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PLASTICS
FOR
ENGINEERS

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Hans Dominghaus

Plastics for Engineers

Materials, Properties,
Applications



Hanser Publishers, Munich Vienna New York Barcelona

05189251
ENGINEERING

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Translated and revised version of
"Die Kunststoffe und ihre Eigenschaften", 3rd Edition
© 1988 VDI-Verlag GmbH, Düsseldorf

Translated by *Dr. John Haim*, Bondway Publishing, Turners Hill, W. Sussex RH10 4YY
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Die Deutsche Bibliothek – CIP-Einheitsaufnahme

Domininghaus, Hans:

Plastics for engineers : materials, properties, applications ;
[translated and revised version] / Hans Domininghaus.
[Transl. by John Haim and David Hyatt]. – Munich ; Vienna ; New York ;
Barcelona : Hanser , 1993

Einheitssacht.: Die Kunststoffe und ihre Eigenschaften <engl.>

ISBN 3-446-15723-9

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Table 69 Guide values for the physical properties of polyarylether

Properties	Units		mod. Polyphenyleneether									
			Noryl		GFN 3		Lauranyl					
	SI	US	J 31	SI	US	SI	US	SI	US			
Density	g/cm ³	lb/in ³	1.06	1.06	0.038	1.27	0.0457	1.07	0.0387	1.26	0.0454	
Water absorption (23°C/78°F, 24h)	%	%	0.07	0.07	0.07	0.06	0.07	<0.1	<0.1	<0.1	<0.1	
<i>Mechanical</i>												
Yield stress	N/mm ²	psi	55	7820	—	—	—	52	74000	100	14200	
Elongation at yield	%	%	6-7	6-7	—	—	—	4	4	1.5	1.5	
Tensile strength	N/mm ²	psi	50	7110	—	120	17100	45	6400	100	14200	
Elongation at break	%	%	50	50	—	2-3	2-3	28	28	2	2	
Tensile modulus of elasticity	N/mm ²	psi	2500	356000	—	9000	1280000	2500	356000	9000	1280000	
Impact strength (Izod)	J/m	J/m	—	—	—	—	—	—	—	—	—	
Impact strength (Charpy)	kJ/m ²	—	—	—	—	—	—	no break	—	12	—	
Notched impact strength	J/m	J/m	>15	200	—	8-10	80	11	—	5	—	
Ball indentation hardness (30 s)	N/mm ²	psi	100	14000	—	137	—	100	—	180	—	
Rockwell hardness	scale	scale	M 78	M 78	—	M 93	M 93	—	—	—	—	
<i>Thermal</i>												
Service temperature in air without mechanical loading	°C	°F	120	248	—	130	266	120	248	130	266	
short-term	°C	°F	100	212	—	110	230	100	212	110	230	
long-term	°C	°F	140	284	—	140	284	—	—	—	—	
Glass transition temperature	°C	°F	135	275	—	150	302	115	239	145	293	
Heat deflection temperature	°C	°F	130	266	—	144	291	90	194	137	279	
Vicat, Method B	°C	°F	—	—	—	—	—	105	221	145	291	
ISO, Method A	°C	°F	—	—	—	—	—	60 · 10 ⁻⁶	33 · 10 ⁻⁶	30 · 10 ⁻⁶	17 · 10 ⁻⁶	
Method B	K ⁻¹	in/in/°F	—	—	—	—	—	—	—	—	—	
Coefficient of linear expansion	—	BTU/lb/°F	60 · 10 ⁻⁶	33 · 10 ⁻⁶	—	30 · 10 ⁻⁶	17 · 10 ⁻⁶	60 · 10 ⁻⁶	33 · 10 ⁻⁶	30 · 10 ⁻⁶	17 · 10 ⁻⁶	
Specific heat capacity	kJ/kgK	BTU/in ³ h/°F	—	—	—	—	—	—	—	—	—	
Thermal conductivity	W/mK	BTU/in ² h/°F	0.22	1.5	—	0.28	1.9	0.18	1.2	0.22	1.5	
<i>Electrical</i>												
Volume resistivity	Ω cm	Ω cm	>10 ¹⁵	>10 ¹⁵	—	>10 ¹⁵	>10 ¹⁵	10 ¹⁵	10 ¹⁵	10 ¹⁵	10 ¹⁵	
Surface resistance	Ω	Ω	10 ¹⁴	10 ¹⁴	—	10 ¹⁴	10 ¹⁴	10 ¹⁴	10 ¹⁴	10 ¹⁴	10 ¹⁴	
Dielectric constant 50 Hz	—	—	2.6	2.6	—	2.9	2.9	2.6	2.6	2.9	2.9	
1 MHz	—	—	2.6	2.6	—	2.9	2.9	2.6	2.6	2.9	2.9	
Dissipation factor 50 Hz	—	—	0.0004	0.0004	—	0.0009	0.0009	0.001	0.001	0.001	0.001	
1 MHz	—	—	0.0009	0.0009	—	0.0015	0.0015	0.001	0.001	0.001	0.001	
Dielectric strength	kV/mm	kV/39.5 mils	22	22	—	22	22	80	80	80	80	
Tracking resistance	class C	class C	—	—	—	—	—	325	325	250	250	
Fire performance to UL 94	class	flame class	HB	HB	—	HB	HB	HB	HB	HB	HB	

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