

FM4910 Listed Materials



Specification Tested

FM4910 Listed Material

 TAKIRON CO., LTD.

 TAKIRON™

FM PLATE

 TAKIRON CO., LTD.

FM4910 is ...

FM4910 is a test protocol that stipulates the allowable quantity of smoke produced by the burning of plastics and the flame retardance level of plastics used in clean rooms as established by FM Approvals.

This protocol is closely related to that of loss prevention in the case of a fire in semiconductor manufacturing facilities, and to the demands of fire insurance companies.

It is generally appreciated that the FM4910 listed materials are suitable for the cabinets and various pieces of process equipment used to manufacture semiconductors. Takiron has developed and manufactured FM4910 listed materials designed for semiconductor process equipment for many years. Takiron is global main supplier of various FM4910 listed materials.

- ① FPI : Fire Propagation Index ≤ 6
- ② SDI : Smoke Damage Index ≤ 0.4
- ③ CDI : Corrosion Damage Index ≤ 1.1 (Non-obligatory criterion)

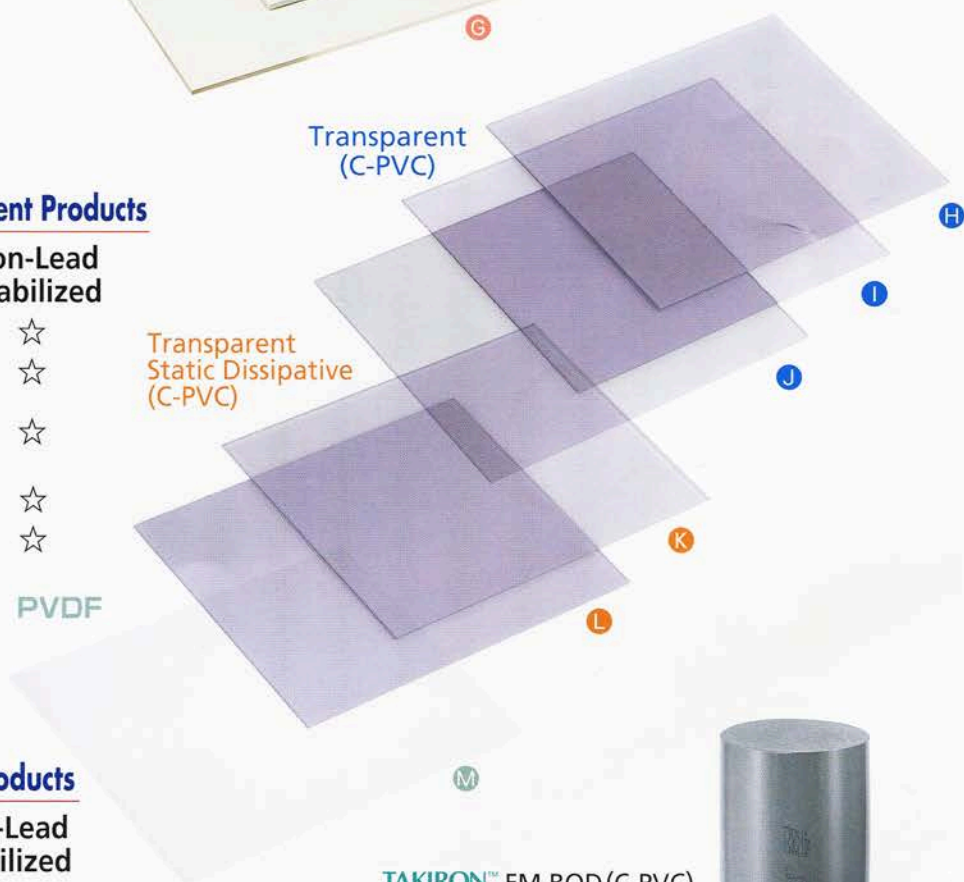
TAKIRON™ FM4910 Listed Opaque Products

| | Code | Color | Non-Lead Stabilized |
|--------------|---|-----------|---------------------|
| NEW A | FMET 4735 | New White | ☆ |
| B | FMT 3331 | Ivory | |
| C | FMT 3700 | White | |
| D | FMET 4325 | New Ivory | ☆ |
| E | FMH 5300 | Ivory | |
| F | FMH 5305 | New Ivory | ☆ |
| G | FMHL 5310 | Ivory | |
| | (With improved chemical contact property) | | |



