



DURACON®

Acetal Co-polymer (POM)

Grade Compositions

POLYPLASTICS CO., LTD.

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Chemically speaking, DURACON® is a crystalline thermoplastic otherwise called an 'acetal copolymer'. The primary raw material is a trimer of formaldehyde known as trioxane. The thermoplastic adopts a copolymer structure in which polyoxymethylene (-C-O) and carbon-carbon (-C-C- bond) comonomer groups are incorporated into its main chain. As a result of this, when compared with acetal homopolymer, it is said that the copolymer has superior stability both chemically and thermally speaking.

One of the most favorable balance of properties

Acetal co-polymer is the most well-balanced resin in terms of mechanical, chemical and thermal properties, and further its superior moldability allows it to be widely employed in various industrial fields as one of the most popular engineering plastics.

Item	Unit	Testing method	Standard					High stiffness		
			M25-44/ M25S	M90-44/ M90S	M140-44/ M140S	M270-44/ M270S	M450-44/ M450S	HP25X	HP90X	HP270X
			High viscosity	Standard	High flow	High flow, High cycle	Super high flow, High cycle	High viscosity	Standard	High flow
Density	g/cm ³	ISO 1183	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41
Tensile strength	MPa	ISO 527-1, 2	59	62	62	63	63	68	68	69
Strain at break	%	ISO 527-1, 2	40*	35*	33*	30*	27*	35*	30*	25*
Tensile modulus	MPa	ISO 527-1, 2	2,500	2,700	2,700	2,800	2,800	—	—	—
Flexural strength	MPa	ISO 178	81	87	87	88	89	92	94	98
Flexural modulus	MPa	ISO 178	2,350	2,500	2,500	2,550	2,550	2,650	2,700	2,800
Charpy notched impact strength	kJ/m ²	ISO 179/1eA	8	6	5.5	5.3	5	11	7	6
Temperature of deflection under load (1.8MPa)	°C	ISO 75-1, 2	90	95	100	100	100	95	100	100
Coefficient of linear thermal expansion (23-55°C) Fellow direction	×10 ⁻⁵ /°C	ISO 11359-2	13	12	11	11	11	13	12	11
Coefficient of linear thermal expansion (23-55°C) Transverse direction	×10 ⁻⁵ /°C	ISO 11359-2	12	12	11	11	11	12	12	11
Electric strength	kV/mm	IEC 60243-1	19	19	19	19	19	19	19	19
Volume resistivity	Ω · cm	IEC 60093	1×10 ¹⁴	1×10 ¹⁴	1×10 ¹⁴	1×10 ¹⁴	1×10 ¹⁴	1×10 ¹⁴	1×10 ¹⁴	1×10 ¹⁴
Surface resistivity	Ω	IEC 60093	1×10 ¹⁶	1×10 ¹⁶	1×10 ¹⁶	1×10 ¹⁶	1×10 ¹⁶	1×10 ¹⁶	1×10 ¹⁶	1×10 ¹⁶
Flammability		UL94	HB	HB	HB	HB	HB	HB	HB	HB

*Nominal strain at break

Item	Mineral filling				Creep resistant	Antistatic		Weather resistance			High sliding		
	TR-5	TR-10D	TR-20	KT-20	CP15X	M90-48	M270-48	M25-45	M90-45	M270-45	NW-02	AW-01	SW-01
	Mineral filling, High rigidity, Low warpage			Mineral filling, High rigidity, Wear resistance	Creep resistant	Standard	High flow	High viscosity	Standard	High flow, High cycle	Special lubricant, High sliding		
Density	1.44	1.48	1.53	1.59	1.41	1.40	1.40	1.41	1.41	1.41	1.36	1.37	1.42
Tensile strength	62	57	59	91	66	62	61	59	62	63	52	54	50
Strain at break	10	5	5	4.8	40*	35*	30*	40*	35*	30*	20*	25*	20*
Tensile modulus	3,200	3,700	4,500	—	—	2,700	2,600	2,500	2,700	2,800	2,350	2,350	2,700
Flexural strength	90	90	96	150	87	85	85	81	87	88	72	75	75
Flexural modulus	3,000	3,500	4,100	7,050	2,450	2,450	2,500	2,350	2,500	2,550	2,200	2,200	2,500
Charpy notched impact strength	4	3.3	3	3.5	12	6	5.3	8	6	5.3	5.9	5.7	5.4
Temperature of deflection under load (1.8MPa)	108	112	125	145	92	95	95	90	95	100	85	80	80
Coefficient of linear thermal expansion (23-55°C) Fellow direction	11	9	7	4	—	12	11	13	12	11	11	13	12
Coefficient of linear thermal expansion (23-55°C) Transverse direction	11	9	8	9	—	12	11	12	12	11	11	13	12
Electric strength	20	21	21	26	19	—	—	19	19	19	20	20	18
Volume resistivity	2×10 ¹⁴	3×10 ¹⁴	2×10 ¹⁴	2×10 ¹⁴	1×10 ¹⁴	1×10 ¹³	1×10 ¹³	1×10 ¹⁴	1×10 ¹⁴	1×10 ¹⁴	1×10 ¹⁴	3×10 ¹⁴	2×10 ¹⁴
Surface resistivity	2×10 ¹⁵	2×10 ¹⁶	9×10 ¹⁵	4×10 ¹⁵	1×10 ¹⁶	1×10 ¹³	1×10 ¹³	1×10 ¹⁶	1×10 ¹⁶	1×10 ¹⁶	3×10 ¹⁵	3×10 ¹⁴	—
Flammability	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB

*Nominal strain at break

- All figures in the table are the typical values of the material and not the minimum values of the material specifications.
- For qualified values of UL (Underwriters Laboratories Inc.) refer to the yellow card (File No.E 45034) issued by UL.

