

**ISO**

# **TECHNO PLASTICS GUIDE**

**TECHNO ABS**

**TECHNO MUH**

**TECHNO AES**

**EXCELLOY**

**SANREX**

## Grade Choices Flow Sheet

Classification	Grade	Application	Page	
<b>General Use</b>	High Rigidity	110(17A)	Printer parts, Automobile interior parts, etc.	P9
	Middle Impact&High Rigidity	130(15)	Pachinko slot machine parts, Toys, Stationery, etc.	P9
	High Impact	150(12A)	Air Conditioner, Toys, Stationery, etc.	P9
	Super High Impact	170(10)	Shoe sole, Toys, Stationary, etc.	P9
<b>High Flow</b>	High Flow	300 330(38)	Air Conditioner Housing, Office supplies, Miscellaneous goods for office use in general, etc.	P9-10
	Super High Flow	350(35)	Air Conditioner housing, Toys, etc.	P10
<b>High Gloss</b>	Middle Impact	130C(15B)	Audiovisual equipment button, Office automation equipment button	P10
	High Impact	150C(12B)	Audiovisual equipment button and control panel, Office automation equipment button and control panel Front panel of Pachinko machine	P10
	High Flow	330C(38B)	Compact cover for cosmetics Audiovisual equipment button, Office automation equipment button	P10
<b>Chemical Resistant</b>	Chemical Resistant	400(YT-552)	Water cleaner parts, waste traps, etc.	P10
	High Chemical Resistant	410	Unit Bathroom component	P10
	Super High Chemical Resistant	R790(TFB310)	Refrigerator parts, waste traps, etc.	P10
<b>Fabricating</b>	Plating	420(21)	Pachinko machine parts, Motorcycle exterior parts, Automobile exterior parts Ornament, license panel, etc.	P11
	Plating & Painting ABS	430(25)	Pachinko slot machine parts, Automobile exterior parts, etc.	P11
	Painting	440	Automobile exterior parts, etc.	P11

Classification	Grade	Application	Page	
<b>Heat Resistant</b>	Heat Resistant	500(45A) 541 543	Automobile exterior parts , Radiator grill cover coating, etc. Oil heater control panel, etc.	P11-12
	High Heat Resistant	545(XT01) 560(XT04)	Heater control panel, Automobile interior parts, etc. Power window switch, etc.	P12
	Super High Heat Resistant	565(XT09H) H571 H593 H596	Automobile interior parts, etc. Power window switch, etc.	P12
<b>Extrusion &amp; Blow Material</b>	Standard	600(YT-346)	Profile extruded doorstop, Unit bathroom apron	P13
	High Impact	620(YT-802)	Clarifying tank panel, Office desk parts, etc.	P13
	Weather Resistant	W270(AES110)	Clarifying tank panel, Automobile exterior parts	P13
	Blow	H630(YM-244)	Spoiler, etc.	P13
	Wood Powder ABS	WX152	Building interior materials, Door sills, base boards Armrest of chair, etc.	P13
<b>Transparent</b>	Refrigerator	722 R760	Refrigerator inner box, Door panel	P14
	Standard	810(55)	Pachinko machine parts, Show case for cosmetics, etc.	P14
	High Rigidity	830(58)	Pachinko machine parts, CD case, etc.	P14
	Heat Resistant	H814	Pachinko slot machine parts Office automation equipment parts	P14
	Chemical Resistant	840	Mobilephone antenna parts Toilet seat parts	P14
<b>Low Gloss</b>	Standard	150L(12LG)	Automobile interior parts	P14
	High Flow	330L(38LG)	Toys, etc.	P15

Classification	Grade	Application	Page	
<b>Low Gloss</b>	Heat Resistant	H530L(D1)	Automobile interior parts, etc.	P15
	Heat Resistant&Impact	545L(XT01LG)	Automobile interior parts, etc. Cluster components	P15
	Heat Resistant&Rigidity	565L(XT09LG)	Automobile interior parts, etc. Switch covers, etc.	P15
	Extrusion	611L	Automobile interior parts, etc.	P15
<b>Laser Mark</b>	Black Lettering	15 K6	Keyboard parts	P16
	White Lettering	77 K4	Keyboard parts	P16
<b>Flame Retardant</b>	1.5mm V-0 Standard	F5330(NC100)	Office automation equipment parts	P16
	1.0mm V-0 High Flow	F5170	Office automation equipment parts	P16
	1.5mm V-0 Thermostable &Light Resistant	F5452(D1)(NC119(D1)) F7850	Office automation equipnebt parts, Enclosure of power supply Degital camera, etc.	P16
	2mm V-0 Thermostable&Light Resistant	F5450(W)(NC118(W))	Office automation equipment housing	P17
	2mm V-0 Light Resistant	F5456	Office automation equipment housing	P17
	2mm V-0 Heat Resistant	TFX-STG1	Office automation equipment housing	P17
	2mm V-0 Chemical Resistant	TFX-SBT3	Toilet seat parts	P17
	V-0 Antibacterial	HZTFXST(4) ZF5551	Office automation equipment housing	P18
	1.1mm V-2 Thermostable&Light Resistant	F1350(NC471) F1350(D4)	DVD camera, Mobilephone battery charger PPC parts, Printer parts, etc.	P18
	0.75mm V-2 Light Resistant	F1150(NC472)	Degital camera, etc.	P18
	1.5mm V-2 Non Harogen	F1384	Audio equipment control panel, etc.	P18

