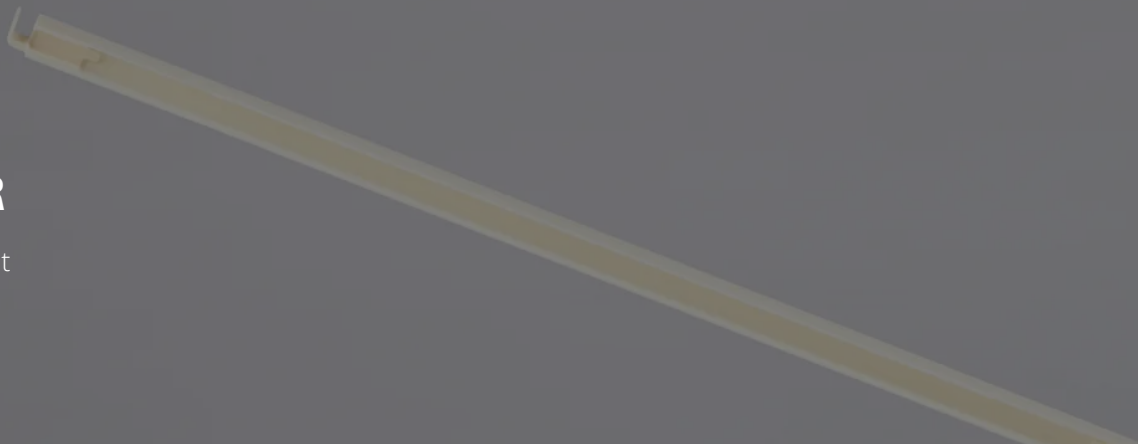


## POLYMER SOLUTIONS

## PA 2210 FR

## Material Data Sheet



## PA 2210 FR

## Product Description

PA 2210 FR is a composition on the basis of polyamide 12 and a halogen-free flame retardant material. With its good mechanical properties and its outstanding fire properties it is mainly used in the electrical and electronics industry. PA 2210 FR is certified by Underwriters Laboratories (UL). Safety and quality are continuously tested by a third-party to ensure ongoing compliance, with an UL Recognized Component Mark on the product label. A growing market are railway applications, as PA 2210 FR fulfills several requirement sets according to EN 45545-2, the European railway standard for fire protection. The material is also used in aerospace industry, flammability compliance according to FAR 25.853 is tested for every material batch.

### MAIN CHARACTERISTICS

- Flame-retardant
- Halogen-free
- Fire classification UL 94/V-0
- UL certified - [View Blue Card](#)
- Fire classification FAR 25.853

### TYPICAL APPLICATIONS

- Electrical and electronic parts, e. g. housings
- Railway interiors, e. g. ventilation ducts
- Aircraft interiors, e. g. air valves

| MECHANICAL PROPERTIES             | DRY / CONDITIONED | UNIT | TEST STANDARD |
|-----------------------------------|-------------------|------|---------------|
| <b>Tensile Modulus</b>            |                   |      | ISO 527-1/-2  |
| X Orientation                     | 2500 / 2400       | MPa  |               |
| Y Orientation                     | 2500 / 2400       | MPa  |               |
| Z Orientation                     | 2300 / 2200       | MPa  |               |
| <b>Tensile Strength</b>           |                   |      | ISO 527-1/-2  |
| X Orientation                     | 46 / 43           | MPa  |               |
| Y Orientation                     | 46 / 43           | MPa  |               |
| Z Orientation                     | 41 / 38           | MPa  |               |
| <b>Strain at Tensile Strength</b> |                   |      | ISO 527-1/-2  |
| X Orientation                     | 4 / 6             | %    |               |
| Y Orientation                     | 4 / 6             | %    |               |
| Z Orientation                     | 3 / 4             | %    |               |
| <b>Strain at Break</b>            |                   |      | ISO 527-1/-2  |
| X Orientation                     | 4 / 7             | %    |               |
| Y Orientation                     | 4 / 7             | %    |               |
| Z Orientation                     | 3 / 4             | %    |               |
| <b>Flexural Modulus</b>           |                   |      | ISO 178       |
| X Orientation                     | 2300 / -          | MPa  |               |
| <b>Flexural Strength</b>          |                   |      | ISO 178       |
| X Orientation                     | 65 / -            | MPa  |               |

