

# PET (PET-P)

## Technical Datasheet

**Stable, tough, Load-Bearing Engineering Plastic** Service. Quality. Value.

### Typical Applications

Mechanical engineering, automotive and general machinery construction - Especially suited to close tolerance bearings running in water. Plain bearings, coil bodies, guide & clutch parts, gears, cams, rollers, slide bearings, seal rings and guide rails.

### Product Description

A high quality wear-resistant engineering plastic material with the chemical name polyethylene terephthalate. It is a crystalline material, a member of the polyester family of plastics, which should not be confused with the clear, amorphous version used to make bottles for carbonated drinks. PET exhibits particularly good dimensional stability and is available in a range of grades and forms to suit many applications.

### Technical Description

Smiths' range of PET includes the following grade options:

Grade	Modification	Purpose
PET, natural and black	None.	Base material for general applications
PET + lubricant	Homogeneous dispersed solid lubricant	Additive to reduce friction, and increase wear resistance

### Machinability

While not as fine as acetal, the machinability of the above grades of PET is excellent. As with all plastic materials, experience has shown that extra care must be taken with larger diameters, especially in the colder months when plastic materials lose some of their toughness and have less resistance to machining stresses. It's important that these materials are not machined while in a chilled condition. Full machining instructions may be supplied on request.

### Dimensional Stability

PET is noted for its dimensional stability, enhanced by very low moisture absorption, 0.25%, and good creep resistance.

### Chemical Resistance

PET has acceptable resistance to weak & diluted acids at 20°C. Contact with alkalis is to be avoided, as is long-term contact with water above 70°C because the material is sensitive to hydrolysis.

Product Attributes	Customer Benefits
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Range of grades available	Correct grade selection for application is optimised.
Excellent dimensional stability - better than nylons and acetals.	
Minimal moisture absorption.	
Able to resist high mechanical loads.	Very good all-round product for diverse engineering applications.
Good creep resistance.	
Natural product may be used in contact with foodstuffs (subject to appropriate limits).	
May be varnished or polished.	Enables easy decoration or colouring.
Good sliding properties.	Long wear life in many industrial bearing, wear and gear applications.
High wear resistance.	
High surface hardness.	
Product sourced from longstanding manufacturer with ISO accreditation.	Consistent quality ensures uniform characteristics in machining and performance.

### Product Availability \*

<b>Extruded round bar</b>	Natural colour made up to 200mm dia, black to 100mm. Modified grades – please call for a quotation.
<b>Extruded sheet/plate</b>	Natural and black colour made to 100mm thk. Modified grades – please call for a quotation.

\* Sizes not stocked are available on relatively short delivery time. 1, 2 or 3m lengths supplied or cut to customer requirements.

	PET, Natural	PET, with PTFE lubricant	
<b>Mechanical Properties</b>			
Density at 20°C	1.38	1.44	g/cm <sup>3</sup>
Tensile strength @ yield	85	70	MPa
Elongation @ break	15	10	%
Tensile modulus of elasticity	3,000	2,600	MPa
Notched impact strength (Charpy)	2	2	kJ/m <sup>2</sup>
Ball indentation hardness	170	160	N/mm <sup>2</sup>
Hardness (Shore D)	84	-	Scale D
<b>Electrical Properties</b>			
Volume resistivity	10 <sup>18</sup>	10 <sup>18</sup>	Ohm cm
Surface resistivity	10 <sup>16</sup>	10 <sup>16</sup>	Ohm
Dielectric constant, 50 Hz	3.4	3.4	-
Dielectric dissipation factor, 50 Hz	0.01	0.01	-
Dielectric strength	20	20	Kv/mm
Comparative tracing index (CTI), Solution 'A'	600	600	-
<b>Thermal Properties</b>			
Melting temperature	255	255	°C
Heat deflection temperature – method A, 1.8 MPa	80	75	°C
Coefficient of thermal expansion (Ave. between 20 - 60 °C)	60	65	10 <sup>-6</sup> .K <sup>-1</sup>
Specific thermal capacity at 100°C	1.10	-	kJ/(kg - K)
Thermal conductivity at 20°C	0.28	0.28	W/(m -K)
Service temperatures without high mechanical load – long term	-20 to +115	-20 to +115	°C
Service temperature – short term (max)	+180	+180	
<b>Chemical resistance</b>			
Acid resistance	+		
Alkali resistance	0		
Hydrocarbon resistance	+		
Chlorinated hydrocarbon resistance	0		
Aromatic resistance	+		
Ketone resistance	+		
Resistance to hot water	-		

Key:    + = YES    0 = LIMITED    - = NO

## Technical Assistance

Our knowledgeable staff backed up by our resident team of qualified metallurgists and engineers, will be pleased to assist further on any technical topic.

### UK Service Centres:

Smiths Belfast    **02895 908 897**  
 Smiths Biggleswade **01767 604 704**  
 Smiths Birmingham **0121 728 4940**  
 Smiths Bristol    **0117 971 2800**  
 Smiths Chelmsford **01245 466 664**  
 Smiths Gateshead **0191 469 5428**  
 Smiths Horsham    **01403 261 981**

Smiths Leeds    **0113 307 5167**  
 Smiths Manchester **0161 794 8650**  
 Smiths Norwich    **01603 789 878**  
 Smiths Nottingham **0115 925 4801**  
 Smiths Redruth    **01209 315 512**  
 Smiths Verwood    **01202 824 347**  
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### Quality & Testing:



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