Classification	Grade	Application	Page	
<b>Weather Resistant</b>	High Rigidity&High Flow	W200(AES117)	Outer hose cover of Air Conditioner, Automobile exterior parts, etc. Door mirrors, etc.	P18
	Middle Impact	W210(AES112)	Automobile exterior parts (radiator grill.) Front panel, etc.	P19
	Middle Impact &Heat Resistant	W240(AES145)	Automobile exterior parts in general, Window flame of Unit Bathroom, Motorcycle meter parts	P19
	Middle Impact &High Heat Resistant	W245(AES147)	Motorcycle meter parts, Automobile exterior parts (radiator grill, garnish, etc.)	P19
	Super High Heat Resistant	W250(AES491)	Automobile exterior parts, etc. Front panel	P19
	<b>Bright Color Resin</b>	Weather Resistant	MX851	Motorcycle cowl
<b>ABS/PC Alloy</b>	Standard	CK10(CB10)	Mobilephone housing Wheel cap for coating	P20
	Heat Resistant	CK50(CB40)	Mobilephone antenna parts Wheel cap for coating	P20
	Heat Resistant&High Rigidity	CK55(PX30)	Mobilephone antenna parts Wheel cap for coating	P20
	V-2 Flame Retardant	CKF10(NX277)	Office automation equipment parts	P20
	V-0 Flame Retardant	CKF51	Office automation equipment parts Dehumidifier, Degital camera	P20
	V-0 Non halogen Flame Retardant	CZ400 CZ500	Electric facilities, power supply boxes	P20
<b>AES/PC Alloy</b>	Weather Resistant	CW10(CE10) CW50(CE40)	Rader dome	P21
<b>ABS/PA Alloy (Chemical Resistant)</b>	Standard	AK10(AK101)	Working machine housing	P21
	High Impact	AK15(AK102)	Electrical appliance housing	P21
<b>ABS/PBT Alloy (Chemical Resistant)</b>	Heat Resistant	TK10(BK101)	Electrical appliance housing	P22
	High Impact	TK15(BK104)	Electrical appliance housing	P22

Classification	Grade	Application	Page	
<b>ABS/PBT Alloy (Chemical Resistant)</b>	Chemical Resistant & High Flow	TK30(BK105)	Electrical appliance housing	P22
<b>Sliding</b>	Standard	SX220(SX A105) SX240(SX A407)	Office automation equipment slinding parts	P22
	High Sliding	SX620(SX E105) SX640(SX E407)	Office automation equipment slinding parts	P22
	Flame Retardant	SXF321	Office automation equipment slinding parts	P22
<b>Vibration Damping</b>	Standard	DX220	Profile extrusion surface coating	P23
<b>Lasting Antistatic/ Conducting Material</b>	Standard	EK10(HK101) EK50(HK141)	Office automation equipment sorter parts	P23
	Transparent	EK81(D5)	Pachinko machine parts	P23
	Flame Retardant	EKF54 EKF55	X-ray machine tray Office automation equipment sorter parts	P23-24
	CF Reinforced	EK13C8	Pachinko machine parts	P24
	Sliding	SXJ220(SXH105)	Office automation equipment slinding parts	P24
<b>Glass Reinforced ABS</b>	Standard	130G10(15G10) 130G20(15G20) 130G30(15G30)	Chassis for Office automation equipment parts Mechanism parts	P24
	Flame Retardant V-0	F5330G10(NC100G10) F5330G20(NC100G20) F5330G30(NC100G30) F5451G10(NC411G10) F5451G20(NC411G20) F5451G30(NC411G30)	Office automation equipment parts	P24-25
	Flame Retardant 1.5mm V-2	F1350G10(NC471G10)	Office automation equipment parts	P25
<b>Glass Reinforced Alloy</b>	ABS/PC Alloy	CK10G10(CB10G10) CK10G20(CB10G20) CK10G30(CB10G30)	Office automation equipment parts	P26
	ABS/PA Alloy	AK12G20(AK602G20)	Working machine housing	P26
	ABS/PBT Alloy	TK12G20	Electrical appliance housing	P26
	ABS/PC Flame Retardant	CKF51G10 CKF51G20 CKF51G30	Chassis for Office automation equipment parts Mechanism parts	P26-27

Classification	Grade	Application	Page	
<b>SAN Resin</b>	Standard	SAN-C<S10>	Containers for cosmetics, cooling tower,merchandise	P27
	High Flow	SAN-R<S20>	Containers for cosmetics	P27
	High Flow&High Rigidity	SAN-T<S40> SAN-L<S45>	Cigar lighter	P27
	High Rigidity	SAN-H<S90>	Containers for cosmetics	P28
	Flame Retardant	SF10<SAN-AK> CLM-AM25	Office automation equipment parts	P28
	Glass Reinforced	S10G12(CLM-S315) S10G15(CLM-S320) S10G20(CLM-S325) S10G32(CLM-S340)	Air Conditioner fans	P28

