

STANDARD TYPES OF TOYOLAC

Type		Processing	Features	Type		Processing	Features
General Purpose ABS	500-322	Injection	High rigidity	High Heat ABS	440Y-MH1	Injection	HDT 95 °C
	700-314 700-X01	Injection	Medium Impact Strength High Flow Medium Impact		450Y-MH1	Injection	HDT 100 °C
	100-322	Injection and Extrusion	High Impact Strength		470Y-MH1	Injection	HDT 155 °C
	100-X01	Injection and Extrusion	Super High Impact Strength	Flame Retardant ABS	828-X01	Injection	1.50 mm V-2
	250-X10	Injection	High Flow		884-X01	Injection	1.50 mm V-0, 2.46 mm 5VA
Glass Fiber Reinforced ABS (ABSG)	100G-10	Injection	10% Glass Fibre Reinforced ABS		894-X01	Injection	1.90 mm V-0
	100G-20	Injection	20% Glass Fibre Reinforced ABS		824V-X01	Injection	0.75 mm V-2, Light resistant
	100G-30	Injection	30% Glass Fibre Reinforced ABS	834V-X01	Injection	2.00 mm V-0, 3.00 mm 5VA, Light resistant	
Glass Fiber Reinforced AS (ASG)	ASG-10	Injection	10% Glass Fibre Reinforced AS	844V-X05	Injection	1.50 mm V-0, 2.50 mm 5VA, Light resistant	
	ASG-20	Injection	20% Glass Fibre Reinforced AS	Chemical Resistant ABS	AX05-X03	Injection	Chemical resistant
	ASG-30	Injection	30% Glass Fibre Reinforced AS		100 MPM	Injection	Paintable

TYPICAL PROPERTIES OF TOYOLAC GENERAL PURPOSE ABS

PROPERTIES	TEST METHOD	Metric Units (SI Unit)	TEST CONDITION	High Rigidity T500-322	Medium Impact T700-314	High Flow Medium Impact T700-X01
Specific gravity	ASTM D792	---	23 °C	1,05	1,05	1,05
Water absorption	ASTM D570	%	23 °C x 24 hrs.	0,3	0,3	0,3
Melt flow rate	ISO 1133	g/10min.	220 °C. 10kg	20	23	40
Mould shrinkage	ASTM D955	%	---	0,4 ~ 0,6	0,4 ~ 0,6	0,4 ~ 0,6
Tensile strength at yield	ASTM D638	kg/cm ² (MPa)	23 °C (Strain rate: 5%)	550 (54)	510 (50)	480 (47)
Tensile elongation at break	ASTM D638	%	23 °C	37	35	15
Flexural yield strength	ASTM D790	kg/cm ² (MPa)	23 °C (Strain rate: 3%)	830 (81)	770 (76)	760 (75)
Flexural modulus	ASTM D790	kg/cm ² (MPa)	23 °C	26500 (2600)	25000 (2450)	24000 (2350)
Izod impact strength 12,7 x 62,5 x 12,7 ^t mm (notched)	ASTM D256	kg. cm/cm (J/m)	23 °C 0 °C -30 °C	14 (137) 10 (98) 7 (69)	19 (186) 11 (108) 8 (78)	19 (186) 11 (108) 8 (78)
Izod impact strength 12,7 x 62,5 x 3,2 ^t mm (notched)	ASTM D256	kg. cm/cm (J/m)	23 °C 0 °C -30 °C	14 (137) 10 (98) 8 (78)	20 (196) 16 (157) 12 (118)	20 (196) 16 (157) 11 (108)
Rockwell hardness	ASTM D785	---	R scale	116	115	114
Distortion temperature under load 127 x 12,7 x 12,7 ^t mm (unannealed 1,82 MPa loading)	ASTM D648	°C	18,56 kg/cm ² Flexural loading	94	92	92
Distortion temperature under load 127 x 12,7 x 6,4 ^t mm (unannealed 1,82 MPa loading)	ASTM D648	°C	18,56 kg/cm ² Flexural loading	88	87	86
Coefficient of linear thermal expansion	ASTM D696	mm/mm°C	---	6,9 x 10 ⁻⁵	7,1 x 10 ⁻⁵	7,2 x 10 ⁻⁵
Thermal conductivity	ASTM C177	W/K.m	---	0,15	0,15	0,16
Specific surface resistivity	ASTM D257	ohm	23 °C	> 10 ¹⁶	> 10 ¹⁶	> 10 ¹⁶
Specific volume resistivity	ASTM D257	ohm.cm	23°C	> 10 ¹⁶	> 10 ¹⁶	> 10 ¹⁶
Dielectric strength	ASTM D194	KV / mm	Short time	22	23	23
Dielectric constant	ASTM D150	---	1000 Hz	3,1	3,1	3,1
Power factor	ASTM D150	---	1000 Hz	5,6 x 10 ⁻³	6,6 x 10 ⁻³	6,2 x 10 ⁻³
Flammability	UL94	---	---	HB All Color	HB All Color	HB All Color

