or if mixed chemicals are used instead. Please keep that in mind when using the plates.

<Symbols and abbreviations used>

Conc: High concentration / sat: Saturated concentration

Evaluation ◎: No change / ○: Still usable despite slight changes / △: Use with care / x: Corroded

| Names of Chemicals | Concentration | Standard Plates | | | Heat-Resistant Plates | | | Impact-Resistant Plates | | | PP Plates | | |
|---------------------------|---------------|-----------------|------|------|-----------------------|------|------|-------------------------|------|------|-----------|------|------|
| | | 20°C | 40°C | 60°C | 20°C | 60°C | 80°C | 20°C | 40°C | 60°C | 20°C | 60°C | 80°C |
| A | | | | | | | | | | | | | |
| Acetaldehyde | 100% | x | x | x | x | x | x | x | x | x | △ | x | x |
| Acetic acid | 30% | ◎ | ◎ | ○ | ◎ | ◎ | △ | ◎ | ○ | ○ | ◎ | ◎ | △ |
| Acetic acid | 60% | ○ | △ | △ | ○ | △ | △ | ○ | △ | x | ◎ | ○ | △ |
| Acetic acid | 95% | △ | x | x | x | x | x | x | x | x | ◎ | x | x |
| Acetic anhydride | - | x | x | x | x | x | x | x | x | x | x | x | x |
| Acetone | 100% | x | x | x | x | x | x | x | x | x | ○ | ○ | △ |
| Aluminum chloride | 25% | ◎ | ◎ | ○ | ◎ | ◎ | ○ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| Aluminum sulfate | 25% | ◎ | ◎ | ○ | ◎ | ○ | ○ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| Ammonia gas (dry) | Conc | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ |
| Ammonia water | sat | ◎ | ○ | ○ | ◎ | ○ | ○ | ○ | △ | x | ◎ | ◎ | ○ |
| Ammonium carbonate | sat | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ |
| Ammonium chloride | 25% | ◎ | ◎ | ○ | ◎ | ○ | | ◎ | ◎ | | ◎ | ◎ | ◎ |
| Ammonium phosphate | sat | ◎ | ◎ | ○ | ◎ | ○ | ○ | ◎ | ◎ | ○ | ◎ | ◎ | ◎ |
| Ammonium sulfate | 40% | ◎ | ◎ | △ | ◎ | △ | | ◎ | ○ | △ | | | |
| Amyl acetate | 100% | x | x | x | x | x | x | x | x | x | x | x | x |
| Aniline | 100% | x | x | x | x | x | x | x | x | x | ○ | △ | x |
| Antimony trichloride | 75% | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ |
| Arsenic acid | 30% > | ◎ | ○ | △ | ◎ | x | x | ○ | ○ | x | ◎ | ◎ | △ |
| Arsenic acid | 75% | ○ | △ | x | ◎ | x | x | ○ | △ | x | ◎ | ○ | x |
| B | | | | | | | | | | | | | |
| Barium chloride | sat | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| Benzaldehyde | 100% | x | x | x | x | x | x | x | x | x | ○ | x | x |
| Benzene | 100% | x | x | x | x | x | x | x | x | x | △ | x | x |
| Benzine | 100% | ○ | ○ | △ | ○ | △ | | ○ | △ | | ◎ | x | x |
| Benzine - benzole mixture | 20% | x | x | x | x | x | x | x | x | x | ○ | x | x |
| Benzine alcohol | 100% | ◎ | | | ◎ | | | ◎ | | | ◎ | ◎ | |
| Benzoic acid | 50% | ◎ | ○ | △ | ◎ | ○ | x | ○ | ○ | △ | | | |
| Boric acid | sat | ◎ | ○ | △ | ◎ | △ | x | ○ | ○ | △ | ◎ | ◎ | ◎ |
| Bromine | Conc | x | x | x | x | x | x | x | x | x | x | x | x |
| Butadiene | 100% | ◎ | ◎ | ◎ | ◎ | ◎ | △ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |

Chemical Resistance of PVC Plates (2)

<Symbols and abbreviations used>

Conc: High concentration / sat: Saturated concentration

Evaluation ⊙: No change / ○: Still usable despite slight changes / △: Use with care / x: Corroded

| Names of Chemicals | Concentration | Standard Plates | | | Heat-Resistant Plates | | | Impact-Resistant Plates | | | PP Plates | | |
|---|---------------|-----------------|------|------|-----------------------|------|------|-------------------------|------|------|-----------|------|------|
| | | 20°C | 40°C | 60°C | 20°C | 60°C | 80°C | 20°C | 40°C | 60°C | 20°C | 60°C | 80°C |
| Butane | Conc | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ |
| Butyl acetate | 100% | x | x | x | x | x | x | x | x | x | ○ | △ | x |
| Butyl alcohol | 100% | ⊙ | ⊙ | ○ | ⊙ | ○ | △ | ⊙ | ⊙ | ○ | ⊙ | ⊙ | ⊙ |
| Butyric acid | 20% | ○ | △ | x | ○ | x | x | ○ | △ | x | ⊙ | ⊙ | ○ |
| Butyric acid | 100% | x | x | x | x | x | x | x | x | x | ○ | △ | x |
| C | | | | | | | | | | | | | |
| Cadmium sulfate | sat | ⊙ | ⊙ | ○ | ⊙ | ○ | ○ | ⊙ | ⊙ | ⊙ | | | |
| Calcium chlorate ^(Note 1) | sat | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ○ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ○ |
| Calcium chloride | sat | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ○ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ |
| Calcium hydroxide | sat | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ○ | ⊙ | ⊙ | ○ | ⊙ | ⊙ | ⊙ |
| Carbon dioxide | - | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ |
| Carbon disulfide | 100% | x | x | x | x | x | x | x | x | x | x | x | x |
| Carbon tetrachloride | 100% | x | x | x | x | x | x | x | x | x | x | x | x |
| Carbonic acid | 100% | ⊙ | ⊙ | ○ | ⊙ | ○ | ○ | ⊙ | ⊙ | ○ | ⊙ | ⊙ | ⊙ |
| Chlorine gas (dry) | 10% | ○ | △ | x | ○ | ○ | x | ○ | △ | x | x | x | x |
| Chlorine gas (dry) | Conc | △ | x | x | △ | x | x | △ | x | x | x | x | x |
| Chlorine gas (wet) | 1% | △ | x | x | △ | x | x | △ | x | x | x | x | x |
| Chlorine gas (wet) | Conc | x | x | x | x | x | x | x | x | x | x | x | x |
| Chlorobenzene | 100% | x | x | x | x | x | x | x | x | x | x | x | x |
| Chloroform | 100% | x | x | x | x | x | x | x | x | x | △ | x | x |
| Chlorosulfonic acid ^(Note 2) | 100% | △ | x | x | △ | x | x | x | x | x | x | x | x |
| Chromic acid ^(Note 3) | 10% | ⊙ | ⊙ | ○ | ○ | x | x | ○ | x | x | ○ | x | x |
| Chromic acid ^(Note 3) | 50% | ○ | ○ | △ | x | x | x | x | x | x | △ | x | x |
| Citric acid | 25% | ⊙ | ⊙ | ○ | ⊙ | ○ | ○ | ⊙ | ⊙ | ○ | ⊙ | ○ | △ |
| Copper (I) chloride | sat | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ○ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ |
| Copper (II) chloride | sat | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ○ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ |
| Copper sulfate | sat | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ○ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ |
| Creosol | 50% | ○ | △ | x | x | x | x | x | x | x | | | |
| Cyclohexanol | 100% | x | x | x | x | x | x | x | x | x | ○ | △ | x |
| Cyclohexanone | 100% | x | x | x | x | x | x | x | x | x | x | x | x |
| D | | | | | | | | | | | | | |
| Diethyl ether | 100% | x | x | x | x | x | x | x | x | x | x | x | x |
| Diglycolic acid | 20% | ⊙ | ⊙ | ○ | | | | ⊙ | ⊙ | ○ | ⊙ | ⊙ | |
| Dimethyl ether | 100% | x | x | x | x | x | x | x | x | x | x | x | x |
| Dimethylamine | 100% | x | x | x | x | x | x | x | x | x | x | x | x |
| Dimethylformamide | 100% | x | x | x | x | x | x | x | x | x | ⊙ | x | x |

Note 1: In neutral or alkaline solutions, chlorates do not have any oxidizing effects. In acid solutions, however, they turn into strong oxidants. If hydrochloric acid is added and the mixture is heated, chlorine and chlorine dioxide are generated.

Note 2: Also known as chlorosulfuric acid, this chemical triggers a strong reaction when it comes into contact with water, generating sulfuric and hydrochloric acid. In other words, it represents a mixed acid that consists of sulfuric and hydrochloric acid. Furthermore, concentrated sulfuric acid generates hydrochloric acid and fuming sulfuric acid.

Note 3: While this chemical is not highly corrosive in isolation, it becomes more so in mixed acids containing sulfuric or nitric acid.



Chemical Resistance of PVC Plates (3)

<Symbols and abbreviations used>

Conc: High concentration / sat: Saturated concentration

Evaluation ◎: No change / ○: Still usable despite slight changes / △: Use with care / x: Corroded

| Names of Chemicals | Concentration | Standard Plates | | | Heat-Resistant Plates | | | Impact-Resistant Plates | | | PP Plates | | |
|-------------------------------|---------------|-----------------|------|------|-----------------------|------|------|-------------------------|------|------|-----------|------|------|
| | | 20°C | 40°C | 60°C | 20°C | 60°C | 80°C | 20°C | 40°C | 60°C | 20°C | 60°C | 80°C |
| E | | | | | | | | | | | | | |
| Ethyl acetate | 100% | x | x | x | x | x | x | x | x | x | ○ | △ | x |
| Ethyl alcohol | 100% | ◎ | ○ | △ | ◎ | ○ | | ◎ | ○ | △ | ◎ | ◎ | |
| Ethylbenzene | 100% | x | | | x | | | x | | | | | |
| Ethylene glycol | 100% | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ◎ | ◎ | ◎ | ◎ | ◎ | |
| F | | | | | | | | | | | | | |
| Fluorosilicic acid | 30% | ◎ | ◎ | ○ | ◎ | ◎ | ○ | ◎ | ○ | ○ | ◎ | ◎ | △ |
| Formalin | 36% | ◎ | ○ | ○ | ◎ | ○ | ○ | ◎ | ○ | ○ | ◎ | ◎ | ○ |
| Formic acid | 50% > | ◎ | ○ | ○ | ◎ | ○ | x | ○ | △ | △ | ◎ | ○ | ○ |
| Formic acid | >50% | ○ | ○ | x | ○ | △ | x | x | x | x | ○ | x | x |
| Fuming nitric acid (Note 4) | | x | x | x | x | x | x | x | x | x | x | x | x |
| Fuming sulfuric acid (Note 5) | | x | x | x | x | x | x | x | x | x | x | x | x |
| Fuming sulfuric acid gas | Conc | △ | △ | x | △ | △ | x | △ | x | x | x | x | x |
| G | | | | | | | | | | | | | |
| Gasoline | 100% | ○ | △ | x | ○ | x | x | ○ | x | x | x | x | x |
| Glycerine | 100% | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| Glycolic acid | - | ◎ | ◎ | ◎ | | | | | | | ◎ | ◎ | |
| H | | | | | | | | | | | | | |
| Hydrobromic acid | 40% | ◎ | ◎ | ○ | ◎ | ○ | ○ | △ | x | x | ◎ | ◎ | ○ |
| Hydrochloric acid | 10% | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ◎ | ○ | ○ | ◎ | ◎ | △ |
| Hydrochloric acid | 36% | ◎ | ◎ | ○ | ◎ | ◎ | ○ | △ | x | x | ◎ | △ | △ |
| Hydrofluoric acid | 10% | ○ | △ | x | △ | x | x | △ | x | x | ◎ | ◎ | ◎ |
| Hydrofluoric acid | 35% | △ | x | x | △ | x | x | △ | x | x | ◎ | ◎ | △ |
| Hydrofluoric acid | 40% | △ | x | x | △ | x | x | △ | x | x | ◎ | ○ | △ |
| Hydrogen | - | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ◎ | ◎ | ○ | ◎ | ◎ | ◎ |
| Hydrogen cyanide | 100% | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| Hydrogen peroxide | 30% > | ◎ | ◎ | ○ | ◎ | ○ | x | ○ | ○ | △ | ○ | △ | x |
| Hydrogen sulfide | Conc | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ |
| I | | | | | | | | | | | | | |
| Iron (II) chloride | 50% | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| Iron (II) sulfate | sat | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| Iron (III) chloride | 50% | ◎ | ◎ | ○ | ◎ | ◎ | ○ | ◎ | ○ | ○ | ◎ | ◎ | ○ |
| Iron (III) sulfate | sat | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ |
| Isobutyl alcohol | 100% | ◎ | ◎ | ○ | ◎ | ○ | ○ | ◎ | ○ | ○ | ◎ | ◎ | |
| Isopropyl alcohol | 100% | ◎ | ○ | ○ | ◎ | ○ | ○ | ◎ | ○ | ○ | ◎ | ◎ | |
| K | | | | | | | | | | | | | |
| Kerosene (paraffin) | 100% | ○ | ○ | x | ○ | x | x | ○ | ○ | x | ○ | x | x |
| L | | | | | | | | | | | | | |
| Lactic acid | 50% | ◎ | ◎ | ○ | ◎ | ○ | ○ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| Lactic acid | 75% | ◎ | ○ | △ | ◎ | x | x | ◎ | ○ | x | ◎ | ◎ | ◎ |

Note 4: This chemical is extremely oxidative since it contains concentrated nitric acid that has absorbed nitrogen dioxide.

Note 5: This chemical is extremely oxidative since it contains 97% to 98% concentrated sulfuric acid that has absorbed a large quantity of sulfur trioxide.

Chemical Resistance of PVC Plates (4)

<Symbols and abbreviations used>

Conc: High concentration / sat: Saturated concentration

Evaluation ○: No change / ◯: Still usable despite slight changes / △: Use with care / x: Corroded

| Names of Chemicals | Concentration | Standard Plates | | | Heat-Resistant Plates | | | Impact-Resistant Plates | | | PP Plates | | |
|--|---------------|-----------------|------|------|-----------------------|------|------|-------------------------|------|------|-----------|------|------|
| | | 20°C | 40°C | 60°C | 20°C | 60°C | 80°C | 20°C | 40°C | 60°C | 20°C | 60°C | 80°C |
| M | | | | | | | | | | | | | |
| Magnesium chloride | 25% | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Magnesium hydroxide | sat | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Magnesium sulfate | sat | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Mercury (I) sulfate | sat | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Mercury (II) chloride | sat | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Mercury (II) sulfate | sat | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Methyl alcohol | 100% | ○ | ○ | △ | ○ | △ | x | ○ | ○ | △ | ○ | ○ | ○ |
| Methyl chloride | 100% | x | x | x | x | x | x | x | x | x | △ | x | x |
| Methyl ethyl ketone | 100% | x | x | x | x | x | x | x | x | x | | | |
| Methyl sulfate | 50% | ○ | ○ | △ | ○ | △ | | ○ | ○ | △ | ○ | ○ | x |
| Methylene chloride | 100% | x | x | x | x | x | x | x | x | x | x | x | x |
| Monochloroacetic acid | 100% | ○ | ○ | △ | ○ | x | x | ○ | x | x | x | x | x |
| N | | | | | | | | | | | | | |
| Nickel chloride | 50% | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Nickel nitrate | 50% | ○ | ○ | ○ | ○ | △ | x | ○ | ○ | ○ | ○ | ○ | ○ |
| Nickel sulfate | sat | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Nitric acid ^(Note 6) | 30% | ○ | ○ | ○ | ○ | △ | x | ○ | △ | x | ○ | △ | x |
| Nitric acid ^(Note 6) | 50% | ○ | ○ | ○ | ○ | △ | x | △ | x | x | △ | x | x |
| Nitric acid ^(Note 6) | 60% | ○ | ○ | △ | ○ | △ | x | △ | | | x | | |
| Nitric acid ^(Note 6) | 70% | ○ | ○ | x | ○ | x | | x | | | | | |
| Nitrobenzene | 100% | x | x | x | x | x | x | x | x | x | ○ | △ | x |
| O | | | | | | | | | | | | | |
| Octanol | 100% | ○ | ○ | ○ | | | | | | | | | |
| Oleic acid | 100% | ○ | ○ | ○ | ○ | ○ | | ○ | ○ | ○ | | | |
| Oxalic acid | sat | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| P | | | | | | | | | | | | | |
| Perchloric acid ^(Note 7) | 10% | ○ | ○ | ○ | ○ | ○ | x | ○ | ○ | ○ | ○ | ○ | x |
| Perchloric acid ^(Note 7) | 20% | ○ | ○ | ○ | ○ | ○ | x | ○ | △ | x | ○ | x | x |
| Phenol | sat | △ | x | x | △ | x | x | x | x | x | x | x | x |
| Phenylhydrazine | 100% | x | x | x | x | x | x | x | x | x | x | x | x |
| Phosphoric acid | 30% > | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Phosphoric acid | >30% | ○ | ○ | ○ | ○ | ○ | △ | ○ | ○ | ○ | ○ | ○ | △ |
| Picric acid | 5% | ○ | ○ | ○ | | | | | | | | | |
| Potassium carbonate | sat | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Potassium chlorate ^(Note 1) | 15% | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Potassium chloride | sat | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Potassium dichromate ^(Note 8) | 40% | ○ | ○ | ○ | ○ | ○ | △ | ○ | ○ | △ | ○ | ○ | ○ |

Note 6: Although this acid is weaker than hydrochloric acid, it is still highly oxidative and becomes even more so at high concentrations.

Note 7: This chemical is highly oxidative and represents the strongest acid among oxyacids of chlorine. Diluted aqueous solutions are stable. Concentrated aqueous solutions, on the other hand, are hygroscopic and tend to emit fumes into the air.

Note 8: Mixtures with strong acids such as sulfuric acid are highly oxidative and need to be handled with caution.



Chemical Resistance of PVC Plates (5)

<Symbols and abbreviations used>

Conc: High concentration / sat: Saturated concentration

Evaluation ○: No change / ◉: Still usable despite slight changes / △: Use with care / x: Corroded

| Names of Chemicals | Concentration | Standard Plates | | | Heat-Resistant Plates | | | Impact-Resistant Plates | | | PP Plates | | |
|---|---------------|-----------------|------|------|-----------------------|------|------|-------------------------|------|------|-----------|------|------|
| | | 20°C | 40°C | 60°C | 20°C | 60°C | 80°C | 20°C | 40°C | 60°C | 20°C | 60°C | 80°C |
| Potassium dichromate mixture | - | △ | × | × | △ | × | × | × | × | × | | | |
| Potassium ferrocyanide | 30% | ◉ | ◉ | ◉ | ◉ | ◉ | ○ | ◉ | ◉ | ◉ | ◉ | ◉ | ◉ |
| Potassium hydroxide ^(Note 9) | 5% | ◉ | ◉ | ○ | ○ | × | × | ◉ | ◉ | ○ | ◉ | ○ | △ |
| Potassium hydroxide ^(Note 9) | sat | ◉ | ◉ | ○ | ◉ | ◉ | ○ | ◉ | ◉ | ○ | ◉ | ◉ | ○ |
| Potassium hypochlorite ^(Note 10) | 15% | ○ | △ | △ | ○ | × | × | ○ | △ | × | ◉ | ○ | △ |
| Potassium iodide | sat | ◉ | ◉ | ○ | ◉ | ○ | ○ | ◉ | ◉ | ○ | ◉ | ◉ | ◉ |
| Potassium perchlorate | 2% | ◉ | ○ | △ | ○ | △ | × | ○ | △ | × | ◉ | ◉ | ○ |
| Potassium permanganate ^(Note 11) | 20% | ◉ | ◉ | ○ | ◉ | ○ | | ○ | ○ | ○ | ◉ | ○ | ○ |
| Propane | Conc | ◉ | ◉ | ◉ | ◉ | ◉ | ◉ | ◉ | ◉ | ◉ | ◉ | ◉ | ◉ |
| Pyridine | 100% | × | × | × | × | × | × | × | × | × | ◉ | ○ | × |
| S | | | | | | | | | | | | | |
| Seawater | - | ◉ | ◉ | △ | ◉ | △ | | ◉ | ◉ | △ | ◉ | ◉ | ◉ |
| Silver nitrate | 5% | ◉ | ◉ | ○ | ◉ | ○ | ○ | ◉ | ◉ | ○ | | | |
| Sodium bisulfate | sat | ◉ | ◉ | ◉ | ◉ | ◉ | ○ | ◉ | ◉ | ◉ | ◉ | ◉ | ○ |
| Sodium bisulfite | sat | ◉ | ◉ | ◉ | ◉ | ◉ | ○ | ◉ | ◉ | ◉ | ◉ | ◉ | ○ |
| Sodium carbonate | sat | ◉ | ◉ | ◉ | ◉ | ◉ | ○ | ◉ | ◉ | ◉ | ◉ | ◉ | ◉ |
| Sodium chlorate ^(Note 1) | 25% | ◉ | ◉ | ◉ | ◉ | ◉ | ○ | ◉ | ◉ | ◉ | ◉ | ◉ | ○ |
| Sodium chloride | sat | ◉ | ◉ | ◉ | ◉ | ◉ | ○ | ◉ | ◉ | ◉ | ◉ | ◉ | ○ |
| Sodium dichromate | 40% | ◉ | ◉ | ○ | ◉ | ○ | △ | ○ | ○ | △ | ◉ | ○ | × |
| Sodium hydrogen carbonate | 25% | ◉ | ◉ | ◉ | ◉ | ◉ | ○ | ◉ | ◉ | ◉ | ◉ | ◉ | ◉ |
| Sodium hydroxide ^(Note 9) | 5% | ◉ | ◉ | ○ | ○ | × | × | ◉ | ◉ | ○ | ◉ | ○ | △ |
| Sodium hydroxide ^(Note 9) | 15% | ◉ | ◉ | ○ | ◉ | × | × | ◉ | ◉ | ○ | ◉ | ○ | △ |
| Sodium hydroxide ^(Note 9) | 30% | ◉ | ◉ | ○ | ◉ | ○ | ○ | ◉ | ◉ | ○ | ◉ | ○ | △ |
| Sodium hydroxide ^(Note 9) | 50% | ◉ | ◉ | ○ | ◉ | ○ | ○ | ◉ | ◉ | ○ | ◉ | ○ | △ |
| Sodium hypochlorite ^(Note 10) | 5% | ○ | △ | △ | ○ | △ | × | ○ | △ | × | ○ | × | × |
| Sodium hypochlorite ^(Note 10) | 15% | × | × | × | × | × | × | × | × | × | × | × | × |
| Sodium iodide | sat | ◉ | ◉ | ○ | ◉ | ○ | ○ | ◉ | ◉ | ○ | ◉ | ○ | △ |
| Sodium nitrate | sat | ◉ | ◉ | ○ | ◉ | ○ | ○ | ◉ | ◉ | ○ | ◉ | ◉ | ◉ |
| Sodium perchlorate | 50% | ◉ | ○ | △ | ◉ | △ | × | ◉ | △ | × | ◉ | ◉ | ○ |
| Sodium phosphate | sat | ◉ | ◉ | ○ | ◉ | ○ | ○ | ◉ | ◉ | ○ | ◉ | ◉ | ○ |
| Sodium sulfate | sat | ◉ | ◉ | ◉ | ◉ | ◉ | ○ | ◉ | ◉ | ◉ | ◉ | ◉ | ◉ |
| Sodium sulfide | sat | ◉ | ◉ | ◉ | ◉ | ◉ | ○ | ◉ | ◉ | ◉ | ◉ | ◉ | ◉ |
| Succinic acid | - | ◉ | ◉ | ○ | ◉ | ○ | ○ | ◉ | ◉ | ○ | ◉ | ◉ | ○ |
| Sulfur dioxide | Conc | ◉ | ◉ | ◉ | ◉ | ○ | ○ | ◉ | ○ | ○ | ◉ | ○ | |
| Sulfuric acid | 30% | ◉ | ◉ | ○ | ◉ | ○ | ○ | ◉ | ○ | ○ | ◉ | ◉ | ○ |
| Sulfuric acid | 80% | ◉ | ◉ | ○ | ◉ | ○ | ○ | ○ | ○ | × | ◉ | △ | |
| Sulfuric acid - nitric acid - water | 10-20-70 | ◉ | ◉ | ○ | ◉ | ◉ | ○ | | | | | | |
| Sulfuric acid - nitric acid - water | 15-20-65 | ◉ | ◉ | ○ | | | | | | | | | |

Note 9: Solutions that contain surfactant need to be handled with care because they tend permeate through surfaces more easily.

Note 10: Hypochlorite aqueous solutions are strong oxidizing agents and generate chlorates at high temperatures.

Note 11: Mixtures with strong acids such as sulfuric acid are highly oxidative and need to be handled with caution.

Chemical Resistance of PVC Plates (6)

<Symbols and abbreviations used>

Conc: High concentration / sat: Saturated concentration

Evaluation ⊙: No change / ○: Still usable despite slight changes / △: Use with care / x: Corroded

| Names of Chemicals | Concentration | Standard Plates | | | Heat-Resistant Plates | | | Impact-Resistant Plates | | | PP Plates | | |
|--|---------------|-----------------|------|------|-----------------------|------|------|-------------------------|------|------|-----------|------|------|
| | | 20°C | 40°C | 60°C | 20°C | 60°C | 80°C | 20°C | 40°C | 60°C | 20°C | 60°C | 80°C |
| Sulfuric acid - nitric acid - water | 50-33-17 | ⊙ | ○ | | | | | | | | | | |
| Sulfuric acid - nitric acid - water | 50-50-0 | △ | × | | △ | | | × | × | × | | | |
| Sulfuric acid - nitric acid - water | 57-28-15 | ⊙ | ○ | | ⊙ | ○ | | | | | | | |
| Sulfuric acid - nitric acid - water ^(Note 12) | 48-49-3 | △ | × | | △ | | | | | | | | |
| Sulfuric acid ^(Note 13) | 95% | ○ | △ | × | △ | × | × | △ | × | × | ○ | × | × |
| Sulfurous acid ^(Note 14) | 100% | ○ | × | × | ○ | × | × | ○ | × | × | | | |
| T | | | | | | | | | | | | | |
| Tannic acid | 100% | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ○ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ |
| Tartaric acid | 50% | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ○ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ○ |
| Tetrachloroethylene | 100% | × | × | × | × | × | × | × | × | × | △ | × | × |
| Tetramethylammonium hydroxide (TMAH) | 25% | △ | | | × | | | △ | | | ⊙ | | |
| Tin (II) chloride | 25% | ⊙ | ○ | ○ | ⊙ | ○ | ○ | ⊙ | ○ | ○ | ⊙ | ⊙ | ○ |
| Tin (IV) chloride | 50% | ⊙ | ○ | ○ | ⊙ | ○ | ○ | ⊙ | ○ | ○ | ⊙ | ⊙ | ○ |
| Toluene | 100% | × | × | × | × | × | × | × | × | × | △ | × | × |
| Trichloroethylene | 100% | × | × | × | × | × | × | × | × | × | △ | × | × |
| Triethanolamine | 100% | × | × | × | × | × | × | × | × | × | × | | |
| U | | | | | | | | | | | | | |
| Urea | 10% > | ⊙ | ⊙ | ○ | ⊙ | ○ | ○ | ○ | ○ | ○ | ⊙ | ⊙ | ⊙ |
| X | | | | | | | | | | | | | |
| Xylene | 100% | × | × | × | × | × | × | × | × | × | × | × | × |
| Z | | | | | | | | | | | | | |
| Zinc chloride | 50% | ⊙ | ⊙ | ○ | ⊙ | ⊙ | ○ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ |
| Zinc sulfate | 28% | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ○ | ⊙ | ⊙ | ⊙ | | | |

Note 12: The oxidizing power intensifies as the nitric acid ratio increases and the water ratio decreases.

Note 13: The oxidizing power intensifies as the concentration and temperature increase.

Note 14: This chemical works as a strong reducing agent and turns into sulfuric acid when oxidized by oxygen, halogen, hydrogen peroxide, or other elements. It also works as an oxidizing agent, and its oxidizing power intensifies if an excessive amount of inorganic acid is added.