**JHOPA registered grade**

Classification	Grade	Application	Page
<b>General Use</b>	Middle Impact&High Rigidity	130P	P29
	High Impact	150P	P29
<b>High Flow</b>	High Flow	330P	P29
<b>Chemical Resistant</b>	Super High Chemical Resistant	R790P	P29
<b>Heat Resistant</b>	Heat Resistant	500P	P30
	High Heat Resistant	546P	P30
<b>Transparent</b>	Standard	810P(55P)	P30
	High Rigidity	830P(58P)	P30
<b>ABS/PC Alloy</b>	Standard	CK10P	P30
<b>SAN Resin</b>	Standard	SAN-CP<S10P>	P30

**TECHNO MUH Grade (Heat Resistant ABS Resin)**

Classification	Grade	Application	Page
<b>Heat Resistant</b>	High Heat Resistant	M3100 M7205 C7103	Automobile interior parts (Cup holder, Console parts) P31
	Super High Heat Resistant	W3404 W7403 E7301 E1300 E1500	Automobile interior parts (Cup holder, Ventilator, Console parts) P31-32
<b>Blow</b>	Blow&Heat Resistant	BM5602	Spoiler, etc. P32
<b>Squeek noise Reduction</b>	Super High Heat Resistant	DN1300	Automobile interior parts (Cup holder, Ventilator, etc.) P33
<b>Low Gloss</b>	Heat Resistant	LG5534	Automobile interior parts (Ventilator, etc.) P33
	Super Heat Resistant	LG5053	Automobile interior parts (switch parts, etc.) P33
	ABS/PC Alloy	MPC2501LG	Automobile interior parts P33
<b>ABS/PC Alloy</b>	Heat Resistant	MPC6801	Automobile interior parts (Center panel) P34
<b>ABS/PA Alloy</b>	Standard	MPA1601	Automobile interior parts (switch parts, etc.) P34
<b>Glass Reinforced Alloy</b>	ABS/PA Alloy	MPA G101	Automobile interior parts (switch parts, etc.) P34
<b>Glass Reinforced ABS</b>	Standard	GF5202	Automobile interior parts (Meter parts) P34

**BIOLLOY (PLA/ABS ALLOY)**

Classification	Grade	Application	Page
<b>General Use</b>	High Impact	KG320	P35
	Middle Impact&High Rigidity	KG330	Printer parts, Toys, Stationery, Containers for cosmetics, etc Audiovisual equipment parts and Office automation equipment parts, Air Conditioner, etc P35
	High Rigidity	KG340	P35

Classification	Grade	Application	Page
<b>Heat Resistant</b>	Heat Resistant	KH320	Motorcycle exterior part, Electric equipment housing P36
<b>Flame Retardant</b>	1.2mm V-2 Standard	KF1380	Office automation equipment housing, Digital camera parts, Audio equipment control panel, etc P36