All grades are subjected to Japan's Ministerial Ordinance for Export Trade Control.

Due to ongoing research and development, the data contained in this catalog is subject to change without notice. The latest data can be found on our Website. Please download from the following address.

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Item	Unit	Testing method	GF reinforced			Low warpage		High impact, Flexible		
			GH-20	GH-25	GH-25D	GB-25R	GM-20	SF-10	SF-15	SF-20
			GF20% reinforced, High strength, High rigidity	GF25% reinforced, High strength, High rigidity	GF25% reinforced, High flow, High strength, High rigidity	GB25% filling	GF20% reinforced	High impact, Flexible		
Density	g/cm ³	ISO 1183	1.54	1.59	1.59	1.59	1.54	1.36	1.33	1.3
Tensile strength	MPa	ISO 527-1, 2	100	136	136	59	55	45	38	33
Strain at break	%	ISO 527-1, 2	2	2.8	2.4	10	5.5	60*	100*	140*
Tensile modulus	MPa	ISO 527-1, 2	—	8,500	8,500	4,450	3,800	1,900	1,700	1,300
Flexural strength	MPa	ISO 178	135	200	196	104	94	61	51	38
Flexural modulus	MPa	ISO 178	6,000	7,900	7,900	3,600	3,500	1,800	1,500	1,200
Charpy notched impact strength	kJ/m ²	ISO 179/1eA	5.2	8	6.4	3.4	3.6	12	15	20
Temperature of deflection under load (1.8MPa)	°C	ISO 75-1, 2	158	162	162	110	112	82	72	62
Coefficient of linear thermal expansion (23-55°C) Fellow direction	×10 ⁻⁵ /°C	ISO 11359-2	—	3	3	9	10	13	13	14
Coefficient of linear thermal expansion (23-55°C) Transverse direction	×10 ⁻⁵ /°C	ISO 11359-2	—	9	11	9	8	13	13	14
Electric strength	kV/mm	IEC 60243-1	—	24	24	21	21	—	18	18
Volume resistivity	Ω · cm	IEC 60093	—	2×10 ¹⁴	2×10 ¹⁴	2×10 ¹⁶	2×10 ¹⁴	—	3×10 ¹³	5×10 ¹³
Surface resistivity	Ω	IEC 60093	—	2×10 ¹⁶	4×10 ¹⁶	7×10 ¹⁶	>5×10 ¹⁶	—	1×10 ¹⁴	5×10 ¹⁴
Flammability		UL94	HB	HB	HB	HB	HB	HB	HB	HB

*Nominal strain at break

Item	High impact, Flexible			Flexible	Conductive						Others	
	TF-10LV	TF-20	TF-30	SX-35	CH-10	CH-15	CH-20	EB-08	EB-10	ES-5	M90-71	WR-01
	High impact, Flexible			Lower noise	CF reinforced, Wear resistance			Antistatic			Heat resistance	Chlorine water resistance
Density	1.38	1.34	1.35	1.24	1.44	1.45	1.47	1.42	1.43	1.41	1.41	1.41
Tensile strength	46	45	37	26	116	130	144	55	55	49	62	58
Strain at break	55*	50*	75*	25*	2	1.5	1.5	4	3	7.5	35*	38*
Tensile modulus	—	—	—	900	8,800	—	14,000	—	—	2,700	2,700	—
Flexural strength	60	57	43	32	170	185	205	93	95	84	87	76
Flexural modulus	1,700	1,550	1,200	800	7,500	10,000	12,000	2,950	3,000	2,800	2,500	2,050
Charpy notched impact strength	12	17	20	10	3	4.5	5	2.6	1.8	3	6	5.6
Temperature of deflection under load (1.8MPa)	82	—	—	69	163	163	163	95	95	109	95	78
Coefficient of linear thermal expansion (23-55°C) Fellow direction	—	—	—	11	2	2	1	11	11	12	12	12
Coefficient of linear thermal expansion (23-55°C) Transverse direction	—	—	—	17	10	10	9	11	11	12	12	12
Electric strength	—	—	—	25	—	—	—	—	—	—	19	19
Volume resistivity	—	—	—	9×10 ¹³	4×10 ⁴	2×10 ²	3×10 ²	5×10 ²	5×10 ¹	1×10 ²	1×10 ¹⁴	1×10 ¹³
Surface resistivity	—	—	—	3×10 ¹³	8×10 ³	—	1×10 ²	5×10 ²	2×10 ²	5×10 ²	1×10 ¹⁶	1×10 ¹³
Flammability	—	—	—	HB	HB	—	HB	—	HB	HB	HB	—

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NOTES TO USERS

- All property values shown in this brochure are the typical values obtained under varying conditions prescribed by applicable standards and test methods.
- This brochure has been prepared based on our own experiences and laboratory test data, and therefore all data shown here are not always applicable to parts used under different conditions. We do not guarantee that these data are directly applicable to the application conditions of users and we ask each user to make his own decision on the application.
- It is the users' responsibility to investigate patent rights, service life and potentiality of applications introduced in this brochure.
Materials we supply are not intended for the implant applications in the medical and dental fields, and therefore are not recommended for such uses.
- For all works done properly, it is advised to refer to the appropriate **"Technical Catalog"** for specific material processing.
- For safe handling of materials we supply, it is advised to refer to the Material Safety Data Sheet **"MSDS"** of the proper material.
- This brochure is edited based on reference literatures, information and data currently available to us. So the contents of this brochure are subject to change without notice due to new data.
- Please contact our office for any questions about products we supply, descriptive literatures or any description in this brochure.

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