Chemical Resistance of PVDF Plates (Vinylidene Fluoride) and Rods (1)

Evaluated as NR: Cannot be used

| Names of Chemicals | Maximum Allowable Temperature (°C) | Names of Chemicals | Maximum Allowable Temperature (°C) | Names of Chemicals | Maximum Allowable Temperature (°C) |
|------------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|------------------------------------|
| A | | Ammonium sulfide | 50 | Butyl ether | 40 |
| Acetaldehyde | NR | Ammonium thiocyanate | 120 | Butylamine | NR |
| Acetamide | 25 | Amyl acetate | 50 | Butylene glycol | 120 |
| Acetic acid (10%) | 110 | Amyl chloride | 120 | Butyraldehyde | 65 |
| Acetic acid (50%) | 95 | Aniline | 50 | Butyric acid | 110 |
| Acetic acid (80%) | 40 | Aniline hydrochloride | 25 | C | |
| Acetic anhydride | NR | Aqua regia | 25 | Calcium acetate | 120 |
| Acetone | NR | Arsenic acid | 120 | Calcium bromide | 120 |
| Acetone (10%) | 50 | B | | Calcium carbonate | 120 |
| Acetonitrile | 50 | Barium carbonate | 120 | Calcium chlorate | 120 |
| Acetophenone | NR | Barium chloride | 120 | Calcium chloride | 120 |
| Acetyl chloride | 50 | Barium hydroxide | 120 | Calcium hydroxide | 120 |
| Acetylacetone | NR | Barium nitrate | 120 | Calcium hypochlorite | 95 |
| Adipic acid | 65 | Barium sulfate | 120 | Calcium nitrate | 120 |
| Aluminum acetate | 120 | Benzaldehyde | 20 | Calcium oxide | 120 |
| Aluminum bromide | 120 | Benzene | 75 | Calcium phosphate | 120 |
| Aluminum chlorate | 120 | Benzenesulfonic acid | 25 | Calcium sulfate | 120 |
| Aluminum fluoride | 120 | Benzoic acid | 110 | Caprylic acid | 80 |
| Aluminum hydroxide | 120 | Benzoyl chloride | 75 | Carbon dioxide | 120 |
| Aluminum nitrate | 120 | Benzoyl peroxide | 75 | Carbon disulfide | 25 |
| Aluminum sulfate | 120 | Benzyl alcohol | 120 | Carbon monoxide | 120 |
| Ammonia gas | NR | Benzyl chloride | 50 | Carbon tetrachloride | 110 |
| Ammonia water | NR | Benzyl ether | 40 | Chloral hydrate | 25 |
| Ammonium acetate | 80 | Boron trifluoride | 25 | Chlorinated phenol | 65 |
| Ammonium bifluoride | 65 | Bromic acid | 95 | Chlorine dioxide | 50 |
| Ammonium carbonate | 120 | Bromine (dry) | 65 | Chlorine gas (dry) | 95 |
| Ammonium chloride | 120 | Bromine (wet) | 65 | Chlorine gas (wet) | 95 |
| Ammonium fluoride | 120 | Bromine water | 100 | Chlorine water | 110 |
| Ammonium hydroxide | 110 | Bromobenzene | 65 | Chloroacetic acid | NR |
| Ammonium metaphosphate | 120 | Bromoform | 65 | Chloroacetyl chloride | 50 |
| Ammonium nitrate | 120 | Butyl acetate | 25 | Chlorobenzene | 75 |
| Ammonium persulfate | 25 | Butyl acrylate | 50 | Chloroethane | 65 |
| Ammonium phosphate | 120 | Butyl alcohol | 95 | Chloroform | 50 |
| Ammonium sulfate | 120 | Butyl chloride | 120 | Chloropicrin | 65 |

Chemical Resistance of PVDF Plates (Vinylidene Fluoride) and Rods (2)

Evaluated as NR: Cannot be used

| Names of Chemicals | Maximum Allowable Temperature (°C) | Names of Chemicals | Maximum Allowable Temperature (°C) | Names of Chemicals | Maximum Allowable Temperature (°C) |
|--------------------------|------------------------------------|---------------------------------|------------------------------------|-------------------------------|------------------------------------|
| Chlorosulfonic acid | NR | Diisopropyl ketone | 20 | Furfural | 25 |
| Chlorotrimethylsilane | 50 | Dimethyl sulfate | 25 | G | |
| Chrome alum | 95 | Dimethyl sulfoxide | NR | | |
| Chromic acid (40%) | 80 | Dimethylacetamide | NR | | |
| Chromic acid (50%) | 50 | Dimethylaniline | 25 | | |
| Chromyl chloride | 50 | Dimethylformamide | NR | H | |
| Citric acid | 110 | Dioxane | NR | | |
| Copper (II) chloride | 120 | Dipropylene glycol methyl ether | 25 | | |
| Copper (II) sulfate | 120 | Divinylbenzene | 50 | | |
| Copper acetate | 120 | E | | Heptane | 120 |
| Copper carbonate | 120 | | | Epichlorohydrin | NR |
| Copper chloride | 120 | Ethaneithiol | 25 | Hexamethylphosphoric triamide | NR |
| Copper cyanide | 120 | Ethanolamine | NR | Hexane | 120 |
| Copper fluoride | 120 | Ethyl acetate | NR | Hexyl alcohol | 80 |
| Copper nitrate | 120 | Ethyl acetoacetate | 25 | Hydrazine | 95 |
| Creosol | 65 | Ethyl alcohol | 120 | Hydrazine hydrate | 50 |
| Crotonaldehyde | 50 | Ethyl chloroacetate | 25 | Hydrazine hydrochloride | 25 |
| Cyclohexane | 120 | Ethyl chloroformate | 50 | Hydrobromic acid | 120 |
| Cyclohexanol | 65 | Ethyl ether | 50 | Hydrochloric acid (35%) | 100 |
| Cyclohexanone | 25 | Ethyl formate | 25 | Hydrofluoric acid (100%) | 95 |
| D | | Ethyl benzene | 50 | Hydrofluoric acid (40%) | 120 |
| | | Ethylene chlorohydrin | 25 | Hydrogen chloride | 100 |
| Dextrin | 120 | Ethylene dichloride | 135 | Hydrogen cyanide | 120 |
| Diacetone alcohol | 25 | Ethylene dichloride | 110 | Hydrogen cyanide | 120 |
| Dibasic sodium phosphate | 120 | Ethylene oxide | NR | Hydrogen peroxide (30%) | 95 |
| Dibutyl phthalate | NR | Ethylenediamine | 25 | Hydrogen peroxide (90%) | 20 |
| Dibutylamine | 20 | F | | Hydrogen sulfide | 120 |
| Dichloroacetic acid | 50 | | | Fluoroboric acid | 35 |
| Dichlorobenzene | 65 | Formaldehyde (35%) | 50 | Hydroiodic acid | 120 |
| Dichlorodimethylsilane | 50 | Formic acid | 110 | Hydroquinone | 120 |
| Dichlorotoluene | 65 | Fumaric acid | 65 | I | |
| Diethanolamine | NR | Fuming nitric acid | NR | | |
| Diethylamine | 25 | Fuming sulfur | NR | Iodine | 65 |
| Diglycolic acid | 25 | Furan | NR | Iron (II) chloride | 120 |
| Diisobutyl ketone | 75 | | | Iron (II) hydroxide | 120 |
| | | | | Iron (II) nitrate | 120 |



Chemical Resistance of PVDF Plates (Vinylidene Fluoride) and Rods (3)

Evaluated as NR: Cannot be used

| Names of Chemicals | Maximum Allowable Temperature (°C) | Names of Chemicals | Maximum Allowable Temperature (°C) | Names of Chemicals | Maximum Allowable Temperature (°C) |
|----------------------|------------------------------------|---------------------------|------------------------------------|-------------------------------|------------------------------------|
| Iron (II) sulfate | 120 | Maleic anhydride | 25 | Nitrotoluene | 80 |
| Iron (III) chloride | 120 | Malic acid | 120 | O | |
| Iron (III) hydroxide | 120 | Manganese sulfate | 120 | Oleic acid | 110 |
| Iron (III) nitrate | 120 | Mercury cyanide | 120 | Oxalic acid | 50 |
| Iron (III) sulfate | 120 | Methacrylic acid | 50 | Ozone | 110 |
| Iron (III) sulfide | 120 | Methane | 100 | P | |
| Iron sulfide | 120 | Methanesulfonic acid | 95 | Palmitic acid | 110 |
| Isoamyl alcohol | 120 | Methyl acetate | 40 | Perchloric acid (10%) | 95 |
| Isobutyl alcohol | 120 | Methyl acrylate | 40 | Perchloric acid (70%) | 50 |
| Isophorone | 80 | Methyl alcohol | 120 | Perchloroethylene | 110 |
| Isopropyl alcohol | 60 | Methyl chloride | 120 | Phenol (5%) | 80 |
| Isopropyl ether | 50 | Methyl chloroacetate | 25 | Phenyl ether | 50 |
| K | | Methyl chloroform | 50 | Phenylhydrazine hydrochloride | 50 |
| Kerosene (paraffin) | 120 | Methyl chloromethyl ether | 25 | Phosgene | 80 |
| L | | Methyl ethyl ketone | NR | Phosphoric acid (85%) | 110 |
| Lactic acid | 50 | Methyl isobutyl ketone | NR | Phosphorus oxychloride | NR |
| Lauric acid | 100 | Methylamine | NR | Phosphorus pentachloride | 95 |
| Lauroyl chloride | 120 | Methylene bromide | 80 | Phosphorus trichloride | 95 |
| Lauryl mercaptan | 95 | Methylene chloride | NR | Picric acid | 25 |
| Lead acetate | 120 | Methylene iodide | 95 | Polyethylene glycol | 95 |
| Lead chloride | 120 | Methyltrichlorosilane | 65 | Potassium acetate | 120 |
| Lead cyanide | 120 | N | | Potassium alum | 135 |
| Lead nitrate | 120 | Naphtha | 120 | Potassium bicarbonate | 95 |
| Lead sulfate | 120 | Naphthalene | 95 | Potassium bisulfate | 120 |
| Lithium bromide | 110 | Nickel acetate | 120 | Potassium bromate | 120 |
| Lithium chloride | 120 | Nickel chloride | 120 | Potassium bromide | 120 |
| M | | Nickel nitrate | 120 | Potassium carbonate | 120 |
| Magnesium carbonate | 120 | Nickel sulfate | 120 | Potassium chlorate | 95 |
| Magnesium chloride | 120 | Nitric acid (10%) | 50 | Potassium chloride | 120 |
| Magnesium citrate | 120 | Nitric acid (50%) | 50 | Potassium chromate | 120 |
| Magnesium hydroxide | 120 | Nitrobenzene | 25 | Potassium cyanide | 120 |
| Magnesium nitrate | 120 | Nitroethane | 20 | Potassium dichromate | 120 |
| Magnesium sulfate | 120 | Nitrogen dioxide | 75 | Potassium ferricyanide | 120 |
| Maleic acid | 110 | Nitroglycerine | 50 | Potassium ferrocyanide | 120 |

Chemical Resistance of PVDF Plates (Vinylidene Fluoride) and Rods (4)

Evaluated as NR: Cannot be used

| Names of Chemicals | Maximum Allowable Temperature (°C) | Names of Chemicals | Maximum Allowable Temperature (°C) | Names of Chemicals | Maximum Allowable Temperature (°C) |
|---------------------------|------------------------------------|---------------------------|------------------------------------|----------------------------|------------------------------------|
| Potassium fluoride | 120 | Sodium chromate | 95 | Tetrachloroethane | 120 |
| Potassium hydroxide (10%) | 75 | Sodium cyanide | 120 | Tetrachlorophenol | 65 |
| Potassium hydroxide (50%) | NR | Sodium dichromate | 95 | Tetrahydrofuran | NR |
| Potassium iodide | 120 | Sodium ferricyanide | 120 | Thionyl chloride | NR |
| Potassium nitrate | 120 | Sodium ferrocyanide | 120 | Toluene | 80 |
| Potassium perborate | 120 | Sodium fluoride | 120 | Trichloroacetic acid (10%) | 95 |
| Potassium perchlorate | 95 | Sodium fluosilicate | 95 | Trichloroethylene | 110 |
| Potassium permanganate | 120 | Sodium hydroxide (10%) | 85 | Tricresyl phosphate | NR |
| Potassium persulfate | 50 | Sodium hydroxide (50%) | NR | Triethanolamine | 50 |
| Potassium sulfate | 120 | Sodium hypochlorite (15%) | 95 | Triethyl phosphate | NR |
| Potassium sulfide | 120 | Sodium hypochlorite (5%) | 120 | Trimethylamine | 65 |
| Propyl acetate | 40 | Sodium iodide | 120 | U | |
| Propyl alcohol | 65 | Sodium nitrate | 120 | Urea | 120 |
| Propylamine | NR | Sodium nitrite | 120 | X | |
| Propylene dichloride | 95 | Sodium palmitate | 120 | Xylene | 95 |
| Propylene glycol | 65 | Sodium perchlorate | 120 | Z | |
| Propylene oxide | NR | Sodium peroxide | 95 | Zinc chloride | 120 |
| Pyridine | NR | Sodium phosphate | 120 | | |
| Pyrogallol | 50 | Sodium sulfite | 120 | | |
| R | | Sodium thiocyanate | 120 | | |
| Red phosphorous | 25 | Sodium thiosulfate | 120 | | |
| Rhodium | 120 | Stearic acid | 120 | | |
| S | | Sulfur chloride | 25 | | |
| Salicylaldehyde | 50 | Sulfur dichloride | 25 | | |
| Salicylic acid | 95 | Sulfur dioxide | 80 | | |
| Silver nitrate | 120 | Sulfur trioxide | NR | | |
| Silver sulfate | 120 | Sulfuric acid (60%) | 110 | | |
| Sodium acetate | 120 | Sulfuric acid (90%) | 95 | | |
| Sodium benzoate | 120 | Sulfuric acid (98%) | 65 | | |
| Sodium bromate | 95 | Sulfuryl chloride | NR | | |
| Sodium bromide | 120 | Sulfuryl fluoride | 25 | | |
| Sodium carbonate | 120 | T | | | |
| Sodium chlorate | 120 | Tannic acid | 110 | | |
| Sodium chloride | 120 | Tetrabromoethane | 120 | | |

Specification Tables for All Product Types

As of April 30, 2022

Polyvinyl Chloride (PVC) Materials — p. 99-100

| | |
|--|--------|
| PVC Plates (Press Laminated Plates) | p. 99 |
| • Filter Plates | p. 99 |
| • Composite Plates | p. 99 |
| • Semi-transparent (Opaque) | p. 99 |
| • Colored Transparent (Clear) | p. 100 |
| • Non-transparent (Opaque) | p. 100 |
| PVC Plates (Extruded Plates) | p. 100 |
| PVC Plates (Continuous Pressed Plates) | p. 100 |

Functional Materials — p. 101-104

| | |
|---|--------|
| Heat-Resistant Plates | p. 101 |
| Impact-Resistant Plates | p. 101 |
| Metal-Free Plates | p. 101 |
| Electromagnetic Wave Shielding Plates | p. 102 |
| Laser-Shielding Plates | p. 102 |
| Static-Dissipative Plates | p. 102 |
| FM Plates (FM 4910 Listed Materials) | p. 103 |
| Low-Foamed Rigid PVC Plates (Foam PVC) | p. 104 |
| Molding Plates (Rigid PVC for Vacuum Forming) | p. 104 |

Composite Materials — p. 105

| | |
|---|--------|
| Aluminum Composite Plates | p. 105 |
| Foam PVC HI Boards (laminated products composed of foam PVC and polyethylene) | p. 105 |
| Channel Plates (Heavy Weather-Resistant) | p. 105 |

Supporting Materials for Processing — p. 106-109

| | |
|---------------------------|------------|
| Rods | p. 106 |
| Heat-Resistant Rods | p. 106 |
| NC Rods | p. 106 |
| Channels | p. 106 |
| Angles | p. 106 |
| Frame Covers | p. 107 |
| Rail Materials | p. 107 |
| Welding Rods | p. 107-109 |
| Adhesive Rods | p. 109 |
| Adhesive for Plates | p. 109 |
| Anti-static Agents | p. 109 |

Polypropylene (PP) Materials — p. 110

| | |
|---------------------------------|--------|
| PP Plates (Polypropylene) | p. 110 |
|---------------------------------|--------|

Polyvinylidene Fluoride (PVDF) Materials — p. 110

| | |
|---|--------|
| PVDF Plates (Vinylidene Fluoride) | p. 110 |
|---|--------|

Polyethylene Terephthalate (PET) Materials — p. 111

| | |
|--|--------|
| Polyethylene Terephthalate Plates (Super PET Plates) | p. 111 |
|--|--------|

Polycarbonate (PC) Materials — p. 112-113

| | |
|----------------------------|------------|
| Polycarbonate Plates | p. 112-113 |
|----------------------------|------------|

Dimensional Tolerance — p. 114-115

| | |
|--|------------|
| Dimensional Tolerance for Takiron Plates | p. 114-115 |
| Dimensional Tolerance for Rods | p. 114 |
| Dimensional Tolerance for Polycarbonate Plates | p. 115 |

Other Available Products — p. 116

| | |
|---|--------|
| Plastic Supports (Piping Support Parts) | p. 116 |
|---|--------|

Takiron Polymer Products — p. 116-120

| | |
|--|------------|
| Super Cast Nylon Plates and Rods | p. 116-117 |
| POM Plates and Rods (TS Grade) | p. 117 |
| Polyethylene Terephthalate Plates and Rods | p. 117 |
| UHMW Plates and Rods | p. 117-118 |
| HDPE Plates and Rods | p. 118 |
| PVDF Plates and Rods for Machining | p. 118 |
| PVDF Plates for Machining (Low-Distortion Grade) | p. 118 |
| PMP (Polymethylpentene) Plates and Rods | p. 119 |
| PP Plates and Rods for Machining (TS Grade) | p. 119 |
| Thick PP Plates and Large-Diameter PP Rods | p. 119 |
| PP Plates (Dark Gray) | p. 119 |
| PEEK Plates and Rods | p. 119-120 |
| PPS Plates | p. 120 |
| PC Plates for Machining (TS Grade) | p. 120 |
| PC/ABS Plates for Machining (TS Grade) | p. 120 |
| Reinforced PP Plates with Glass Fillers (TS Grade) | p. 120 |
| Reinforced PC Plates with Glass Fillers | p. 120 |
| Conductive Nylon Plates | p. 120 |
| Conductive PP Plates | p. 120 |

Additional Information — p. 121-135

| | |
|--|------------|
| Restrictions for Organotin Compounds Included in Annex XVII to REACH Regulations | p. 121 |
| FM 4910 Listed Materials | p. 121 |
| How to access UL Yellow Card | p. 122 |
| Products That Comply with UL Standards | p. 123-124 |
| Products That Comply with JIS Standards | p. 124 |
| Products That Comply with the Food Sanitation Act | p. 125 |
| Products That Comply with Vehicle Interior Standards (JIS D 1201 Combustion Test) | p. 125 |
| Products That Comply with Standards for Vehicle Interior Materials (Japan Auto-Body Industries Association Inc.) | p. 125 |
| Products That Comply with FMVSS No. 205 (Federal Standards) | p. 125 |
| Products That Comply with Fire Retardancy Test Requirements (Japan Fire Retardant Association) | p. 126 |
| Products That Comply with Test Requirements for Incombustibility of Thin Materials for Buildings (Kaken Test Center) | p. 126 |
| List of Plates and Corresponding Recommended Welding Rods | p. 126 |
| Processing Methods and Precautions for Use | p. 127-135 |

*We may change the specifications without prior notice in order to improve the quality of our products.

Polyvinyl Chloride (PVC) Materials

Note 1: Standard products are marked with a check mark (✓). The number in brackets is the number of products in one case.
 Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive*. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.
 *(1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)
 Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials. (As of April 30, 2022)

PVC Plates (Press Laminated Plates)

The number in brackets is the number of plates in one case.

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | | | | | | | | | | | | | Protective Film Specifications | | |
|---------------|----------------|--------------------------------|---------------|----------------|---|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|-----|-----|-----|--------------------------------|-------------|-------------|
| | | | | Size (mm) | | | | | | | | | | | | | | | | Front | Back | |
| T | 938 | ✓ | Gray | 1,000x1,000 | | | | | | | | | | | | | | | | * | Green paper | White paper |
| | | | | 1,000x2,000 | * | * | * | (6) | (4) | (3) | (3) | (2) | (1) | (1) | (1) | * | (1) | (1) | * | (1) | Green paper | White paper |
| | | | | 1,212x2,424 | | | (4) | (3) | (2) | (2) | (2) | (1) | (1) | | | | (1) | | | | (1) | Green paper |
| TSP | 338 | ✓ | Ivory | 1,000x2,000 | | | * | * | * | * | * | * | * | * | * | | | * | | (1) | Green paper | White paper |
| | | | | 1,212x2,424 | | | | * | * | * | * | * | * | * | * | | | | | | | Green paper |
| TS | 608A Note | ✓ | Transparent | 1,000x2,000 | | (12) | (8) | (6) | (4) | * | (3) | * | (1) | (1) | | | (1) | | | Blue paper | White paper | |
| | | | | 1,212x2,424 | | | (4) | (3) | * | (2) | * | (1) | (1) | | | | | | | | Blue paper | White paper |
| | 608 | ✓ | Transparent | 1,000x1,000 | | | | | | | | | | | | | | | (1) | Blue paper | White paper | |
| | | | | 1,000x2,000 | | | | | | | | | | | | | | | | (1) | Blue paper | White paper |

Note: Production will end at the end of March 2023, and the product will be discontinued as soon as the stock runs out. Green character printed to paper protective film Green paper
 * symbol: Made-to-order product Please contact us for more information about production lots. Plain white paper protective film White paper
 Blue character printed to paper protective film Blue paper

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | | | | | | | | Protective Film Specifications | | | | | |
|---------------|----------------|--------------------------------|---------------|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--------------------------------|------|------|---------------------------|---------------------------|------|
| | | | | Size (mm) | | | | | | | | | | | Front | Back | | | | |
| T | 938 | ✓ | Gray | 500x1,000 | | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | None | None |
| | | | | 1,000x1,000 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | None | None |
| | | | | 1,000x2,000 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | None | None |
| | | | | 1,212x2,424 | (1) | (1) | | | | | | | | | | | | | None | None |
| TSP | 338 | ✓ | Ivory | 1,000x2,000 | (1) | (1) | | (1) | | | | | | | | | None | None | | |
| TS | 608 | ✓ | Transparent | 500x1,000 | | (1) | (1) | | | | | | | | | | | Transparent PE (adhesive) | Transparent PE (adhesive) | |
| | | | | 1,000x1,000 | (1) | (1) | | (1) | | | | | | | | | | Transparent PE (adhesive) | Transparent PE (adhesive) | |
| | | | | 1,000x2,000 | (1) | (1) | | (1) | | | | | | | | | | Transparent PE (adhesive) | Transparent PE (adhesive) | |

- If you wish to use a non-standard thickness or color, contact us. Transparent PE protective film (with adhesive)....Transparent PE (adhesive)
- Type T938 with a thickness of less than 60 mm and type T938 with a thickness of 60 mm or more have different physical properties. Please be aware of these differences before use.
- For the delivery times of the sizes 500 x 1,000 and 1,000 x 1,000, check with one of our representatives.

● Filter Plates

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | Hole Shapes | | Open Area Rate (%) | Protective Film Specifications | Remarks | |
|---------------------|----------------|--------------------------------|---------------|----------------|-----|-------------|---------------|--------------------|--------------------------------|---------|----------------------|
| | | | | Size (mm) | 3.0 | 5.0 | Diameter (mm) | | | | Pitch |
| TFL (Filter plates) | 9307A | ✓ | Gray | 1,000x2,000 | (4) | | 3 | 7 mm, square | 14.4 | None | Base plate: T938 |
| | 9512A | ✓ | Gray | 1,000x2,000 | | (3) | 5 | 12 mm, square | 13.6 | None | Base plate: T938 |
| | 3512A | ✓ | Ivory | 1,000x2,000 | | (3) | 5 | 12 mm, square | 13.6 | None | Base plate: ETSP1388 |

● Composite Plates

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | Protective Film Specifications | |
|---------------|----------------|--------------------------------|----------------------------|----------------|-----|--------------------------------|-------------|
| | | | | Size (mm) | 3.0 | Front | Back |
| SAK | K608 | ✓ | Transparent with wire mesh | 1,000x2,000 | (4) | Blue paper | White paper |

Blue character printed to paper protective film...Blue paper
 Plain white paper protective film.....White paper

● Semi-transparent (Opaque)

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | Protective Film Specifications | | | | | |
|---------------|----------------|--------------------------------|---------------|----------------|--|--|--|--------------------------------|-----|-----|-----|------------|-------------|
| | | | | Size (mm) | | | | 1.0 | 2.0 | 3.0 | 5.0 | Front | Back |
| S | 704 | ✓ | Opal cool | 1,000x2,000 | | | | * | | | | Blue paper | White paper |
| S | 700 | ✓ | Opal | 1,000x2,000 | | | | | (6) | (4) | (3) | Blue paper | White paper |

* symbol: Made-to-order product Please contact us for more information about production lots. Blue character printed to paper protective film.....Blue paper
 Plain white paper protective film.....White paper

PVC Plates (Press Laminated Plates)

The number in brackets is the number of plates in one case.

● Colored Transparent (Clear)

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | Protective Film Specifications | | |
|---------------|----------------|--------------------------------|---------------|----------------|-----|-----|--------------------------------|------------|-------------|
| | | | | Size (mm) | 2.0 | 3.0 | 5.0 | Front | Back |
| S | 202 | ✓ | Orange tinted | 1,000x2,000 | | (4) | | Blue paper | White paper |
| | 403 | ✓ | Green tinted | 1,000x2,000 | | (4) | | Blue paper | White paper |
| | 506 | ✓ | Blue tinted | 1,000x2,000 | | (4) | | Blue paper | White paper |
| | 581 | ✓ | Blue tinted | 1,000x2,000 | | | (3) | Blue paper | White paper |
| | 881 | ✓ | Smoky brown | 1,000x2,000 | | | (3) | Blue paper | White paper |
| | 802 | ✓ | Smoky brown | 1,000x2,000 | (6) | (4) | | Blue paper | White paper |
| | 981 | ✓ | Smoky | 1,000x2,000 | | | (3) | Blue paper | White paper |

Blue character printed to paper protective film..... Blue paper
Plain white paper protective film..... White paper

● Non-transparent (Opaque)

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | Protective Film Specifications | | |
|---------------|----------------|--------------------------------|---------------|----------------|-----|-----|--------------------------------|------------|-------------|
| | | | | Size (mm) | 2.0 | 3.0 | 5.0 | Front | Back |
| S | 912 | ✓ | Black | 1,000x2,000 | (6) | (4) | (3) | Blue paper | White paper |

Blue character printed to paper protective film..... Blue paper
Plain white paper protective film..... White paper

PVC Plates (Extruded Plates)

The number in brackets is the number of plates in one case.

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | | | | | | | | | Protective Film Specifications | | | |
|---------------|----------------|--------------------------------|---------------|----------------|------|-----|-----|-----|-----|-----|-----|-----|------|------|------|--------------------------------|---------------------------|---------------------------|------|
| | | | | Size (mm) | 1.0 | 1.5 | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 8.0 | 10.0 | 12.0 | 15.0 | 18.0 | 20.0 | Front | Back |
| ET | 1980 | ✓ | Gray | 1,000x2,000 | (12) | (8) | (6) | (4) | (3) | (3) | (2) | (1) | (1) | (1) | (1) | (1) | (1) | Blue paper | None |
| | | | | 1,212x2,424 | | | (4) | (3) | (2) | (2) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | Blue paper | None |
| | | | | 1,500x2,000 | | | | | (1) | | * | (1) | (1) | * | * | * | White paper | None | |
| ETSP | 1388 | ✓ | Ivory | 1,000x2,000 | | | (6) | (4) | (3) | (3) | | (1) | (1) | | (1) | (1) | Transparent PE (adhesive) | Blue tinted PE (adhesive) | |
| | | | | 1,220x2,440 | | | (3) | (2) | (2) | | (1) | (1) | | (1) | (1) | Transparent PE (adhesive) | Blue tinted PE (adhesive) | | |

* symbol: Made-to-order product Please contact us for more information about production lots.

Blue character printed to paper protective film..... Blue paper
Plain white paper protective film..... White paper
Transparent PE protective film (with adhesive)..... Transparent PE (adhesive)
Blue transparent PE protective film (with adhesive)..... Blue transparent PE (adhesive)

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | | | Protective Film Specifications | | | |
|---------------------------|----------------|--------------------------------|---------------|----------------|-----|-----|-----|------|------|--------------------------------|---------------------------|---------------------------|---------------------------|
| | | | | Size (mm) | 3.0 | 5.0 | 8.0 | 10.0 | 15.0 | 20.0 | Front | Back | |
| ESA (Continuous press) | 9810 | ✓ | Transparent | 1,000x2,000 | (4) | (3) | (1) | (1) | | | | Transparent PE (adhesive) | Transparent PE (adhesive) |
| | | | | 1,212x2,424 | (3) | (2) | (1) | (1) | | | Transparent PE (adhesive) | Transparent PE (adhesive) | |
| | | | | 1,000x2,000 | | | | | (1) | (1) | Transparent PE | Transparent PE | |
| | | | | 1,212x2,424 | | | | | (1) | (1) | Transparent PE | Transparent PE | |

Note: ESA9810 and ESA-9810 (continuous press) will be stopped production at the end of December 2022, and will be discontinued as soon as the stock runs out.

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | | Protective Film Specifications | | | |
|-----------------------------------|----------------|--------------------------------|---------------|----------------|-----|-----|-----|-----|--------------------------------|------|---------------------------|---------------------------|
| | | | | Size (mm) | 3.0 | 4.0 | 5.0 | 6.0 | 8.0 | 10.0 | Front | Back |
| NESA (New Method of Extrusion) | 1110 | ✓ | Transparent | 1,000x2,000 | (4) | (3) | (3) | (2) | (1) | (1) | Transparent PE (adhesive) | Transparent PE (adhesive) |
| | | | | 1,212x2,424 | (3) | (2) | (2) | (2) | (1) | (1) | Transparent PE (adhesive) | Transparent PE (adhesive) |

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | | | | | Protective Film Specifications | | | |
|---------------|----------------|--------------------------------|---------------|----------------|------|------|-----|-----|-----|-----|-----|--------------------------------|------------|-------------|-------------|
| | | | | Size (mm) | 0.8 | 1.0 | 1.5 | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | Front | Back | |
| ESS | 8800A | ✓ | Transparent | 910x1,820 | (15) | (12) | (8) | (6) | (4) | (3) | (3) | (3) | (2) | Blue paper | White paper |
| | | | | 1,000x2,000 | | (12) | (8) | (6) | (4) | (3) | (3) | (2) | Blue paper | White paper | |
| | | | | 1,212x2,424 | | | | | (3) | | (2) | | Blue paper | White paper | |
| ES- | 9700A | ✓ ^{Note} | White | 910x1,820 | | (12) | (8) | (6) | (4) | | (3) | | Blue paper | White paper | |
| | | | | 1,000x2,000 | | (12) | (8) | (6) | (4) | | (3) | | Blue paper | White paper | |

Note: Compliant with RoHS and REACH from April 2020.

Blue character printed to paper protective film..... Blue paper
Plain white paper protective film..... White paper

Packaging Unit: 500 kg Pallet

(Quantity)

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | | | | | |
|---------------|----------------|--------------------------------|---------------|----------------|-----|-----|-----|-----|-----|-----|-----|-----|
| | | | | Size (mm) | 0.8 | 1.0 | 1.5 | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 |
| ESS | 8800A | ✓ | Transparent | 910x1,820 | * | 200 | 140 | 100 | 70 | 50 | 40 | - |
| | | | | 1,000x2,000 | - | 180 | - | 90 | 60 | 45 | 35 | * |
| ES- | 9700A | ✓ ^{Note} | White | 910x1,820 | - | 200 | - | 100 | 70 | - | - | |
| | | | | 1,000x2,000 | - | * | - | * | - | - | - | |

* symbol: Made-to-order product Contact us for more information about packaging units.

Note: Compliant with RoHS and REACH from September 2020.

PVC Plates (Continuous Pressed Plates)

The number in brackets is the number of plates in one case.

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | | | | | Protective Film Specifications | | |
|---------------|----------------|--------------------------------|---------------|----------------|-----|-----|-----|-----|-----|------|------|--------------------------------|------------------------------|----------------|
| | | | | Size (mm) | 3.0 | 4.0 | 5.0 | 6.0 | 8.0 | 10.0 | 15.0 | 20.0 | Front | Back |
| RTS | 110PE | ✓ | Transparent | 1,000x2,000 | (4) | (3) | (3) | (2) | (1) | (1) | (1) | (1) | Blue printing transparent PE | Transparent PE |
| | | | | 1,212x2,424 | (3) | (2) | (2) | (2) | (1) | (1) | (1) | (1) | Blue printing transparent PE | Transparent PE |
| RTSP | 133PE | ✓ | Ivory | 1,000x2,000 | (4) | (3) | (3) | (2) | (1) | (1) | (1) | (1) | Blue printing transparent PE | Transparent PE |
| | | | | 1,212x2,424 | (3) | (2) | (2) | (2) | (1) | (1) | (1) | (1) | Blue printing transparent PE | Transparent PE |

Blue character printed to transparent PE protective film

Functional Materials

Note 1: Standard products are marked with a check mark (✓). The number in brackets is the number of products in one case.
 Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive*. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.
 *(1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)
 Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials. (As of April 30, 2022)

Heat-Resistant Plates

The number in brackets is the number of plates in one case.

Dark Gray

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | | | | | | | | | Protective Film Specifications | | | | | | | | | | | |
|---------------|----------------|--------------------------------|---------------|----------------|--|-----|-----|-----|-----|-----|-----|------|------|------|------|--------------------------------|------|------|------|------|------|-------|------|------|-----|-----------------------------|-----------------------------|
| | | | | Size (mm) | | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 8.0 | 10.0 | 12.0 | 15.0 | 20.0 | 25.0 | 30.0 | 35.0 | 40.0 | 50.0 | 60.0 | Front | Back | | | | |
| HT | 928 | ✓ | Dark gray | 500×1,000 | | | | | | | | | | | | | | (1) | (1) | (1) | (1) | (1) | None | None | | | |
| | | | | 1,000×1,000 | | | | | | | | | | | | | | | | (1) | (1) | (1) | (1) | (1) | (1) | None ^{Note} | None ^{Note} |
| | | | | 1,000×2,000 | | (6) | (4) | (3) | (3) | (2) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | Green paper ^{Note} | White paper ^{Note} |
| | | | | 1,212×2,424 | | | | | (2) | | (1) | (1) | | | | | | | | | | | | | | Green paper | White paper |

Note: Type HT928 with a thickness of 20 mm and size of 1,000 x 1,000 has protective film.
 Products with a thickness of 25 mm or more do not have protective film.