Note: The above value are guide value, they may vary from lower or higher value depend on the production lot and color pigment. Copyright © 2001 by TORAY Deutschland GmbH

TYPICAL PROPERTIES OF TOYOLAC GENERAL PURPOSE ABS

PROPERTIES	TEST METHOD	Metric Units (SI Unit)	TEST CONDITION	High Impact T100-322	Super High Impact T100-X01	High Flow T250-X10
Specific gravity	ASTM D792	---	23 °C	1,04	1,04	1,05
Water absorption	ASTM D570	%	23 °C x 24 hrs.	0,3	0,3	0,3
Melt flow rate	ISO 1133	g/10min.	220 °C. 10kg	15	14	48
Mould shrinkage	ASTM D955	%	---	0,4 ~ 0,6	0,4 ~ 0,6	0,4 ~ 0,6
Tensile strength at yield	ASTM D638	kg/cm ² (MPa)	23 °C (Strain rate: 5%)	500 (49)	430 (42)	520 (49)
Tensile elongation at break	ASTM D638	%	23 °C	48	>50	15
Flexural yield strength	ASTM D790	kg/cm ² (MPa)	23 °C (Strain rate: 3%)	750 (74)	650 (64)	790 (77)
Flexural modulus	ASTM D790	kg/cm ² (MPa)	23 °C	23500 (2300)	20000 (1960)	26000 (2550)
Izod impact strength 12,7 x 62,5 x 12,7 ^t mm (notched)	ASTM D256	kg. cm/cm (J/m)	23 °C 0 °C -30 °C	23 (226) 18 (177) 12 (118)	23 (274) 20 (196) 14 (137)	11 (108) 8 (78) 7 (69)
Izod impact strength 12,7 x 62,5 x 3,2 ^t mm (notched)	ASTM D256	kg. cm/cm (J/m)	23 °C 0 °C -30 °C	27 (265) 20 (196) 14 (137)	32 (314) 23 (225) 16 (157)	17 (167) 9 (88) 7 (69)
Rockwell hardness	ASTM D785	---	R scale	113	108	115
Distortion temperature under load 127 x 12,7 x 12,7 ^t mm (unannealed 1,82 MPa loading)	ASTM D648	°C	18,56 kg/cm ² Flexural loading	93	91	92
Distortion temperature under load 127 x 12,7 x 6,4 ^t mm (unannealed 1,82 MPa loading)	ASTM D648	°C	18,56 kg/cm ² Flexural loading	87	85	87
Coefficient of linear thermal expansion	ASTM D696	mm/mm°C	---	7,4 x 10 ⁻⁵	7,6 x 10 ⁻⁵	7,0 x 10 ⁻⁵
Thermal conductivity	ASTM C177	W/K.m	---	0,15	0,15	0,15
Specific surface resistivity	ASTM D257	ohm	23 °C	> 10 ¹⁶	> 10 ¹⁶	> 10 ¹⁶
Specific volume resistivity	ASTM D257	ohm.cm	23°C	> 10 ¹⁶	> 10 ¹⁶	> 10 ¹⁶
Dielectric strength	ASTM D194	KV / mm	short time	23	24	23
Dielectric constant	ASTM D150	---	1000 Hz	3,1	3,1	3,1
Power factor	ASTM D150	---	1000 Hz	6,6 x 10 ⁻³	6,6 x 10 ⁻³	6,3 x 10 ⁻³
Flammability	UL94	---	---	HB All Color	HB All Color	HB All Color