TAKIRON™ FM4910 Listed Transparent Products

| | Code | Color | Non-Lead Stabilized |
|---|---|-------------|---------------------|
| H | FMHS 5650 | Transparent | ☆ |
| I | FMHS 6650* | Transparent | ☆ |
| | (*Enhanced transparent product) | | |
| J | FMSL 5670 | Transparent | ☆ |
| | (With improved chemical contact property) | | |
| K | FMND 7605 | Transparent | ☆ |
| L | FMND MR760 | Transparent | ☆ |



TAKIRON™ FM4910 Listed PVDF Products

| | Code | Color | Non-Lead Stabilized |
|---|-------------|---------|---------------------|
| M | FMPVDF F300 | Natural | ☆ |

TAKIRON™ FM ROD (C-PVC)
FMH-ROD (Gray)



TAKIRON™ FM PLATE

| Group | Code | Lead-Free | Color | Size (mm) | Thickness(mm) | | | | | | | | | | | | |
|-------|------|-----------|-------|-----------|---------------|---|---|---|----|----|----|----|----|----|----|--|--|
| | | | | | 3 | 5 | 6 | 8 | 10 | 12 | 15 | 20 | 25 | 30 | 40 | | |

◆ PVC

| | | | | | | | | | | | | | | | | |
|---------|------|---|-----------|-------------|---|---|---|---|---|---|---|---|---|---|---|--|
| F M T | 3331 | — | Ivory | 1,000×2,000 | ④ | ③ | | ① | ① | | ① | ① | ① | | ① | |
| | | | | 1,212×2,424 | ③ | ② | | ① | ① | | | | | | | |
| | 3700 | — | White | 1,000×2,000 | ※ | ※ | | ※ | ※ | | | | | | | |
| | | | | 1,212×2,424 | ※ | ※ | | ※ | ※ | | | | | | | |
| F M E T | 4325 | ○ | New Ivory | 1,000×2,000 | | ③ | | ① | ① | | | ※ | | ※ | ※ | |
| | | | | 1,212×2,424 | | ② | ※ | ※ | ① | ※ | | | | | | |

| Group | Code | Lead-Free | Color | Size | | Thickness | |
|---------|------|-----------|-----------|---------|-------------|-------------------------------|--|
| | | | | inch | mm | | |
| F M E T | 4735 | ○ | New White | | 1,000×2,000 | 20mm, 25mm | |
| | | | | 48"×96" | 1,220×2,440 | 3/16", 1/4", 3/8", 1/2"(inch) | |

※:Post Order Production. Please inquire.

(Note) Colors shown in this leaflet are rough visual images and not to be regarded as color references of the products.

| Group | Code | Lead-Free | Color | Size (mm) | Thickness(mm) | | | | | | | | | | |
|-------|------|-----------|-------|-----------|---------------|---|---|----|----|----|----|----|----|----|--|
| | | | | | 3 | 5 | 8 | 10 | 12 | 15 | 20 | 25 | 30 | 40 | |

◆ C-PVC

| | | | | | | | | | | | | | | | | |
|--|------|---|-----------|-------------|---|---|--|---|--|---|---|---|---|---|--|--|
| F M H | 5300 | — | Ivory | 1,000×2,000 | ④ | ③ | | ① | | ① | ① | ① | ① | ① | | |
| | | | | 1,212×2,424 | ③ | ② | | ① | | | | | | | | |
| | 5305 | ○ | New Ivory | 1,000×2,000 | ④ | ③ | | ① | | ① | ① | | | | | |
| | | | | 1,212×2,424 | | ② | | ① | | | | | | | | |
| F M H L (with improved chemical contact property) | 5310 | — | Ivory | 1,000×2,000 | | ③ | | ① | | | | | | | | |
| | | | | 1,212×2,424 | | ② | | ① | | | | | | | | |