Property	Test Method	Unit	General Use				High Flow		High Flow		High Gloss			Chemical Resistant		
			High Rigidity	Middle Impact & High Rigidity	High Impact	Super High Impact	High Flow		High Flow	Super High Flow	Middle Impact	High Impact	High Flow	Chemical Resistant	High Chemical Resistant	Super High Chemical Resistant
			TECHNO ABS 110 (17A)	TECHNO ABS 130 (15)	TECHNO ABS 150 (12A)	TECHNO ABS 170 (10)	TECHNO ABS 300		TECHNO ABS 330 (38)	TECHNO ABS 350 (35)	TECHNO ABS 130C (15B)	TECHNO ABS 150C (12B)	TECHNO ABS 330C (38B)	TECHNO ABS 400 (YT-552)	TECHNO ABS 410	TECHNO ABS R790 (TFB310)
Tensile Strength	ISO 527	M Pa	52	47	43	35	43		44	40	45	43	47	49	39	49
Flexural Strength	ISO 178	M Pa	82	75	69	54	70		70	63	70	69	73	76	56	59
Flexural Modulus	ISO 178	M Pa	2,550	2,470	2,290	1,750	2,310		2,320	2,130	2,200	2,180	2,260	2,400	1,670	1,950
Charpy Impact	ISO 179	KJ/m2	12	20	26	36	22		19	23	22	26	9	16	12	23
Rockwell Hardness	ISO 2039	-	R113	R109	R105	R89	R108		R108	R104	R109	R108	R108	R109	R92	R99
Melt Mass Flow Rate	ISO 1133	g/10Min. Test condition	23.0 220°C,98N	18.0 220°C,98N	16.0 220°C,98N	9.0 220°C,98N	30.0 220°C,98N		42.0 220°C,98N	55.0 220°C,98N	18.0 220°C,98N	18.0 220°C,98N	56.0 220°C,98N	23.0 220°C,98N	14.0 220°C,98N	16.0 220°C,98N
Temp. of Deflection	ISO 75 (Under Load)	°C	83	80	79	76	78		78	77	78	79	80	79	73	79
Density	ISO 1183	-	1.05	1.05	1.04	1.03	1.05		1.05	1.04	1.05	1.04	1.05	1.05	1.06	1.06
Molding Shrinkage	ISO 294-4	Low High	0.40 0.60	0.40 0.60	0.40 0.60	0.40 0.60	0.40 0.60		0.40 0.60	0.40 0.60	0.30 0.60	0.30 0.60	0.30 0.60	0.40 0.60	0.40 0.60	0.40 0.60
Flammability	UL94	Min. Thick (mm) Flame Class	HB	HB	HB		HB		HB	HB	HB	HB	HB	HB		HB
		color	ALL	ALL	ALL		ALL		ALL	ALL	ALL	ALL	ALL	ALL		ALL
Surface Resistivity	ASTM D257	Ω														
Static Voltage	JIS L1094	V														
JHOPA	JHOPA	-														
Tensile Strength	ASTM D638	M Pa kgf/cm2	53.9 550	49.0 500	43.1 440	35.3 360	47.0 480		47.1 480	41.2 420	48.1 490	47.1 480	49.0 500	54.9 560	52.0 530	52.0 530
Flexural Strength	ASTM D790	M Pa kgf/cm2	91.2 930	88.3 900	73.5 750	58.8 600	78.4 800		81.4 830	72.6 740	81.4 830	76.5 780	82.4 840	93.2 950	82.4 840	80.4 820
Flexural Modulus	ASTM D790	M Pa kgf/cm2	2,990 30,500	2,750 28,000	2,350 24,000	1,860 19,000	2,480 25,300		2,600 26,500	2,350 24,000	2,750 28,000	2,600 26,500	2,700 27,500	2,940 30,000	2,350 24,000	2,300 23,500
Izod Impact	ASTM D256	kgf cm/cm J/m	16 157	20 196	32 314	40 392	22 215		18 177	23 226	25 245	33 324	12 118	17 167	19 186	25 245
Rockwell Hardness	ASTM D785	-	R114	R112	R106	R91	R108		R110	R105	R110	R109	R111	R114	R112	R102
Deflection Temp.	ASTM D648	°C	94	91	90	89	91		90	88	91	93	92	93	92	93
Density	ASTM D792	-	1.05	1.05	1.04	1.03	1.05		1.05	1.04	1.05	1.04	1.05	1.05	1.06	1.06

**Typical molding condition**

Predrying temperature	B	B	B	B	B		B	B	B	B	B	B	B	B	B
temperature	4	4	4	4	4		4	4	4	4	4	4	4	4	4
Mold temperature	T	T	T	T	T		T	T	S	S	S	T	T	T	

Information of typical molding condition are showed on page 29 and 30.

Property	Test Method	Unit	Fabricating			Heat Resistant		Heat Resistant							
			Plating	Plating & Painting ABS	Painting	Heat Resistant	Heat Resistant	Heat Resistant	High Heat Resistant	High Heat Resistant	Super High Heat Resistant	Super High Heat Resistant	Super High Heat Resistant	Super High Heat Resistant	
			TECHNO ABS 420 (21)	TECHNO ABS 430 (25)	TECHNO ABS 440	TECHNO ABS 500 (45A)	TECHNO ABS 541	TECHNO ABS 543	TECHNO ABS 545 (XT01)	TECHNO ABS 560 (XT04)	TECHNO ABS 565 (XT09H)	TECHNO ABS H571	TECHNO ABS H593	TECHNO ABS H596	
Tensile Strength	ISO 527	M Pa	42	42	40	49	46		47	43	42	49	48	48	48
Flexural Strength	ISO 178	M Pa	68	65	62	79	73		75	66	64	74	75	78	77
Flexural Modulus	ISO 178	M Pa	2,220	2,150	2,060	2,530	2,410		2,360	2,100	2,000	2,210	2,330	2,370	2,330
Charpy Impact	ISO 179	KJ/m2	30	31	28	19	20		20	12	10	13	12	11	9
Rockwell Hardness	ISO 2039	-	R105	R105	R104	R111	R108		R107	R104	R104	R107	R113	R113	R114
Melt Mass Flow Rate	ISO 1133	g/10Min. Test condition	15.0 220°C,98N	24.0 220°C,98N	36.0 220°C,98N	9.0 220°C,98N	5.9 220°C,98N		2.9 220°C,98N	5.8 220°C,98N	4.0 220°C,98N	2.0 220°C,98N	12.0 240°C,98N	10.4 240°C,98N	8.0 240°C,98N
Temp. of Deflection	ISO 75 (Under Load)	°C	78	79	77	83	88		89	90	96	100	100	104	107
Density	ISO 1183	-	1.04	1.04	1.04	1.05	1.05		1.05	1.05	1.05	1.05	1.08	1.08	1.08
Molding Shrinkage	ISO 294-4	Low High	0.40 0.60	0.40 0.60	0.40 0.60	0.40 0.70	0.40 0.70		0.40 0.70	0.40 0.70	0.40 0.70	0.40 0.70	0.40 0.70	0.40 0.70	0.40 0.70
Flammability	UL94	Min. Thick (mm)	HB	HB		HB	HB		HB	HB		HB	HB	HB	HB
		Flame Class													
		color	ALL	ALL		ALL	ALL		ALL	ALL		ALL	ALL	ALL	ALL
Surface Resistivity	ASTM D257	Ω													
Static Voltage	JIS L1094	V													
JHOPA	JHOPA	-													
Tensile Strength	ASTM D638	M Pa kgf/cm2	43.1 440	44.1 450	41.0 420	53.0 540				44.1 450	43.1 440	53.0 540			
Flexural Strength	ASTM D790	M Pa kgf/cm2	73.5 750	78.5 800	71.0 720	87.3 890				75.5 770	71.6 730	86.3 880			
Flexural Modulus	ASTM D790	M Pa kgf/cm2	2,350 24,000	2,450 25,000	2,470 25,200	2,750 28,000				2,450 25,000	2,400 24,500	2,650 27,000			
Izod Impact	ASTM D256	kgf cm/cm J/m	32 314	32 314	30 294	17 167				15 147	10 98	14 137			
Rockwell Hardness	ASTM D785	-	R105	R106	R105	R112				R108	R105	R109			
Deflection Temp.	ASTM D648	°C	90	92	91	94				104	110	115			
Density	ASTM D792	-	1.04	1.04	1.04	1.05	1.05		1.05	1.05	1.05	1.05			

