Duratron® T5530 PAI

QUADRANT
ENGINEERING PLASTIC PRODUCTS

PRODUCT DATA SHEET

This 30% glass fibre reinforced grade offers higher stiffness, strength and creep resistance than Duratron T4203 PAI and Duratron T4301 PAI. It is well suited for structural applications supporting static loads for long periods of time at high temperatures. In addition, **Duratron T5530 PAI** exhibits superb dimensional stability up to 250 °C making it extremely popular for precision parts in e.g. the electronical and semiconductor industries.
The suitability of **Duratron T5530 PAI** for sliding parts, however, is to be carefully examined since the glass fibres tend to abrade the mating surface.

Physical properties (indicative values ▪)

PROPERTIES	Test methods	Units	VALUES
Colour	-	-	khaki grey
Density	ISO 1183-1	g/cm³	1.61
Water absorption:			
- after 24/96 h immersion in water of 23 °C (1)	ISO 62	mg	25 / 50
	ISO 62	%	0.26 / 0.52
- at saturation in air of 23 °C / 50 % RH	-	%	1.7
- at saturation in water of 23 °C	-	%	3.2
Thermal Properties (2)			
Melting temperature (DSC, 10 °C/min)	ISO 11357-1/-3	°C	NA
Glass transition temperature (DSC, 20 °C/min) - (3)	ISO 11357-1/-2	°C	280
Thermal conductivity at 23 °C	-	W/(K.m)	0.36
Coefficient of linear thermal expansion:			
- average value between 23 and 100 °C	-	m/(m.K)	35×10^{-6}
- average value between 23 and 150 °C	-	m/(m.K)	35×10^{-6}
- average value above 150 °C	-	m/(m.K)	40×10^{-6}
Temperature of deflection under load:			
- method A: 1.8 MPa	ISO 75-1/-2	°C	280
Max. allowable service temperature in air:			
- for short periods (4)	-	°C	270
- continuously : for min. 20,000 h (5)	-	°C	250
Min. service temperature (6)	-	°C	-20
Flammability (7):			
- "Oxygen Index"	ISO 4589-1/-2	%	50
- according to UL 94 (1.5 / 3 mm thickness)	-	-	V-0 / V-0
Mechanical Properties at 23 °C (8)			
Tension test (9):			
- tensile stress at yield / tensile stress at break (10)	ISO 527-1/-2	MPa	NYP / 125
- tensile strength (10)	ISO 527-1/-2	MPa	125
- tensile strain at yield(10)	ISO 527-1/-2	%	NYP
- tensile strain at break (10)	ISO 527-1/-2	%	3
- tensile modulus of elasticity (11)	ISO 527-1/-2	MPa	6400
Compression test (12):			
- compressive stress at 1 / 2 / 5 % nominal strain (11)	ISO 604	MPa	55 / 104 / 190
Charpy impact strength - unnotched (13)	ISO 179-1/1eU	kJ/m²	30
Charpy impact strength - notched	ISO 179-1/1eA	kJ/m²	3.5
Ball indentation hardness (14)	ISO 2039-1	N/mm²	275
Rockwell hardness (14)	ISO 2039-2	-	E 85 (M125)
Electrical Properties at 23 °C			
Electric strength (15)	IEC 60243-1	kV/mm	28
Volume resistivity	IEC 60093	Ohm.cm	$> 10^{14}$
Surface resistivity	ANSI/ESD STM 11.11	Ohm/sq.	$> 10^{13}$
Relative permittivity ε_r : - at 100 Hz	IEC 60250	-	4.4
- at 1 MHz	IEC 60250	-	4.2
Dielectric dissipation factor tan δ: - at 100 Hz	IEC 60250	-	0.022
- at 1 MHz	IEC 60250	-	0.050
Comparative tracking index (CTI)	IEC 60112	-	175

Note: 1 g/cm³ = 1,000 kg/m³ ; 1 MPa = 1 N/mm² ; 1 kV/mm = 1 MV/m.
NA: not applicable
NYP: there is no yield point

Distributed by:
Alperton Engineering Ltd
Dublin Industrial Estate,
Glasnevin, Dublin11, Ireland
www.alperton.com info@alperton.ie
Phone +353 1 8306277

Legend:

(1) According to method 1 of ISO 62 and done on discs Ø 50 mm x 3 mm.
(2) The figures given for these properties are for the most part derived from raw material supplier data and other publications.
(3) Values for this property are only given here for amorphous materials and for materials that do not show a melting temperature (PBI & PI).
(4) Only for short time exposure (a few hours) in applications where no or only a very low load is applied to the material.
(5) Temperature resistance over a period of min. 20,000 hours. After this period of time, there is a decrease in tensile strength – measured at 23 °C – 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.
(6) Impact strength decreasing with decreasing temperature, the minimum allowable service temperature is practically mainly determined by the extent to which the material is subjected to impact. The value given here is based on unfavourable impact conditions and may consequently not be considered as being the absolute practical limit.
(7) These estimated ratings, derived from raw material supplier data and other publications, are not intended to reflect hazards presented by the material under actual fire conditions. There is no 'UL File Number' available for Duratron T5530 PAI stock shapes.
(8) Most of the figures given for the mechanical properties are average values of tests run on dry test specimens machined out of 20 mm thick compression moulded plate.
(9) Test specimens: Type 1 B
(10) Test speed: 5 mm/min [chosen acc. to ISO 10350-1 as a function of the ductile behaviour of the material (tough or brittle)]
(11) Test speed: 1 mm/min.
(12) Test specimens: cylinders Ø 8 mm x 16 mm
(13) Pendulum used: 4 J.
(14) Measured on 10 mm thick test specimens.
(15) Electrode configuration: ∅ 25 mm / ∅ 75 mm coaxial cylinders ; in transformer oil according to IEC 60296 ; 1 mm thick test specimens.

▪ This table, mainly to be used for comparison purposes, 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.**

It has to be noted that this fibre reinforced material shows an anisotropic behaviour (properties differ when measured parallel and perpendicular to the compression direction).

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