(Note) Colors shown in this leaflet are rough visual images and not to be regarded as color references of the products.

| Group | Code | Lead-Free | Color | Size (mm) | Thickness(mm) | | | | | | | | |
|-------|------|-----------|-------|-----------|---------------|---|---|----|----|----|----|----|--|
| | | | | | 3 | 5 | 8 | 10 | 12 | 15 | 20 | 25 | |

◆ Transparent (C-PVC)

| | | | | | | | | | | | | | | | | |
|--|------|---|-------------|-------------|---|---|--|---|---|---|--|--|--|--|--|--|
| F M H S | 5650 | ○ | Transparent | 1,000×2,000 | ④ | ③ | | ① | ① | | | | | | | |
| | | | | 1,212×2,424 | ③ | ② | | | | | | | | | | |
| | 6650 | ○ | Transparent | 1,000×2,000 | ④ | ③ | | ① | ① | ※ | | | | | | |
| | | | | 1,212×2,424 | ③ | ② | | ① | ① | ※ | | | | | | |
| F M S L (with improved chemical contact property) | 5670 | ○ | Transparent | 1,000×2,000 | | ③ | | ① | ① | | | | | | | |

※:Post Order Production. Please inquire.

(Note) Colors shown in this leaflet are rough visual images and not to be regarded as color references of the products.

| Group | Code | Lead-Free | Color | Size (mm) | Thickness(mm) | | | | | | | | |
|-------|------|-----------|-------|-----------|---------------|---|---|----|----|----|----|----|--|
| | | | | | 3 | 5 | 8 | 10 | 12 | 15 | 20 | 25 | |

◆ Transparent Static Dissipative (C-PVC)

| | | | | | | | | | | | | | | | | |
|--------------------------|-------|---|-------------|-------------|---|---|--|---|---|--|--|--|--|--|--|--|
| F M N D | 7605 | ○ | Transparent | 1,000×2,000 | ④ | ③ | | ① | ① | | | | | | | |
| | | | | 1,212×2,424 | ③ | ② | | ① | ① | | | | | | | |
| F M N D (Hard coated) | MR760 | ○ | Transparent | 1,212×2,424 | ③ | ② | | | | | | | | | | |

※:Post Order Production. Please inquire.

(Note) Colors shown in this leaflet are rough visual images and not to be regarded as color references of the products.

| Group | Code | Lead-Free | Color | Size (mm) | Thickness(mm) | | | | | | | | | | |
|-------|------|-----------|-------|-----------|---------------|---|---|----|----|----|----|----|----|----|--|
| | | | | | 3 | 5 | 8 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | |

◆ PVDF

| | | | | | | | | | | | | | | | | |
|--------|------|---|---------|-------------|---|---|---|---|---|---|---|---|---|---|--|--|
| FMPVDF | F300 | ○ | Natural | 490×1,000 | | | | | | ① | ① | ① | ① | ① | | |
| | | | | 1,000×2,000 | ① | ① | ① | ① | ① | ① | | | | | | |

(Note) Colors shown in this leaflet are rough visual images and not to be regarded as color references of the products.

◆ Rod (C-PVC)

| Code | Lead-Free | Color | Length | Diameter (mm) | | | | | | | |
|---------|-----------|-------|--------|---------------|----|----|----|----|----|----|--|
| | | | | 20 | 30 | 40 | 50 | 60 | 70 | 80 | |
| FMH-ROD | — | Gray | 1m | ※ | ※ | ※ | ※ | ※ | ※ | ※ | |

※:Post Order Production. Please inquire.

(Note) Color shown in this leaflet are rough visual images and not to be regarded as color references of the products.

