>> POLYACETAL [POM-C]

ERTACETAL® C

QUADRANT ENGINEERING PLASTIC PRODUCTS

PRODUCT DATA SHEET

This is a Quadrant Engineering Plastic Products virgin copolymer acetal. The acetal copolymer is more resistant against hydrolysis, strong alkalis and thermal-oxidative degradation than the acetal homopolymer.

Physical properties (indicative values•)

PROPERTIES		Test methods ISO/(IEC)	Units	VALUES
Colour		—	—	natural (white)/ black
Density		1183	g/cm³	1.41
Water absorption:				
– after 24/96 h immersion in water of 23°C (1)		62	mg	20/37
		62	%	0.24/0.45
– at saturation in air of 23°C / 50% RH		—	%	0.20
– at saturation in water of 23°C		—	%	0.85
Thermal Properties (2)				
Melting temperature		—	°C	165
Thermal conductivity at 23°C		—	W/(K·m)	0.31
Coefficient of linear thermal expansion:				
– average value between 23 and 60°C		—	m/(m·K)	$110 \cdot 10^{-6}$
– average value between 23 and 100°C		—	m/(m·K)	$125 \cdot 10^{-6}$
Temperature of deflection under load:				
– method A: 1.8 MPa	+	75	°C	105
Max. allowable service temperature in air:				
– for short periods (3)		—	°C	140
– continuously: for 5,000/20,000 h (4)		—	°C	115/100
Min. service temperature (5)				-50
Flammability (6):				
– "Oxygen Index"		4589	%	15
– according to UL 94 (3/6 mm thickness)		—	—	HB/HB
Mechanical Properties at 23°C (7)				
Tension test (8):				
– tensile stress at yield (9)	+	527	MPa	68
	++	527	MPa	68
– tensile strain at break (9)	+	527	%	35
	++	527	%	35
– tensile modulus of elasticity (10)	+	527	MPa	3,100
	++	527	MPa	3,100
Compression test (11):				
– compressive stress at 1/2/5% nominal strain (10)	+	604	MPa	19/35/67
Creep test in tension (8):				
– stress to produce 1% strain in 1,000 h ($\sigma_{1/1,000}$)	+	899	MPa	13
	++	899	MPa	13
Charpy impact strength – Unnotched (12)	+	179/1eU	kJ/m²	≥ 150
Charpy impact strength – Notched	+	179/1eA	kJ/m²	7
Izod impact strength – Notched	+	180/2A	kJ/m²	7
	++	180/2A	kJ/m²	7
Ball indentation hardness (13)	+	2039-1	N/mm²	140
Rockwell hardness (13)	+	2039-2	—	M 84
Electrical Properties at 23°C				
Electric strength (14)	+	(60243)	kV/mm	20
	++	(60243)	kV/mm	20
Volume resistivity	+	(60093)	Ω·cm	> 10^{14}
	++	(60093)	Ω·cm	> 10^{14}
Surface resistivity	+	(60093)	Ω	> 10^{13}
	++	(60093)	Ω	> 10^{13}
Relative permittivity ε_r: – at 100 Hz	+	(60250)	—	3.8
	++	(60250)	—	3.8
– at 1 MHz	+	(60250)	—	3.8
	++	(60250)	—	3.8
Dielectric dissipation factor tan δ: – at 100 Hz	+	(60250)	—	0.003
	++	(60250)	—	0.003
– at 1 MHz	+	(60250)	—	0.008
	++	(60250)	—	0.008
Comparative tracking index (CTI)	+	(60112)	—	600
	++	(60112)	—	600

Note: 1 g/cm³ = 1,000 kg/m³; 1 MPa = 1 N/mm²; 1 kV/mm = 1 MV/m

Legend

+ : values referring to dry material
++ : values referring to material in equilibrium with the standard atmosphere 23°C/50 % RH (mostly derived from literature)

(1) According to method 1 of ISO 62 and done on discs Ø 50 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) Only for short time exposure (a few hours) in applications where no or only a very low load is applied to the material.
(4) Temperature resistance over a period of 5,000/20,000 hours. After these periods of time, there is a decrease in tensile strength of about 50% as compared with the original value. The temperature values given here are thus based on the thermal-oxidative degradation which takes place and causes a reduction in properties. Note, however, that, as for all thermoplastics, 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.
(5) 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.
(6) These 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 ERTACETAL C stock shapes.
(7) The figures given for the properties of dry material (+) are for the most part average values of tests run on test specimens machined out of rods Ø 40-60 mm. Considering the very low water absorption of ERTACETAL C, the values for the mechanical and electrical properties of these materials can be considered as being practically the same for dry (+) and moisture conditioned (++) test specimens.
(8) Test specimens: Type 1 B.
(9) Test speed: 20 mm/min.
(10) Test speed: 1 mm/min.
(11) Test specimens: cylinders Ø 12 x 30 mm.
(12) Pendulum used: 15 J.
(13) 10 mm thick test specimens.
(14) Electrode configuration: 25/75 mm coaxial cylinders; in transformer oil according to IEC 60296; 1 mm thick natural coloured test specimens. It is important to know that the electric strength of black extruded material can be as low as 50% of the value for natural material. Possible microporosity in the centre of polyacetal stock shapes also significantly reduces the electric strength.

• This table is a valuable help in the choice of a material. The data listed here fall within the normal range of product properties. **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: ∅ 3-320 mm - **Sheets/Plates:** Thicknesses 0.5-120 mm - **Tubes:** O.D. 20-350 mm