Green character printed to paper protective film Green paper
 Plain white paper protective film..... White paper

Heat-Resistant Transparent Grade (FM 4910 Listed Material)

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | | Protective Film Specifications | | | |
|-------------------------|----------------|--------------------------------|---------------|----------------|--|-----|-----|-----|--------------------------------|------|-------------------------------|-------------------------------|
| | | | | Size (mm) | | 3.0 | 5.0 | 8.0 | 10.0 | 12.0 | Front | Back |
| FMHS (Press lamination) | 6650 | ✓ | Transparent | 1,000×2,000 | | (4) | (3) | (1) | (1) | * | Green FM paper/Transparent PE | Green FM paper/Transparent PE |
| | | | | 1,212×2,424 | | (3) | (2) | (1) | (1) | * | Green FM paper/Transparent PE | Green FM paper/Transparent PE |

* symbol: Made-to-order product Please contact us for more information about production lots.
 • For other FM series, refer to p. 103.

Green character printed to paper protective film special to FM products
 Green FM paper

HT Laminate (Heat-Resistant Plates with Improved Chemical Resistance Grade)

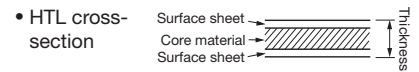
| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | Protective Film Specifications | | | |
|---------------|----------------|--------------------------------|---------------|----------------|--|-----|--------------------------------|------|-------------|-------------|
| | | | | Size (mm) | | 5.0 | 8.0 | 10.0 | Front | Back |
| HTL | 958 | ✓ | Gray | 1,000×2,000 | | (3) | (1) | (1) | Green paper | White paper |
| | | | | 1,212×2,424 | | * | * | (1) | Green paper | White paper |
| | 358 | ✓ | Ivory | 1,000×2,000 | | (3) | (1) | (1) | Green paper | White paper |
| | | | | 1,212×2,424 | | (2) | (1) | (1) | Green paper | White paper |

* symbol: Made-to-order product Please contact us for more information about production lots.

Green character printed to paper protective film Green paper
 Plain white paper protective film..... White paper

• The thickness of the surface sheet of type HTL is 1.0 mm, and is combined as shown in the following table.

| Product Number | Surface Types | Core Materials |
|----------------|---------------|----------------------|
| 958 | T938 | HT928 |
| 358 | TSP338 | Heat-resistant ivory |



Impact-Resistant Plates

The number in brackets is the number of plates in one case.

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | | | | | | | | Protective Film Specifications | | |
|---------------|----------------|--------------------------------|---------------|----------------|--|-----|-----|-----|-----|-----|-----|------|------------|-------------|--------------------------------|-------------|-------------|
| | | | | Size (mm) | | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 8.0 | 10.0 | 15.0 | 20.0 | Front | Back | |
| THQ | 048 | ✓ | Green | 1,000×2,000 | | | * | * | * | * | * | * | * | | | Green paper | White paper |
| | | | | 1,212×2,424 | | | * | | * | | | * | | | Green paper | White paper | |
| | 098 | ✓ | Dark gray | 1,000×2,000 | | * | (4) | (3) | (3) | (2) | (1) | (1) | (1) | (1) | Green paper | White paper | |
| | | | | 1,212×2,424 | | | (3) | (2) | (2) | (2) | (1) | (1) | | | Green paper | White paper | |
| 038 | ✓ | Ivory | 1,000×2,000 | | | | | | (3) | | | (1) | | Green paper | White paper | | |
| | | | 1,212×2,424 | | | | | | (2) | | | (1) | | Green paper | White paper | | |
| TSHI | 601HI | ✓ | Transparent | 1,000×2,000 | | (6) | (4) | | (3) | | * | | | Blue paper | White paper | | |
| | 1,212×2,424 | | | | | (3) | | (2) | | | | | Blue paper | White paper | | | |
| EQ | 801HI | ✓ | Smoky brown | 1,000×2,000 | | | * | | * | | | | | Blue paper | White paper | | |
| | | | | 1,000×2,000 | | | (4) | | (3) | | * | * | | | Blue paper | None | |

* symbol: Made-to-order product Please contact us for more information about production lots.

Green character printed to paper protective film Green paper
 Plain white paper protective film..... White paper
 Blue character printed to paper protective film..... Blue paper

Metal-Free Plates

The number in brackets is the number of plates in one case.

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | Protective Film Specifications | | | |
|---------------|----------------|--------------------------------|---------------|----------------|-----|-----|--------------------------------------|---------------------------------------|------|--------------------------------------|---------------------------------------|
| | | | | Size (mm) | | 3.0 | 5.0 | 8.0 | 10.0 | Front | Back |
| TMC | 60601 | △ | Transparent | 1,000×2,000 | | (4) | (3) | (1) | (1) | Blue paper/Transparent PE (adhesive) | White paper/Transparent PE (adhesive) |
| | 1,000×2,000 | | (4) | (3) | (1) | (1) | Blue paper/Transparent PE (adhesive) | White paper/Transparent PE (adhesive) | | | |

△: It is not compliant only with REACH.

Blue character printed to paper protective film..... Blue paper
 Plain white paper protective film..... White paper
 Transparent PE protective film (with adhesive)..... Transparent PE (adhesive)

Electromagnetic Wave Shielding Plates

The number in brackets is the number of plates in one case.

| | Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Size (mm) | Thickness (mm) | | Protective Film Specifications | |
|---|---------------|----------------|--------------------------------|---------------|-------------|----------------|-----|--------------------------------------|---------------------------------------|
| | | | | | | 3.0 | 5.0 | Front | Back |
| PVC electromagnetic wave shielding plate | TEND | 57600 | ✓ | Transparent | 1,000x2,000 | (4) | (3) | Blue paper/Transparent PE (adhesive) | White paper/Transparent PE (adhesive) |
| PC electromagnetic wave shielding plate ^{Note 1} | PCEND | 57610 | ✓ | Transparent | 1,000x2,000 | (4) | (3) | Blue paper/Blue tinted PE (adhesive) | White paper/Transparent PE (adhesive) |

- Actual thickness of type TEND: Nominal thickness + 0.25 mm
 - Actual thickness of type PCEND: Nominal thickness + 0.15 mm
- Note: Production will end at the end of March 2023, and the product will be discontinued as soon as the stock runs out.



Laser-Shielding Plates

The number in brackets is the number of plates in one case.

| | Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Applicable Wavelength Range (nm) | Optical Density (OD) | Thickness (mm) | | Protective Film Specifications | | |
|------------------------------------|---------------|-------------------------|--------------------------------|---------------|----------------------------------|----------------------|----------------|-----|--------------------------------|---------------------------|---------------------------|
| | | | | | | | 3.0 | 5.0 | Front | Back | |
| For YAG lasers For fiber lasers | | W402 | ✓ | Green tinted | 950 to 1150 | 6 < | 1,000x2,000 | (1) | G | Transparent PE (adhesive) | Transparent PE (adhesive) |
| | | | | | | | * | | | | |
| For doubled YAG lasers | | W102 | ✓ | Red tinted | 480 to 550 | 6 < | 1,000x2,000 | (1) | G | Transparent PE (adhesive) | Transparent PE (adhesive) |
| | | | | | | | * | | | | |
| For argon-ion lasers | TSLA | W202 | ✓ | Orange tinted | 200 to 515 | 4 < | 1,000x2,000 | (1) | G | Transparent PE (adhesive) | Transparent PE (adhesive) |
| | | | | | | | * | | | | |
| For semiconductor lasers | | W502 | ✓ | Blue tinted | 570 to 650 | 5 < | 1,000x2,000 | (1) | G | Transparent PE (adhesive) | Transparent PE (adhesive) |
| | | | | | | | * | | | | |
| | | W4066 ^{Note 1} | ✓ | Green tinted | 720 to 840 | 6 < | 1,000x2,000 | △ | △ | Transparent PE (adhesive) | Transparent PE (adhesive) |
| | | | | | | | * | | | | |

- G: Cut size available
- * symbol: The smallest and largest available sizes are 50 x 50 and 1,000 x 2,000 respectively.
- Note: The triangle symbol (△) means that the corresponding model is only going to remain available while stocks last. However, we are currently planning a new product to replace it.

Static-Dissipative Type

| | Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Applicable Wavelength Range (nm) | Optical Density (OD) | Thickness (mm) | | Protective Film Specifications | | |
|------------------------------------|---------------|-------------------------|--------------------------------|---------------|----------------------------------|----------------------|----------------|-----|--------------------------------|---------------------------|---------------------------|
| | | | | | | | 3.5 | 5.0 | Front | Back | |
| For YAG lasers For fiber lasers | | N402 | ✓ | Green tinted | 950 to 1150 | 6 < | 1,000x2,000 | (1) | G | Transparent PE (adhesive) | Transparent PE (adhesive) |
| | | | | | | | * | | | | |
| For doubled YAG lasers | | N102 | ✓ | Red tinted | 480 to 550 | 6 < | 1,000x2,000 | (1) | G | Transparent PE (adhesive) | Transparent PE (adhesive) |
| | | | | | | | * | | | | |
| For argon-ion lasers | TSLAND | N202 | ✓ | Orange tinted | 200 to 515 | 4 < | 1,000x2,000 | (1) | G | Transparent PE (adhesive) | Transparent PE (adhesive) |
| | | | | | | | * | | | | |
| For semiconductor lasers | | N502 | ✓ | Blue tinted | 570 to 650 | 5 < | 1,000x2,000 | (1) | G | Transparent PE (adhesive) | Transparent PE (adhesive) |
| | | | | | | | * | | | | |
| | | N4066 ^{Note 1} | ✓ | Green tinted | 720 to 840 | 6 < | 1,000x2,000 | △ | △ | Transparent PE (adhesive) | Transparent PE (adhesive) |
| | | | | | | | * | | | | |

- G: Cut size available
- * symbol: The smallest and largest available sizes are 50 x 50 and 1,000 x 2,000 respectively.
- Note: The triangle symbol (△) means that the corresponding model is only going to remain available while stocks last. However, we are currently planning a new product to replace it.

Static-Dissipative Plates

The number in brackets is the number of plates in one case.

| | Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Size (mm) | Thickness (mm) | | | | | | | | Protective Film Specifications | | | | |
|-------------------------|-------------------------|----------------|--------------------------------|---------------|-------------|----------------|-----|-----|-----|-----|-----|-----|------|---------------------------------------|---------------------------------------|---------------------------------------|------------------------------------|------------------------------------|
| | | | | | | 1.0 | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 8.0 | 10.0 | Front | Back | | | |
| Static-dissipative PVC | TND | 77665 | ✓ | Transparent | 1,000x2,000 | | (6) | (4) | (3) | (3) | (2) | (1) | (1) | Blue paper/Transparent PE (adhesive) | White paper/Transparent PE (adhesive) | | | |
| | | | | | | | | | | | | | | | | | | |
| | | 77285 | ✓ | Orange tinted | 1,000x2,000 | | | (3) | (2) | (2) | (2) | (1) | (1) | Blue paper/Transparent PE (adhesive) | White paper/Transparent PE (adhesive) | | | |
| | | | | | | | | | | | | | | | | | | |
| | | 77385 | ✓ | Yellow tinted | 1,000x2,000 | | | | | (4) | (3) | | | Blue paper/Transparent PE (adhesive) | White paper/Transparent PE (adhesive) | | | |
| | | | | | | | | | | | | (2) | | | Blue paper/Transparent PE (adhesive) | White paper/Transparent PE (adhesive) | | |
| | | 77885 | ✓ | Smoky brown | 1,000x2,000 | | | | | (4) | (3) | | | | Blue paper/Transparent PE (adhesive) | White paper/Transparent PE (adhesive) | | |
| | | | | | | | | | | | | | (1) | (1) | White paper/Transparent PE (adhesive) | White paper/Transparent PE (adhesive) | | |
| | 77368 ^{Note 1} | ✓ | Ivory | 1,000x2,000 | | | | (3) | (2) | (1) | (1) | | | White paper/Transparent PE (adhesive) | White paper/Transparent PE (adhesive) | | | |
| | | | | | | | | | | | | | | | | | | |
| | 77001 | ✓ | Smoky | 1,000x2,000 | | | | | (4) | (3) | (1) | (1) | | Blue paper/Transparent PE (adhesive) | White paper/Transparent PE (adhesive) | | | |
| | | | | | | | | | | | | | | Blue paper/Transparent PE (adhesive) | White paper/Transparent PE (adhesive) | | | |
| | 77002 | ✓ | Smoky gray | 1,000x2,000 | | | | | (4) | (3) | | | | Blue paper/Transparent PE (adhesive) | White paper/Transparent PE (adhesive) | | | |
| | | | | | | | | | | | | | | | | | | |
| | FMND | 7605 | △ | Transparent | | | | | | | | | | | | | Green FM/Transparent PE (adhesive) | Green FM/Transparent PE (adhesive) |
| | | | | | | | | | | | | | | | | | Green FM/Transparent PE (adhesive) | Green FM/Transparent PE (adhesive) |
| 74605 ^{Note 2} | | ✓ | Transparent | | | | | | | | | | | | | | Brown FMPE | Transparent PE |
| | | | | | | | | | | | | | | | | | Brown FMPE | Transparent PE |
| ESND | 47800 ^{Note 4} | ✓ | Transparent | | | | | | | | | | | | | Purple tinted PE (adhesive) | Transparent PE (adhesive) | |
| | | | | | | | | | | | | | | | | Purple tinted PE (adhesive) | Transparent PE (adhesive) | |
| | 47802 ^{Note 3} | ✓ | Transparent | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| 47300 ^{Note 4} | ✓ | Yellow tinted | | | | | | | | | | | | | | Purple tinted PE (adhesive) | Transparent PE (adhesive) | |
| | | | | | | | | | | | | | | | | Purple tinted PE (adhesive) | Transparent PE (adhesive) | |
| 47302 ^{Note 3} | ✓ | Yellow tinted | | | | | | (4) | (3) | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| Conductive PVC | TND | CV930 | ✓ | Black | 1,000x2,000 | (12) | (6) | (4) | | (3) | | (1) | (1) | Blue paper/Transparent PE (adhesive) | White paper/Transparent PE (adhesive) | | | |

- * symbol: Made-to-order product. Contact us for more information about sizes and lots.
- Note1: 77368 is the successor of 77348.
- Note2: Orders will be terminated at the end of September 2022.
- Note3: ESND 74602, ESND 47802, ESND 47302 has been the standard product since June 2022.
- Note4: Production will end at the end of September 2022, and the product will be discontinued as soon as the stock runs out.
- △: It is not compliant only with REACH. (Since January 19, 2021)

Static-Dissipative Plates

The number in brackets is the number of plates in one case.

ESND47800 (Packaging Unit: Pallet)

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | 3.0 | 5.0 | Protective Film Specifications | |
|------------------------|-------------------------|--------------------------------|---------------|----------------|-------------|-----|-----|--------------------------------|---------------------------|
| | | | | Size (mm) | | | | Front | Back |
| Static-dissipative PVC | ESND | 47800 ^{Note 1} | ✓ | Transparent | 1,000x2,000 | (4) | (3) | Purple tinted PE (adhesive) | Transparent PE (adhesive) |
| | | | | | 1,212x2,424 | (5) | (3) | Purple tinted PE (adhesive) | Transparent PE (adhesive) |
| | 47802 ^{Note 2} | ✓ | Transparent | 1,000x2,000 | (6) | (4) | | | |
| | | | | 1,212x2,424 | (5) | (3) | | | |

Note1: Production will end at the end of September 2022, and the product will be discontinued as soon as the stock runs out. Purple character printed to transparent PE protective film (with adhesive).....Purple transparent PE (adhesive) Transparent PE protective film (with adhesive).....Transparent PE (adhesive)

Note2: ESND47802 has been the standard product since June 2022. From October 2022, ESND- 47800 will become ESND- 47802.

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | 3.0 | 4.0 | 5.0 | 6.0 | 8.0 | 10.0 | Protective Film Specifications | |
|------------------------|---------------------|--------------------------------|---------------|----------------|-------------|-----|-----|-----|-----|----------------|---------------------------|--------------------------------|---------------------------|
| | | | | Size (mm) | | | | | | | | Front | Back |
| Static-dissipative PC | PCNDL | 78610 | ✓ | Transparent | 1,000x2,000 | (4) | (3) | | | | | Transparent PE | Transparent PE |
| | | | | | 1,220x2,440 | (4) | (2) | | | | Transparent PE | Transparent PE | |
| | 78810 | ✓ | Smoky brown | 1,000x2,000 | (4) | (3) | | | | Transparent PE | Transparent PE | | |
| | 78910 | ✓ | Smoky gray | 1,000x2,000 | (4) | (3) | | | | Transparent PE | Transparent PE | | |
| Static-dissipative PET | PETND- | 76600 | ✓ | Transparent | 1,000x2,000 | (4) | (3) | | (1) | (1) | | Transparent PE (adhesive) | Transparent PE (adhesive) |
| | | | | | 1,220x2,440 | (4) | (2) | (2) | (2) | | Transparent PE (adhesive) | Transparent PE (adhesive) | |
| | PETND (Hard coated) | MRG60 | ✓ | Transparent | 1,000x2,000 | (4) | (3) | | | | | Transparent PE (adhesive) | Transparent PE (adhesive) |
| | | MRG30 | ✓ | Yellow tinted | 1,000x2,000 | (4) | (3) | | | | | Transparent PE (adhesive) | Transparent PE (adhesive) |

Transparent PE protective film (with adhesive)..... Transparent PE (adhesive)

FM Plates (FM 4910 Listed Materials)

The number in brackets is the number of plates in one case.

Products with PVC Materials

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | 3.0 | 5.0 | 8.0 | 10.0 | 12.0 | 15.0 | 20.0 | 25.0 | 30.0 | 40.0 | Protective Film Specifications | | Grades |
|--------------------------|-------------------------|--------------------------------|---------------|----------------|-----|-----|-----|-----|------|------|------|------|--------|--|--|--|-----------------------------------|----------------|
| | | | | Size (mm) | | | | | | | | | | | | Front | Back | |
| FMET (Continuous press) | 4323 | ✓ | Ivory | 1,000x2,000 | (4) | (3) | (1) | (1) | | | (1) | (1) | (1) | (1) | (1) | Note 1 | Note 1 | Standard |
| | | | | 1,212x2,424 | (3) | (2) | (1) | (1) | | | | | | | | | Green FMPE | |
| | 4773 | ✓ | White | 500x1,000 | | | | | | | | | | | (1) | None | None | |
| | | | | 1,000x2,000 | (4) | (3) | (1) | (1) | | (1) | (1) | (1) | (1) | (1) | Note 1 | Note 1 | | |
| 1,212x2,424 | (3) | (2) | (1) | (1) | | (1) | | | | | | | | Note 1 | Note 1 | | | |
| FMRTS (Continuous press) | 4605 | ✓ | Transparent | 1,000x2,000 | (4) | (3) | (1) | (1) | | | | | | | | Green FMPE | Transparent PE | Standard |
| | | | | 1,212x2,424 | (3) | (2) | (1) | (1) | | | | | | | | Green FMPE | Transparent PE | |
| FMH (Press lamination) | 5305 | ✓ ^{Note 2} | Ivory | 1,000x2,000 | (4) | (3) | (1) | (1) | | (1) | (1) | (1) | (1) | (1) | | Note 3 | Note 3 | Heat-resistant |
| | | | | 1,212x2,424 | | (2) | (1) | (1) | | | | | | | | Note 3 | Note 3 | |
| | 5775 | ✓ | White | 500x1,000 | | | | | | | | | | (1) | None | None | | |
| | 1,000x1,000 | | | | | | | | | | | | (1) | None | None | | | |
| 1,000x2,000 | (4) | (3) | (1) | (1) | | (1) | (1) | (1) | (1) | (1) | | | Note 4 | Note 4 | | | | |
| 1,212x2,424 | (3) | (2) | (1) | (1) | | | | | | | | | | Pink FM paper | Pink FM paper | | | |
| FMHS (Press lamination) | 6650 | ✓ | Transparent | 1,000x2,000 | (4) | (3) | (1) | (1) | * | | | | | | Green FM paper/Transparent PE (adhesive) | Green FM paper/Transparent PE (adhesive) | Heat-resistant/Static-dissipative | |
| | | | | 1,212x2,424 | (3) | (2) | (1) | (1) | * | | | | | Green FM paper/Transparent PE (adhesive) | Green FM paper/Transparent PE (adhesive) | | | |
| FMND (Press lamination) | 7605 | △ | Transparent | 1,000x2,000 | (4) | (3) | (1) | (1) | | | | | | | Green FM paper/Transparent PE (adhesive) | Green FM paper/Transparent PE (adhesive) | | |
| | | | | 1,212x2,424 | (3) | (2) | (1) | (1) | | | | | | Green FM paper/Transparent PE (adhesive) | Green FM paper/Transparent PE (adhesive) | | | |
| FMND- (Continuous press) | 74605 ^{Note 4} | ✓ | Transparent | 1,000x2,000 | * | * | | | | | | | | | Brown FMPE | Transparent PE | Static-dissipative | |
| | | | | 1,212x2,424 | * | * | | | | | | | | | Brown FMPE | Transparent PE | | |
| | 74602 ^{Note 5} | ✓ | Transparent | 1,000x2,000 | (4) | (3) | (1) | (1) | | | | | | | | | | |
| | | | | 1,212x2,424 | (3) | (2) | (1) | (1) | | | | | | | | | | |

* symbol: Made-to-order product Please contact us for more information about production lots.

Note 1: 3 mm to 10 mm thick Front: Green FMPE Back: Transparent PE
15 mm and 20 mm thick Front: Green FM paper Back: Green FM paper
More than 20 mm thick Front: None Back: None

Note 2: Products manufactured from April 2019 onwards comply with the RoHS Directive and REACH Regulations.

Note 3: 3 mm to 20 mm thick Front: Pink FM paper Back: Pink FM paper
More than 20 mm thick Front: None Back: None

Note4: Orders will be terminated at the end of September 2022.

Note5: FMND- 74602 has been the standard product since June 2022.

△: It is not compliant only with REACH. (Since January 19, 2021)

• The continuous press method is used for FMET plates that are 3 mm to 10 mm thick. The press lamination method is used for FMET plates that are 15 mm to 40 mm thick.

Green character printed to PE protective film special to FM products.....Green FMPE
Blue character printed to paper protective film special to FM products.....Blue FM paper
Green character printed to paper protective film special to FM products.....Green FM paper
Pink character printed to paper protective film special to FM products.....Pink FM paper
Transparent PE protective film(with adhesive)
.....Transparent PE(adhesive)
Brown character printed to PE protective film special to FM products.....Brown FMPE

Products with Polyvinylidene Fluoride (PVDF) Materials

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | 3.0 | 5.0 | 8.0 | 10.0 | 15.0 | 20.0 | 25.0 | 30.0 | 50.0 | Protective Film Specifications | |
|---------------|----------------|--------------------------------|---------------|----------------|-----|-----|-----|-----|------|------|------|------|------|---------------------------|---|---|
| | | | | Size (mm) | | | | | | | | | | | Front | Back |
| FMPVDF | F300 | ✓ | Natural | 490x1,000 | | | | | | | (1) | (1) | (1) | (1) | Blue PE (adhesive) or Milky White PE (adhesive) | Blue PE (adhesive) or Milky White PE (adhesive) |
| | | | | 1,000x2,000 | (4) | (3) | (1) | (1) | (1) | | | | | Milky White PE (adhesive) | Milky White PE (adhesive) | |

• Plates with a size of 1,000 x 2,000 can be shipped from 1 sheet.

• The press lamination method is used for types that are 25 mm thick or thicker. However if you want to use the plate surface for processed products in its original state, keep in mind that the surface conditions are different compared to press laminated PVC plates.

Low-Foamed Rigid PVC Plates (Foam PVC) The number in brackets is the number of plates in one case.

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | 1.0 | 2.0 | 3.0 | 5.0 | 8.0 | 10.0 | 15.0 | Protective Film Specifications | |
|---------------|----------------|--------------------------------|---------------|----------------|------|------|-----|-----|-----|-----|------|------------|--------------------------------|-------------|
| | | | | Size (mm) | | | | | | | | | Front | Back |
| Foam PVC | 713 | ✓ | Off-white | 910x1,820 | (20) | (10) | (6) | (4) | (2) | (2) | | | Blue paper | White paper |
| | | | | 1,000x2,000 | (20) | (10) | (6) | (4) | (2) | (2) | (1) | Blue paper | White paper | |
| | 714 | | White | 910x1,820 | (20) | (10) | (6) | (4) | | | | Blue paper | White paper | |
| | | | | 1,000x2,000 | | | (6) | | | | | Blue paper | White paper | |
| | 915 | | Light gray | 1,000x2,000 | | (10) | (6) | (4) | (2) | (2) | * | Blue paper | White paper | |
| | 900 | | Black | 1,000x2,000 | | (10) | (6) | (4) | | | | Blue paper | White paper | |

* symbol: Made-to-order product Please contact us for more information about production lots.

☆ The foaming ratio is approximately x2.

• Contact us for more information about made-to-order 115 (red), 415 (green), or 515 (blue).

Blue character printed to paper protective film..... Blue paper
Plain white paper protective film..... White paper

Molding Plates (Rigid PVC for Vacuum Forming) The number in brackets is the number of plates in one case.

Standard Products

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | Protective Film Specifications | |
|---------------|----------------|--------------------------------|---------------|----------------|-----|-----|-----|-----|-----|----------------|--------------------------------|------|
| | | | | Size (mm) | | | | | | | Front | Back |
| EVX | 7300T | ✓ | Ivory | 1,000x2,000 | * | (3) | * | (2) | * | None | None | |
| | 7350S | ✓ | Olive gray | | * | (3) | | * | | None | None | |
| | 7350T | ✓ | | | | * | | | | None | None | |
| | 7700T | ✓ | White | | (5) | (3) | * | (2) | | None | None | |
| | 7900S | ✓ | Black | | * | (3) | * | | | None | None | |
| | 7900T | ✓ | | | * | (3) | * | (2) | | None | None | |
| | 7980S | ✓ | Gray | | * | * | * | * | | None | None | |
| | 7980T | ✓ | | | * | (3) | | * | | None | None | |
| EVC- | 8600 | ✓ | Transparent | 1,000x2,000 | (5) | (3) | | (2) | | Transparent PE | Transparent PE | |

* symbol: Made-to-order product Lot: 1,000 kg

• Product numbers ending in T indicate coarse-grained products (matte particles on the surface), and product numbers ending in S indicate fine-grained products (matte particles on the surface).

Made-to-Order Products Manufactured from Rigid PVC for Vacuum Forming

| Number | Product Types | Specifications | Thickness (mm) | Width (mm) | Length (mm) | Order Lots |
|--------|---------------|-------------------------|----------------|----------------|----------------|--|
| (1) | EVX | | 1.8 to 6.0 | 550 to 1,000 | 550 to 3,820 | 1 color, 1 thickness, 1 size, 1,000 kg or more |
| ☆ | EVX, EVD | Width: 1,500 | 5.0 to 7.0 | 1,300 to 1,500 | 1,200 to 3,000 | 1 color, 1 thickness, 1 size, 3,000 kg or more |
| (2) | EVD- | | 1.8 to 6.0 | 550 to 1,000 | 550 to 3,820 | 1 color, 1 thickness, 1 size, 1,000 kg or more |
| (3) | EVC- | Transparent | 1.8 to 6.0 | 600 to 1,000 | 550 to 3,820 | 1 color, 1 thickness, 1 size, 2,000 kg or more |
| (4) | EVH- | Heat-resistant | 2.0 to 6.0 | 600 to 1,000 | 550 to 3,820 | 1 color, 1 thickness, 1 size, 2,000 kg or more |
| (5) | EVG- | High-gloss | 2.0 to 6.0 | 600 to 1,000 | 550 to 3,820 | 1 color, 1 thickness, 1 size, 2,000 kg or more |
| (6) | EVND | Static-dissipative | 2.0 to 6.0 | 600 to 1,000 | 550 to 3,820 | 1 color, 1 thickness, 1 size, 2,000 kg or more |
| (7) | EVW- | Heavy weather-resistant | 2.0 to 5.0 | 600 to 1,000 | 550 to 3,820 | 1 color, 1 thickness, 1 size, 1,000 kg or more |

☆ Types EVX and EVD with a width of 1,500 are only available as flat products.

Composite Materials

Note 1: Standard products are marked with a check mark (✓). The number in brackets is the number of products in one case.
 Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive*. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.
 *(1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)
 Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials. (As of April 30, 2022)

Aluminum Composite Plates

The number in brackets is the number of plates in one case.

| Product Types | Product Number | Compliance with RoHS and REACH | Surface Specifications | Top Layer Materials | Core Materials | Thickness (mm) | | Protective Film Specifications | |
|---|-----------------------|--------------------------------|--|---------------------|---------------------------|----------------|--------------------------------------|--------------------------------|---------------------------|
| | | | | | | Size (mm) | 3.0 | Front | Back |
| Aluminum composite plates L | 002L | ✓ | Silver Glossy on both sides | Aluminum | Black low-foamed PE | 910×1,820 | (5) | Transparent PE (adhesive) | Transparent PE (adhesive) |
| | 772L | ✓ | White Glossy on both sides | | 910×1,820 | (10) | Blue tinted PE (adhesive) | Blue tinted PE (adhesive) | |
| | | | | | 1,000×2,000 | (5) | Blue tinted PE (adhesive) | Blue tinted PE (adhesive) | |
| | | | | | 1,220×2,440 | (5) | Blue tinted PE (adhesive) | Blue tinted PE (adhesive) | |
| | 772LR | ✓ | White Glossy on one side Matte on one side | | 910×1,820 | (10) | Blue tinted PE (adhesive) | Transparent PE (adhesive) | |
| | | | | | 1,000×2,000 | (5) | Blue tinted PE (adhesive) | Transparent PE (adhesive) | |
| | | | | | 1,220×2,440 | (5) | Blue tinted PE (adhesive) | Transparent PE (adhesive) | |
| | | | | | 1,000×3,000 | (3) | Blue tinted PE (adhesive) | Transparent PE (adhesive) | |
| | | | | | 1,220×3,000 | (3) | Blue tinted PE (adhesive) | Transparent PE (adhesive) | |
| | | | | | 778L | ✓ | White Glossy on one side (One-sided) | 910×1,820 | (10) |
| | 778L | ✓ | White Glossy on one side (One-sided) | | 1,000×2,000 | (5) | Blue tinted PE (adhesive) | None | |
| | | | | | 1,220×2,440 | (5) | Blue tinted PE (adhesive) | None | |
| | | | | | 1,000×3,000 | (3) | Blue tinted PE (adhesive) | None | |
| 1,220×3,000 | | | | (3) | Blue tinted PE (adhesive) | None | | | |
| Steel composite plates ST (For whiteboards) | 700GR | ✓ | White Glossy on one side (One-sided) | Steel | Black low-foamed PE | 910×1,820 | (5) | Transparent PE (adhesive) | None |
| | 700GL ^{Note} | | White Glossy on one side (One-sided) | | 1,205×2,400 | (2) | Transparent PE (adhesive) | None | |

- Steel composite plates ST (for whiteboards) comply with the Act on Promoting Green Procurement.
 - Be sure to only use steel composite plates ST indoors.
 - The finish of the cut ends of the shipped product differs.
- Aluminum composite plates L and steel composite plates ST 700GR: Serrated/Steel composite plates ST 700GL: Sheared
 Note: 700GL and 700GR have different white color tone of the surface coating color.
 Please check with a sample book.