**Typical molding condition**

Predrying temperature	B	B	B	B	D		D	D	E	F	F	F	F	F
temperature	4	4	4	4	5		5	5	5	5	5	5	5	5
Mold temperature	T	T	T	T	T		T	T	T	T	T	T	T	T

Information of typical molding condition are showed on page 29 and 30.

Property	Test Method	Unit	Extrusion & Blow Material					Extrusion & Blow Material				Transparent				Low Gloss
			Standard	High Impact	Weather Resistant	Blow	Wood Powder ABS		Refrigerator (for Cyclopentane)	Refrigerator (for Fluoro Carbon)	Standard	High Rigidity	Heat Resistant	Chemical Resistant	Standard	
			TECHNO ABS 600 (YT-346)	TECHNO ABS 620 (YT-802)	TECHNO AES W270 (AES110)	TECHNO ABS H630 (YM-244)	EXCELLOY WX152		TECHNO ABS 722	TECHNO ABS R760	TECHNO ABS 810 (55)	TECHNO ABS 830 (58)	TECHNO ABS H814	TECHNO ABS 840	TECHNO ABS 150L (12LG)	
Tensile Strength	ISO 527	M Pa	45	38	39	45	43		47	46	42	53	48	41	39	
Flexural Strength	ISO 178	M Pa	69	59	56	73	74		72	66	64	80	76	57	60	
Flexural Modulus	ISO 178	M Pa	2,170	1,750	1,740	2,250	3,790		2,220	2,050	2,040	2,610	2,210	1,720	2,030	
Charpy Impact	ISO 179	KJ/m2	19	28	40	14	2.1		25	36	15	9	8	16	22	
Rockwell Hardness	ISO 2039	-	R104	R94	R89	R106	R106		R108	R98	R105	R114	R114	R97	R101	
Melt Mass Flow Rate	ISO 1133	g/10Min. Test condition	11.0 220°C,98N	5.5 220°C,98N	17.0 220°C,98N	5.0 240°C,98N	16.0 220°C,98N		4.2 220°C,98N	3.8 220°C,98N	26.0 220°C,98N	30.0 220°C,98N	14.0 240°C,98N	39.0 220°C,98N	12.0 220°C,98N	
Temp. of Deflection	ISO 75 (Under Load)	°C	80	77	77	86	79		80	81	73	74	85	68	75	
Density	ISO 1183	-	1.05	1.05	1.04	1.05	1.12		1.05	1.06	1.07	1.09	1.09	1.09	1.04	
Molding Shrinkage	ISO 294-4	Low High									0.40 0.60	0.40 0.60	0.40 0.60	0.40 0.60	0.40 0.60	
Flammability	UL94	Min. Thick (mm)	HB	HB	HB					HB	HB	HB	HB	HB	HB	
		Flame Class														
		color	ALL	ALL	ALL					ALL	ALL	ALL	ALL	ALL	ALL	
Surface Resistivity	ASTM D257															
Static Voltage	JIS L1094	V														
JHOPA	JHOPA	-														
Tensile Strength	ASTM D638	M Pa kgf/cm2	49.0 500	42.2 430	39.2 400	49.0 500	47.0 480				44.1 450	53.9 550	49.0 500	40.0 410	42.2 430	
Flexural Strength	ASTM D790	M Pa kgf/cm2	81.4 830	69.6 710	63.7 650	76.5 780	81.0 830				72.6 740	92.2 940	75.5 770	66.7 680	70.6 720	
Flexural Modulus	ASTM D790	M Pa kgf/cm2	2,350 24,000	2,160 22,000	1,960 20,000	2,650 27,000	4,320 44,000				2,160 22,000	2,750 28,000	2,350 24,000	1,910 19,500	2,350 24,000	
Izod Impact	ASTM D256	kgf cm/cm J/m	19 186	29 284	38 373	16 157	3 29				16 157	10 98	9 88	16 157	15 147	
Rockwell Hardness	ASTM D785	-	R105	R102	R93	R107	R107				R105	R112	R114	R98	R103	
Deflection Temp.	ASTM D648	°C	92	89	92	98	86				87	87	96	80	87	
Density	ASTM D792	-	1.05	1.05	1.04	1.05	1.12				1.07	1.09	1.09	1.09	1.04	