Features of Takiron FM Plate

- Less ignitable. Flames will not easily spread over Takiron FM Plates.
- Takiron FM Plates produce a small quantity of smoke after ignition.
- Takiron FM Plates emit a small quantity of corrosive gas.
(The FMH5300 and the FMHL5310 have corrosion damage index CDI ≤ 1.1)
- High chemical resistance
- Easy to fabricate
(Except for FMND MR)

Features of FMET4735 and FMET4325

- Low contraction and low expansion in heat
- Applicable for thermoforming

Features of Static Dissipative FMND

- The world's first Static Dissipative C-PVC plate that complies with the FM4910 standard
The FMND has a surface resistance of $10^6 \sim 10^8 \Omega/\square$ which is an excellent static dissipative effect level. Despite changes in temperature and humidity, the FMND maintains its features.

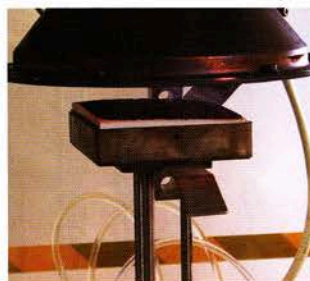
Fire safety evaluation for FM-certified material (comparison with conventional PVC, FRPP)

Flammability test with cone calorimeter (which complies with ISO5660, ASTM E 1354)

Takiron FM Plate
(FMH5300)



Ignited using an electric spark of 10,000 V.



35 seconds later



It is carbonizes without ignition.

Did not Ignite

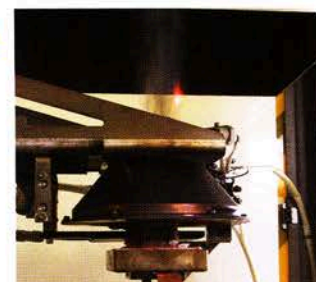
Conventional PVC Plate



Starting test



Ignited

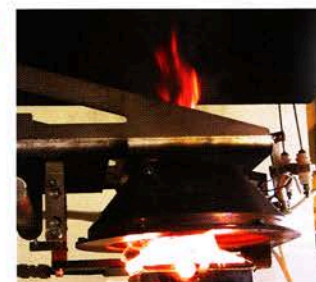


5 minutes later

FRPP Plate
(UL94 V-0)



Ignited



Schematic view of the three materials burned



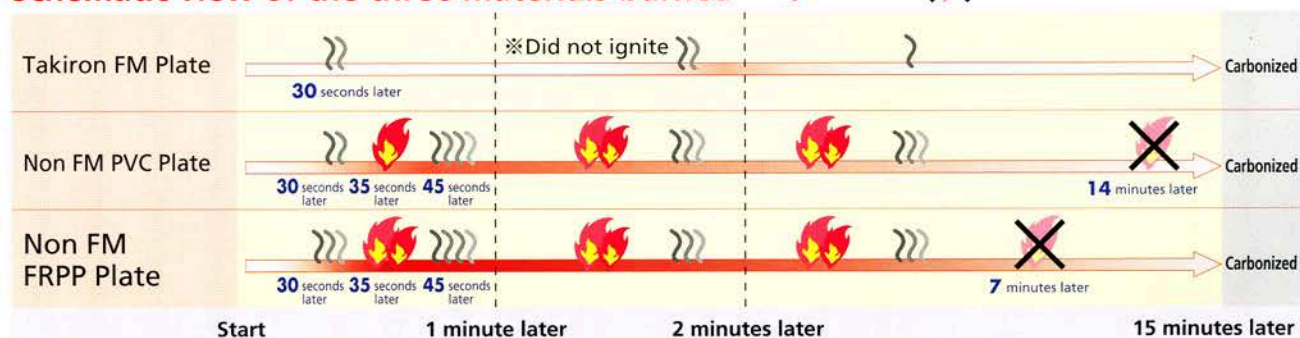
: Ignited



: Extinguished



: Quantity of smoke



• The FM plate degree of burning varies depending on product type.