Foam PVC HI Boards

The number in brackets is the number of plates in one case.

(laminated products composed of foam PVC and polyethylene)

| Product Types | Product Number | Compliance with RoHS and REACH | Nominal Thickness (mm) | Size (mm) | Packaging | Protective Film Specifications | |
|------------------------------------|----------------|--------------------------------|------------------------|-----------|-----------|--------------------------------|----------------------|
| | | | | | | Front | Back |
| Foam PVC HI boards ^{Note} | 1000H | ✓ | 10.0 | 910×1,820 | (5) | Black printing paper | Black printing paper |
| | 1500H | ✓ | 15.0 | 910×1,820 | (4) | Black printing paper | Black printing paper |
| | 2000H | ✓ | 20.0 | 910×1,820 | (3) | Black printing paper | Black printing paper |
| | 3000H | ✓ | 30.0 | 910×1,820 | (2) | Black printing paper | Black printing paper |
| | 5000H | ✓ | 50.0 | 910×1,820 | (1) | Black printing paper | Black printing paper |

- Note: Sales will end at the end of March 2023. Black character printed to paper protective film Black printing paper
- Packaging: Cardboard Store in a location not exposed to direct sunlight.

Channel Plates (Heavy Weather-Resistant)

The number in brackets is the number of plates in one case.

| Product Types | Product Number | Hues (Colors) | Thickness (mm) | Size (mm) | Packaging | Protective Film Specifications | |
|------------------------|----------------|---------------|----------------|-----------|-----------|--------------------------------|------|
| | | | | | | Front | Back |
| SCHA15 ^{Note} | CH760 | Super white | 15.0 | 910×1,820 | (2) | Plain yellow paper | None |
| SCHA30 ^{Note} | | | 30.0 | | (1) | | |
| SCHA50 ^{Note} | | | 50.0 | | (1) | | |

- Note: Production will end at the end of March 2023, and the product will be discontinued as soon as the stock runs out. Plain yellow pressure-sensitive paper...Plain yellow paper
- Type CH760 is a laminated product consisting of an acrylic front plate that is 2.0 mm thick and a PVC back plate that is 0.45 mm thick, covering the main body made from the aforementioned foaming material.

Supporting Materials for Processing

Note 1: Standard products are marked with a check mark (✓). The number in brackets is the number of products in one case.
 Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive*. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.
 *(1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)
 Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials. (As of April 30, 2022)

Rods

The number in brackets is the number of plates in one case.

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Nominal Designation (mm) | Length (mm) | Weight per Unit (approx./kg) | No. of Units per Bundle |
|---------------|----------------|--------------------------------|---------------|--------------------------|-------------|------------------------------|-------------------------|
| Rods | 938A | ✓ | Gray | 10 | 2,000 | 0.27 | (50) |
| | | | | 13 | 2,000 | 0.44 | (35) |
| | | | | 16 | 2,000 | 0.64 | (25) |
| | | | | 20 | 2,000 | 0.98 | (20) |
| | | | | 25 | 2,000 | 1.51 | (15) |
| | | | | 30 | 2,000 | 2.14 | (10) |
| | | | | 35 | 2,000 | 2.89 | (10) |
| | | | | 40 | 1,000 | 1.88 | (5) |
| | | | | 45 | 1,000 | 2.36 | (5) |
| | | | | 50 | 1,000 | 2.90 | (3) |
| | | | | 55 | 1,000 | 3.62 | (3) |
| | | | | 60 | 1,000 | 4.35 | (3) |
| | | | | 65 | 1,000 | 5.08 | (3) |
| | | | | 70 | 1,000 | 5.94 | (3) |
| | | | | 80 | 1,000 | 8.00 | (3) |
| | | | | 90 | 1,000 | 10.00 | (3) |
| | | | | 100 | 1,000 | 12.30 | (1) |
| | | | | 120 | 1,000 | 17.50 | (1) |
| | | | | 150 | 1,000 | 26.80 | (1) |
| | | | | 200 | 500 | 25.00 | (1) |

- Rod thickness equals or exceeds nominal diameter.

Heat-Resistant Rods

The number in brackets is the number of plates in one case.

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Nominal Designation (mm) | Length (mm) | Weight per Unit (approx./kg) | No. of Units per Bundle |
|---------------|----------------|--------------------------------|---------------|--------------------------|-------------|------------------------------|-------------------------|
| HT rods | 928 | ✓ | Dark gray | 20 | 1,000 | 0.55 | (20) |
| | | | | 30 | 1,000 | 1.21 | (10) |
| | | | | 40 | 1,000 | 2.11 | (5) |
| | | | | 50 | 1,000 | 3.27 | (3) |
| | | | | 60 | 1,000 | 4.67 | (3) |
| | | | | 70 | 1,000 | 6.51 | (3) |
| | | | | 80 | 1,000 | 8.40 | (3) |
| | | | | 90 | 1,000 | 10.80 | (1) |

- Rod thickness equals or exceeds nominal diameter.

NC Rods

The number in brackets is the number of plates in one case.

| Product Types | Compliance with RoHS and REACH | Hues (Colors) | Nominal Designation (mm) | Length (mm) | Weight per Unit (approx./kg) | No. of Units per Bundle |
|---------------|--------------------------------|---------------|--------------------------|-------------|------------------------------|-------------------------|
| NC rods | ✓ | Ivory | 20 | 1,000 | 0.49 | (20) |
| | | | 30 | 1,000 | 1.07 | (10) |
| | | | 40 | 1,000 | 1.88 | (5) |
| | | | 50 | 1,000 | 2.90 | (3) |

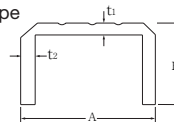
- Rod thickness equals or exceeds nominal diameter.

Channels

The number in brackets is the number of plates in one case.

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Nominal Designation (mm) | A (mm) | B (mm) | t 1 (mm) | t 2 (mm) | Length (mm) | Weight per Unit (approx./kg) | No. of Units per Bundle |
|---------------|----------------|--------------------------------|---------------|--------------------------|--------|--------|----------|----------|-------------|------------------------------|-------------------------|
| Channels | 1980 | ✓ | Gray | 4x45x30 | 45 | 30 | 3 | 4 | 4,000 | 1.95 | (12) |
| | | | | 5x60x40 | 60 | 40 | 4 | 5 | 4,000 | 3.31 | (6) |
| | | | | 6x75x50 | 75 | 50 | 5 | 6 | 4,000 | 5.06 | (4) |

- Shape

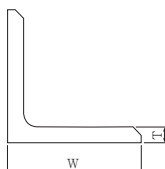


Angles

The number in brackets is the number of plates in one case.

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Nominal Designation (mm) | W (mm) | T (mm) | Length (mm) | Weight per Unit (approx./kg) | No. of Units per Bundle |
|--|----------------|--------------------------------|---------------|--------------------------|--------|--------|-------------|------------------------------|-------------------------|
| Angles | 1980 | ✓ | Gray | 4x30 | 30 | 4 | 4,000 | 1.34 | (20) |
| | | | | 5x40 | 40 | 5 | 4,000 | 2.11 | (15) |
| | | | | 6x50 | 50 | 6 | 4,000 | 3.62 | (10) |
| | | | | 7x60 | 60 | 7 | 4,000 | 4.43 | (7) |
| | | | | 9x75 | 75 | 9 | 4,000 | 7.30 | (5) |
| | 1330 | ✓ | Ivory | 5x40 | 40 | 5 | 4,000 | 2.11 | (15) |
| | | | | 6x50 | 50 | 6 | 4,000 | 3.62 | (10) |
| Angles C | 600 | ✓ | Transparent | 4x20 | 20 | 4 | 2,000 | 0.40 | (20) |
| Angles HQ (For impact-resistant plates) | 098 | ✓ | Dark gray | 5x40 | 40 | 5 | 4,000 | 2.00 | (15) |
| | | | | 6x50 | 50 | 6 | 4,000 | 3.40 | (10) |

- Shape

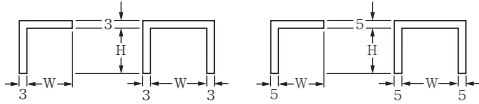


Frame Covers

The number in brackets is the number of plates in one case.

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Nominal Designation (mm) | Size (mm) | | | Packaging Unit |
|----------------|----------------|--------------------------------|---------------|--------------------------|-----------|----|-------|----------------|
| | | | | | W | H | L | |
| Frame covers L | 1330 | ✓ | Ivory | 3x45 | 42 | 42 | 2,400 | (10) |
| | | | | 5x48 | 43 | 43 | 2,400 | (8) |
| | | | | 5x58 | 53 | 53 | 2,400 | (8) |
| Frame covers C | 1330 | ✓ | Ivory | 3x48x45 | 42 | 42 | 2,400 | (8) |
| | | | | 3x83x45 | 77 | 42 | 2,400 | (8) |
| | | | | 5x51x48 | 41 | 43 | 2,400 | (6) |
| | | | | 5x61x58 | 51 | 53 | 2,400 | (6) |

• Shape



Unit: mm

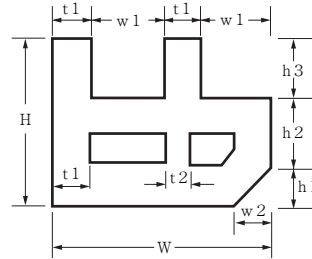
Rail Materials

The number in brackets is the number of plates in one case.

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | Size | Packaging Unit |
|------------------|----------------|--------------------------------|---------------|----------------|------|----------------|
| Rail materials A | 1330 | ✓ | Ivory | 5.0 | 2400 | (8) |
| Rail materials B | | | | 5.0 | | (8) |
| Rail materials A | | | | 8.0 | | (8) |
| Rail materials B | | | | 8.0 | | (8) |

• Rail materials 338 (compliant with RoHS and REACH) are sold as made-to-order products. Please contact us for more information about production lots.

• Shape



Rail materials A: For head jams (top)
Rail materials B: For thresholds (bottom)

| | 5mm | | 8mm | |
|--------|-------|-------|-------|-------|
| | A | B | A | B |
| H | 30 | 20 | 30 | 20 |
| h1 | 5 | 5 | 5 | 5 |
| h2 | 10 | 8 | 10 | 8 |
| h3 | 15 | 7 | 15 | 7 |
| W | 22 | 22 | 29 | 29 |
| w1 | 6 | 6 | 9.5 | 9.5 |
| w2 | 5 | 5 | 5 | 5 |
| t1 | 5 | 5 | 5 | 5 |
| t2 | 0 | 0 | 3 | 3 |
| Length | 2,400 | 2,400 | 2,400 | 2,400 |

Welding Rods

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Shapes | Nominal Designation (mm) | Length (mm) | Packaging specifications per case | No. of Units per Case (Estimated No. of Units) | Inner Packaging |
|-----------------|----------------|--------------------------------|----------------------|------------|--------------------------|-------------------------|-----------------------------------|--|---------------------|
| Welding rods | 1980S | ✓ | Gray (color ET1980) | Single ● | 2.0 | 1,000 | (1 kg x 5 bags) 5 kg | Approx. 1,060 | Transparent PE bags |
| | 1980W | | | | 3.0 | | | Approx. 500 | |
| | 1980T | | | | 4.0 | | | Approx. 270 | |
| | 938AS | ✓ | Gray (color ET938) | Double ●● | 3.0 | | | Approx. 220 | |
| | | | | | 3.0 | | | Approx. 380 | |
| | | | | | 4.0 | | | Approx. 200 | |
| | | | | | 3.0 | | | Approx. 220 | |
| | 938AW | ✓ | Gray (color ET938) | Triple ●●● | 3.0 | | | Approx. 1,060 | |
| | | | | | 4.0 | | | Approx. 500 | |
| | | | | | 3.0 | | | Approx. 220 | |
| 3.0 | | | | | Approx. 380 | | | | |
| 938AT | ✓ | Gray (color ET938) | B-type — | 3.0 | Approx. 220 | | | | |
| | | | | 3.0 | Approx. 220 | | | | |
| | | | | 3.0 | Approx. 220 | | | | |
| | | | | 3.0 | Approx. 220 | | | | |
| Welding rods | 8061 | ✓ | Transparent | Single ○ | 2.0 | 1,000 | (1 kg x 5 bags) 5 kg | Approx. 1,060 | Transparent PE bags |
| | 8062 | | | | 3.0 | | | Approx. 500 | |
| | 8063 | | | | 3.0 | | | Approx. 220 | |
| | 338S | ✓ | Ivory (color TSP338) | Double ●● | 3.0 | | | Approx. 380 | |
| | | | | | 3.0 | | | Approx. 1,060 | |
| | | | | | 3.0 | | | Approx. 500 | |
| | | | | | 3.0 | | | Approx. 220 | |
| | 338T | ✓ | Ivory (color TSP338) | Triple ●●● | 3.0 | | | Approx. 380 | |
| | | | | | 3.0 | | | Approx. 1,060 | |
| | | | | | 3.0 | | | Approx. 500 | |
| 3.0 | | | | | Approx. 220 | | | | |
| 1330S | ✓ | Ivory (color RTSP133PE) | Single ● | 2.0 | Approx. 380 | | | | |
| | | | | 3.0 | Approx. 1,060 | | | | |
| | | | | 3.0 | Approx. 500 | | | | |
| | | | | 3.0 | Approx. 220 | | | | |
| 1330W | ✓ | Ivory (color RTSP133PE) | Double ●● | 3.0 | Approx. 380 | | | | |
| | | | | 3.0 | Approx. 1,060 | | | | |
| | | | | 3.0 | Approx. 500 | | | | |
| | | | | 3.0 | Approx. 220 | | | | |
| 1330T | ✓ | Ivory (color RTSP133PE) | Triple ●●● | 3.0 | Approx. 380 | | | | |
| | | | | 3.0 | Approx. 1,060 | | | | |
| | | | | 3.0 | Approx. 500 | | | | |
| | | | | 3.0 | Approx. 220 | | | | |
| 1388S | ✓ | Ivory (color ETSP1388) | Single ● | 2.0 | 1,000 | (1 kg x 5 bags) 5 kg | Approx. 930 | Transparent PE bags | |
| | | | | 3.0 | | | Approx. 500 | | |
| | | | | 3.0 | | | Approx. 220 | | |
| | | | | 3.0 | | | Approx. 380 | | |
| 1388W | ✓ | Ivory (color ETSP1388) | Double ●● | 3.0 | | | Approx. 190 | | |
| | | | | 3.0 | | | Approx. 1,060 | | |
| | | | | 3.0 | | | Approx. 500 | | |
| | | | | 3.0 | | | Approx. 220 | | |
| 1388T | ✓ | Ivory (color ETSP1388) | Triple ●●● | 3.0 | | | Approx. 190 | | |
| | | | | 3.0 | | | Approx. 1,060 | | |
| | | | | 3.0 | Approx. 500 | | | | |
| | | | | 3.0 | Approx. 220 | | | | |
| Welding rods HT | 928S | ✓ | Dark gray | Single ● | 2.0 | 1,000 | (1 kg x 5 bags) 5 kg | Approx. 930 | Blue PE bags |
| | 928W | | | | 3.0 | | | Approx. 430 | |
| | 2061 | ✓ | Transparent | Double ●● | 3.0 | | | Approx. 190 | |
| | | | | | 3.0 | | | Approx. 1,060 | |
| 2062 | ✓ | Transparent | Single ○ | 2.0 | Approx. 500 | | | | |
| | | | | 3.0 | Approx. 220 | | | | |

Welding Rods

Welding Rods for HT Laminate

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Shapes | Nominal Designation (mm) | Length (mm) | Packaging specifications per case | No. of Units per Case (Estimated No. of Units) | Applications | Inner Packaging |
|---------------|----------------|--------------------------------|----------------------|-----------|--------------------------|-------------|-----------------------------------|--|---|-----------------|
| Welding rods | 958S | ✓ | Gray (color T938) | Single ● | 3.0 | 1,000 | (1 kg x 5 bags) 5 kg | Approx. 500 | For high temperatures (common for core material and surface protection) | Yellow PE bags |
| | 958W | | | Double ●● | 3.0 | | | Approx. 220 | | |
| | 358S | ✓ | Ivory (color TSP338) | Single ● | 3.0 | 1,000 | (1 kg x 5 bags) 5 kg | Approx. 500 | | |
| | 358W | | | Double ●● | 3.0 | | | Approx. 220 | | |

• Please use color T938 or TSP338 for surface protection.

Welding Rods (HI) for Impact-Resistant Plates (Transparent)

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Shapes | Nominal Designation (mm) | Length (mm) | Packaging specifications per case | No. of Units per Case (Estimated No. of Units) | Inner Packaging |
|---------------|----------------|--------------------------------|---------------|----------|--------------------------|-------------|-----------------------------------|--|-----------------|
| Welding rods | 601S | ✓ | Transparent | Single ○ | 3.0 | 1,000 | (1 kg x 5 bags) 5 kg | Approx. 550 | Green PE bags |

Welding Rods (HQ) for Impact-Resistant Plates

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Shapes | Nominal Designation (mm) | Length (mm) | Packaging specifications per case | No. of Units per Case (Estimated No. of Units) | Inner Packaging |
|-----------------|----------------|--------------------------------|-------------------------------------|------------|--------------------------|-------------|-----------------------------------|--|-----------------|
| Welding rods HQ | 048S | ✓ | Green (colors THQ048) | Single ● | 3.0 | 1,000 | | * | Green PE bags |
| | 048W | | | Double ●● | 3.0 | | | | |
| | 048T | | | Triple ●●● | 3.0 | | | | |
| | 198S | ✓ | Gray (color ET1980) | Single ● | 3.0 | 1,000 | (1 kg x 5 bags) 5 kg | Approx. 520 | |
| | 198W | | | Double ●● | 3.0 | | | Approx. 230 | |
| | 198T | | | Triple ●●● | 3.0 | | | Approx. 400 | |
| | 038S | ✓ | Ivory (color THQ038) | Single ● | 2.0 | 1,000 | (1 kg x 5 bags) 5 kg | Approx. 1,100 | |
| | 038W | | | Double ●● | 3.0 | | | Approx. 230 | |
| | 038T | | | Triple ●●● | 3.0 | | | Approx. 400 | |
| | 098S | ✓ | Dark gray (colors THQ098 and EQ009) | Single ● | 2.0 | 1,000 | (1 kg x 5 bags) 5 kg | Approx. 1,100 | |
| | 098W | | | Double ●● | 3.0 | | | Approx. 230 | |
| | 098T | | | Triple ●●● | 3.0 | | | Approx. 400 | |

* symbol: Made-to-order product. Please contact us for more information about production lots.

Welding Rods for Metal-Free Plates

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Shapes | Nominal Designation (mm) | Length (mm) | Packaging specifications per case | No. of Units per Case (Estimated No. of Units) | Inner Packaging |
|------------------|----------------|--------------------------------|---------------|-----------|--------------------------|-------------|-----------------------------------|--|-----------------|
| Welding rods TMC | M601S | △ | Transparent | Single ○ | 2.0 | 1,000 | (1 kg x 3 bags) 3 kg | Approx. 650 | Blue PE bags |
| | M601W | △ | | Double ○○ | 3.0 | | | Approx. 300 | |
| | M331S | △ | Ivory | Single ● | 2.0 | 1,000 | (1 kg x 3 bags) 3 kg | Approx. 650 | |
| | M331W | △ | | Double ●● | 3.0 | | | Approx. 300 | |

△: It is not compliant only with REACH.

Welding Rods for Conductive PVC Plates

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Shapes | Nominal Designation (mm) | Length (mm) | Packaging specifications per case | No. of Units per Case (Estimated No. of Units) | Inner Packaging |
|---------------|----------------|--------------------------------|---------------|----------|--------------------------|-------------|-----------------------------------|--|---------------------|
| Welding rods | 930S | ✓ | Black | Single ● | 3.0 | 1,000 | (1 kg x 5 bags) 5 kg | Approx. 520 | Transparent PE bags |

Welding Rods

Recommended Welding Rods for FM Plates

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Shapes | Nominal Designation (mm) | Length (mm) | Packaging specifications per case | No. of Units per Case (Estimated No. of Units) | Inner Packaging | Corresponding FM Plates | | | |
|-------------------|----------------|--------------------------------|---------------|----------|--------------------------|-------------|-----------------------------------|--|---------------------|-------------------------|----------------|---------------------|------|
| | | | | | | | | | | Product Types | Product Number | | |
| Welding rods | 4325S | ✓ | Ivory | Single ● | 2.0 | 1,000 | (1 kg x 5 bags) 5 kg | Approx. 1,060 | Transparent PE bags | FMET | 4323 | | |
| | 4325W | ✓ | | | 3.0 | | | Approx. 500 | | | | | |
| | 4325T | ✓ | | | 3.0 | | | Approx. 220 | | | | | |
| Welding rods | 4773S | ✓ | White | Single ● | 2.0 | 1,000 | (1 kg x 5 bags) 5 kg | Approx. 1,060 | | | | FMRTS | 4773 |
| | 4773W | ✓ | | | 3.0 | | | Approx. 500 | | | | | |
| | | ✓ | | | 3.0 | | | Approx. 220 | | | | | |
| Welding rods | 8061 | ✓ | Transparent | Single ○ | 2.0 | 1,000 | (1 kg x 5 bags) 5 kg | Approx. 1,060 | | Red PE bags | FMH | 5305 | |
| | 8062 | ✓ | | | 3.0 | | | Approx. 500 | | | | | |
| | 8063 | ✓ | | | 3.0 | | | Approx. 220 | | | | | |
| Welding rods HT | 5305S | ✓ | Ivory | Single ● | 2.0 | 1,000 | (1 kg x 5 bags) 5 kg | Approx. 930 | Yellow PE bags | FMHS | 6650 | | |
| | 5305W | ✓ | | | 3.0 | | | Approx. 430 | | | | | |
| Welding rods HT | 5775S | ✓ | White | Single ● | 2.0 | 1,000 | (1 kg x 5 bags) 5 kg | Approx. 930 | | | | FMPVDF | F300 |
| | 5775W | ✓ | | | 3.0 | | | Approx. 190 | | | | | |
| Welding rods HT | 2061 | ✓ | Transparent | Single ○ | 2.0 | 1,000 | (1 kg x 5 bags) 5 kg | Approx. 1,060 | | | | Transparent PE bags | F300 |
| | 2062 | ✓ | | | 3.0 | | | Approx. 500 | | | | | |
| PVDF welding rods | F301 | ✓ | Natural | Single ● | 3.0 | 1,000 | (1 kg x 2 bags) 2 kg | Approx. 160 | | | | | |

• None of the welding rods have the FM certification.

Adhesive Rods

| Description | Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Shapes | Dimensions (mm) | | Length (mm) | Packaging specifications per case | No. of Units per Case (Estimated No. of Units) | Inner Packaging |
|--|------------------|----------------|--------------------------------|---------------|-------------------|---------------------------------------|-----|-------------|-----------------------------------|--|---------------------|
| | | | | | | | | | | | |
| Adhesive rods for PVC | Welding rods | 8066 | ✓ | Transparent | Triangular rods ▽ | Two sides adjacent to the right angle | 3.0 | 1,000 | (1 kg x 5 bags) 5 kg | Approx. 700 | Transparent PE bags |
| | | 8065 | ✓ | Transparent | Square rods □ | Each side | 5.0 | | | Approx. 125 | |
| | | 1330D | ✓ | Ivory | Triangular rods ▴ | Two sides adjacent to the right angle | 3.0 | | | * | |
| | | | | | | | 7.0 | | | | |
| Adhesive rods for acrylic (Reinforcing rods) | Welding rods MA | MA005 | ✓ | Transparent | Square rods □ | Each side | 3.0 | 1,000 | (1 kg x 5 bags) 5 kg | Approx. 500 | Yellow PE bags |
| | | MA006 | ✓ | Transparent | Triangular rods ▽ | Two sides adjacent to the right angle | 5.0 | | | Approx. 180 | |
| | | | | | | | 3.0 | | | Approx. 780 | |
| | | | | | | | 5.0 | | | Approx. 280 | |
| Adhesive rods for super PET plates | Welding rods PET | PT006 | ✓ | Transparent | Triangular rods ▽ | Two sides adjacent to the right angle | 3.0 | 1,000 | (1 kg x 4 bags) 4 kg | Approx. 620 | Blue PE bags |

* symbol: Made-to-order product Please contact us for more information about production lots.

Adhesive for Plates

For PVC Plates

| Product Types | Compliance with RoHS and REACH | Description | Applications | Packaging |
|------------------|--------------------------------|---|--|---|
| Adhesive No. 200 | ✓ | Colorless transparent liquid with a fluid texture | Adhesive for bonding PVC parts | 1 kg round can (12 cans per box) |
| Adhesive No. 600 | ✓ | Colorless transparent liquid with a fluid texture | Dedicated adhesive for metal-free plates | 500 ml glass bottle (6 bottles per box) |

• Contact us for more information about UN cans (for exports).

For Super PET Plates

| Product Types | Compliance with RoHS and REACH | Description | Applications | Packaging |
|------------------|--------------------------------|---|--|----------------------------------|
| Adhesive No. 700 | ✓ | Colorless transparent liquid with a fluid texture | Adhesive for bonding super PET plates (For surface adhesion) | 1 kg round can (12 cans per box) |
| Adhesive No. 750 | ✓ | Colorless transparent liquid with a fluid texture | Adhesive for bonding super PET plates (For edge adhesion) | 1 kg round can (6 cans per box) |

• In order to export Adhesive No. 700, you need to obtain an export permit from the government of Japan (based on an export permit application submitted to the Ministry of Economy, Trade and Industry) in accordance with the Foreign Exchange and Foreign Trade Act.

Anti-static Agents

Anti-static Agents

| Product Types | Compliance with RoHS and REACH | Description | Packaging |
|--------------------|--------------------------------|---|---|
| Anti-static Agents | ✓ | Colorless transparent anti-static agent | 1 l plastic container (6 containers per box) 18l square cans |

Note: Please use for PVC, PET, PP, PE, ABS, etc.

Polypropylene (PP) Materials

Note 1: Standard products are marked with a check mark (✓). The number in brackets is the number of products in one case.
 Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive*. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.
 *(1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)
 Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials. (As of April 30, 2022)

PP Plates (Polypropylene)

The number in brackets is the number of plates in one case.

PP Plates

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | | | | | | | Protective Film Specifications | |
|---|----------------|--------------------------------|---------------|----------------|------|-----|-----|-----|-----|-----|----------------|----------------|----------------|--------------------------------|---------------------------|
| | | | | Size (mm) | | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 8.0 | 10.0 | 15.0 | 20.0 | Front |
| RPP (Continuous press) | 1350 | ✓ | Natural | 1,000x2,000 | | (6) | (5) | (4) | (3) | (2) | (2) | (1) | (1) | Transparent PE | None |
| | | | | 1,212x2,424 | | | | | | (1) | | Transparent PE | None | | |
| | 1950 | ✓ | Dark gray | 1,000x2,000 | | (6) | (5) | (4) | (3) | (2) | (2) | (1) | (1) | Transparent PE | None |
| | | | | 1,212x2,424 | | | | | | (1) | | Transparent PE | None | | |
| 1333 | ✓ | Ivory | 1,000x2,000 | | (6) | | (4) | | (2) | (2) | (1) | (1) | Transparent PE | None | |
| | | | 1,212x2,424 | | | | (2) | | (1) | | Transparent PE | None | | | |
| PPE (Extrusion) | P310A | ✓ | Natural | 1,000x2,000 | (10) | | | | | | | | Transparent PE | None | |
| | P915A | ✓ | Dark gray | 1,400x2,000 | | (4) | | (3) | (2) | | | | None | None | |
| RPPN (Continuous press) (Flame-retardant) | PN303 | ✓ | White | 1,212x2,424 | | | | (2) | | | | (1) | | Blue tinted PE (adhesive) | Blue tinted PE (adhesive) |

Blue tinted transparent PE protective film (with adhesive).....Blue tinted PE (adhesive)

Welding Rods for PP Plates

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Shapes | Nominal Designation (mm) | Length (mm) | Packaging specifications per case | No. of Units per Case (Estimated No. of Units) | Inner Packaging |
|------------------------------------|----------------|--------------------------------|---------------|------------|--------------------------|-------------|-----------------------------------|--|---------------------|
| Welding rods PP | 7031 | ✓ | Natural | Single ● | 3.0 | 1,000 | (0.5 kg x 6 bags) 3 kg | Approx. 430 | Transparent PE bags |
| | 7032 | ✓ | | Double ●● | 3.0 | | | Approx. 220 | |
| | 7033 | ✓ | | Triple ●●● | 4.0 | | | Approx. 200 | |
| | 7091 | ✓ | Dark gray | Single ● | 3.0 | | | Approx. 430 | |
| | 7092 | ✓ | | Double ●● | 3.0 | | | Approx. 220 | |
| | 7093 | ✓ | | Triple ●●● | 4.0 | | | Approx. 200 | |
| | P333S | ✓ | Ivory | Single ● | 2.0 | | | Approx. 950 | |
| | P333W | ✓ | | Double ●● | 3.0 | | | Approx. 430 | |
| Welding rods PPN (Flame-retardant) | 7331 | ✓ | White | Single ● | 3.0 | 1,000 | (1 kg x 5 bags) 5 kg | Approx. 510 | Green PE bags |
| | 7332 | ✓ | | Double ●● | 3.0 | | Approx. 310 | | |
| | 7333 | ✓ | | Triple ●●● | 4.0 | | Approx. 230 | | |
| | | | | | | | | | |

* symbol: Made-to-order product. Please contact us for more information about production lots.

Polyvinylidene Fluoride (PVDF) Materials

Note 1: Standard products are marked with a check mark (✓). The number in brackets is the number of products in one case.
 Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive*. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.
 *(1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)
 Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials. (As of April 30, 2022)

PVDF Plates (Vinylidene Fluoride)

The number in brackets is the number of plates in one case.

FMPVDF Plates

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | | | | | | | Protective Film Specifications | |
|---------------|----------------|--------------------------------|---------------|----------------|-----|-----|-----|-----|------|------|------|------|----------------|--------------------------------|---------------------------|
| | | | | Size (mm) | | 3.0 | 5.0 | 8.0 | 10.0 | 15.0 | 20.0 | 25.0 | 30.0 | 50.0 | Front |
| FMPVDF | F300 | ✓ | Natural | 490x1,000 | | | | | | | (1) | (1) | (1) | Blue PE or Milky White PE | Blue PE or Milky White PE |
| | | | | 1,000x2,000 | (4) | (3) | (1) | (1) | (1) | | | | Milky White PE | Milky White PE | |

- Type FMPVDF F300 can be shipped from 1 sheet.
- The press lamination method is used for types that are 25 mm thick or thicker. However if you want to use the plate surface for processed products in its original state, keep in mind that the surface conditions are different compared to press laminated PVC plates.