TYPICAL PROPERTIES OF TOYOLAC Glass Fibre Reinforced ABS (ABSG)

PROPERTIES	TEST METHOD	Metric Units (SI Unit)	ABSG		
			100G-10	100G-20	100G-30
6,4 t mm Heat distortion temperature (unannealed 1,82 MPa loading)	ASTM D648	°C	100	102	104
Melt flow rate (240 °C, 98 N)	ISO 1133	g/10min.	30	23	17
12,7 t mm Izod impact strength (notched)	ASTM D256	kg. cm/cm (J/m)	8,5 (83)	7,5 (74)	5 (49)
Tensile yield stress	ASTM D638	kg/cm ² (MPa)	800 (78)	1000 (98)	1200 (118)
Tensile elongation at break	ASTM D638	%	3	3	3
Flexural yield stress	ASTM D790	kg/cm ² (MPa)	1220 (120)	1430 (140)	1630 (160)
Flexural modulus	ASTM D790	kg/cm ² (MPa)	41800 (4100)	63200 (6200)	86700 (8500)
Rockwell hardness	ASTM D785	R scale	118	120	125
Specific Gravity	ASTM D785	---	1,11	1,18	1,26
Flammability	UL94	---	HB	HB	HB
Mold Shrinkage Rate	Toray Method	%	0,2-0,4	0,1-0,3	0,1-0,3

TYPICAL PROPERTIES OF TOYOLAC Glass Fibre Reinforced AS (ASG)

PROPERTIES	TEST METHOD	Metric Units (SI Unit)	ASG		
			ASG-10	ASG-20	ASG-30
6,4 t mm Heat distortion temperature (unannealed 1,82 MPa loading)	ASTM D648	°C	104	108	110
Melt flow rate (240 °C, 98 N)	ISO 1133	g/10min.	32	25	20
12,7 t mm Izod impact strength (notched)	ASTM D256	kg. cm/cm (J/m)	4 (39)	4 (39)	4 (39)
Tensile yield stress	ASTM D638	kg/cm ² (MPa)	800 (78)	1200 (118)	1400 (137)
Tensile elongation at break	ASTM D638	%	3	3	3
Flexural yield stress	ASTM D790	kg/cm ² (MPa)	1300 (130)	1500 (150)	1700 (170)
Flexural modulus	ASTM D790	kg/cm ² (MPa)	50000 (4900)	72000 (7100)	95500 (9400)
Rockwell hardness	ASTM D785	R scale	120	123	125
Specific Gravity	ASTM D785	---	1,15	1,22	1,3
Flammability	UL94	---	HB	HB	HB
Mold Shrinkage Rate	Toray Method	%	0,2-0,4	0,1-0,3	0,1-0,3

TYPICAL PROPERTIES OF TOYOLAC HIGH HEAT ABS

PROPERTIES	TEST	Metric Units (SI Unit)			
	METHOD		T440Y-MH1	T450Y-MH1	T470Y-MH1
6,4 t mm Heat distortion temperature (unannealed 1,82 MPa loading)	ASTM D648	°C	95	100	105
Melt flow rate (220 °C, 98 N)	ISO 1133	g/10min.	8	3,5	1,5
12,7 t mm Izod impact strength (notched)	ASTM D256	kg. cm/cm (J/m)	17 (167)	17 (167)	15 (147)
Tensile yield stress	ASTM D638	kg/cm ² (MPa)	490 (49)	420 (41)	400 (39)
Tensile elongation at break	ASTM D638	%	22	26	20
Flexural yield stress	ASTM D790	kg/cm ² (MPa)	780 (77)	650 (64)	630 (62)
Flexural modulus	ASTM D790	kg/cm ² (MPa)	24500 (2400)	21000 (2060)	20000 (1960)
Rockwell hardness	ASTM D785	R scale	115	111	110
Specific Gravity	ASTM D785	---	1,06	1,07	1,07
Flammability	UL94	---	HB	HB	HB

