TORLON® 4203 PAI

PRODUCT DATA SHEET

TORLON 4203 PAI offers the best toughness and impact strength of all TORLON PAI grades. Because of its intrinsic high temperature resistance, high dimensional stability and good machinability, this extruded TORLON PAI grade is very popular for precision parts in high-tech equipment. In addition, its good electrical insulating ability provides numerous possibilities in the field of electrical components.

Physical properties (indicative values•)

PROPERTIES	Test methods ISO/(IEC)	Units	VALUES
Colour	—	—	yellow-ochre
Density	1183	g/cm³	1.41
Water absorption:			
- after 24 h immersion in water of 23°C (1)	62	mg	29
	62	%	0.35
- at saturation in air of 23°C / 50% RH	—	%	2.5
- at saturation in water of 23°C	—	%	4.4
Thermal Properties			
Melting temperature	—	°C	NA
Glass transition temperature	—	°C	280
Thermal conductivity at 23°C	—	W/(K·m)	0.26
Coefficient of linear thermal expansion:			
- average value between 23 and 100°C	—	m/(m·K)	$30 \cdot 10^{-6}$
- average value between 23 and 150°C	—	m/(m·K)	$30 \cdot 10^{-6}$
- average value above 150°C	—	m/(m·K)	$30 \cdot 10^{-6}$
Temperature of deflection under load:			
- method A: 1.8 MPa	75	°C	280
Max. allowable service temperature in air:			
- for short periods (2)	—	°C	270
- continuously: for min. 20,000h (3)	—	°C	250
Flammability (4):			
- "Oxygen index"	4589	%	45
- according to UL 94 (1.5/3 mm thickness)	—	—	V-0/V-0
Mechanical Properties at 23°C			
Tension test (5):			
- tensile stress at yield (6)	527	MPa	120
- tensile strain at break (6)	527	%	10
- tensile modulus of elasticity (7)	527	MPa	4,500
Compression test (8):			
- compressive stress at 1% nominal strain (7)	604	MPa	27
- compressive stress at 2% nominal strain (7)	604	MPa	53
Charpy impact strength - Unnotched (9)	179/1eU	kJ/m²	no break
Charpy impact strength - Notched	179/1eA	kJ/m²	10
Ball indentation hardness (10)	2039-1	N/mm²	200
Rockwell hardness (10)	2039-2	—	E 80 (M 120)
Electrical Properties at 23°C			
Electric strength (11)	(60243)	kV/mm	24
Volume resistivity	(60093)	Ω·cm	$> 10^{14}$
Surface resistivity	(60093)	Ω	$> 10^{13}$
Relative permittivity ε_r : - at 100 Hz	(60250)	—	4.2
- at 1 MHz	(60250)	—	3.9
Dielectric dissipation factor tan δ : - at 100 Hz	(60250)	—	0.026
- at 1 MHz	(60250)	—	0.031

Note: 1 g/cm³ = 1,000 kg/m³; 1 MPa = 1 N/mm²; 1 kV/mm = 1 MV/m — NA: not applicable

Legend

(1) According to method 1 of ISO 62 and done on discs Ø 50 x 3mm.
(2) Only for short time exposure (a few hours) in applications where no or only a very low load is applied to the material.
(3) Temperature resistance over a period of min. 20,000 hours. After this period of time, there is a decrease in tensile strength of about 50% as compared with the original value. The temperature value given here is thus based on the thermal-oxidative degradation which takes place and causes a reduction in properties. Note, however, that the maximum allowable service temperature depends in many cases essentially on the duration and the magnitude of the mechanical stresses to which the material is subjected.
(4) These mostly estimated ratings, derived from raw material supplier data, are not intended to reflect hazards presented by the materials under actual fire conditions. There is no UL yellow card available for TORLON 4203 PAI stock shapes.
(5) Test specimens: Type 1 B.
(6) Test speed: 5 mm/min.
(7) Test speed: 1 mm/min.
(8) Test specimens: cylinders Ø 12 x 30 mm.
(9) Pendulum used: 4 J.
(10) 10 mm thick test specimens.
(11) 1 mm thick test specimens.

• This table is a valuable help in the choice of a material. The data listed here fall within the normal range of product properties of dry material. **However, they are not guaranteed and they should not be used to establish material specification limits nor used alone as the basis of design.**

Availability

Round Rods: ∅ 2.38-50.80 mm - **Plates:** Thicknesses 6.35-25.40 mm