PVDF Welding Rods

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Shapes | Nominal Designation (mm) | Length (mm) | Packaging specifications per case | No. of Units per Case (Estimated No. of Units) | Inner Packaging |
|-------------------|----------------|--------------------------------|---------------|----------|--------------------------|-------------|-----------------------------------|--|---------------------|
| PVDF welding rods | F301 | ✓ | Natural | Single ● | 3.0 | 1,000 | (1 kg x 2 bags) 2 kg | Approx. 160 | Transparent PE bags |

Polyethylene Terephthalate (PET) Materials

Note 1: Standard products are marked with a check mark (✓). The number in brackets is the number of products in one case.
 Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive*. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.
 *(1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)
 Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials. (As of April 30, 2022)

Polyethylene Terephthalate Plates (Super PET Plates)

The number in brackets is the number of plates in one case.

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | | | | | | | | Protective Film Specifications | | |
|--------------------------------------|----------------|--------------------------------|---------------|----------------|------|------|-----|-----|-----|-----|-----|-----|-----|------|--------------------------------|----------------|----------------|
| | | | | Size (mm) | 0.8 | 1.0 | 1.5 | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 8.0 | 10.0 | Front | Back | |
| PET- | 6010 | ✓ | Transparent | 915x1,830 | (15) | (10) | (8) | (6) | (4) | (3) | (3) | | | | | Transparent PE | Pink tinted PE |
| | | | | 1,000x2,000 | (15) | (10) | (8) | (6) | (4) | (3) | (3) | | | | | | |
| | | | | 1,220x2,440 | | | | | (4) | | (2) | | | | | | |
| PET- (For industrial purposes) | 6010A | ✓ | Transparent | 1,000x2,000 | | | | | | | | | (2) | (1) | (1) | Transparent PE | Pink tinted PE |
| | | | | 1,220x2,440 | | | | | | | * | (1) | (1) | | | | |
| PET- | 6710 | ✓ | White | 915x1,830 | | (10) | (8) | (6) | (4) | | | | | | Transparent PE | Pink tinted PE | |
| | | | | 1,000x2,000 | | (10) | (8) | (6) | (4) | | (3) | | | | | | |
| PET- PET guards (Insect-proof) | 6025 | ✓ | Orange tinted | 1,000x2,000 | | | | | | (4) | | (3) | | | Transparent PE | Transparent PE | |
| | | | | 1,220x2,440 | | | | | (4) | | (2) | | | | | | |
| PETA- (Bio) | 6020 | ✓ | Transparent | 915x1,830 | | (10) | (8) | (6) | | | | | | | Transparent PE | Transparent PE | |

* symbol: Made-to-order product. Please contact us for more information about production lots.

Kraft Packages on Pallets (Standard: PET-6010/6710)

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | Protective Film Specifications | | |
|---------------|----------------|--------------------------------|---------------|----------------|-----------------------------|-----------------------------|--------------------------------|----------------|----------------|
| | | | | Size (mm) | 0.8 | 1.0 | 1.5 | Front | Back |
| PET- | 6010 | ✓ | Transparent | 915x1,830 | 225 (15 plates x 15 c/s) | 180 (10 plates x 18 c/s) | 120 (8 plates x 15 c/s) | Transparent PE | Pink tinted PE |
| | | | | 1,000x2,000 | | | | Transparent PE | Pink tinted PE |
| PET- | 6710 | ✓ | White | 915x1,830 | - | 180 (10 plates x 18 c/s) | 120 (8 plates x 15 c/s) | Transparent PE | Pink tinted PE |

• Contact us for more information about pallet packaging types that are not included here.

Pallet Packaging (Standard: PET-6010)

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | Protective Film Specifications | |
|---------------|----------------|--------------------------------|---------------|----------------|-----|--------------------------------|----------------|
| | | | | Size (mm) | 2.0 | Front | Back |
| PET- | 6010 | ✓ | Transparent | 915x1,830 | 90 | Transparent PE | Pink tinted PE |
| | | | | 1,000x2,000 | | Transparent PE | Pink tinted PE |

• Contact us for more information about pallet packaging types that are not included here.

Functional Super PET Plates

| Product Types | Features | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | | | | Protective Film Specifications | |
|---------------|-----------------------------------|----------------|--------------------------------|---------------|----------------|-----|-----|-----|-----|-----|------|--------------------------------|---------------------------|
| | | | | | Size (mm) | 3.0 | 4.0 | 5.0 | 6.0 | 8.0 | 10.0 | Front | Back |
| PETND- | Static-dissipative | 76600 | ✓ | Transparent | 1,000x2,000 | (4) | | (3) | | (1) | (1) | Transparent PE (adhesive) | Transparent PE (adhesive) |
| | | | | | 1,220x2,440 | (4) | (2) | (2) | (2) | | | Transparent PE (adhesive) | Transparent PE (adhesive) |
| PETND | Static-dissipative Hard coated | MRG60 | ✓ | Transparent | 1,000x2,000 | (4) | | (3) | | | | Transparent PE (adhesive) | Transparent PE (adhesive) |
| | | MRG30 | ✓ | Yellow tinted | 1,000x2,000 | (4) | | (3) | | | | Transparent PE (adhesive) | Transparent PE (adhesive) |

Transparent PE protective film (with adhesive)...Transparent PE (adhesive)

Welding Rods for Super PET Plates

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Shapes | Nominal Designation (mm) | Length (mm) | Packaging specifications per case | No. of Units per Case (Estimated No. of Units) | Inner Packaging |
|------------------|----------------|--------------------------------|---------------|----------|--------------------------|-------------|-----------------------------------|--|-----------------|
| Welding rods PET | PT001 | ✓ | Transparent | Single ○ | 3.0 | 1,000 | (1 kg x 4 bags) 4 kg | Approx. 420 | Blue PE bags |

Adhesive Rods for Super PET Plates

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Shapes | Nominal Designation (mm) | Length (mm) | Packaging specifications per case | No. of Units per Case (Estimated No. of Units) | Inner Packaging |
|------------------|----------------|--------------------------------|---------------|-------------------|--|-------------|-----------------------------------|--|-----------------|
| Welding rods PET | PT006 | ✓ | Transparent | Triangular rods ▽ | Two sides adjacent to the right angle: 3 | 1,000 | (1 kg x 4 bags) 4 kg | Approx. 620 | Blue PE bags |

Polycarbonate (PC) Materials

Note 1: Standard products are marked with a check mark (✓). The number in brackets is the number of products in one case.
 Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS and REACH" column do not contain any restricted substances specified in the RoHS Directive*. In addition, these products do not contain any of the 219 substances on the SVHC list (Candidate List of Substances of Very High Concern updated on July 8, 2021) based on the REACH Regulations.
 *(1) Mercury and its compounds, (2) cadmium and its compounds, (3) lead and its compounds, (4) hexavalent chromium compounds, (5) polybrominated biphenyls (PBBs), (6) polybrominated diphenyl ethers (PBDEs), (7) bis(2-ethylhexyl) phthalate (DEHP), (8) butyl benzyl phthalate (BBP), (9) dibutyl phthalate (DBP), (10) diisobutyl phthalate (DIBP)
 Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials. Bisphenol A, which was added to the 16th SVHC list based on the REACH Regulations, is a material used in polycarbonate resins. Thus, all polycarbonate plates contain traces of bisphenol A (less than 1,000 ppm).
 (As of April 30, 2022)

Polycarbonate Plates

The number in brackets is the number of plates in one case.

Standard

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | | | | | | | | Protective Film Specifications | | |
|---------------|----------------|---|--|----------------|-----|-----|-----|-----|-----|-----|------|------|----------------------------------|----------------------------------|----------------------------------|----------------|----------------|
| | | | | Size (mm) | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 8.0 | 10.0 | 12.0 | 15.0 | Front | Back | | |
| PC- PC | 1600 | ✓ | Transparent | 910x1,820 | (6) | (4) | (3) | (3) | | | | | | | | Transparent PE | Blue tinted PE |
| | | | | 1,000x2,000 | (6) | (4) | (3) | (3) | (2) | (1) | (1) | (1) | (1) | Transparent PE | Blue tinted PE ^{Note 1} | | |
| | | | | 1,220x2,440 | (6) | (4) | | (2) | (2) | (1) | (1) | | | Transparent PE | Blue tinted PE ^{Note 1} | | |
| | | | | 1,220x3,000 | G | | | | | | | | | Transparent PE | Blue tinted PE | | |
| | | | | 2,000x3,000 | | G | G | G | G | G | G | | | Transparent PE | Blue tinted PE ^{Note 1} | | |
| PCSP | 1700 | ✓ | White | 1,000x2,000 | | G | G | | | | | | | | Transparent PE | Transparent PE | |
| | 1900 | ✓ | Black | 1,000x2,000 | | G | G | | | | | | | | Transparent PE | Transparent PE | |
| PCSP | 660T | ✓ | Transparent, weather-resistant on both sides | 1,000x2,000 | | (4) | (3) | | | | | | | | Transparent PE | Transparent PE | |
| | | | | 1,000x3,500 | G | | | | | | | | Transparent PE | Transparent PE | | | |
| | | | | 1,220x2,000 | | | | | | G | G | | | Transparent PE | Transparent PE | | |
| | | | | 2,000x3,000 | | | | | G | G | | | Transparent PE | Transparent PE | | | |
| PCSP | 642T | ✓ | Transparent glass color, weather-resistant on both sides | 2,000x3,000 | | G | G | | | | | | | Transparent PE | Transparent PE | | |
| PCSP | 692T | ✓ | Smoky gray, weather-resistant on both sides | 1,000x2,000 | (6) | (4) | (3) | | | | | | | | Transparent PE | Transparent PE | |
| | | | | 1,000x3,500 | G | | | | | | | | Transparent PE | Transparent PE | | | |
| | | | | 2,000x4,000 | | G | G | | | | | | Transparent PE | Transparent PE | | | |
| PCSP | 693T | ✓ | Smoky brown, weather-resistant on both sides | 1,000x2,000 | (6) | (4) | (3) | | | | | | | | Transparent PE | Transparent PE | |
| | | | | 1,000x3,500 | G | | | | | | | | Transparent PE | Transparent PE | | | |
| | | | | 2,000x3,000 | | | | | | G | | | Transparent PE | Transparent PE | | | |
| | | | | 2,000x4,000 | | G | G | | | | | | Transparent PE | Transparent PE | | | |
| PCSP | 677T | ✓ | Opaque, weather-resistant on both sides | 1,000x2,000 | (6) | (4) | (3) | | | | | | | | Transparent PE | Transparent PE | |
| | | | | 1,000x3,500 | G | | | | | | | | Transparent PE | Transparent PE | | | |
| | | | | 2,000x4,000 | | G | G | | | | | | Transparent PE | Transparent PE | | | |
| PCSP | K6600 | ✓ | Transparent, weather-resistant on both sides, matte on one side | 1,000x3,500 | G | | | | | | | | | | Blue tinted PE ^{Note 2} | Transparent PE | |
| | | | | 1,250x3,000 | | G | G | | | | | | Blue tinted PE ^{Note 2} | Transparent PE | | | |
| | R6600 | ✓ | Transparent, weather-resistant on both sides, matte on both sides | 1,250x3,000 | | G | G | G | G | G | G | | | Blue tinted PE | Transparent PE | | |
| | F6600 | ✓ | Transparent, weather-resistant on both sides, matte frosted glass finish on both sides | 1,070x3,000 | G | G | G | G | | | | | | | Blue tinted PE | Transparent PE | |
| | | | | 1,000x3,500 | G | | | | | | | | Blue tinted PE ^{Note 2} | Transparent PE | | | |
| | K6920 | ✓ | Smoky gray, weather-resistant on both sides, matte on one side | 1,250x3,000 | | G | G | | | | | | | | Blue tinted PE ^{Note 2} | Transparent PE | |
| | | | | 1,000x3,500 | G | | | | | | | | Blue tinted PE ^{Note 2} | Transparent PE | | | |
| | R6920 | ✓ | Smoky gray, weather-resistant on both sides, matte on both sides | 1,250x3,000 | | G | G | | | | | | | | Blue tinted PE | Transparent PE | |
| | | | | 1,000x3,500 | G | | | | | | | | Blue tinted PE ^{Note 2} | Transparent PE | | | |
| | R6930 | ✓ | Smoky brown, weather-resistant on both sides, matte on both sides | 1,250x3,000 | | G | G | | | | | | | | Blue tinted PE | Transparent PE | |
| | | | | 1,070x3,000 | G | G | G | G | | | | | Blue tinted PE | Transparent PE | | | |
| | F6400 | ✓ | Glass color, weather-resistant on both sides, matte frosted glass finish on both sides | 1,070x3,000 | G | G | G | G | | | | | | | Blue tinted PE | Transparent PE | |
| 36600 | ✓ | Transparent, weather-resistant on both sides, figured glass look | 1,250x3,000 | | G | G | | | | | | | | Blue tinted PE ^{Note 2} | Transparent PE | | |
| 36400 | ✓ | Green tinted, weather-resistant on both sides, figured glass look | 1,250x3,000 | | G | G | | | | | | | | Blue tinted PE ^{Note 2} | Transparent PE | | |

G: Cut size available. If you require plates that are 3,000 mm long or longer, contact us.
 Note 1: Transparent PE protective film is used for plates with a thickness of 8 mm or more.
 Note 2: This specification applies to matte surfaces and single-sided.

Custom Cut Products

| Available cutting size | Size | Shapes | Tolerance | Weight |
|---|--|--------|------------------------|--------|
| 400 mm x 500 mm per plate (0.2 m ²) or more (minimum side length: 200 mm or more) | Rectangular (Chamfered cuts, corner cuts, protective film cuts, and similar shapes are not available.) | ±2.5mm | 30 kg or more in total | |

Before placing a large order (500 kg of plates of the same type and with the same thickness), contact us to confirm the delivery times.

Weight calculation: Thickness (mm) x (Surface) Vertical (m) x Horizontal (m) x 1.2 kg (Specific gravity) = Weight of a single plate (kg)

Polycarbonate Plates

The number in brackets is the number of plates in one case.

Static-Dissipative and Electromagnetic Wave Shielding Types

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | 3.0 | 5.0 | Protective Film Specifications | |
|---|-----------------------|--------------------------------|---------------|----------------|--|-----|-----|--|---|
| | | | | Size (mm) | | | | Front | Back |
| PCNDL (Static-dissipative) | 78610 | ✓ | Transparent | 1,000×2,000 | | (4) | (3) | Transparent PE | Transparent PE |
| | | | | 1,220×2,440 | | (4) | (2) | Transparent PE | Transparent PE |
| | 78810 | ✓ | Smoky brown | 1,000×2,000 | | (4) | (3) | Transparent PE | Transparent PE |
| | 78910 | ✓ | Smoky gray | 1,000×2,000 | | (4) | (3) | Transparent PE | Transparent PE |
| PCEND (Electromagnetic wave shielding) | 57610 ^{Note} | ✓ | Transparent | 1,000×2,000 | | (4) | (3) | Blue paper/ Blue tinted PE (adhesive) | White paper/ Transparent PE (adhesive) |

Note: Production will end at the end of March 2023, and the product will be discontinued as soon as the stock runs out.

Blue character printed to paper protective film..... Blue paper
Plain white paper protective film..... White paper
Blue transparent PE protective film (with adhesive)..... Blue transparent PE (adhesive)
Transparent PE protective film (with adhesive)..... Transparent PE (adhesive)

Hard Coating Types

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | 3.0 | 5.0 | Protective Film Specifications | |
|---------------|----------------|--------------------------------|------------------------------|----------------|--|-----|-----|--------------------------------|----------------|
| | | | | Size (mm) | | | | Front | Back |
| PCMRMS | 61600 | ✓ | Transparent (For indoor use) | 1,000×2,000 | | (4) | (3) | Transparent PE | Transparent PE |

Flame-Retardant Types

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | Protective Film Specifications | | | | | |
|--------------------|----------------|--------------------------------|---------------|----------------|--|-----|---|--------------------------------|----------------|----------------|-----|----------------|----------------|
| | | | | Size (mm) | | | | 2.0 | 3.0 | 4.0 | 5.0 | Front | Back |
| PCMU (UL94 V-0) | PZ620 | ✓ | Transparent | 1,000×2,000 | | | | (6) | | | | Transparent PE | Transparent PE |
| | PY620 | ✓ | | | | (4) | * | (3) | Transparent PE | Transparent PE | | | |

* symbol: Made-to-order product Lot: 2,000 kg (Contact us for more information.)

• PCMU PZ620 2.0 mm is not a product approved by UL, however, is being produced with UL approved raw materials.

Machining Types

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Thickness (mm) | | | | Protective Film Specifications | | | | | |
|---------------|----------------|--------------------------------|---------------|----------------|--|--|--|--------------------------------|------|------|------|---------------------------|---------------------------|
| | | | | Size (mm) | | | | 15.0 | 20.0 | 25.0 | 30.0 | Front | Back |
| PCP | 1609A | ✓ | Transparent | 1,000×1,000 | | | | (1) | (1) | (1) | (1) | Transparent PE (adhesive) | Transparent PE (adhesive) |
| | | | | 1,000×2,000 | | | | (1) | (1) | (1) | (1) | Transparent PE (adhesive) | Transparent PE (adhesive) |

• For the delivery times of the size 1,000 x 1,000, check with one of our representatives.

Transparent PE protective film (with adhesive)...Transparent PE (adhesive)

Optical Types

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Width (mm) | Thickness (mm) | | | | | | | Protective Film Specifications | | | | | | | |
|---------------|----------------|--------------------------------|--|----------------|----------------|--|--|--|--|--|--|--------------------------------|------|------|-----|-----|-----|------------------------------------|----------------------------------|
| | | | | | Length (mm) | | | | | | | 0.5 | 0.8 | 1.0 | 1.2 | 1.5 | 2.0 | Front | Back |
| PCSM | PS610 | ✓ | Transparent (For nameplates) | 915 | 1,830 | | | | | | | (20) | | (10) | | | | Transparent PE | Green tinted PE |
| | | | | 1,000 | 2,000 | | | | | | | (20) | (12) | (10) | | (8) | (6) | Transparent PE | Green tinted PE |
| PCMA | K3250 | ✓ | Transparent (PC/PMMA multilayer plates) | 1,000 to 1,040 | 1,500 to 2,400 | | | | | | | | * | * | * | * | * | Yellow tinted PE ^{Note 1} | Transparent PE ^{Note 2} |

* symbol: Made-to-order product Lot: 2,000 kg

• Note 1 and Note 2 in protective film specifications refer to PMMA and PC plates respectively.

• Contact us for more information about thicknesses and sizes that are not included here.

Polycarbonate Welding Rods

| Product Types | Product Number | Compliance with RoHS and REACH | Hues (Colors) | Shapes | Nominal Designation (mm) | Length (mm) | Packaging specifications per case | No. of Units per Case (Estimated No. of Units) | Inner Packaging |
|-----------------|----------------|--------------------------------|---------------|----------|--------------------------|-------------|-----------------------------------|--|---------------------|
| Welding rods PC | 9061 | ✓ | Transparent | Single ○ | 3.0 | 1,000 | (1 kg x 4 bags) 4 kg | Approx. 470 | Transparent PE bags |

Dimensional Tolerance

Dimensional Tolerance for Takiron Plates (Width and Length)

| Product Types and Numbers | Thickness (mm) ("d" stands for thickness.) | Nominal Designation | Width | | Length | |
|--|---|-------------------------------|-----------------------|----------------|-----------------------|----------------|
| | | | Reference Values (mm) | Tolerance (mm) | Reference Values (mm) | Tolerance (mm) |
| TS ¹ , S, HTS, TSHI TMC, SAK, TND T ¹ , TSP HT ¹ , HTL THQ, TND77368 FMET- ² , FMH ² , FMST FMHS, FMND | d≤22.0 | 3×6 | 910 | 0, +5 | 1,820 | 0, +5 |
| | | 1×2 | 1,000 | +2, +8 | 2,000 | +5, +11 |
| | | 4×8 | 1,212 | +2, +8 | 2,424 | +5, +11 |
| | 22.0<d | 1×2 | 1,000 | +2, +10 | 2,000 | +10, +25 |
| Machining type 500×1,000 | 20≤d | 4×8 | 1,212 | +2, +10 | 2,424 | +2, +10 |
| | | Machining type 1,000×1,000 | 500 | 0, +10 | 1,000 | 0, +10 |
| Machining type 500×1,000 | 20≤d | Machining type 1,000×1,000 | 500 | 0, +10 | 1,000 | 0, +10 |
| | | Machining type 1,000×1,000 | 1,000 | | 1,000 | |
| ET, ETSP, EQ, ESS, ES, ESA RTS, ESND, ESA-, RTSP FMET, FMRTS, FMND- | d≤20 | 3×6 | 910 | 0, +7 | 1,820 | 0, +7 |
| | | 1×2 | 1,000 | +2, +8 | 2,000 | +5, +11 |
| | | 4×8 | 1,212 | +2, +8 | 2,424 | +5, +11 |
| ETSP1388 | d≤20 | 1,220×2,440 | 1,220 | +2, +8 | 2,440 | +5, +11 |
| Foam PVC | 1≤d≤15 | 3×6 | 910 | 0, +10 | 1,820 | 0, +20 |
| | | 1×2 | 1,000 | 0, +10 | 2,000 | 0, +20 |
| PP, RPP, RPPN | d≤20 | 1×2 | 1,000 | +2, +8 | 2,000 | +2, +15 |
| | | 4×8 | 1,212 | +2, +8 | 2,424 | +2, +15 |
| PPE | 2≤d≤6 | 1×2 | 1,000 | 0, +7 | 2,000 | 0, +15 |
| | | 1.4×2 | 1,400 | 0, +7 | 2,000 | 0, +15 |
| TEND 57600 PCEND 57610 | d = 3, 5 | 1×2 | 1,000 | +2, +8 | 2,000 | +5, +11 |
| PET-, PETND- PETND (hard coated) PETA- (Bio) | 0.8≤d≤10 | 915×1,830 | 915 | 0, +9 | 1,830 | 0, +9 |
| | | 1×2 | 1,000 | +2, +8 | 2,000 | +5, +11 |
| | | 1,220×2,440 | 1,220 | 0, +9 | 2,440 | 0, +9 |
| FMPVDF | 3≤d≤50 | 1×2 | 1,000 | 0, +10 | 2,000 | 0, +15 |
| | | — | 490 | 0, +10 | 1,000 | 0, +10 |

Dimensional Tolerance for Rods

| Product Types and Numbers | Nominal Designation (mm) | Width | | Length | | | |
|---------------------------|--------------------------|-----------------------|----------------|-----------------------|----------------|-----|-----------|
| | | Reference Values (mm) | Tolerance (mm) | Reference Values (mm) | Tolerance (mm) | | |
| Rods 938A | 10 | 10 | 0 +1 | 2000 | +5 +20 | | |
| | 13 | 13 | | | | | |
| | 16 | 16 | | | | | |
| | 20 | 20 | | | | | |
| | 25 | 25 | | | | | |
| | 30 | 30 | | | | | |
| | 35 | 35 | 0 +1.5 | 1000 | +5 +20 | | |
| | 40 | 40 | | | | | |
| | 45 | 45 | | | | | |
| | 50 | 50 | 0 +2.5 | 1000 | +5 +20 | | |
| | 55 | 55 | | | | | |
| | 60 | 60 | | | | | |
| | 65 | 65 | 0 +4 | 1000 | +5 +20 | | |
| | 70 | 70 | | | | | |
| | 80 | 80 | | | | | |
| | 90 | 90 | 0 +6 | | | 500 | +5 +20 |
| | 100 | 100 | | | | | |
| 120 | 120 | | | | | | |
| 150 | 150 | 0 +10.0 | 500 | | | | |
| 200 | 200 | | | | | | |

| Product Types and Numbers | Nominal Designation (mm) | Width | | Length | |
|---------------------------|--------------------------|-----------------------|----------------|-----------------------|----------------|
| | | Reference Values (mm) | Tolerance (mm) | Reference Values (mm) | Tolerance (mm) |
| NC Rods | 20 | 20 | 0 | 1000 | +5 +20 |
| | 30 | 30 | +1.5 | | |
| | 40 | 40 | 0 | | |
| | 50 | 50 | +2.5 | | |
| HT Rods 928 | 20 | 20 | 0 | 1000 | +5 +25 |
| | 30 | 30 | +1.5 | | |
| | 40 | 40 | 0 | | |
| | 50 | 50 | +2.5 | | |
| | 60 | 60 | 0 | | |
| | 70 | 70 | +4 | | |
| | 80 | 80 | +6 | | |
| | 90 | 90 | 0 | | |
| | | | | | +5 +30 |

Dimensional Tolerance for Takiron Plates (Thickness)

| Product Types and Numbers | Thickness ("d" stands for thickness.) | | | Product Types | Thickness ("d" stands for thickness.) | | | |
|-------------------------------------|---------------------------------------|----------|----------------|----------------------------|---------------------------------------|--|---------------------------------------|---|
| | Reference Values (mm) | | Tolerance (mm) | | Reference Values (mm) | | Tolerance (mm) | |
| T938 | d=0.5 | | ±13% | FMET4323 FMRTS FMND- | d=3.0 | | ±10% | |
| | 1.0≤d<20.0 | | ±10% | | 3.0<d<15.0 | | -5, +10% | |
| | 20.0≤d<30.0 | | -3, +10% | | 3.0 | | ±10% | |
| | 30.0≤d≤110.0 | | 0, +10% | | 3.0<d<15.0 | | -2, +10% | |
| TS, S HTS, TSHI TMC, SAK, TND | 0.5≤d<0.8 | | ±15% | Foam PVC | d=1.0 | | ±15% | |
| | 0.8<d<20.0 | | ±10% | | 1.0<d≤15.0 | | ±10% | |
| | 20.0≤d<30.0 | | -3, +10% | | 3.0 to 6.0 | | ±8% | |
| | 30.0≤d | | 0, +10% | | 8.0 to 20.0 | | -7, +10% | |
| TSP HT, HTL THQ, TND77368 | d=0.5 | | ±13% | PPE | 2.0 to 3.0 | | ±7% | |
| | 1.0≤d<8.0 | | ±10% | | 4.0 to 6.0 | | ±4% | |
| | 8.0≤d<20.0 | | -7, +10% | | TEND57600 PCEND 57610 | | 3.0, 5.0 | ±10% |
| | 20.0≤d<30.0 | | -3, +10% | | 0.8 | | -12.5 to +15% | |
| FMET-, FMH, FMMS FMHS, FMND | All FMET- types | 15 to 40 | 0, +10% | PET- PETND- | 1.0 | | -12 to +15% | |
| | FMH5775 FMT3733 | 3, 5, 8 | ±10% | | 1.5 to 3.0 | | ±10% | |
| | | 10, 15 | -3, +10% | | 4.0 to 10.0 | | -5 to +10% | |
| | Other | 2 to 15 | ±10% | | PETND (Hard coated) | | 3, 5 | ±10% |
| ET | d = 1.0 | | -10, +13% | PETA- (Bio) | (Nominal: 1.0) Reference: 0.95 | | -12 to +15% | |
| | 1.0<d≤3.0 | | ±10% | | (Nominal: 1.5) Reference: 1.40 | | ±10% | |
| | 3.0<d≤15.0 | | -5, +10% | | (Nominal: 2.0) Reference: 1.85 | | ±10% | |
| | 15.0<d≤20.0 | | -2, +7% | | Size 1,000×2,000 | | 3.0, 5.0 8.0, 10.0 15.0 20.0 | ±0.2mm ±0.25mm ±0.3mm 0, +2.3 mm |
| ETSP, EQ ESS, ES ESA | 0.8≤d≤1.0 | | -10, +15% | FMPVDF | Size 490×1,000 | | 20 | 0, +2.3 mm |
| | 1.0<d≤3.0 | | ±10% | | 25.0 to 40.0 | | 50 | 0, +3.4 mm |
| | 3.0<d≤15.0 | | -5, +10% | | | | | 0, +4.8 mm |
| | 15.0<d≤20.0 | | -2, +7% | | | | | |
| RTS, ESND ESA- | d=3.0 | | ±10% | | | | | |
| | 3.0<d<20.0 | | -5, +10% | | | | | |
| RTSP | d=20.0 | | 0, +10% | | | | | |
| | d=3.0 | | ±10% | | | | | |
| | 3.0<d<15.0 | | -5, +10% | | | | | |
| | | d≤15.0 | 0, +10% | | | | | |

Dimensional Tolerance for Polycarbonate Plates

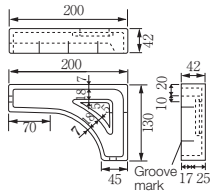
| Product Types | Nominal Designation | Width | | Length | | Thickness | |
|---|---------------------|-----------------------|----------------|-----------------------|----------------|-----------------------------|---------------|
| | | Reference Values (mm) | Tolerance (mm) | Reference Values (mm) | Tolerance (mm) | Reference Values (mm) | Tolerance (%) |
| Standard PC- Weather-resistant PCSP- | 910×1,820 (3×6) | 910 | 0, +3 | 1,827 | 0, +6 | 2.0 or more, 5.0 or less | ±10 |
| | 1,000×2,000 (1×2) | 1,002 | 0, +6 | 2,007 | 0, +9 | More than 5.0, 15.0 or less | ±5 |
| | 1,220×2,440 (4×8) | 1,222 | 0, +6 | 2,445 | 0, +9 | | |
| PCSM PS610 | 915×1,830 | 915 | 0, +3 | 1,837 | 0, +6 | 0.5, 0.8, 1.0 1.5, 2.0 | ±10 |
| | 1,000×2,000 (1×2) | 1,002 | 0, +6 | 2,007 | 0, +9 | | |
| PCMA K3250 | 1,000×1,710 | 1,000 | 0, +6 | 1,710 | 0, +9 | 0.8, 1.0, 1.2, 1.5 | ±10 |
| | 1,040×1,900 | 1,040 | | 1,900 | | | |
| PCMRMS 61600 | 1,000×2,000 (1×2) | 1,002 | 0, +6 | 2,007 | 0, +9 | 3.0, 5.0 | ±10 |
| PCMU | PZ620 | 1,000×2,000 (1×2) | 1,002 | 2,007 | 0, +9 | 2.0 | 0, +20 |
| | PY620 | 1,000×2,000 (1×2) | 1,002 | 2,007 | 0, +9 | 3.0 5.0 | 0, +10 ±10 |
| PCNDL | 1,000×2,000 (1×2) | 1,002 | 0, +6 | 2,007 | 0, +9 | 3.0, 5.0 | ±10 |
| | 1,220×2,440 (4×8) | 1,222 | 0, +6 | 2,445 | 0, +9 | | |
| G-cut types | Custom dimensions | Specified dimension | ±2.5 | Specified dimension | ±2.5 | 2.0 or more, 5.0 or less | ±10 |
| | | | | | | More than 5.0, 15.0 or less | ±5 |
| PCEND | 1×2 | 1,000 | +2, +8 | 2,000 | +5, +11 | 3.0, 5.0 | ±10 |
| PCP | 1×1 (For machining) | 1,000 | +2, +8 | 1,000 | 0, +10 | 15.0, 20.0 25.0, 30.0 | 0, +10 |
| | 1×2 (For machining) | 1,000 | +2, +8 | 2,000 | +7, +16 | | |

Other Available Products

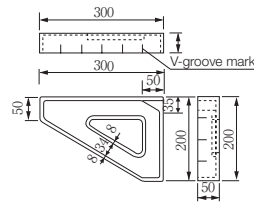
Plastic Supports (Piping Support Parts)

◆ Specifications/Dimensions (Dimension unit: mm)

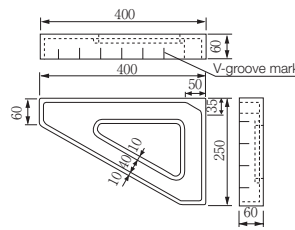
Type BH-200 (Bracket)



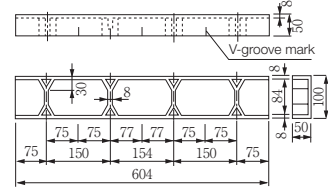
Type BH-300 (Bracket)



Type BH-400 (Bracket)



Type FH-600 (Support base)



*The product can be cut as necessary.

| Product Number | Hues (Colors) | No. of Units per Case (Quantity) |
|----------------|---------------|----------------------------------|
| BH-200 | Black | (20) |
| BH-300 | | (12) |
| BH-400 | | (10) |
| FH-600 | | (12) |

Takiron Polymer Products

Note 1: Standard products are marked with a check mark (✓).