Properties

◆ PVC

| Item | Unit | Value | | | | | | test method |
|--|-------------------|----------|----------|----------|----------|----------|----------|------------------------------------|
| | | FMT3331 | FMT3700 | FMET4325 | FMET4735 | TSP333 | RTSP1330 | |
| Specific Gravity | — | 1.55 | 1.55 | 1.45 | 1.45 | 1.45 | 1.45 | JIS K7112 (MOD ISO 1183) |
| Tensile Stress at Yield | MPa | 56 | 56 | 58 | 58 | 59 | 58 | JIS K7162-1B/50 (IDT ISO 527-2) |
| Nominal Tensile Strain at Break | % | 16 | 16 | 13 | 13 | 14 | 20 | JIS K7162-1B/50 (IDT ISO 527-2) |
| Modulus of Elasticity in Tension | MPa | 3400 | 3400 | 2900 | 2900 | 3100 | 3100 | JIS K7162-1B/1 (IDT ISO 527-2) |
| Flexural Stress | MPa | 78 | 78 | 77 | 77 | 85 | 83 | JIS K7171 (IDT ISO 178) |
| Flexural Modulus | MPa | 3600 | 3600 | 2900 | 2900 | 3200 | 3000 | |
| Charpy Impact Strength (Notched) | kJ/m ² | 10 | 10 | 5.2 | 5.2 | 6.3 | 4.2 | JIS K7111-1epA (MOD ISO 179) |
| Vicat Softening Temperature | °C | 81 | 81 | 81 | 81 | 83 | 81 | JIS K7206 (B method) (MOD ISO 306) |
| Temperature of Deflection under load | °C | 76 | 76 | 73 | 73 | 76 | 75 | JIS K7191 |
| Dimensional Change on Heating (140°C, 55 min.) | Longitudinal % | -3 | -3 | -2 | -2 | -3 | -2 | JIS K7133 (IDT ISO 11501) |
| | Latitudinal % | -2 | -2 | -1 | -1 | -2 | -1 | |
| Conforming Fire Retardant Standards | — | FM4910 | FM4910 | FM4910 | FM4910 | — | — | FM4910 |
| | | UL94 V-0 | UL94 V-0 | UL94 V-0 | — | UL94 V-0 | UL94 V-0 | UL94 |

• The above data are typical test results (of 5mm thick specimen) and given here without guarantee.

◆ C-PVC

| Item | Unit | Value | | | | | test method |
|--|-------------------|----------|---------|----------------|----------|----------------|------------------------------------|
| | | FMH5300 | FMH5305 | FMHL5310 | HT925 | HTL357 | |
| Specific Gravity | — | 1.75 | 1.55 | 1.63 | 1.65 | 1.58 | JIS K7112 (MOD ISO 1183) |
| Tensile Stress at Yield | MPa | 54 | 63 | 55 | 60 | 59 | JIS K7162-1B/50 (IDT ISO 527-2) |
| Nominal Tensile Strain at Break | % | 23 | 20 | 22 | 25 | 25 | JIS K7162-1B/50 (IDT ISO 527-2) |
| Modulus of Elasticity in Tension | MPa | 3300 | 3000 | 3300 | 3100 | 3200 | JIS K7162-1B/1 (IDT ISO 527-2) |
| Flexural Stress | MPa | 81 | 88 | 83 | 87 | 84 | JIS K7171 (IDT ISO 178) |
| Flexural Modulus | MPa | 3300 | 3000 | 3300 | 3200 | 3200 | |
| Charpy Impact Strength (Notched) | kJ/m ² | 12 | 7.2 | 8.4 | 7.7 | 8.4 | JIS K7111-1epA (MOD ISO 179) |
| Vicat Softening Temperature | °C | 105 | 97 | Not Applicable | 107 | Not Applicable | JIS K7206 (B method) (MOD ISO 306) |
| Temperature of Deflection under load | °C | 94 | 86 | 85 | 95 | 90 | JIS K7191 |
| Dimensional Change on Heating (140°C, 55 min.) | Longitudinal % | -3 | -4 | -3 | -5 | -4 | JIS K7133 (IDT ISO 11501) |
| | Latitudinal % | -2 | -1 | -2 | -1 | -1 | |
| Conforming Fire Retardant Standards | — | FM4910 | FM4910 | FM4910 | — | — | FM4910 |
| | | UL94 V-0 | — | UL94 V-0 | UL94 V-0 | UL94 V-0 | UL94 |

• The above data are typical test results (of 5mm thick specimen) and given here without guarantee.