**Typical molding condition**

Predrying temperature	B	B	B	D	B		B	B	B	B	D	B	B
temperature	1	1	1	4	~200°C		3	3	4	4	5	4	4
Mold temperature	-	-	-	-	-		-	-	T	T	T	T	T

Information of typical molding condition are showed on page 29 and 30.

Property	Test Method	Unit	Low Gloss					Laser Mark		Flame Retardant				
			High Flow	Heat Resistant	Heat Resistant & Impact	Heat Resistant & Rigidity	Extrusion	Black Lettering	White Lettering	1.5mm V-0 Standard	1.0mm V-0 High Flow	1.5m V-0 Thermostable & Light Resistant	1.5mm V-0 Thermostable & Light Resistant	
			TECHNO ABS 330L (38LG)	TECHNO ABS H530L(D1)	TECHNO ABS 545L (XT01LG)	TECHNO ABS 565L (XT09LG)	TECHNO ABS 611L	TECHNO ABS 15 K6	TECHNO ABS 77 K4	TECHNO ABS F5330 (NC100)	TECHNO ABS F5170	TECHNO ABS F5452(D1) (NC119(D1))	TECHNO ABS F7850	
Tensile Strength	ISO 527	M Pa	41	40	40	42	42		52	48	42	47	42	43
Flexural Strength	ISO 178	M Pa	62	64	63	68	66		81	72	62	70	66	68
Flexural Modulus	ISO 178	M Pa	2,130	2,120	2,000	2,120	2,250		2,490	2,270	2,160	2,330	2,110	2,300
Charpy Impact	ISO 179	KJ/m2	12	23	8	5	17		13	9	9	12	10	11
Rockwell Hardness	ISO 2039	-	R105	R103	R106	R107	R102		R113	R110	R102	R105	R102	R105
Melt Mass Flow Rate	ISO 1133	g/10Min. Test condition	50.0 220°C,98N	43.0 240°C,98N	2.8 220°C,98N	2.9 220°C,98N	4.3 220°C,98N		21.0 220°C,98N	25.0 220°C,98N	9.0 200°C,49N	33.0 220°C,98N	37.0 220°C,98N	35.0 220°C,98N
Temp. of Deflection	ISO 75 (Under Load)	°C	77	78	87	93	80		82	74	67	75	72	72
Density	ISO 1183	-	1.05	1.05	1.05	1.05	1.05		1.05	1.09	1.21	1.22	1.19	1.19
Molding Shrinkage	ISO 294-4	Low High	0.40 0.60	0.40 0.60	0.40 0.60	0.40 0.60	0.40 0.60		0.40 0.60	0.40 0.60	0.40 0.60	0.30 0.60	0.40 0.60	0.40 0.60
Flammability	UL94	Min. Thick (mm) Flame Class  color	HB  ALL						HB (15)  ALL	HB (77)  ALL	2.5mm 5V 1.5mm V-0  ALL	1.5mm 5VB 1.0mm V-0  ALL	2.0mm 5V 1.5mm V-0 1.2mm V-2  ALL	1.7mm 5VB 1.5mm V-0  ALL
Surface Resistivity	ASTM D257	Ω												
Static Voltage	JIS L1094	V												
JHOPA	JHOPA	-												
Tensile Strength	ASTM D638	M Pa kgf/cm2	45.1 460		42.2 430	44.1 450			53.9 550	45.1 460	45.1 460		47.1 480	
Flexural Strength	ASTM D790	M Pa kgf/cm2	72.6 740		71.6 730	74.5 760			102.0 1,040	73.5 750	70.6 720		78.5 800	
Flexural Modulus	ASTM D790	M Pa kgf/cm2	2,550 26,000		2,400 24,500	2,550 26,000			2,920 29,800	2,300 23,500	2,550 26,000		2,650 27,000	
Izod Impact	ASTM D256	kgf cm/cm J/m	9 88		10 98	5 49			16 157	11 108	10 98		14 137	
Rockwell Hardness	ASTM D785	-	R107		R110	R108			R114	R108	R103		R108	
Deflection Temp.	ASTM D648	°C	91		104	110			96	90	77		90	
Density	ASTM D792	-	1.05		1.05	1.05			1.05	1.09	1.21		1.21	

**Typical molding condition**

Predrying temperature	B	C	D	F	B		B	B	A	A	A	A
temperature	4	4	5	5	1		4	4	2	2	3	3
Mold temperature	T	U	T	T	-		T	T	T	T	T	T

Information of typical molding condition are showed on page 29 and 30.