Note 2: Products marked with a check mark (✓) in the "Compliance with RoHS 2" column do not contain any restricted substances specified in the RoHS 2.

Note 3: "Note 2" applies to substances added deliberately in order to provide functional performance but does not apply to impurities included in the raw materials.

(As of April 30, 2022)

Super Cast Nylon Plates and Rods

The number in brackets is the number of plates in one case.

Plates

| Product Types | Product Number | Compliance with RoHS 2 | Hues (Colors) | Thickness Tolerance (mm) | | 0 to +1.5 | | | | | | | | | | 0 to +5.0 | | | | | | Width Tolerance (mm) | Length Tolerance (mm) | | | | |
|---------------|----------------|------------------------|---------------|--------------------------|-----|-----------|------|------|------|------|------|------|------|------|------|-----------|------|------|------|----------|----------|----------------------|-----------------------|----------|----------|----------|----------|
| | | | | Size (mm)/Thickness (mm) | 5.0 | 7.0 | 10.0 | 12.0 | 15.0 | 20.0 | 25.0 | 30.0 | 35.0 | 40.0 | 45.0 | 50.0 | 60.0 | 70.0 | 80.0 | | | | | | | | |
| MCN | N550 | ✓ | Blue | 500×1,000 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | 0 to +20 | 0 to +25 | | | | | |
| | | | | 1,000×1,000 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | | | | | | | |
| | | | | 1,000×2,000 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | | | | | | | |
| | N350 | ✓ | Natural | 500×1,000 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | | | 0 to +20 | 0 to +25 | | | |
| | | | | 1,000×1,000 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | | | | | | | | |
| | | | | 1,000×2,000 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | | | | | | | | |
| | N950 | ✓ | Black | 500×1,000 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | | | | | 0 to +20 | 0 to +25 | |
| | | | | 1,000×1,000 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | | | | | | | | |
| | | | | 1,000×2,000 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | | | | | | | | |
| | N050 | ✓ | Gray | 500×1,000 | | | | | | | | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | 0 to +20 | | | | | | | 0 to +25 |
| | | | | 1,000×1,000 | | | (1) | (1) | (1) | (1) | | | | | | | | | | | | | | | | | |

| Product Types | Product Number | Compliance with RoHS 2 | Hues (Colors) | Thickness Tolerance (mm) | | 0 to +1.5 | | | | | | | | | | 0 to +5.0 | | | | | | Width Tolerance (mm) | Length Tolerance (mm) | |
|---------------|----------------|------------------------|---------------|--------------------------|-----|-----------|------|------|------|------|------|------|------|------|------|-----------|------|------|------|------|----------|----------------------|-----------------------|-------|
| | | | | Size (mm)/Thickness (mm) | 5.0 | 7.0 | 10.0 | 12.0 | 15.0 | 20.0 | 25.0 | 30.0 | 35.0 | 40.0 | 45.0 | 50.0 | 60.0 | 70.0 | 80.0 | 90.0 | 100.0 | | | 120.0 |
| MCN | N550 | ✓ | Blue | 600×1,200 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | 0 to +20 | 0 to +25 | | |
| | N350 | ✓ | Natural | | | | | | | | | | | | | | | | | (1) | | | (1) | |
| | N950 | ✓ | Black | | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | | | | |
| | N050 | ✓ | Gray | | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | | | | |

* symbol: Made-to-order product. Please contact us for more information about production lots.

Rods

| Product Types | Product Number | Compliance with RoHS 2 | Hues (Colors) | External Diameter Tolerance (mm) | | 0 to +1.5 | | 0 to +2.5 | | 0 to +3.0 | | | | | | | | Length Tolerance (mm) | | | | |
|---------------|----------------|------------------------|---------------|------------------------------------|------|-----------|-----|-----------|-----|-----------|-----|-----|-----|-----|-----|-----|-----|-----------------------|-----|-----|-----|----------|
| | | | | Length (mm)/External Diameter (mm) | 10 | 16 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | | 75 | | | |
| MCN rods | 550 | ✓ | Blue | 1,000 | (10) | (10) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | 0 to +20 |
| | 350 | | Natural | 1,000 | | | | | (1) | | (1) | | (1) | | (1) | | (1) | | (1) | | | |
| | 950 | | Black | 1,000 | | | | | (1) | | (1) | | (1) | | (1) | | (1) | | (1) | | | |
| | 050 | | Gray | 1,000 | | | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | |

| Product Types | Product Number | Compliance with RoHS 2 | Hues (Colors) | External Diameter Tolerance (mm) | | 0 to +3.0 | | 0 to +5.0 | | | | 0 to +7.0 | | | | | Length Tolerance (mm) | | | | | |
|---------------|----------------|------------------------|---------------|------------------------------------|-----|-----------|-----|-----------|-----|-----|-----|-----------|-----|-----|-----|-----|-----------------------|-----|-----|-----|-----|----------|
| | | | | Length (mm)/External Diameter (mm) | 80 | 85 | 90 | 95 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | | 180 | 190 | | | |
| MCN rods | 550 | ✓ | Blue | 1,000 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | 0 to +20 |
| | 350 | | Natural | 1,000 | (1) | | (1) | | (1) | | (1) | | (1) | | (1) | | (1) | | (1) | | (1) | |
| | 950 | | Black | 1,000 | (1) | | (1) | | (1) | | (1) | | (1) | | (1) | | (1) | | (1) | | (1) | |

Super Cast Nylon Rods

The number in brackets is the number of plates in one case.

Rods

| Product Types | Product Number | Compliance with RoHS 2 | Hues (Colors) | External Diameter Tolerance (mm) | | 0 to +10.0 | | | | 0 to +15.0 | | | | Length Tolerance (mm) |
|---------------|----------------|------------------------|---------------|------------------------------------|-----|------------|-----|-----|-----|------------|-----|-----|--|-----------------------|
| | | | | Length (mm)/External Diameter (mm) | 200 | 230 | 250 | 280 | 300 | 330 | 350 | 400 | | |
| MCN rods | 550 | ✓ | Blue | 1,000 | (1) | | | | | | | | | 0 to +20 |
| | 350 | | | 500 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | | |
| | 950 | | Natural | 1,000 | (1) | | | | | | | | | |
| | | | Black | 1,000 | (1) | | | | | | | | | |

POM Plates and Rods (TS Grade)

The number in brackets is the number of plates in one case.

Plates

| Product Types | Product Number | Compliance with RoHS 2 | Hues (Colors) | Thickness Tolerance (mm) | | 0 to +3.0 | | | | | | | | | | 0 to +5.0 | | | | | Width Tolerance (mm) | Length Tolerance (mm) |
|---------------|----------------|------------------------|---------------|--------------------------|-----|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----------|-----|-----|-----|-----|----------------------|-----------------------|
| | | | | Size (mm)/Thickness (mm) | 10 | 12 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 70 | 80 | 90 | 100 | | | |
| POM | 760 | ✓ | Natural | 500x1,000 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | 0 to +30 | 0 to +30 |
| | | | | 600x1,200 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | * | (1) | (1) | (1) | (1) | (1) | (1) | | |
| | | | | 1,000x1,000 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | * | * | * | * | * | * | | |

* symbol: Made-to-order product Please contact us for more information about production lots.

Rods

| Product Types | Product Number | Compliance with RoHS 2 | Hues (Colors) | External Diameter Tolerance (mm) | | 0 to +3.5 | | | | | 0 to +6.5 | | | | | Length Tolerance (mm) | | | | | |
|---------------|----------------|------------------------|---------------|------------------------------------|-----|-----------|-----|-----|-----|-----|-----------|-----|-----|-----|-----|-----------------------|-----|-----|-----|-----|-----------|
| | | | | Length (mm)/External Diameter (mm) | 30 | 40 | 45 | 50 | 55 | 60 | 70 | 80 | 90 | 100 | | | | | | | |
| POM rods | 760 | ✓ | Natural | 1,000 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | +2 to +50 |

Polyethylene Terephthalate Plates and Rods

The number in brackets is the number of plates in one case.

Plates

| Product Types | Product Number | Compliance with RoHS 2 | Hues (Colors) | Thickness Tolerance (mm) | | 0 to +3.0 | | | | | | | | | | 0 to +5.0 | | | | | Width Tolerance (mm) | Length Tolerance (mm) | | | | |
|---------------|----------------|------------------------|---------------|--------------------------|-----|-----------|------|------|------|------|------|------|------|------|------|-----------|------|------|------|-------|----------------------|-----------------------|---|-----|----------|----------|
| | | | | Size (mm)/Thickness (mm) | 6.0 | 8.0 | 10.0 | 12.0 | 15.0 | 20.0 | 25.0 | 30.0 | 35.0 | 40.0 | 50.0 | 60.0 | 70.0 | 80.0 | 90.0 | 100.0 | | | | | | |
| PEX | C777 | ✓ | White | 610x1,000 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | ▲ | (1) | 0 to +30 | 0 to +30 |

▲ symbol: When the corresponding model is no longer in stock, it will still be available as a made-to-order product.

Rods

| Product Types | Product Number | Compliance with RoHS 2 | Hues (Colors) | External Diameter Tolerance (mm) | | 0 to +3.5 | | | | | 0 to +6.5 | | | | | | | | | | Length Tolerance (mm) | | | | |
|---------------|----------------|------------------------|---------------|------------------------------------|-----|-----------|-----|-----|-----|-----|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----------------------|-----|-----|-----|-----------|
| | | | | Length (mm)/External Diameter (mm) | 30 | 36 | 40 | 45 | 50 | 60 | 70 | 80 | 90 | 100 | 120 | 140 | 200 | | | | | | | | |
| PEX rods | 777 | ✓ | White | 1,000 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | +2 to +50 |
| | 778 | | | 1,000 | | | | | | | | | | | | | | | | | | | | | |
| | 977 | | Black | 1,000 | * | * | * | * | * | (1) | (1) | * | * | * | * | * | * | * | * | * | * | * | * | * | |

* symbol: Made-to-order product Please contact us for more information about production lots.

UHMW Plates

The number in brackets is the number of plates in one case.

Plates

| Product Types | Product Number | Compliance with RoHS 2 | Hues (Colors) | Thickness Tolerance (mm) | | -0.2 to +0.5 | | | 0 to +0.8 | | 0 to +1.5 | | | 0 to +2.5 | | | 0 to +4.0 | | | Width Tolerance (mm) | Length Tolerance (mm) |
|---------------|----------------|------------------------|---------------|--------------------------|-----|--------------|-----|-----|-----------|-----|-----------|------|------|-----------|------|------|-----------|------|-----|----------------------|-----------------------|
| | | | | Size (mm)/Thickness (mm) | 1.0 | 2.0 | 3.0 | 5.0 | 6.0 | 8.0 | 10.0 | 12.5 | 15.0 | 17.5 | 20.0 | 25.0 | 30.0 | 35.0 | | | |
| UP | 140 | ✓ | Natural | 1,000x1,000 | | | | | | | | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | | |
| | | | | 1,000x2,000 | (1) | (1) | (1) | * | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | | | |

| Product Types | Product Number | Compliance with RoHS 2 | Hues (Colors) | Thickness Tolerance (mm) | | 0 to +5.0 | | 0 to +6.0 | | 0 to +8.0 | | | 0 to +15 | | | | Width Tolerance (mm) | Length Tolerance (mm) | | |
|---------------|----------------|------------------------|---------------|--------------------------|------|-----------|------|-----------|------|-----------|------|------|----------|-------|-------|-------|----------------------|-----------------------|----------|----------|
| | | | | Size (mm)/Thickness (mm) | 40.0 | 45.0 | 50.0 | 55.0 | 60.0 | 65.0 | 70.0 | 80.0 | 90.0 | 100.0 | 110.0 | 120.0 | | | | |
| UP | 140 | ✓ | Natural | 600x1,200 | | | | | | | | | (1) | (1) | (1) | (1) | (1) | 0 to +10 | 0 to +20 | |
| | | | | 1,000x1,000 | (1) | (1) | (1) | * | (1) | * | (1) | | | | | | | | 0 to +25 | 0 to +40 |
| | | | | 1,000x2,000 | (1) | (1) | (1) | * | * | * | * | | | | | | | | | |

| Product Types | Product Number | Compliance with RoHS 2 | Hues (Colors) | Thickness Tolerance (mm) | | 0 to +2.5 | | | | 0 to +4.0 | | 0 to +5.0 | | Width Tolerance (mm) | Length Tolerance (mm) |
|---------------|----------------|------------------------|---------------|--------------------------|-----|-----------|------|------|------|-----------|------|-----------|----------|----------------------|-----------------------|
| | | | | Size (mm)/Thickness (mm) | 8.0 | 10.0 | 15.0 | 20.0 | 25.0 | 30.0 | 40.0 | 50.0 | | | |
| UP | 542 | ✓ | Blue | 1,000x1,000 | (1) | (1) | (1) | (1) | (1) | (1) | * | * | 0 to +25 | 0 to +40 | |
| | | | | 1,000x2,000 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | | | |

* symbol: Made-to-order product Please contact us for more information about production lots.

PMP (Polymethylpentene) Plates and Rods

The number in brackets is the number of plates in one case.

Plates

| Product Types | Product Number | Compliance with RoHS 2 | Hues (Colors) | Thickness Tolerance (mm) | 0 to +3.0 | Width Tolerance (mm) | Length Tolerance (mm) |
|-------------------------|----------------|------------------------|---------------|--------------------------|-----------|----------------------|-----------------------|
| | | | | Size (mm)/Thickness (mm) | 30.0 | | |
| PMP (Polymethylpentene) | M600 | ✓ | Transparent | 500x1,000 | (1) | 0 to +40 | 0 to +40 |

Rods

| Product Types | Product Number | Compliance with RoHS 2 | Hues (Colors) | Thickness Tolerance (mm) | 0 to +3.0 | 0 to +6.5 | Length Tolerance (mm) |
|---------------|----------------|------------------------|---------------|--------------------------|-----------|-----------|-----------------------|
| | | | | Size (mm)/Thickness (mm) | 50.0 | 100 | |
| PMP rods | 600 | ✓ | Transparent | 1,000 | (1) | (1) | +2 to +50 |

PP Plates and Rods for Machining (TS Grade)

The number in brackets is the number of plates in one case.

Plates

| Product Types | Product Number | Compliance with RoHS 2 | Hues (Colors) | Thickness Tolerance (%) | 0 to +15 | | | | 0 to +10 | | | | 0 to +8 | | | | Width Tolerance (mm) | Length Tolerance (mm) | |
|---------------|----------------|------------------------|---------------|--------------------------|----------|------|------|------|----------|------|------|------|---------|------|------|------|----------------------|-----------------------|----------|
| | | | | Size (mm)/Thickness (mm) | 10.0 | 12.0 | 15.0 | 20.0 | 25.0 | 30.0 | 35.0 | 40.0 | 50.0 | 60.0 | 70.0 | 80.0 | | | 90.0 |
| PP | P370 | ✓ | Natural | 500x1,000 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | 0 to +30 | 0 to +30 |
| | | | | 1,000x1,000 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | | |
| | | | | 1,000x2,000 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | | |
| | P975 | ✓ | Black | 500x1,000 | (1) | | | (1) | | (1) | (1) | | | | (1) | | | | |
| | 570 | ✓ | Blue | 500x1,000 | (1) | | (1) | (1) | (1) | (1) | (1) | | | * | | | | | |

* symbol: Made-to-order product. Please contact us for more information about production lots.

Rods

| Product Types | Product Number | Compliance with RoHS 2 | Hues (Colors) | External Diameter Tolerance (mm) | 0 to +3.5 | | | | | | | | | | 0 to +6.5 | | | | | | Length Tolerance (mm) | | |
|---------------|----------------|------------------------|---------------|------------------------------------|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----------|-----|-----|-----|-----|-----|-----------------------|-----|-----------|
| | | | | Length (mm)/External Diameter (mm) | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 90 | 100 | | | |
| PP rods | 370 | ✓ | Natural | 1,000 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | +2 to +50 |
| | 570 | ✓ | Blue | 1,000 | | | | | | | | | (1) | | | | | | | | | (1) | +2 to +50 |

| Product Types | Product Number | Compliance with RoHS 2 | Hues (Colors) | External Diameter Tolerance (mm) | 0 to +6.5 | | | | 0 to +8.5 | | | | 0 to +10.0 | | | Length Tolerance (mm) | |
|---------------|----------------|------------------------|---------------|------------------------------------|-----------|-----|-----|-----|-----------|-----|-----|-----|------------|-----|-----|-----------------------|-----------|
| | | | | Length (mm)/External Diameter (mm) | 110 | 120 | 130 | 140 | 150 | 160 | 180 | 200 | 230 | 250 | 300 | | |
| PP rods | 370 | ✓ | Natural | 1,000 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | +2 to +50 |
| | 570 | ✓ | Blue | 1,000 | | (1) | | | | (1) | | (1) | | ▲ | | | +2 to +50 |

▲ symbol: When the corresponding model is no longer in stock, it will still be available as a made-to-order product.

Thick PP Plates and Large-Diameter PP Rods

The number in brackets is the number of plates in one case.

| Product Types | Product Number | Compliance with RoHS 2 | Hues (Colors) | Thickness Tolerance (%) | 0 to +10 | Width Tolerance (mm) | Length Tolerance (mm) |
|---------------|----------------|------------------------|---------------|--------------------------|----------|----------------------|-----------------------|
| | | | | Size (mm)/Thickness (mm) | 150 | | |
| PP | 301 | ✓ | Natural | 600x1,200 | (1) | 0 to +30 | 0 to +30 |

| Product Types | Product Number | Compliance with RoHS 2 | Hues (Colors) | External Diameter Tolerance (mm) | 0 to +20 | | | | | | Length Tolerance (mm) | |
|---------------|----------------|------------------------|---------------|------------------------------------|----------|-----|-----|-----|-----|------|-----------------------|-----------|
| | | | | Length (mm)/External Diameter (mm) | 40 | 60 | 80 | 100 | 130 | 2000 | | |
| PP rods | 301 | ✓ | Natural | 320 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | +2 to +50 |
| | | | | 445 | | (1) | (1) | (1) | (1) | (1) | | |

PP Plates (Dark Gray)

The number in brackets is the number of plates in one case.

| Product Types | Product Number | Compliance with RoHS 2 | Hues (Colors) | Thickness Tolerance (%) | 0 to +10 | | | | 0 to +0.8 | Width Tolerance (mm) | Length Tolerance (mm) |
|---------------|----------------|------------------------|---------------|--------------------------|----------|------|------|------|-----------|----------------------|-----------------------|
| | | | | Size (mm)/Thickness (mm) | 25.0 | 30.0 | 40.0 | 50.0 | | | |
| PP | 922 | ✓ | Dark gray | 1,000x1,000 | (1) | (1) | (1) | (1) | (1) | 0 to +40 | 0 to +40 |
| | | | | 1,000x2,000 | (1) | (1) | (1) | (1) | | | |

PEEK Plates

The number in brackets is the number of plates in one case.

Plates

| Product Types | Product Number | Compliance with RoHS 2 | Hues (Colors) | Thickness Tolerance (mm) | 0 to +1.5 | | | | | | | | 0 to +2.5 | | | | Width Tolerance (mm) | Length Tolerance (mm) |
|---------------|----------------|------------------------|---------------|--------------------------|-----------|-----|-----|-----|-----|-----|-----|-----|-----------|-----|-----|----------|----------------------|-----------------------|
| | | | | Size (mm)/Thickness (mm) | 8 | 10 | 12 | 15 | 20 | 25 | 30 | 35 | 40 | 50 | | | | |
| PEEK | 810 | ✓ | Beige | 500x1,000 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | * | (1) | (1) | 0 to +10 | 0 to +20 | |
| | | | | 500x500 | # | # | # | # | # | # | # | # | # | # | # | | | |
| | | | | 500x245 | # | # | # | # | # | # | # | # | # | # | # | | | # |
| | | | | 245x245 | # | # | # | # | # | # | # | # | # | # | # | | | # |

: Please contact us for the delivery date since it will be shipped after cutting.

* symbol: Made-to-order product. Please contact us for more information about production lots.

PEEK Rods

The number in brackets is the number of plates in one case.

Rods

| Product Types | Product Number | Compliance with RoHS 2 | Hues (Colors) | External Diameter Tolerance (mm) | | 0 to +1.0 | | | | | | 0 to +1.5 | | | | | 0 to +2.5 | | | | 0 to +4.0 | | | Length Tolerance (mm) |
|---------------|----------------|------------------------|---------------|------------------------------------|-----|-----------|-----|-----|-----|-----|-----|-----------|-----|-----|-----|-----|-----------|-----|-----|-----|-----------|-----|-----|-----------------------|
| | | | | Length (mm)/External Diameter (mm) | 6 | 8 | 10 | 12 | 16 | 18 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 70 | 80 | 90 | 100 | 120 | |
| PEEK rods | 810 | ✓ | Beige | 1,000 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | 0 to +15 |
| | | | | 495 | | | | | | | | | # | # | # | # | # | # | # | # | # | # | # | |

#: Please contact us for the delivery date since it will be shipped after cutting.

PPS Plates

The number in brackets is the number of plates in one case.

| Product Types | Product Number | Compliance with RoHS 2 | Hues (Colors) | Thickness Tolerance (mm) | | 0 to +3.0 | | | | | Width Tolerance (mm) | Length Tolerance (mm) |
|---------------|----------------|------------------------|---------------|--------------------------|------|-----------|------|------|------|--|----------------------|-----------------------|
| | | | | Size (mm)/Thickness (mm) | 10.0 | 20.0 | 30.0 | 40.0 | 50.0 | | | |
| PPS | 800 | ✓ | Natural | 250x500 | (1) | (1) | (1) | (1) | (1) | | 0 to +40 | 0 to +40 |
| | | | | 250x250 | # | # | # | # | # | | | |

#: Please contact us for the delivery date since it will be shipped after cutting.

PC Plates for Machining (TS Grade)

The number in brackets is the number of plates in one case.

| Product Types | Product Number | Compliance with RoHS 2 | Hues (Colors) | Thickness Tolerance (mm) | | 0 to +3.0 | | | | | | | | 0 to +5.0 | | | 0 to +10.0 | Width Tolerance (mm) | Length Tolerance (mm) | |
|---------------|----------------|------------------------|---------------|--------------------------|------|-----------|------|------|------|------|------|------|------|-----------|------|-------|------------|----------------------|-----------------------|----------|
| | | | | Size (mm)/Thickness (mm) | 10.0 | 15.0 | 20.0 | 25.0 | 30.0 | 35.0 | 40.0 | 45.0 | 50.0 | 60.0 | 80.0 | 100.0 | 200.0 | | | |
| PCET | 1600 | ✓ | Transparent | 500x500 | | | | | | | | | | | | | | (1) | 0 to +40 | 0 to +40 |
| | | | | 500x1,000 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | ▲ | (1) | (1) | (1) | | | | | |
| | 1,000x1,000 | | * | * | * | * | | | | | | | | | | | | | | |
| | 1900 | | Black | 500x1,000 | (1) | (1) | (1) | (1) | (1) | (1) | | (1) | (1) | | | | | | | |
| 1,000x1,000 | * | * | | * | * | | | | | | | | | | | | | | | |

▲ symbol: When the corresponding model is no longer in stock, it will still be available as a made-to-order product.

* symbol: Made-to-order product. Please contact us for more information about production lots.

PC/ABS Plates for Machining (TS Grade)

The number in brackets is the number of plates in one case.

| Product Types | Product Number | Compliance with RoHS 2 | Hues (Colors) | Thickness Tolerance (mm) | | 0 to +3.0 | | | | | | | | 0 to +5.0 | | | Width Tolerance (mm) | Length Tolerance (mm) | | |
|---------------|----------------|------------------------|---------------|--------------------------|-----|-----------|------|------|------|------|------|------|------|-----------|------|------|----------------------|-----------------------|----------|----------|
| | | | | Size (mm)/Thickness (mm) | 5.0 | 10.0 | 15.0 | 20.0 | 25.0 | 30.0 | 35.0 | 40.0 | 45.0 | 50.0 | 60.0 | 80.0 | | | 100.0 | |
| PCABS | 2900 | ✓ | Black | 500x1,000 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | 0 to +40 | 0 to +40 |

Reinforced PP Plates with Glass Fillers (TS Grade)

The number in brackets is the number of plates in one case.

| Product Types | Product Number | Compliance with RoHS 2 | Hues (Colors) | Thickness Tolerance (%) | | 0 to +15 | 0 to +8 | | Width Tolerance (mm) | Length Tolerance (mm) |
|---------------|----------------|------------------------|---------------|--------------------------|------|----------|---------|-----|----------------------|-----------------------|
| | | | | Size (mm)/Thickness (mm) | 20.0 | 50.0 | 100.0 | | | |
| PP | 90G30 | ✓ | Black | 500x1,000 | (1) | (1) | (1) | (1) | 0 to +30 | 0 to +30 |

Reinforced PC Plates with Glass Fillers

The number in brackets is the number of plates in one case.

| Product Types | Product Number | Compliance with RoHS 2 | Hues (Colors) | Thickness Tolerance (mm) | | 0 to +3.0 | | | | | | 0 to +5.0 | Width Tolerance (mm) | Length Tolerance (mm) |
|---------------|----------------|------------------------|---------------|--------------------------|------|-----------|------|------|------|------|------|-----------|----------------------|-----------------------|
| | | | | Size (mm)/Thickness (mm) | 10.0 | 15.0 | 20.0 | 25.0 | 30.0 | 40.0 | 50.0 | 60.0 | | |
| PCET | GF20 | ✓ | Black | 500x1,000 | (1) | (1) | | | | | | | 0 to +40 | 0 to +40 |
| | 91G20 | ✓ | Black | 500x1,000 | | | (1) | (1) | (1) | (1) | (1) | (1) | | |

Conductive Nylon Plates

The number in brackets is the number of plates in one case.

| Product Types | Product Number | Compliance with RoHS 2 | Hues (Colors) | Thickness Tolerance (mm) | | 0 to +1.5 | | | | 0 to +3.0 | | | | Width Tolerance (mm) | Length Tolerance (mm) |
|---------------|----------------|------------------------|---------------|--------------------------|-----|-----------|------|------|------|-----------|------|------|-----|----------------------|-----------------------|
| | | | | Size (mm)/Thickness (mm) | 5.0 | 8.0 | 10.0 | 12.0 | 15.0 | 20.0 | 25.0 | 30.0 | | | |
| PA | 910CV | ✓ | Black | 600x1,200 | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | 0 to +20 | 0 to +25 |

Conductive PP Plates

The number in brackets is the number of plates in one case.

| Product Types | Product Number | Compliance with RoHS 2 | Hues (Colors) | Thickness Tolerance (mm) | | 0 to +3.0 | | | | | | Width Tolerance (mm) | Length Tolerance (mm) |
|---------------|----------------|------------------------|---------------|--------------------------|------|-----------|------|------|------|------|--|----------------------|-----------------------|
| | | | | Size (mm)/Thickness (mm) | 10.0 | 13.0 | 15.0 | 20.0 | 25.0 | 30.0 | | | |
| PP | P973CV | ✓ | Black | 600x1,200 | (1) | △ | (1) | (1) | ▲ | (1) | | 0 to +30 | 0 to +30 |

△: This product will be discontinued when we run out of the stock thereafter.

▲ symbol: When the corresponding model is no longer in stock, it will still be available as a made-to-order product.

Additional Information

Information about Standard Certifications

REACH Regulations

REACH is an acronym that stands for "Registration, Evaluation, Authorization and Restriction of Chemicals." It is a comprehensive system for registering, evaluating, authorizing, and restricting chemical substances that was approved as Regulation (EC) No. 1907/2006 on December 13, 2006 and became effective on June 1, 2007. The goals of the REACH Regulations include safeguarding human health, protecting the environment, and keeping the European Union chemical industry competitive. They apply to virtually all types of chemical substances. All chemical substances that are manufactured in or imported to the European Union must have their information related to safety and use registered if their quantity equals or exceeds 1 ton per year.

FM Standards

We design products that have the FMRC 4910 flame retardation certification for clean room materials. They are designed to prevent fires from spreading and minimize pollution caused by smoke or corrosive gases. Their characteristics also include excellent chemical resistance, heat resistance, and workability.

UL Standards

UL is a testing organization that was founded in 1894 by the fire insurance industry in the U.S. It creates, authorizes, and registers safety standards for a wide variety of materials and products in order to protect human life and assets from fires, theft, and similar accidents. While these are optional standards established by a private sector organization, their authority is widely recognized because of their history and impact on various industries. Products sold in many U.S. states and cities are legally required to have the UL certification. Virtually all electric and other products exported to the U.S. need the UL certification.

Thickness Specifications Defined by the UL Standards

Plates that have a UL94 flammability rating of V, 5V, and HB are subject to UL standards if they are not thicker than 13 mm.

JIS Standards

Our products that comply with the Japanese Industrial Standards include rigid PVC plates (JIS K 6745-2008, certification number: JQ0507064) and polycarbonate plates (JIS K 6735-2014, certification number: JQ0507136).

Tests for Vehicle Interior Materials

We offer products that comply with the standards introduced by JABIA (Japan Auto-Body Industries Association Inc.).

FMVSS No. 205

This Federal Motor Vehicle Safety Standard applies to glazing materials for motorcycles.

Fire Retardancy Tests

We supply products that are used as fire-retardant parts in fire-retardant objects and whose performance complies with and is equivalent to the stipulations in section 3 of Article 4 of the Ordinance for Enforcement of the Fire Service Act of Japan.

Tests for Incombustibility of Thin Materials for Buildings

We manufacture products that comply with the JIS A 1322 standard (Testing Method for Incombustibility of Thin Materials for Buildings).

Food Sanitation Act

These are national sanitation standards that apply to food products, additives, utensils, containers, packaging, toys, and detergents, banning the sale of any harmful or toxic products. We provide products that comply with the testing stipulations specified in the Public Notice of the Ministry of Health, Labour and Welfare No. 201 of 2006 and Public Notice of the Ministry of Health, Labour and Welfare No. 595 of 2012.

Restrictions for Organotin Compounds Included in Annex XVII to REACH Regulations

The regulations related to organotin compounds (dibutyltin (DBT) compounds and dioctyltin (DOT) compounds) only apply to products manufactured for the general public. Industrial plate materials are exempt. With a few exceptions, our products contain both DBT and DOT. However, most of them are industrial plate materials and can therefore be considered exempt from the restrictions for organotin compounds based on Annex XVII to REACH Regulations.