TYPICAL PROPERTIES OF TOYOLAC FLAME RETARDANT ABS

PROPERTIES	TEST METHOD	Metric Units (SI Unit)	General Purpose		
			T884-X01	T894-X01	T828-X01
Flammability	UL94	---	0,75 mm V2 1,50 mm V0 2,46 mm 5VA	1,98 mm V0	1,50 mm V2
6,4 t mm Heat distortion temperature (unannealed 1,82 MPa loading)	ASTM D648	°C	76	77	80
Melt flow rate (200 °C, 49 N)	ISO 1133	g/10min.	4,5	3,8	4,9
Melt flow rate (200 °C, 98 N)	ISO 1133	g/10min.			
12,7 t mm Izod impact strength (notched)	ASTM D256	kg. cm/cm (J/m)	16 (158)	19 (188)	18 (176)
3,2 t mm Izod impact strength (notched)	ASTM D256	kg. cm/cm (J/m)	25 (246)	28 (276)	28 (274)
Tensile yield stress	ASTM D638	kg/cm ² (MPa)	460 (45)	460 (45)	470 (46)
Tensile elongation at break	ASTM D638	%	> 5	> 5	> 10
Flexural yield stress	ASTM D790	kg/cm ² (MPa)	690 (68)	690 (68)	710 (70)
Flexural modulus	ASTM D790	kg/cm ² (MPa)	23600 (2310)	23200 (2270)	22800 (2230)
Specific Gravity	ASTM D792	---	1,15	1,14	1,09
Mould shrinkage rate	Toray method	%	0,4 - 0,7	0,4 - 0,7	0,4 - 0,7

TYPICAL PROPERTIES OF TOYOLAC FLAME RETARDANT ABS

PROPERTIES	TEST METHOD	Metric Units (SI Unit)	Light resistant		
			T844V-X05	T834V-X01	T824V-X01
Flammability	UL94	---	1,50 mm V2 2,50 mm 5V	2,00 mm V0 3,00 mm 5VA	0,75 mm V2
6,4 t mm Heat distortion temperature (unannealed 1,82 MPa loading)	ASTM D648	°C	82	84	85
Melt flow rate (200 °C, 49 N)	ISO 1133	g/10min.	34	29	37
Melt flow rate (200 °C, 98 N)	ISO 1133	g/10min.			
12,7 t mm Izod impact strength (notched)	ASTM D256	kg. cm/cm (J/m)	14 (139)	16 (158)	16 (157)
3,2 t mm Izod impact strength (notched)	ASTM D256	kg. cm/cm (J/m)	19 (187)	23 (227)	24 (235)
Tensile yield stress	ASTM D638	kg/cm ² (MPa)	420 (41)	430 (42)	450 (44)
Tensile elongation at break	ASTM D638	%	> 5	> 5	> 10
Flexural yield stress	ASTM D790	kg/cm ² (MPa)	670 (66)	660 (65)	680 (67)
Flexural modulus	ASTM D790	kg/cm ² (MPa)	22800 (2230)	22400 (2200)	22400 (2200)
Specific Gravity	ASTM D792	---	1,16	1,14	1,09
Mould shrinkage rate	Toray method	%	0,4 – 0,7	0,4 - 0,7	0,4 - 0,7

TYPICAL PROPERTIES OF TOYOLAC CHEMICAL RESISTANT ABS

PROPERTIES	TEST	Metric Units (SI Unit)		
	METHOD		AX05-X03	100-MPM
6,4 t mm Heat distortion temperature (unannealed 1,82 MPa loading)	ASTM D648	°C	84	86
Melt flow rate (220 °C, 98 N)	ISO 1133	g/10min.	15	16
12,7 t mm Izod impact strength (notched)	ASTM D256	kg. cm/cm (J/m)	35 (340)	25 (240)
Tensile yield stress	ASTM D638	kg/cm ² (MPa)	400 (39)	460 (45)
Tensile elongation at break	ASTM D638	%	25	50
Flexural yield stress	ASTM D790	kg/cm ² (MPa)	610 (60)	700 (69)
Flexural modulus	ASTM D790	kg/cm ² (MPa)	20400 (2000)	22000 (2160)
Specific Gravity	ASTM D792	%	1,04	1,04
Rockwell hardness (R scale)	ASTM D785	---	108	110