Property	Test Method	Unit	Flame Retardant							Flame Retardant					Weather Resistant
			2mm V-0 Thermostable & Light Resistant	2mm V-0 Light Resistant	2mm V-0 Heat Resistant	2mm V-0 Chemical Resistant		1.5mm V-0 Antibacterial	2.5mm V-0 Antibacterial	1.1mm V-2 Thermostable &Light Resistant	1.1mm V-2 Thermostable &Light Resistant	0.75mm V-2 Light Resistant	1.5mm V-2 Non Harogen	High Rigidity &High Flow	
			TECHNO ABS F5450 (W) (NC118 (W))	TECHNO ABS F5456	TECHNO ABS TFX-STG(1)	TECHNO ABS TFX-SBT3		TECHNO ABS HZTFXST(4)	TECHNO ABS ZF5551	TECHNO ABS F1350 (NC471)	TECHNO ABS F1350(D4)	TECHNO ABS F1150 (NC472)	TECHNO ABS F1384	TECHNO AES W200 (AES117)	
Tensile Strength	ISO 527	M Pa	43	44	40	39		45	44	51	50	46	48	51	
Flexural Strength	ISO 178	M Pa	66	65	61	59		70	71	73	79	71	71	77	
Flexural Modulus	ISO 178	M Pa	2,170	2,210	1,940	1,850		2,300	2,450	2,430	2,660	2,270	2,310	2,500	
Charpy Impact	ISO 179	KJ/m2	9	18	9	27		9	7	11	13	10	19	8	
Rockwell Hardness	ISO 2039	-	R104	R100	R100	R90		R105	R109	R110	R112	R108	R109	R110	
Melt Mass Flow Rate	ISO 1133	g/10Min. Test condition	69.0 220°C,98N	16.0 220°C,98N	14.0 220°C,98N	17.0 220°C,98N		35.0 220°C,98N	50.0 220°C,98N	35.0 220°C,98N	23.0 220°C,98N	52.0 220°C,98N	42.0 220°C,98N	47.0 220°C,98N	
Temp. of Deflection	ISO 75 (Under Load)	°C	72	76	80	73		77	75	79	82	78	72	78	
Density	ISO 1183	-	1.19	1.18	1.19	1.19		1.21	1.19	1.09	1.09	1.11	1.06	1.05	
Molding Shrinkage	ISO 294-4	Low High	0.40 0.60	0.30 0.60	0.30 0.60	0.40 0.60		0.40 0.60	0.40 0.60	0.40 0.60	0.40 0.60	0.30 0.60	0.40 0.60	0.40 0.60	
Flammability	UL94	Min. Thick (mm) Flame Class  color	2.5mm 5V 2.1mm V-0 1.4mm V-1  ALL	2.5mm 5VB 2.0mm V-0  ALL	2.5mm 5VA 2.0mm V-0  ALL	2.5mm 5VB 2.0mm V-0  ALL		1.5mm V-0  ALL	2.5mm Only V-0  ALL	1.1mm V-2  ALL	1.1mm V-2  ALL	0.75-2.5mm V-2  ALL	1.5mm V-2  ALL	HB  ALL	
Surface Resistivity	ASTM D257	Ω													
Static Voltage	JIS L1094	V													
JHOPA	JHOPA	-													
Tensile Strength	ASTM D638	M Pa kgf/cm2	47.1 480							52.0 530		46.1 470	51.0	53.9 550	
Flexural Strength	ASTM D790	M Pa kgf/cm2	78.5 800							82.4 840		74.5 760	87.3	90.2 920	
Flexural Modulus	ASTM D790	M Pa kgf/cm2	2,840 29,000							2,890 29,000		2,550 26,000	2,830	2,750 28,000	
Izod Impact	ASTM D256	kgf cm/cm J/m	10 98							12 118		12 118	137	8 78	
Rockwell Hardness	ASTM D785	-	R108							R111		R108	R110	R111	
Deflection Temp.	ASTM D648	°C	87							93		90	84	92	
Density	ASTM D792	-	1.19							1.09		1.11	1.06	1.05	

**Typical molding condition**

Predrying temperature	A	A	A	A		A	A	A	A	A	A	A	B
temperature	3	3	3	3		3	3	3	3	3	3	3	4
Mold temperature	T	T	T	T		T	T	T	T	T	T	T	U

Information of typical molding condition are showed on page 29 and 30.