◆ Transparent (C-PVC)

| Item | Unit | Value | | | | test method |
|--|-------------------|----------|----------|----------------|----------|------------------------------------|
| | | FMHS5650 | FMHS6650 | FMSL5670 | HTS625 | |
| Specific Gravity | — | 1.55 | 1.46 | 1.55 | 1.55 | JIS K7112 (MOD ISO 1183) |
| Tensile Stress at Yield | MPa | 71 | 74 | 69 | 70 | JIS K7162-1B/50 (IDT ISO 527-2) |
| Nominal Tensile Strain at Break | % | 12 | 12 | 22 | 15 | JIS K7162-1B/50 (IDT ISO 527-2) |
| Modulus of Elasticity in Tension | MPa | 3100 | 3300 | 3000 | 3200 | JIS K7162-1B/1 (IDT ISO 527-2) |
| Flexural Stress | MPa | 98 | 99 | 93 | 98 | JIS K7171 (IDT ISO 178) |
| Flexural Modulus | MPa | 3200 | 3300 | 3000 | 3200 | |
| Charpy Impact Strength (Notched) | kJ/m ² | 2.2 | 1.6 | 2.4 | 2.2 | JIS K7111-1epA (MOD ISO 179) |
| Vicat Softening Temperature | °C | 98 | 94 | Not Applicable | 99 | JIS K7206 (B method) (MOD ISO 306) |
| Temperature of Deflection under load | °C | 88 | 85 | 84 | 88 | JIS K7191 |
| Dimensional Change on Heating (140°C, 55 min.) | Longitudinal % | -5 | -5 | -5 | -5 | JIS K7133 (IDT ISO 11501) |
| | Latitudinal % | -2 | 0.5 | -2 | -2 | |
| Total Light Transmittance | % | 54 | 71 | 58 | 55 | JIS K7361-1 (IDT ISO 13468-1) |
| Haze | % | 5.5 | 3.1 | 5.5 | 5.5 | JIS K7361-1 (IDT ISO 13468-1) |
| Conforming Fire Retardant Standards | — | FM4910 | FM4910 | FM4910 | — | FM4910 |
| | | UL94 V-0 | — | UL94 V-0 | UL94 V-0 | UL94 |

• The above data are typical test results (of 5mm thick specimen) and given here without guarantee.

◆ Transparent Static Dissipative (C-PVC)

| Item | Unit | Value | | | test method |
|--|-------------------|----------|------------|----------|------------------------------------|
| | | FMND7605 | FMND MR760 | TND77665 | |
| Specific Gravity | — | 1.46 | 1.46 | 1.40 | JIS K7112 (MOD ISO 1183) |
| Tensile Stress at Yield | MPa | 72 | 74 | 74 | JIS K7162-1B/50 (IDT ISO 527-2) |
| Nominal Tensile Strain at Break | % | 14 | 12 | 7 | JIS K7162-1B/50 (IDT ISO 527-2) |
| Modulus of Elasticity in Tension | MPa | 3000 | 3000 | 3300 | JIS K7162-1B/1 (IDT ISO 527-2) |
| Flexural Stress | MPa | 93 | 98 | 98 | JIS K7171 (IDT ISO 178) |
| Flexural Modulus | MPa | 3000 | 3200 | 3400 | |
| Charpy Impact Strength (Notched) | kJ/m ² | 1.7 | 1.6 | 2.3 | JIS K7111-1epA (MOD ISO 179) |
| Vicat Softening Temperature | °C | 94 | 94 | 72 | JIS K7206 (B method) (MOD ISO 306) |
| Temperature of Deflection under load | °C | 85 | 85 | 65 | JIS K7191 |
| Dimensional Change on Heating (140°C, 55 min.) | Longitudinal % | -5 | -5 | -6 | JIS K7133 (IDT ISO 11501) |
| | Latitudinal % | 0.5 | 0.5 | -1 | |
| Total Light Transmittance | % | 63 | 60 | 77 | JIS K7361-1 (IDT ISO 13468-1) |
| Haze | % | 4.2 | 4.1 | 2.3 | JIS K7361-1 (IDT ISO 13468-1) |
| Conforming Fire Retardant Standards | — | FM4910 | FM4910 | — | FM4910 |
| | | — | — | UL94 V-0 | UL94 |