| THERMAL PROPERTIES                                   | DRY /<br>CONDITIONED | UNIT  | TEST STANDARD                           |
|--|----------------------|-------|---|
| <b>Melting Temperature</b>                           | 185                  | °C    | ISO 11357-1/-3                          |
| <b>Temperature of Deflection under Load 1.80 MPa</b> |                      |       | ISO 75-1/-2                             |
| X Orientation  | 95                   | °C    |   |
| Z Orientation  | 108                  | °C    |   |
| <b>Temperature of Deflection under Load 0.45 MPa</b> |                      |       | ISO 75-1/-2                             |
| X Orientation  | 165                  | °C    |   |
| Z Orientation  | 170                  | °C    |   |
| <b>Flammability</b>                                  |                      |       | CS 25 / JAR25 / FAR 25 § 25-853         |
| Test Passed, 12s ignition time                       | 1.7                  | mm    |   |
| Test Passed, 12s ignition time                       | 2.0                  | mm    |   |
| <b>Smoke Density</b>                                 |                      |       | ABD 0031 (Issue:F), method: AITM 2.0007 |
| Test Passed  | 1.7                  | mm    |   |
| Test Passed  | 2.0                  | mm    |   |
| <b>Toxicity</b>                                      |                      |       | ABD 0031 (Issue:F), method: AITM 3.0005 |
| Test Passed  | 1.7                  | mm    |   |
| Test Passed  | 2.0                  | mm    |   |
| <b>Burning Behavior, 0.75 mm nom. Thickness</b>      | HB                   | class | ANSI/UL 94, IEC 60695-11-10, -20        |
| Thickness Tested                                     | 0.75                 | mm    |   |
| Blue Card Available                                  | Yes                  |       |   |
| <b>Burning Behavior, 3.0 mm nom. Thickness</b>       | V-0                  | class | ANSI/UL 94, IEC 60695-11-10, -20        |
| Thickness Tested                                     | 3.0                  | mm    |   |
| Blue Card Available                                  | Yes                  |       |   |

| ELECTRICAL PROPERTIES                 | DRY / CONDITIONED | UNIT  | TEST STANDARD  |
|---------------------------------------|-------------------|-------|----------------|
| <b>Comparative Tracking Index CTI</b> |                   |       | IEC 60112      |
| X Orientation                         | - / 425           |       |                |
| Y Orientation                         | - / 425           |       |                |
| Z Orientation                         | - / 450           |       |                |
| <b>Electric Strength</b>              |                   |       | IEC 60243-1    |
| X Orientation                         | - / 18.1          | kV/mm |                |
| Y Orientation                         | - / 18.1          | kV/mm |                |
| <b>Volume Resistivity</b>             |                   |       | IEC 62631-3-1  |
| X Orientation                         | - / 1E15          | Ohm·m |                |
| Y Orientation                         | - / 1E15          | Ohm·m |                |
| <b>Surface Resistivity</b>            |                   |       | IEC 62631-3-12 |
| X Orientation                         | - / 1E14          | Ohm   |                |
| Y Orientation                         | - / 1E14          | Ohm   |                |
| <b>Dissipation Factor 100 Hz</b>      |                   |       | IEC 62631-2-1  |
| X Orientation                         | - / 1013          | E-4   |                |
| Y Orientation                         | - / 1013          | E-4   |                |
| <b>Dissipation Factor 1 MHz</b>       |                   |       | IEC 62631-2-1  |
| X Orientation                         | - / 691           | E-4   |                |
| Y Orientation                         | - / 691           | E-4   |                |
| <b>Relative Permittivity 100 Hz</b>   |                   |       | IEC 62631-2-1  |
| X Orientation                         | - / 3.39          |       |                |
| Y Orientation                         | - / 3.39          |       |                |
| <b>Relative Permittivity 1 MHz</b>    |                   |       | IEC 62631-2-1  |
| X Orientation                         | - / 2.25          |       |                |
| Y Orientation                         | - / 2.25          |       |                |

| OTHER PROPERTIES        | VALUE | UNIT              | TEST STANDARD |
|-------------------------|-------|-------------------|---------------|
| <b>Density</b>          | 1.06  | g/cm <sup>3</sup> | ISO 1183-1    |
| <b>Powder Color</b>     | white | -                 | -             |
| <b>Components Color</b> | white | -                 | -             |

## HEADQUARTERS

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This powder has not been developed, tested or certified as a medical device according to Directive 93/42/EEC (MDD) or Regulation (EU) 2017/745 (MDR) and is not intended to be used as a medical device, in particular for the purposes specified in Art. 2 No. 1 MDR. Insofar as you intend to use the powder as raw material for the manufacture of pharmaceutical products or medical devices (e.g. as raw material which as a material must meet the requirements of Annex 1, Chapter II MDR), the responsibility and liability for all analyses, tests, evaluations, procedures, risk assessments, conformity assessments, approval and certification procedures as well as for all other official and regulatory measures required for this purpose shall lie solely with you both with regard to the pharmaceutical product and/or medical device manufactured by you and with regard to the properties, suitability, testing, evaluation, risk assessment, other requirements for use of the powder as raw material. In this respect, the limitations of liability pursuant to our General Terms and Conditions and the system sales or material contracts shall apply.

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Status as of 28.10.2024. Subject to technical modifications. EOS is certified according to ISO 9001.

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