When manufacturing products for the general public, be sure to utilize our materials that do not contain DBT or DOT (table 1). Also, keep in mind that none of our PP, PET, PC, or PVDF products contain DBT or DOT.

Table 1: Products That Comply with the Restrictions for Organotin Compounds Included in Annex XVII to REACH Regulations

| Product Types | Product Number | Hues (Colors) | Remarks/Features |
|---------------|----------------|---------------|--------------------------------|
| FMRTS | 4605 | Transparent | Standard/FM |
| FMND- | 74605 | Transparent | Standard/FM/Static-dissipative |
| FMHS | 6650 | Transparent | Heat-resistant/FM |

FM 4910 Listed Materials

| Product Types | Product Number | Certified Thickness |
|---------------|----------------|---------------------|
| FMT | 3331 | 3.0 mm or more |
| FMET | 4323 | 3.0 mm or more |
| FMET | 4735A | 3.0 mm or more |
| FMET | 4773 | 3.0 mm or more |
| FMH | 5300 | 3.0 mm or more |
| FMH | 5305 | 3.0 mm or more |
| FMH | 5335 | 3.0 mm or more |
| FMH | 5775 | 3.0 mm or more |

FM Approvals has developed a database for materials that have been evaluated by FM 4910.

Use this database to confirm if the material of a particular Takiron FM plate is listed in the standard or to search for other types of materials.

Website link: <http://www.approvalguide.com/>

| Product Types | Product Number | Certified Thickness |
|---------------|----------------|---------------------|
| FMTS | 3608 | 3.0 mm or more |
| FMRTS | 4605 | 3.0 mm or more |
| FMHS | 5650 | 3.0 mm or more |
| FMHS | 6650 | 3.0 mm or more |
| FMND | 7605 | 3.0 mm or more |
| FMND | 7708 | 3.0 mm or more |
| FMND | 74605 | 3.0 mm or more |
| FMND | *7460* | 3.0 mm or more |
| FMPVDF | F300 | 3.0 mm to 50 mm |





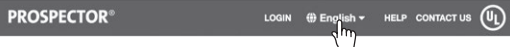
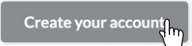
* symbol: The "*" in FMND 7460* is a number from 0 to 9.

How to access UL Yellow Card

Using UL Database


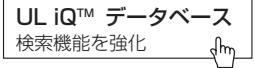
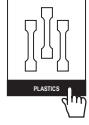
After creating an account on the UL website, log in with your registered password. Then you can access to view and retrieve Yellow Card.

<How to make account>

1. Open UL Japan's official website. (<https://japan.ul.com/>) 
2. Click on "UL Product iQ" on the right side of the UL website. 
3. Select your preferred language on the right side of the top page. 
4. Click "Register for Free". 
5. Change the language to your preferred language on the right side of the top page. 
6. Fill all the forms marked with * by using half-width alphanumeric, and click "Create your Free Account".
 - Set a password that contains at least 8 characters.
 - Check "I agree to the Terms and Conditions." after reviewing terms and condition. 
7. Receive an email from UL.

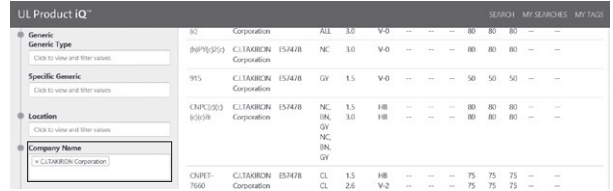
You will receive an email titled "Please confirm your Prospector registration", access to <https://www.ulprospector.com/users/confirm/...> and login.

<How to access Yellow Card>

1. Open UL Product iQ and login. 
2. Click on iQ database on the left. 
3. Click on the icon on the right to access UL iQTM FAMILY OF DATABASES. 
4. Enter "C.I. TAKIRON" or "TAKIRON" in the "●Company Name" on the left side.

↓

 You may view C.I. TAKIRON UL registration list.



| Generic Type | Material | Standard | Class | Thickness | Color | Flame Retardancy | Smoke Density | Heat Release | Weight Loss | Char Yield |
|--------------|-------------------------|----------|-------|-----------|-------|------------------|---------------|--------------|-------------|------------|
| INPESQ5 | C.I.TAKIRON Corporation | ES747B | NC | 3.0 | V-0 | — | — | 80 | 80 | 80 |
| 915 | C.I.TAKIRON Corporation | ES747B | GY | 1.5 | V-0 | — | — | 50 | 50 | 50 |
| ENPESQ2 | C.I.TAKIRON Corporation | ES747B | NC | 1.5 | HB | — | — | 80 | 80 | 80 |
| 8300R | C.I.TAKIRON Corporation | ES747B | IN | 3.0 | HB | — | — | 80 | 80 | 80 |
| ENPESQ2 | C.I.TAKIRON Corporation | ES747B | NC | 1.5 | HB | — | — | 75 | 75 | 75 |
| 7560 | C.I.TAKIRON Corporation | ES747B | CL | 2.6 | V-2 | — | — | 75 | 75 | 75 |

Additional Information

Thicknesses Covered by UL Standards

For UL94 combustion class V, 5V, and HB, the applicable thickness is 13.0 mm or less.

Products That Comply with UL Standards (PVC)

Yellow Book File No. E57478

| Product Types | UL Certification Details | | Product Names | UL94 Flammability Rating | Product Types | UL Certification Details | | Product Names | UL94 Flammability Rating |
|---------------|--------------------------|------------------------|---------------------------|--------------------------|---------------|--------------------------|---------------------------------------|--|--------------------------|
| | Product Number | Minimum Thickness (mm) | Product Types and Numbers | | | Product Number | Minimum Thickness (mm) | Product Types and Numbers | |
| T | TTU | 0.43 | T 932 | V-0 | ESND (3,5mm) | UESND (b) | 3.0 | ESND 47802 | V-0 |
| | SUT | 0.4 | T 938 | | ESND (8,10mm) | AESND (b) | | ESND 47302 | |
| TSP | UT (b) | 0.41 | TSP 333 | V-0 | ETSND | ETSND MR (b) | 1.0 | ETSND MR100 ETSND MR120 | |
| | | | TSP 539 | | | | | | |
| | TSP 739 | V-0 | TEND | PVCEMI | 2.5 | TEND 57600 | V-0, 5VA | | |
| TS | SCU | 0.43 | TS 608A | V-0 | TSLA | TSLA W (b) | 1.5 | TSLA W402 TSLA W102 TSLA W202 TSLA W502 TSLA W4066 | |
| | SCU2 | 3.51 | | | | | | | |
| HT | TUH | 1.77 | HT 925 | V-0 | TSLAND | TSLAND N (b) | 1.5 | TSLAND N402 TSLAND N102 TSLAND N202 TSLAND N502 TSLAND N4066 | |
| | SUH | 0.4 | HT 928 | | | | | | |
| HTS | HTS (b) | 0.75 | HTS 625 | V-0 | TMC | TMC (b) | 2.0 | TMC 60601 | |
| THQ | HQ (b) | 1.5 | THQ 004 | | 2.0 | TMC 60331 | | | |
| | | | THQ 009 | | 1.5 | ET | ET91912 | 1.5 | ET 91912 |
| | THQ 89512 | ET91912 II | 6.0 | | | ET 91912 II | | | |
| | THQ 048 | 1.0 | ET | | ETU (l) | 1.0 | ET 1980 ^{*2} | | |
| THQ 098 | ETSP | | ETU (l) | | 1.0 | ETSP 1388 ^{*2} | | | |
| THQ 038 | ETS | ETS | 1.5 | | ETS 1000A | | | | |
| TSHI | TSHI601HI | 1.5 | TSHI 601HI | | ESS | ESS8800 | 0.5 | ESS 8800A | |
| FMT | UT (b) | 0.5 | FMT 3331 | | ESA | ESU (m) | 0.5 | ESA 9810 | |
| | | | FMT 3700 | | ESA (m) | 3.0 | | | |
| FMET | UET (b) | 0.4 | FMET 4323 | | RTS | EON1100 | 2.5 | RTS 1100, 110PE | |
| FMH | TUH | 3.0 | FMH 5300 ^{*1} | | RTSP | RTSP | 2.0 | RTSP 1330, 133PE | |
| | | | FMH 5310 | | | | | | |
| FMHL | HTL (b) | 3.0 | FMHL 5310 | RTSHI | RTSHI (b) | 1.5 | RTSHI 6100 | | |
| | | | FMHL 5310 | | | | | | |
| FMHS | HTS (b) | 0.75 | FMHS 5650 | EVX | EVX (b) | 0.79 | All product types/ product numbers | | |
| | FMHS | 1.0 | FMHS 6650 | EVC | EVC8600, EVCU | 0.75 | EVC 8600 | | |
| FMSL | FMSL5670 | 1.7 | FML 5670 | EVD | EVD (b) | | All product types/ product numbers | | |
| FMND | FMND7600 | 1.5 | FMND 7600 | EVG | EVG8902A | 0.37 | EVG 8902A | | |
| | FMND7708 | 2.5 | FMND 7708 | EVSP | EVSP92804 | 0.43 | EVSP 92804 | | |
| | FMND7605 | 2.5 | FMND 7605 | | EVSP95602 | | EVSP 95602 | | |
| TND | TND77665 | 1.5 | TND 77665 | EVSP95801 | EVSP 95801 | V-0 | | | |
| | TUN (TND77685) | 0.76 | TND 77685 | V-0 | S | | SCU | 0.43 | S 602 |
| | | | TND 77285 | | | | SCU2 | 3.51 | |
| | | | TND 77385 | | | | SSU | 0.41 | SA 602 |
| | | | TND 77885 | | | | S704 | 0.75 | S 704 |
| TND 77001 | | | S735 | | | | 0.4 | S 735 | |
| TND 77002 | S909 | 1.5 | S 909 | | | | | | |
| TND 77003 | 1.5 | TND 77345 | V-0 | Foam PVC | 915 | 1.5 | Foam PVC 915 | | |
| TND 77368 | | | | | | | | | |
| ESND | ESND (b) | 2.5 | ESND 47800 | V-0 | | | | | |
| ESND 47300 | | | | | | | | | |

• (b) stands for a number or similar symbol.

• (l) stands for a number or letter.

• (m) stands for any number from 1 to 9999.

*1 When the nominal thickness of the corresponding product is 3.0 mm, the actual value may drop below 3.0 mm due to the thickness tolerance level, which is why the product cannot have a V-0 rating.

*2 When the nominal thickness of the corresponding product is 1.0 mm, the actual value may drop below 1.0 mm due to the thickness tolerance level, which is why the product cannot have a V-0 rating. On the other hand, standard products with a nominal thickness of 1.5 mm or more have a V-0 rating.

Additional Information

Products That Comply with UL Standards (PET)

Yellow Book File No. E57478

| Product Types | UL Certification Details | | Product Names | UL94 Flammability Rating |
|---------------|--------------------------|------------------------|---------------------------|--------------------------|
| | Product Number | Minimum Thickness (mm) | Product Types and Numbers | |
| PET- | PETEC (n1)(n2) | 1.1 | PET- 6010 [*] | HB |
| | | 2.7 | | V-2 |
| PETND- | PETND76600 | 1.5 | PETND- 76600 | HB |
| PETND | PETND MRG60 | 1.5 | PETND MRG60 | HB |
| | PETND MRG20 | | PETND MRG20 | |
| | PETND MRG30 | | PETND MRG30 | |
| | PETND MRG80 | | PETND MRG80 | |

• (n1): A number, etc. (n2): Alphabet, etc.

For standard products, the nominal thickness of 3.0 mm or more corresponds to V-2.

Products That Comply with UL Standards (PP)

Yellow Book File No. E57478

| Product Types | UL Certification Details | | Product Names | UL94 Flammability Rating |
|---------------|--------------------------|------------------------|---------------------------|--------------------------|
| | Product Number | Minimum Thickness (mm) | Product Types and Numbers | |
| PPUN | PPNN | 3.0 | PPUN 3330 PPUN 3370 | V-0 |
| RPPN | | | RPPN PN303 | |

Products That Comply with UL Standards (PC)

Yellow Book File No. E57478

| UL Certification Details | | | Product Names | Colors |
|--------------------------------------|-----------------|---------------------|---------------------------|-------------------------|
| Grade name | Thickness | Flammability Rating | Product Types and Numbers | |
| PC 1 (c) (c) (c) PC-1 (c) (c) (c) | 0.41 mm or more | HB | PC 1600 PC- 1600 | Transparent |
| PCSP6 (c) (c) T PCSP-6 (c) (c) T | 1.5 mm or more | HB | PCSP 660T | Transparent |
| | | | PCSP- 660T | Transparent glass color |
| | | | PCSP 642T | |
| | | | PCSP 677T | Opaque |
| | | | PCSP- 677T | |
| | | | PCSP 692T | |
| | | | PCSP 693T | Smoky brown |
| PCSP- 693T | | | | |
| PCSM PS (c) (c) (c) | 0.44 mm or more | V-2 | PCSM PS610 | Transparent |
| PCMU PY (c) 2 (c) | 3.0 mm or more | V-0 | PCMU PY620 | Transparent |
| PCNDL 78 (c) (c) (c) (j) | 1.5 mm or more | HB | PCNDL 78610 | Transparent |
| | | | PCNDL 78810 | Smoky brown |
| | | | PCNDL 78910 | Smoky gray |
| PCEMI | 1.5 mm or more | HB | PCEND 57610 | Transparent |
| PCNDU (b) | 2.6 mm or more | V-1 | PCNDU 610U | Transparent |
| | 4.6 mm or more | V-0 | | |
| PCMA K (c) (c) (c) (c) | 0.6 mm or more | HB | PCMA K3250 | Transparent |

Note: (b) stands for a number or similar symbol. (c) stands for a number from 0 to 9.

(j) may stand for A depending on the UV stabilizer content.

Note: Type PCNDU is available as custom-made products.

Products That Comply with JIS Standards

● Rigid PVC Plates (JIS K 6745-2015) Certification No. JQ0507064

| Categories | Corresponding Group | Product Types and Numbers | Nominal Designation | Width x Length (mm) | Thickness (mm) |
|------------------------|---------------------|---------------------------|---------------------|---------------------|----------------|
| Extruded plates | 1 | ET 1980 | 1x2 | 1,000x2,000 | 1.0 to 20.0 |
| | | | 4x8 | 1,212x2,424 | |
| | | ED 1950 | 1x2 | 1,000x2,000 | 3.0 to 6.0 |
| Press laminated plates | 1 | T 932 | 1x2 | 1,000x2,000 | 1.0 to 20.0 |
| | | | 4x8 | 1,212x2,424 | |
| | | T 938 | 1x2 | 1,000x2,000 | |
| | | | 4x8 | 1,212x2,424 | |

• Customized length dimensions (custom dimensions) for type ET1980 can also be adjusted to meet the JIS standards.

● Polycarbonate Plates (JIS K 6735-2014) Certification No. JQ0507136

| Categories | Types | Product Types and Numbers | Plate Size (mm) | Thickness (mm) | |
|-----------------|----------|---------------------------|-----------------|--|---------------|
| Extruded plates | Type 1 G | PC- 1600 | 910x1,820 | 2.0, 3.0, 4.0, 5.0 | |
| | | | 1,000x2,000 | 2.0, 3.0, 4.0, 5.0, 6.0, 8.0, 10.0, 12.0, 15.0 | |
| | | | 1,220x2,440 | 2.0, 3.0, 5.0, 6.0, 8.0, 10.0 | |
| | Type 1 W | PCSP- 660T | 1,000x2,000 | 3.0, 5.0 | |
| | | | PCSP- 677T | 1,000x2,000 | 2.0, 3.0, 5.0 |
| | | | PCSP- 692T | 1,000x2,000 | 2.0, 3.0, 5.0 |
| | | | PCSP- 693T | 1,000x2,000 | 2.0, 3.0, 5.0 |

• Standard products with standard dimensions (910 x 1,820, 1,000 x 2,000, 1,220 x 2,440) are shipped with JIS labels. The labels are attached to the products and their cardboard cases. If you need to have JIS labels attached to any products with custom dimensions, contact us. (G-cut products are excluded from the JIS standards.)

Products That Comply with the Food Sanitation Act*

- The Public Notice of the Ministry of Health, Labour and Welfare No. 267 of 2002 applies to all materials that come into direct contact with food products containing oils and fats.
- The Public Notice of the Ministry of Health, Labour and Welfare No. 201 of 2006 defines the types of substances that utensils, containers, and packaging materials made from synthetic resins must not contain if they come into direct contact with food products. The Public Notice also specifies the corresponding reference values and testing methods.
- The Public Notice of the Ministry of Health, Labour and Welfare No. 595 of 2012 was published as a revised document as it added styrene and rubber to the list of substances in utensils, containers, and packaging materials made from synthetic resins that were in defined in No. 201 described above.
- Materials that contain polyethylene naphthalate (PEN) as their main component were added to the list of substances used in utensils, containers, and packaging materials made from synthetic resins. The revised version was published in the Public Notice of the Ministry of Health, Labour and Welfare No. 245 of 2016. (Note: None of the standards and testing methods we use for our products have changed.)

*The Food Sanitation Act and some other regulations are expected to be revised in 2020 through the enforcement of new legislation. Once the new legislation is enforced, you may no longer be able to use some of our products. If you require any information as to which products are still going to comply with the Food Sanitation Act after the revisions, we kindly ask you to contact us.

(1) PVC Products

| Materials | Product Types and Numbers | Hues (Colors) | No. 201 | No. 267 | No. 595 |
|-----------|---------------------------|---------------|---------|---------|---------|
| PVC | TMC 60601 | Transparent | ✓ | ✓ | - |
| | TMC 60331 | Ivory | ✓ | ✓ | - |
| | FD 311 | Ivory | - | - | ✓ |
| | Foam PVC | All colors | ✓ | - | - |
| | Rod 938A | Gray | - | - | ✓ |
| | NC Rod | Ivory | ✓ | - | - |

- Some types of TMC and FD welding rods also comply with the requirements. Contact us for more information.
- Type FD311 is a made-to-order product.

(2) Non-PVC Products

| Materials | Product Types and Numbers | Hues (Colors) | No. 201 | No. 595 |
|-----------|---|----------------------------------|---------|---------|
| PETG | PET- 6010/6010A | Transparent | ✓ | - |
| | PET- 6710 | White | ✓ | - |
| | PET- 6820 | Smoky brown | ✓ | - |
| | PET- 6025 | Orange tinted | ✓ | - |
| | PETND- 76600 | Transparent | ✓ | - |
| | PETND MRG60 | Transparent | ✓ | - |
| PVDF | FMPVDF F300 | Natural | ✓ | - |
| PP | PP 1300 | Natural | ✓ | - |
| | RPP 1350 | | ✓ | - |
| | PPU 1300 | | ✓ | - |
| | PP 1905 | Dark gray | ✓ | - |
| | RPP 1950 | | ✓ | - |
| | PPU 1905 | | ✓ | - |
| ABS | ABS- | Natural, white | ✓ | - |
| PC | PCI 11930 | Smoky brown | - | ✓ |
| | PCSP 91560 | Smoky brown | ✓ | - |
| | PCI 11920 | Smoky gray | - | ✓ |
| | PCNDL 78610 | Transparent (Static-dissipative) | - | ✓ |
| | PCNDL 78810 | Smoky brown (Static-dissipative) | - | ✓ |
| | PCNDL 78910 | Smoky gray (Static-dissipative) | - | ✓ |
| | PCSM PS610 | Transparent | ✓ | - |
| | PC 1600, PC K1600, PC R1600, PC- 1600 | Transparent | - | ✓ |
| | PCSP- 660T, PCSP 660T, PCSP K6600, PCSP R6600, PCSP F6600, PCSP 36600 | Transparent | - | ✓ |
| | PCSP 692T, PCSP- 692T, PCSP R6920 | Smoky gray | - | ✓ |
| | PCSP 693T, PCSP- 693T, PCSP R6930 | Smoky brown | - | ✓ |
| | PCSP 677T, PCSP- 677T | Opaque | - | ✓ |
| | Welding Rod PC 9061 | Transparent | ✓ | - |

- If you wish to use these materials with food products, contact us.

Products That Comply with Vehicle Interior Standards (JIS D 1201 Combustion Test)

| Product Types | Performance |
|---------------|---------------------------------------|
| EVX | Flame retardancy class 1/Fume class 3 |

Products That Comply with Standards for Vehicle Interior Materials (Japan Auto-Body Industries Association Inc.)

| Product Types | Thickness (mm) | Material Registration Number | Performance |
|---------------|----------------|------------------------------|--|
| EVX | 2.0 | V0178 | Non-combustible |
| | 3.0 | V0179 | Non-combustible |
| | 4.0 | V0180 | Non-combustible |
| | 5.0 | V0181 | Non-combustible |
| EVH- | 3.0 | V0182 | Non-combustible |
| | 5.0 | V0183 | Non-combustible |
| EVC- | 2.0 | V1226 | Non-combustible |
| ABS | 2.0 | Z0126 | Flame-retardant (Combustion rate: 81 mm/min) |

(3) Takiron Polymer Products

| Materials | Product Types and Numbers | Hues (Colors) | No. 201 | No. 595 | No. 245 |
|----------------------------|--|---------------|---------|---------|---------|
| PP | PP P370 (Former product number: PPE P370) | Natural | ✓ | - | - |
| | PP Rod 370 | | ✓ | - | - |
| | PP P922 | Dark gray | ✓ | - | - |
| | PP P975 | Black | ✓ | ✓ | - |
| | PP 570 | Blue | - | ✓ | - |
| | PP Rod 570 | | - | ✓ | - |
| | HDPE | PE 721 | Natural | - | - |
| PE Rod 730 | | - | | ✓ | - |
| PE 520 | | Blue | - | ✓ | - |
| PE Rod 530 | | | - | ✓ | - |
| UHMW-PE | UP 140 | Natural | ✓ | - | - |
| | UP Rod 140 | | ✓ | - | - |
| | UP 542 | Blue | - | ✓ | - |
| | UP 143SL | Natural | - | ✓ | - |
| MCN*1 | MCN N550 | Blue | ✓ | - | - |
| | MCN Rod 550 | | ✓ | - | - |
| | MCN N350 | Natural | ✓ | - | - |
| | MCN Rod 350 | | ✓ | - | - |
| | MCN N950 | Black | ✓ | - | - |
| | MCN Rod 950 | | ✓ | - | - |
| | MCN N050*2 | Gray | - | ✓ | - |
| MCN Rod 050*2 | - | | ✓ | - | |
| PET | PEX C777 | White | ✓ | - | - |
| | PEX Rod 777 | | ✓ | - | - |
| | PEX Rod 778 | | ✓ | - | - |
| | PEX Rod 977 | Black | ✓ | - | - |
| PVDF | PVDF F2 | Natural | ✓ | - | - |
| | PVDF Rod F2 | | ✓ | - | - |
| PC | PCET 1600 | Transparent | ✓ | - | - |
| POM | POM 760 | Natural | - | ✓ | - |
| | POM Rod 760 | | - | ✓ | - |
| PEEK | PEEK 810 | Beige | - | ✓ | - |
| | PEEK Rod 810 | | - | ✓ | - |
| PMP (Polymethylpentene) | PMP (Polymethylpentene) M600 | Transparent | - | ✓ | - |
| | PMP (Polymethylpentene) Rod 600 | | - | ✓ | - |

*1 If you wish to use these materials with food products, contact us.

*2 Do not use this material with any food products that contain oils. The oils may dissolve the components added to the material and cause them to get mixed in with the food.

*3 The products listed above conform to Notification No. 370 of the Ministry of Health and Welfare, and all base polymers and additives used are on the positive list (updated on April 28, 2020). Therefore, the product can continue to be used after June 1, 2020, when the revised Food Sanitation Law comes into effect.

*4 A separate dissolution test may be required for use in containers and packaging for milk and dairy products. Please contact us before use.

Products That Comply with FMVSS No. 205 (Federal Standards)

| Product Types | FMVSS Certification Details | Corresponding Takiron Plates | | Colors | Testing Categories |
|---------------|-----------------------------|------------------------------|----------------|-------------|--------------------|
| | Product Number | Product Types and Numbers | Thickness (mm) | | |
| PCIHF160 | M-160-25 | PCIHF160 | 2.5 | Transparent | AS6/7 |
| PCI92410 | M-410-25 | PCI92410 | 2.5 | Smoky gray | AS7 |

Processing Methods for Takiron Plates

Machine Processing

Follow the steps described below to achieve a highly aesthetic finish without any chipping or cracking when you cut, machine, or drill holes in Takiron plates.

- (1) When using machines to process the plates, it is vitally important to make sure the tools you utilize are sharp enough.
- (2) Be sure to prevent any temperature spikes that can be caused by heat during work.
- (3) Monitor the temperature during work, especially in winter, in order to prevent the material from cracking.
- (4) During shearing or punching processes, make sure the blade clearance is suitable for the plate thickness and shape.
- (5) Be sure to use suitable aperture plates or underlay materials to prevent chipping.
 - If the clearance between the aperture plate and cutting blade of the height-adjustable circular saw bench or running saw is too large, replace the aperture plate.
 - If you use cutting dies for punching processes, replace the underlay material if the groove in the blade contact point is too large.
 - We also recommend using underlay material for drilling processes.

Adhesion Processing

● Adhesion of multiple Takiron plates

To bond multiple Takiron plates, use Adhesive No. 200 (solvent type). Adhesive No. 200 is particularly practical since it can be applied with syringes.

Instructions for Adhesion Processing

- (1) Do not use more adhesive than necessary.
- (2) Work fast and do not move the plates until the adhesive has properly dried.
- (3) Avoid separating and reattaching the plates once they have been bonded. Doing so will weaken the adhesive significantly.
- (4) Reinforce the corners with adhesive rods to increase the adhesion surface and prevent cracking that can occur due to stress concentration.
- (5) Adhesive spills may leave marks in the material. Exercise caution during work.

In particular, be sure to take the necessary steps to ensure fire safety and adequate ventilation when performing adhesion processes.

⚠ Warning

● Adhesion of broad surfaces

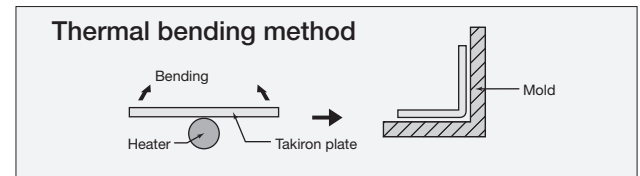
When broad surfaces such as large signboards are bonded, the surface layer may get foggy due to uneven distribution of the adhesive and the effects of the solvent. To prevent that from happening, we recommend using an Adhesive No. 200 mixture that contains up to 20% ethanol in order to reduce the dissolving power and drying speed of the adhesive.

Also, make sure you carry out work on a glass plate backlit by a fluorescent light to be able to spot any air bubbles or unevenly distributed adhesive. Compared to pure Adhesive No. 200, the adhesive strength of its ethanol mixtures is slightly weaker. Therefore, only use such mixtures to bond surfaces that are not exposed to excessive stress such as sign letters.

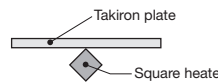
Heat Processing

● Bending

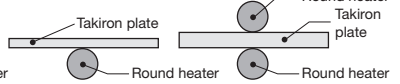
Thermal bending can be carried out by simply using a commercially available rod heater. Rod heaters come in two shapes: square and round. For plates that are no thicker than 2 mm, we recommend using the edges of the square type to heat the surface. For plates that are 2 mm thick or thicker, on the other hand, we recommend using the round type. By attaching Teflon tape to the surface of the rod heater, you can prevent the materials from fusing together when heated and create an elegant-looking curve.



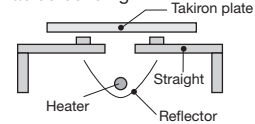
● Heating method for bending thin plates



● Heating method for bending thick plates

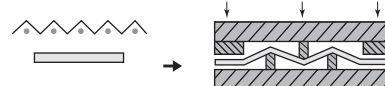
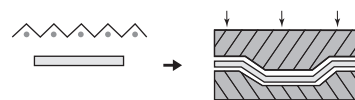
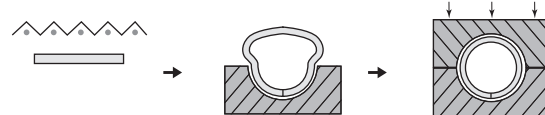
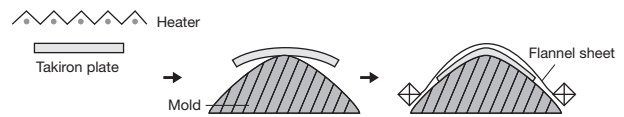


● Heating method for small radius bending



● Radius bending and molding

Although the actual processing and molding methods need to be adjusted according to the product shape and production quantity, the basic work procedures are described below. For best results, be sure to keep the temperature low when heating the material. These plates tend to shrink when heated in an unclamped state. You need to take that into consideration to make sure you cut each plate to the right size for processing. Also, keep in mind that press laminated plates tend to lose their original texture.



Precautions for Use and Processing Methods

Precautions for Using Takiron Plates

● Operating temperature

Once Takiron plates reach or exceed their softening temperature, their physical properties are compromised, which results in deformations and other issues. Make sure the temperature of the environment where the plates are used never exceeds 40°C.

Furthermore, exposing plates with darker color shades to direct sunlight in the summer season may push the plate temperature above the softening limit and cause deformations. Be sure to take extra precautions when using individual dark plates on broad surfaces outdoors.

In addition, keep in mind that if channel plates are exposed to direct sunlight or a similar heat source with the protective film attached and if their temperature reaches or exceeds 50°C, the paper layer may leave traces on the plate surface.

● Expansion and contraction caused by temperature fluctuations

Rigid PVC resins have a linear thermal expansion coefficient that is 5 to 6 times that of iron. When designing products made from such resins to be attached to metals with screws or used in permanent fixtures, make sure you take the necessary steps such as making slotted holes in the surface that prevent deformations due to material expansion or cracks due to its contraction.

● Notching effects

Any notched parts (such as cuts, notches, scratches, or sharp corners that are included in the design) can have a significantly adverse effect on the structural strength of a processed product due to stress concentration. Be sure to keep that in mind when designing, processing, and finishing your products.

● Anti-static treatment

Rigid PVC plates and other standard plastic products tend to attract dust particles due to static electricity. Be sure to apply our anti-static agent to the surfaces.

For our channel plates, on the other hand, we use a special type of treatment that makes the surfaces highly weather-resistant. When using anti-static agent on those plates, apply a small amount of it to a flannel cloth and quickly smear it over the surface once.

Keep in mind that if you use too much anti-static agent and apply multiple layers of it to the surface or if you stack multiple plates on top of each other before the agent dries, the surface may whiten.

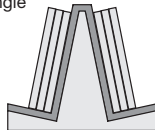
● Storage

Store Takiron plates as shown in the figures below in order to prevent them from getting warped or bent. Also, keep the protective film from getting wet otherwise you may have difficulty removing it later.