• The above data are typical test results (of 5mm thick specimen) and given here without guarantee.

◆ PVDF

| Item | Unit | Value | test method |
|--------------------------------------|-------------------|-------|---------------------------------|
| | | F300 | |
| Specific Gravity | — | 1.78 | JIS K7112 (MOD ISO 1183) |
| Tensile Stress at Yield | MPa | 53 | JIS K7162-1B/50 (IDT ISO 527-2) |
| Nominal Tensile Strain at Break | % | 15 | JIS K7162-1B/50 (IDT ISO 527-2) |
| Flexural Stress | MPa | 64 | JIS K7171 (IDT ISO 178) |
| Flexural Modulus | MPa | 1800 | |
| Charpy Impact Strength | kJ/m ² | 10 | JIS K7111-1epA (MOD ISO 179) |
| Vicat Softening Temperature | °C | 165 | JIS K7206 (MOD ISO 306) |
| Temperature of Deflection under load | °C | 140 | JIS K7191 |

• The above data are typical test results (of 5mm thick specimen) and given here without guarantee.

◆ ROD (C-PVC)

| Item | Unit | Value | | | test method |
|-------------------------------------|-------------------|---------|----------------|---------------------------|-----------------------------------|
| | | FMH-ROD | PVC Rod Non-FM | Heat Resistant Rod Non-FM | |
| Tensile Stress at Yield | MPa | 46 | 65 | 46 | JIS K7162 |
| Nominal Tensile Strain at Break | % | 7.0 | 9.0 | 7.0 | |
| Charpy Impact Strength | kJ/m ² | 3.4 | 3.4 | 3.4 | JIS K7111-1epA (MOD ISO 179) |
| Vicat Softening Temperature | °C | 110 | 77 | 111 | JIS K7206(B method) (MOD ISO 306) |
| Conforming Fire Retardant Standards | — | FM4910 | — | — | FM4910 |

• The above data are typical test results and given here without guarantee.

Accessory (Welding Rod for FM Plate)

| FM PLATE | | Welding Rod | | | | | | note |
|--|----------|---|-----------|----------------------|-----------------------|------------|-------------------|---------|
| | | Color | Lead-Free | Item No. | Diameter (mm) | Length (m) | Packing Unit (kg) | |
| PVC | FMT3331 | Ivory | — | 333S 333W 333T | 2.0 3.0 3.0 3.0 | 1 | 5 | |
| | FMT3700 | White | — | 739S 739W 739T | 2.0 3.0 3.0 3.0 | 1 | 5 | |
| | FMET4735 | New White | ○ | 4735A 4735E | 3.0 4.0 3.0 4.0 | 1 | 5 | |
| | FMET4325 | New Ivory | ○ | 4325S 4325W | 2.0 3.0 3.0 | 1 | 5 | |
| C-PVC | FMH5300 | FM Ivory | ○ | 5300S 5300W | 2.0 3.0 3.0 | 1 | 5 | |
| | FMH5305 | New Ivory | ○ | 5305S 5305W | 2.0 3.0 | 1 | 5 | |
| | FMHL5310 | Ivory | — | 333S 333W | 2.0 3.0 3.0 | 1 | 5 | Surface |
| | | FM Ivory | ○ | 5300S 5300W | 2.0 3.0 3.0 | 1 | 5 | Core |
| Transparent (C-PVC) | FMHS5650 | Transparent | ○ | 2061 2062 | 2.0 3.0 3.0 | 1 | 5 | |
| | FMHS6650 | Transparent | ○ | 5670S 5670W | 2.0 3.0 3.0 | 1 | 5 | |
| | FMSL5670 | Transparent | ○ | 5670S 5670W | 2.0 3.0 3.0 | 1 | 5 | |
| Transparent Static Dissipative (C-PVC) | FMND7605 | FMHS5650 Welding Rod (2061,2062) or 6650 Welding Rod | | | | 1 | 5 | |
| PVDF | FMPVDF | Natural | — | F301S | 3.0 | 1.6 | 2 | |

Note 1) Alphabets after item numbers indicates the cross-section shape of welding rod.

S or A:● W:∞ T:♣ E:▲

Note 2) Welding rods are not FM4910 listed.

Limitation of Warranty

Values of physical properties herein are presented as typical test results in Takiron Co., Ltd., and are considered accurate to the best of our knowledges. It is offered solely for your consideration, examination and verification, and is not to be construed as a representation or warranty expressed or implied, for which Takiron Co., Ltd. assumes any legal responsibility. Our warranties are limited to those expressly stated in the formal contracts or in conditions of sale on our invoices and order acceptances. Conditions and methods of use may vary and are beyond the control of Takiron Co., Ltd., therefore, Takiron Co., Ltd. disclaims any liability incurred as a result of the use of Takiron FM Plates in accordance with the values of physical properties herein.

No information herein shall be construed as an offer of indemnity for infringement or as a recommendation to use Takiron FM Plates in such a manner as to infringe any patent, utility model and design, domestic or foreign. The values of physical properties of Takiron FM Plates cannot be automatically used when engineering finished fabricated components; and the fabricator or end user is responsible for insuring the suitability of Takiron FM Plates for their specific application or end use.

THERE ARE NO WARRANTIES AS TO TAKIRON FM PLATES DESCRIBED HEREIN. EITHER EXPRESSED OR IMPLIED. INCLUDING, BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE.



Notes on Handling Takiron FM Plates

① Notes on usage

- 1-1. For the best suitable selection of Takiron FM Plates, ensure to carefully check temperature, chemicals, ultra violet effect, external stress and other actual conditions on which Takiron FM Plates are to be used.
- 1-2. In your design, it is important to consider not only the theory of strength calculation but also your experiences related to the fabricating conditions and methods.
- 1-3. Figures of physical properties and other aspects are typical test values, not guaranteed performances.
- 1-4. According to your intended use, ensure to select suitable Takiron FM Plates.
- 1-5. Ensure that Takiron FM Plates are not in contact with materials that may contain harmful substances to the plates, such as flexible PVC and rubber.

② Notes on fabricating

- 2-1. During your fabricating of Takiron FM Plates, ensure to wear the protections such as gloves and goggles according to necessity and use appropriate machines and tools.
- 2-2. During your cutting and welding of Takiron FM Plates, gas may be generated. Ensure that the fabricating room is adequately ventilated.
- 2-3. When you use adhesives and solvents, there is a risk of gas poisoning, fire, gas explosion and other accidents. Be careful of fire, and ensure there is adequate ventilation. Take the correct precautions according to the notes and indications on the materials to be used.

③ Notes on storage and transportation

- 3-1. During storing and transporting Takiron FM Plates, ensure to keep the plates placed horizontally. If Takiron FM Plates are stored and transported leaning against a wall, the plates may warp.
- 3-2. It should be noted that some masking materials protecting Takiron FM Plates may not peel off, if the plates become wet.
- 3-3. Ensure that Takiron FM Plates and their fabricated plates are not exposed to direct sunlight. Don't store and transport them in a high temperature environment.

④ Notes on disposal

- 4-1. If you dispose of Takiron FM Plates, always dispose the plates as industrial waste in compliance with the relevant laws and regulations.

* FM labels are necessary to verify the status of FM-certified products, and to trace the causes of any problems that may arise. Ensure to maintain FM labels with care.



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