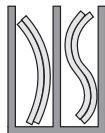
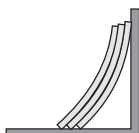
● Horizontally stacked plates



● Plates stacked on shelves that are tilted vertically at an approx. 10° angle



● Incorrectly stacked plates (leading to warps and bends)

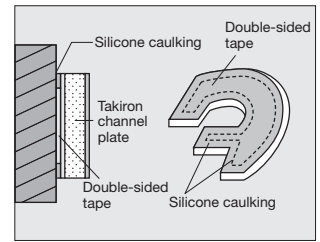


Processing Methods for Takiron Channel Plates

Attaching Methods

● Large letters

Attach double-sided tape to the letter surface by leaving a margin of a few centimeters along its edges. Add silicone caulking to the surface along the edges. Double-sided tape is easy to attach, while silicone caulking keeps water out and increases the adhesive strength.

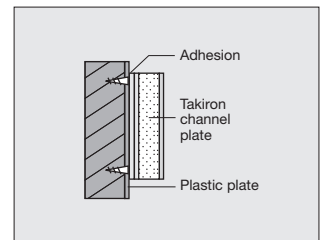


● Small letters

Apply silicone caulking across the entire back surface, and attach the letter to the wall. Small letters will not slide off on their own before the silicone hardens.

● Adhesion to plastic plates used as the foundation

If you find it difficult to attach channel plate sign letters to the current foundation, you can instead try attaching the letters to a plastic plate, such as a PVC plate, which should provide a better grip.



Processing Methods

● Straight cuts

Use a circular saw for straight cuts. Although any standard circular saw for PVC should be suitable enough for this kind of work, you may be able to create a smoother edge if you use a blade with a large number of teeth and cut through the material slowly.

● Curved cuts

Use a fretsaw for curved cuts. The ideal tooth pitch for a smooth cut is between 24 and 50. If the blade has a small number of teeth, the cut may be too coarse, and if the blade has too many teeth, the material may become viscous along the cut.

● Cross-sectional coatings

Apply acrylic coatings to cross-sectional surfaces. You can either spray-paint the surfaces or use a brush to apply the coating. Use some masking tape or a similar tool to protect the surfaces, and apply two or three layers of coating for best results.

Processing Methods for Foam PVC

● Cutting and machining

This type of material can easily be cut with a standard circular handsaw for wood.

When using a fretsaw, it may be easier to cut the material with a coarser blade (18 to 20 teeth per inch).

● Punching

Punching can be performed if the material is not thicker than 3 mm.

However, keep in mind that in order to avoid any cracking issues, the punching shape should be as obtuse as possible.

● Thermal bending

Double-sided heating is recommended for products with a thickness of 3 mm or more.

For double-sided heating, the rod heater temperature should be about 140°C. Keep in mind that if the rod heater is too hot, the plate material may start adhering to the

heater.

● Adhesion

You can use Adhesive No. 200 to bond foam PVC plates. However, if you use an excessive amount of adhesive, you may corrode parts outside the adhesion area. Exercise caution when applying adhesive.



Precautions for Using Foam PVC

- (1) This type of material is not suitable for applications and locations that put it in direct physical contact with food products or beverages. Do not use it in such environments.
- (2) Wipe the surface with anti-static agent to prevent particles and dust from adhering to it due to static electricity. However, keep in mind that because this is a standard foamed plate, it may be more difficult to clean compared to non-foamed solid plates.

Physical Properties of Foam PVC (Chemical Resistance Data)

| Names of Chemicals | 20°C | 40°C |
|-----------------------|------|------|
| Hydrochloric acid | ○ | ○ |
| (Same) 35% | ○ | ○ |
| Sulfuric acid 10% | ○ | ○ |
| (Same) 30% | ○ | ○ |
| (Same) 50% | ○ | ○ |
| (Same) 90% | △ | × |
| Carbonic acid 100% | ○ | ○ |
| Acetic acid 10% | ○ | ○ |
| (Same) 30% | ○ | ○ |
| Methyl alcohol | ○ | △ |
| Ethyl acetate | × | × |
| Carbon tetrachloride | × | × |
| Methyl ethyl ketone | × | × |
| Glycerine | ○ | ○ |
| Glacial acetic acid | △ | × |
| Formic acid 5% | ○ | ○ |
| Oxalic acid Saturated | ○ | ○ |
| Citric acid 20% | ○ | ○ |
| Hydrogen peroxide 10% | ○ | ○ |
| Sodium hydroxide 10% | ○ | ○ |
| (Same) 30% | ○ | ○ |

| Names of Chemicals | 20°C | 40°C |
|------------------------------|------|------|
| Potassium hydroxide 10% | ○ | ○ |
| (Same) 30% | ○ | ○ |
| Calcium hydroxide | ○ | ○ |
| Ethyl alcohol | ○ | △ |
| Isopropyl alcohol | ○ | △ |
| Benzine | ○ | △ |
| Paraffin | △ | × |
| Trichloroethylene | × | × |
| Ammonium hydroxide 10% | ○ | ○ |
| Ammonium hydroxide Saturated | ○ | ○ |
| Magnesium hydroxide | ○ | ○ |
| Sodium chloride | ○ | ○ |
| Calcium chloride | ○ | ○ |
| Ammonium chloride | ○ | ○ |
| Aluminum chloride | ○ | ○ |
| Ammonium sulfate | ○ | ○ |
| Copper sulfate | ○ | ○ |
| Acetone | × | × |
| Cyclohexanone | × | × |
| Benzene | × | × |
| Gasoline | △ | × |
| Methylene chloride | × | × |
| Toluene | × | × |

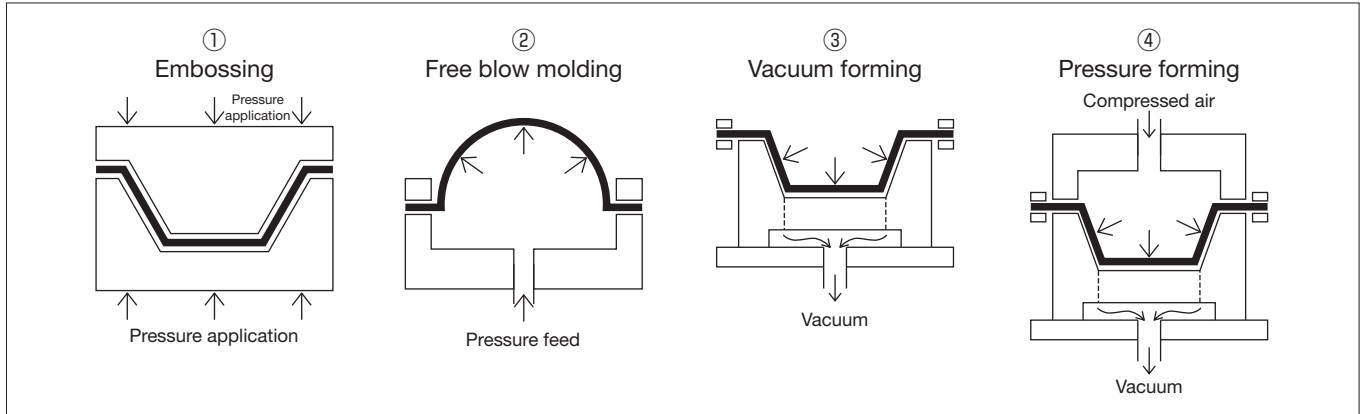
(○: Can be used △: Use with care ×: Corroded)

Molding and Processing Methods for Rigid PVC for Vacuum Forming

Types of Molding Methods

Takiron rigid PVC for vacuum forming is suitable for all standard embossing and vacuum-forming processes. Moreover, the material can produce a particularly sharp finish and achieve a uniform thickness when processed with the

pressure forming method, which is also ideal for deep-draw forming. By utilizing a grainy mold, you can create a molded product where the texture resembles that obtained with the injection process without any grain distortions.



Molding Temperature

The molding temperature for rigid PVC for vacuum forming depends on the molding method. However, the ideal range is usually between 170°C and 190°C. If the material absorbs too much humidity and starts foaming during the heating process, leave it to dry at 60°C to 70°C.

Printing and Coating

Use acrylic inks or paints when printing or coating on our rigid PVC for vacuum forming.

Machine Processing

● Cutting and drilling

This material will not chip if you cut it with a tipped saw, shearing machine, bandsaw, fretsaw, router machine, or a similar tool.

When drilling holes, use a standard drill for metals.

● Punching

The material is ideal for press punching processes and for punching processes with cutting dies.

● Cold bending

You can bend this type of PVC at room temperature by using a press brake or a similar machine. However, avoid performing this process at high temperatures since the material will likely return to its original form. Thermal bending is, of course, possible just like with standard PVC materials.

Binding

● Adhesion

Adhesive No. 200 is the most suitable adhesive for bonding parts made from rigid PVC for vacuum forming or for bonding parts made from this material to parts made from PVC.

● Welding

When welding parts made from rigid PVC for vacuum forming, use welding rods for impact-resistant plates or welding rods for PVC. This material is also suitable for hot jet welding.

● Screw mounting

The material does not crack easily, which is why it can be fixed to a surface with screws, rivets, or nails.

Handling Precautions

● Anti-static treatment

Rigid PVC plates and other standard plastic products tend to attract dust particles due to static electricity. Be sure to apply our anti-static agent to the surfaces.

● Storage

When storing rigid PVC for vacuum forming, be sure to protect it from getting warped or bent.

Processing Methods for Super PET Plates (Secondary Workability)

Machine Processing

Super PET plates can be cut, drilled, or otherwise machined just like any other standard plastics. The table below lists the standard conditions for various machining processes.

| Types of Processes | Tools | Blades | Blade Specifications | Blade Rotational Frequency | Feeding Speed | Precautions for Processing |
|--------------------|------------------|------------------------------------|--|----------------------------|---------------------|--|
| Straight cuts | Circular saw | Tipped saw | 80 to 120 teeth (ø 255 to 305) | 4,500 rpm | 3 to 8 m/min | Cutter recommended for up to 1.0 mm |
| Curved cuts | Jigsaw, bandsaw | 12.7 mm wide for finishing | 7 teeth/in 3 teeth/in | — 130 m/min | 1 m/min | — |
| Trimming | Router | High-speed steel with carbide tips | Diameter of 3/8 in | 20,000 rpm | 1 m/min | — |
| Drilling | Drill press | Drill bit | Point angle between 60° and 90° Clearance angle between 12° and 18° | 500 rpm | 0.25 to 0.64 mm/rev | To prevent cracking, make sure the hole exceeds the bolt diameter. |
| Milling | Milling machine | Tip | Spiral blade | 500 rpm | 120 mm/min | Cutting dimensions and precision can be improved by using air or water cooling. |
| Punching | Hydraulic system | Cutting die | Blade thickness of 0.7 mm | — | — | Use this method to process plates that are not thicker than 1.5 mm. Determine the number of cuts according to the hydraulic performance, plate thickness, and plate shape. |
| Hole punching | Electric puncher | Blade | Clearance of 0.025 mm | — | — | This tool is suitable for plates that are not thicker than approx. 2.5 mm. Use a drill or a similar tool when machining plates that are thicker than that. |

[Remarks] Punching holes with a 3 mm diameter and 7 mm square pitch (open area rate: 14.4%) in super PET plates reduces the amount of burrs (plate thickness: 3 mm).

Adhesion Processing

Use either Adhesive No. 700 (for surface adhesion) or Adhesive No. 750 (quick-drying type for edge adhesion) since these adhesives are best suited for super PET plates. Also, if you need to increase the adhesion strength, we recommend reinforcing the corners with dedicated adhesive rods (Welding rods PET PT006).

● Specifications

| Product Types | Description | Packaging | Remarks |
|---------------|---|--------------------------------------|---------------------------------------|
| Adhesive 700 | Colorless transparent liquid with a fluid texture | 1 kg x 12 = 12 kg (1 c/s), round can | For surface adhesion |
| Adhesive 750 | | 1 kg x 6 = 6 kg (1 c/s), round can | For edge adhesion (quick-drying type) |

● Characteristics

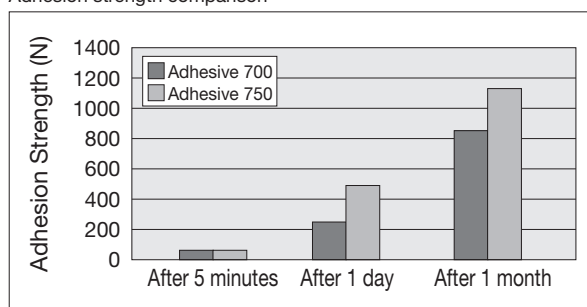
| Adhesive 700 | Adhesive 750 |
|---|---|
| 1. This product is suitable for surface adhesion processes that require a high level of transparency and a polished look. | 1. Compared to Adhesive 700, this adhesive is stronger and therefore suitable for edge adhesion processes. |
| 2. It is easy to work with due to its excellent capability of permeating through surfaces. | 2. It is easy to work with due to its excellent capability of permeating through surfaces. |
| 3. Once applied, its adhesion strength increases at a relatively moderate pace. | 3. Its adhesion strength increases at an outstanding pace immediately after application. (Also, type 750 dries very quickly.) |

● Evaluation table for super PET plate adhesives

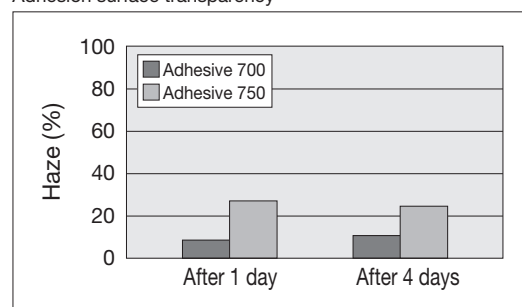
| Product Types | Applications | Adhesion Strength | Permeating Ability | Adhesion Surface Transparency | Initial Adhesion Performance |
|---------------|----------------------|-------------------|--------------------|-------------------------------|------------------------------|
| Adhesive 700 | For surface adhesion | ☆☆ | ☆☆☆ | ☆☆☆ | ☆ |
| Adhesive 750 | For edge adhesion | ☆☆☆ | ☆☆☆ | ☆☆ | ☆☆☆ |

*The table above merely provides a relative evaluation by comparing Adhesive 700 and 750. It does not represent an evaluation on an absolute scale.

Adhesion strength comparison



Adhesion surface transparency



*The above data are a series of test results and given here without guarantee.



Warning

In particular, be sure to take the necessary steps to ensure fire safety and adequate ventilation when performing adhesion processes.

● Instructions for using Adhesive No. 700/750

- Use these adhesives to bond super PET plates.
*However, they are not very strong when used with acrylic. Do not use them to bond super PET plates with acrylic parts.
- You can use a glass syringe to apply them.
- Applying an excessive amount of these adhesives results in material fogginess. Be sure to only apply the minimum necessary amount.
- We recommend pressurizing the surface after the adhesives have been applied in order to increase their strength.
- If you leave the adhesive container open after you finishing using it, the chemical components inside will vaporize, which can change the adhesion performance of the product. Be sure to keep the container properly sealed when you do not use it.
- Keep in mind that the adhesion surface tends to whiten in highly humid environments.
- The estimated pressure adhesion strength of Adhesive No. 700 between super PET plates is 1/2 to 1/3 the adhesion strength of Adhesive No. 200 between PVC plates.
- Adhesive No. 750 is designed to be used as an edge adhesive for super PET plates and is therefore unsuitable for bonding surfaces.
- These adhesives contain flammable solvents. Do not use them in environments where they could catch fire. For more information about the chemical components in the adhesives, refer to p. 19.
- Install local exhaust systems in the locations where you are planning to use and work with these adhesives.

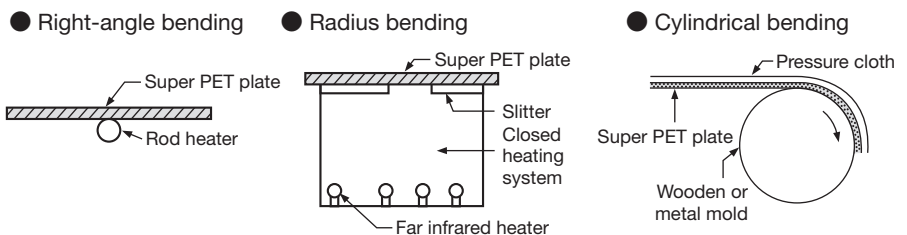
Bending

● Thermal bending

By using rod heaters, bending machines with slit heaters, or furnaces for thermal bending processes with super PET plates, you can use the right-angle, radius, or cylindrical bending method just like with any other standard plastics. Using a square rod heater for thermal bending processes with thin plates (1.5 mm or less) will result in sharper bends. When bending thick plates (2.0 mm or more), on the other hand, using a round rod heater will prevent narrowing anomalies on the outer side of the bend and allow you to create an elegant curve. In cold processes, you can also use the bending or cylindrical bending method.

| Types of Processes | Tools | Processing Conditions |
|---------------------|--|---|
| Right-angle bending | Rod heater (round type) | When a plate is 3 mm thick, the ideal heater temperature is 140°C and the ideal heating time is 40 seconds. If you continue heating the plate for too long, the material on its surface will melt and stick to the heater, which will damage the appearance of the product. |
| Radius bending | Bending machine with a slit heater, forming mold | When a plate is 3 mm thick, the ideal surface temperature is 120°C and the ideal heating time is 10 minutes. |
| Cylindrical bending | Furnace, pressure cloth, forming mold | When a plate is 3 mm thick, the standard furnace temperature is 120°C and the standard heating time is approximately 5 minutes. |

[Remarks]
Types of thermal bending methods



● Cold bending

Compared to other materials, super PET plates are better suited for cold bending processes and less prone to whitening in the bend section. However, we recommend applying the cold bending method to plates that are not thicker than 2 mm in order to prevent any drops in structural strength due to stress. (For plates that are thicker than 2 mm, we recommend the thermal bending method.) However, keep in mind that applying the cold bending method to the same section of the plate multiple times may eventually cause the material to get stretched, deformed, or weakened.

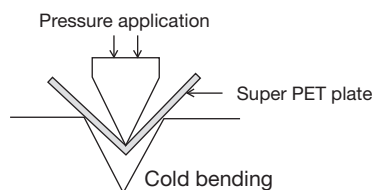
| Types of Processes | Tools and Other Items | Conditions and Precautions | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------------|-----------------------|--|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|-----|-----|-----|-----|-----|-----|-----|-----|---|---|-----|-----|-----|-----|-----|
| Bending | Hand bending | The amount of work that an operator can handle depends on the size of the plate. Our estimate is that the maximum thickness limit for hand bending is about 1.5 mm. Make sure you are aware of these differences before starting to design a product. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Hydraulic press brake | <p>The table below shows how the bend angle changes over time during right-angle bending at room temperature. The estimated long-term angle return at room temperature is between 2° and 3°. Be sure to keep that in mind when setting the initial finish angle.</p> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Thickness (mm) \ Time (h)</th> <th>1</th> <th>7</th> <th>24</th> <th>48</th> <th>72</th> <th>120</th> <th>144</th> <th>168</th> </tr> </thead> <tbody> <tr> <td>1.0</td> <td>0</td> <td>0.5</td> <td>0.5</td> <td>1.0</td> <td>1.5</td> <td>1.5</td> <td>2.0</td> <td>2.0</td> </tr> <tr> <td>2.0</td> <td>0</td> <td>0</td> <td>0.5</td> <td>1.0</td> <td>1.5</td> <td>2.0</td> <td>2.0</td> <td>2.0</td> </tr> </tbody> </table> <p style="text-align: right;">(20°C) Unit: °(degrees)</p> <p>*The above data are a series of test results and given here without guarantee. *Keep in mind that, compared to room temperature environments, angle return tends to increase at high temperatures. *If you think the angle return phenomenon could cause issues during use, consider opting for the thermal bending method instead.</p> | Thickness (mm) \ Time (h) | 1 | 7 | 24 | 48 | 72 | 120 | 144 | 168 | 1.0 | 0 | 0.5 | 0.5 | 1.0 | 1.5 | 1.5 | 2.0 | 2.0 | 2.0 | 0 | 0 | 0.5 | 1.0 | 1.5 | 2.0 | 2.0 |
| Thickness (mm) \ Time (h) | 1 | 7 | 24 | 48 | 72 | 120 | 144 | 168 | | | | | | | | | | | | | | | | | | | | |
| 1.0 | 0 | 0.5 | 0.5 | 1.0 | 1.5 | 1.5 | 2.0 | 2.0 | | | | | | | | | | | | | | | | | | | | |
| 2.0 | 0 | 0 | 0.5 | 1.0 | 1.5 | 2.0 | 2.0 | 2.0 | | | | | | | | | | | | | | | | | | | | |
| Cylindrical bending Radius bending | - | We recommend making the radius of the cylinder at least 100 times larger than the plate thickness . A small radius may cause the plate to start cracking quickly due to stress. Also, using an industrial dryer to gently heat the entire surface can mitigate stress and reduce the stress applied on the coupling. | | | | | | | | | | | | | | | | | | | | | | | | | | |



Caution

Be aware that the processed section is under stress and can therefore start cracking if it comes into contact with cutting oils or solutions.

[Remarks]
Cold bending method



Caution

Processing Methods for Rigid PVC Plates

[1] Cutting



This type of PVC can be cut by a shearing machine, circular saw for plastic or wood, bandsaw, fretsaw, or handsaw. Compared to wood or metal, it is more susceptible to humidity. If it starts turning viscous during work, use air or a similar cooling source to keep the temperature low during the cutting process. If the cutting surface starts chipping or cracking, replace the blade you are currently using with a sharper one.

[2] Machine Processing



You can use machine tools for metals or wood to drill, punch, machine, or otherwise process rigid PVC plates. (Be careful not to accidentally make notches or similar cuts in the surface.) Use a drill or a similar blade that is sharp enough to cut through the material. (Be sure to always keep your hands away from the blade during drilling or punching processes.) During machining, use water and water-soluble cutting oil to keep the cutting surface as cool as possible.

[3] Heat Processing



● Bending

The optimal surface temperature of the rod heater for standard PVC plates and heat-resistant PVC plates is approximately 150°C and 170°C respectively. If the processing temperature is too high, the material may become viscous and the bend section may start to crack. If, however, the temperature is too low, you may need to use force to bend the material, which can lead to residual deformation issues. Exercise caution during work. When using a pipe heater or a similar tool for the thermal bending process, be sure to wear gloves to protect your hands during work.

● Radius bending and embossing

Use an oil solvent (vegetable oil, liquid paraffin, or glycol), infrared light, electric heat, hot air, or a similar source to heat the material. In order to heat the entire surface, you need to estimate the contraction margin before you cut the material.

[4] Lining



● Installing loose linings

This method involves mounting the plates along the can body without fixing the plates to the lined object. It is important to mount the plates along the can body by decreasing the space between the lined object and the plates as much as possible. This method is not suitable for environments where the lined object is exposed to external impacts or significant temperature fluctuations.

● Installing adhesive linings

This process involves using plates that are approximately 1.5 mm to 3 mm thick, applying rubber adhesive to them, and attaching them to the lined object. As long as it is performed in a secure manner, this is the safest possible method because it dissipates stress. Use chloroprene rubber adhesives for standard rigid PVC plates, and use Bond G-18H (manufactured by Konishi Co., Ltd.) for heat-resistant PVC plates. If the lined object is made from concrete or wood, the adhesive may not perform well due to moisture. Be sure to dry the surfaces properly before attaching the linings. If the object is made from concrete, use an approximately 5% hydrochloric acid solution to remove the alkaline content and thoroughly wash the surfaces with water.

[5] Welding



To weld the material, you can use Takiron welding rods and a commercially available hot jet welder.

[6] Adhesion Processing



To bond multiple plates, use Adhesive No. 200 (quick-drying adhesive). Solvents may cause heat-resistant transparent PVC to crack. Thus, avoid using Adhesive No. 200 with this type of PVC whenever possible. Adhesive No. 200 is an organic solvent, which is why it must never be used in environments where it could catch fire. (Use near open flames is strictly forbidden.) If during adhesion processing some of the adhesive enters your eyes or if you accidentally inhale the adhesive vapors and start feeling sick, consult your physician immediately.

[7] Finishing Processed Surfaces



Blow any residue off the processed surfaces, and then wipe them with some anti-static agent and neutral detergent. If there are any oil stains, wipe them off gently with a cloth soaked in isopropyl alcohol. (Caution: Acetone, MEK, or similar solvents can corrode the surface.)

[8] Packaging Processed Products



Using soft PVC wrap to package processed products can lead to material cracks and fogginess. Avoid using soft PVC wrap for packaging.

[9] Other



Be sure to keep your workspace properly ventilated when using solvents and when cutting or welding processes generate gases.

*For details about the processing methods for rigid PVC plates, refer to "Technical Data for Processing" related to Takiron Plates.

*Polycarbonate plates, super PET plates, and other materials may require different processing techniques compared to rigid PVC plates. Refer to the corresponding product catalog and technical data or contact us.



Caution

Precautions for Using Polycarbonate Plates

- (1) Avoid using these plates in locations where coatings or solvents are present because such substances can corrode or crack the surface. Also, always wait for the coating to dry completely before mounting the plates.
- (2) The surface is more prone to damage compared to other materials like glass. Make sure it always stays protected. When the interior or exterior of a building where the polycarbonate plates are mounted is under construction, use some film or a similar type of material to cover and protect the plates.
- (3) When drilling bolt holes that are used for mounting, make sure their diameter is 2 to 4 mm larger than the bolt diameter to compensate for any contraction or expansion of the material caused by temperature fluctuations.
- (4) Do not hit the plates with excessive force, step on them, or carry out any similar dangerous acts.
- (5) If you need to use sealing material, make sure you choose a dedicated silicone sealant for polycarbonate.

| | |
|---|--------------------|
| Momentive Performance Materials Japan LLC | Tosseal 380 |
| Dow Corning Toray Co., Ltd. | SE960 |
| Shin-Etsu Chemical Co., Ltd. | Sealant-72 |
| Cemedine Co., Ltd. | 8051N |

Choose one of the products listed in the table above.

*Any other types of sealing materials, such as primers or acetic acid silicones, may corrode or crack the surfaces of polycarbonate plates.

- (6) If the surface gets contaminated, wipe it gently with a soft cloth soaked in a 1/200 water dilution of a neutral detergent. (If you use undiluted detergent, it may cause the material to crack.) Never use abrasive cleansers, alkaline detergents, scrub brushes, or hard fiber cloths.
- (7) After using IPA or anti-static agent, make sure you let the surfaces dry properly. If you package the plates before they dry properly, the solvent vapors may cause the material to crack. Do not use anti-static agent on products that are designed for highly clean environments. The anti-static residue that remains on the surface may cause issues.
We recommend using neutral detergents (1/200 water dilutions) on parts that undergo stress loads (parts where bolts are tightened or where bending processes are carried out). However, be sure to completely remove the detergent after work as its residue may cause issues.

Chemicals that should generally not be used with polycarbonate plates

| A | Chemicals that do not greatly affect any physical properties but do cause discoloration | <ul style="list-style-type: none"> ● Acids (low concentrations), hydrogen peroxide solutions (high concentrations), chlorine |
|---|---|---|
| B | Chemicals that cause the material to crack, craze, and swell | <ul style="list-style-type: none"> ● Acetic acid (70% or more) ● Gasoline ● Methyl isobutyl ketone, ethyl acetate, butyl acetate ● Methyl methacrylate, ethyl ether, MEK ● Acetone, m-amino alcohol, carbon tetrachloride ● Carbon dioxide, trichloroethylene, creosol ● Various thinners, turpentine ● Triethanolamine, ethyl triamine, TCP, TBP |
| C | Chemicals that dissolve the material Solvents are listed in the brackets. | <ul style="list-style-type: none"> ● Concentrated sulfuric acid ● Benzene, toluene ● Styrene, acrylonitrile, vinyl acetate ● Ethylenediamine, diethylenetriamine { Chloroform, methylene chloride, carbon tetrachloride, dioxane, 1,2-dichloroethane } |
| D | Chemicals that cause cracks and deterioration of physical properties | <ul style="list-style-type: none"> ● Ammonia water ● Other alkalis |

- Takiron polycarbonate plates remain relatively stable when used with weak acids, alcohols, and similar substances. However, they get dissolved by alkalis, aromatic hydrocarbons, and chlorinated aliphatic hydrocarbons.
- Chemical resistance changes according to temperature and stress. Before using these plates with liquid chemicals (including pesticides and disinfectants), make sure you properly test the plates or contact us for guidance.



Precautions for Handling Takiron Plates

1

Precautions for Use

- When using Takiron plates, make sure you choose a material that is suitable for the type of environment where the product is going to be used, namely the temperature, exposure to chemicals, conditions that require weather resistance (UV radiation effects), and the like.
- When designing products, it is important not to rely only on strength calculations and other theoretical documentation but to also take into consideration empirical data related to processing surfaces and other elements.
- Keep in mind that flammable plates (such as PP, PE, ABS, or PET-G) with the oxygen index below 26 are considered special flammable goods according to the Fire Service Act and as such subject to legal limitations regarding buildings, quantities, fire extinguishers, and other factors.
- The evaluation figures for physical properties, chemical resistance, and other characteristics are descriptive and given here without guarantee.
- If the PVC plates included in the catalog come into contact with substances that dissolve PVC materials, such as soft PVC that contains plasticizer, various types of rubbers, or cleaners that contain thinner, the contact surface may start to dissolve or become rough. Therefore, be sure to prevent any such contact.
- Make sure you choose a type of material that meets the JIS and UL standards, stipulations in the Food Sanitation Act, and other requirements according to the purpose of use of the product you are going to design.

2

Precautions for Processing

- When processing Takiron plates, wear gloves, protective goggles, and other necessary protective equipment. Also, make sure you use adequate tools and machinery.
- Cutting and welding these plates may generate gases. Keep your workspace properly ventilated.
- Solvents and adhesives may cause intoxication, fires, explosions, and similar accidents. Always keep your workspace ventilated, avoid using these substances in environments where they could catch fire, and observe the instructions and precautions related to their use.

3

Precautions for Storage and Transportation

- When storing Takiron plates, make sure they are in a horizontal position. If you leave them in a diagonal position, they will start bending and warping.
- If the protective film on Takiron plates gets wet, you may have difficulty peeling it off afterwards. Exercise caution when handling the plates.
- Avoid exposing the plates to direct sunlight or shipping processed products at high temperatures.
- Keep in mind that the plates and supporting materials for processing may get discolored if they are exposed to rain or direct sunlight.

4

Precautions for Disposal

- If PVC, vinylidene fluoride resins, and similar materials are burnt, they generate toxic gases. Hire a certified industrial waste disposal company to dispose of such materials.
- If flammable plates made from materials such as polypropylene are burnt, they may generate a large amount of heat and emit CO gases. Do not burn such materials.
- To dispose of industrial waste in accordance with the laws and regulations, hire a certified industrial waste disposal company.

5

Precautions for Handling Adhesives Warning

- Adhesives are flammable. Make sure that you do not use them in environments where they could catch fire and that your workspace is properly ventilated.
- Adhesives are volatile organic solvents and can have harmful effects on your health if inhaled. Handle these substances with caution.
- Thoroughly wash your hands and face after you finish using adhesives.
- If adhesives come into contact with your skin or enter your eyes, they can cause injuries. Always wear protective goggles, gloves, and other protective equipment during work. If you feel any discomfort, consult your physician immediately.
- Because adhesives are volatile, their performance may change. Be sure to always keep their containers sealed.
- In order to export Adhesive No. 700, you need to obtain an export permit from the government of Japan (based on an export permit application submitted to the Ministry of Economy, Trade and Industry) in accordance with the Foreign Exchange and Foreign Trade Act.

*Handling methods may differ depending on the type of adhesive. For more information, refer to the Material Safety Data Sheet (MSDS).

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