Property	Test Method	Unit	Weather Resistant				Bright Color Resin	ABS/PC Alloy							
			Middle Impact	Middle Impact &Heat Resistant	Middle Impact &High Heat Resistant	Super High Heat Resistant	Weather Resistant	Standard	Heat Resistant	Heat Resistant &High Rigidity	1.4mm V-2 Flame Retardant	1.5mm V-0 Flame Retardant	V-0 Non halogen Flame Retardant	V-0 Non halogen Flame Retardant	
			TECHNO AES W210 (AES112)	TECHNO AES W240 (AES145)	TECHNO AES W245 (AES147)	TECHNO AES W250 (AES491)	EXCELLOY MX851		EXCELLOY CK10 (CB10)	EXCELLOY CK50 (CB40)	EXCELLOY CK55 (PX30)	EXCELLOY CKF10 (NX277)	EXCELLOY CKF51	EXCELLOY CZ400	EXCELLOY CZ500
Tensile Strength	ISO 527	M Pa	49	48	48	49	46		45	52	55	48	53	61	59
Flexural Strength	ISO 178	M Pa	71	72	70	76	67		67	69	78	78	80	92	89
Flexural Modulus	ISO 178	M Pa	2,220	2,200	2,200	2,350	2,000		1,800	1,700	2,200	2,130	2,290	2,510	2,400
Charpy Impact	ISO 179	KJ/m2	9	18	18	13	10		50	53	42	44	50	43	48
Rockwell Hardness	ISO 2039	-	R106	R104	R104	R107	R101		R106	R108	R118	R110	R110	R119	R119
Melt Mass Flow Rate	ISO 1133	g/10Min. Test condition	19.0 220°C,98N	17.5 220°C,98N	6.3 220°C,98N	26.0 240°C,98N	37.0 220°C,98N		15.0 240°C,98N	9.5 240°C,98N	15.0 240°C,98N	59.0 240°C,98N	58.0 240°C,98N	53.0 240°C,98N	47.0 240°C,98N
Temp. of Deflection	ISO 75 (Under Load)	°C	77	78	83	92	68		94	107	108	91	93	81	83
Density	ISO 1183	-	1.04	1.04	1.05	1.06	1.08		1.10	1.14	1.15	1.15	1.22	1.19	1.19
Molding Shrinkage	ISO 294-4	Low High	0.40 0.60	0.40 0.60	0.40 0.70	0.40 0.70	0.40 0.60		0.40 0.60	0.40 0.70	0.40 0.70	0.40 0.70	0.40 0.70	0.40 0.70	0.40 0.70
Flammability	UL94	Min. Thick (mm) Flame Class  color		HB  ALL					HB  ALL	HB  ALL		1.4mm V-2  ALL	2.5mm 5VB 1.5mm V-0  ALL	0.9-2.5mm V-0  ALL	1.2-2.5mm V-0  ALL
Surface Resistivity	ASTM D257	Ω													
Static Voltage	JIS L1094	V													
JHOPA	JHOPA	-													
Tensile Strength	ASTM D638	M Pa kgf/cm2	51.0 520	49.0 500	49.0 500	52.0 530	47.0 480		49.0 500	53.9 550	59.8 610	50.0 510		61.0 630	61.0 630
Flexural Strength	ASTM D790	M Pa kgf/cm2	82.4 840	82.4 840	73.5 750	86.3 880	74.5 760		78.5 800	75.5 770	112.8 1,150	80.4 820		97.0 990	97.0 990
Flexural Modulus	ASTM D790	M Pa kgf/cm2	2,550 26,000	2,450 25,000	2,450 25,000	2,600 26,500	2,350 24,000		2,260 23,000	2,110 21,500	2,650 27,000	2,260 23,000		2,900 29,600	2,880 29,400
Izod Impact	ASTM D256	kgf cm/cm J/m	12 118	21 206	20 196	12 118	13 133		50 490	60 588	26 255	30 294		12 120	48 470
Rockwell Hardness	ASTM D785	-	R108	R105	R100	R107	R102		R108	R111	R119	R110		R118	R119
Deflection Temp.	ASTM D648	°C	89	95	98	105	80		105	123	124	102		92	95
Density	ASTM D792	-	1.04	1.04	1.05	1.06	1.08		1.10	1.14	1.15	1.15		1.19	1.19

**Typical molding condition**

Predrying temperature	B	B	D	E	B		F	F	F	E	E	B	B
temperature	4	4	5	5	5		5	5	5	4	4	4	4
Mold temperature	U	U	U	T	T		U	U	U	T	T	T	T

Information of typical molding condition are showed on page 29 and 30.

Property	Test Method	Unit	AES/PC Alloy		ABS/PA Alloy (Chemical Resistant)				ABS/PBT Alloy (Chemical Resistant)			Sliding					
			Weather Resistant EXCELLOY CW10 (CE10)	Weather Resistant EXCELLOY CW50 (CE40)	Standard EXCELLOY AK10 (AK101)		High Impact EXCELLOY AK15 (AK102)		Heat Resistant EXCELLOY TK10 (BK101)	High Impact EXCELLOY TK15 (BK104)	Chemical Resistant & High Flow EXCELLOY TK30 (BK105)	Standard EXCELLOY SX220 (SX A105)	Standard EXCELLOY SX240 (SX A407)	High Sliding EXCELLOY SX620 (SX E105)	High Sliding EXCELLOY SX640 (SX E407)	1.6mm V-2 Flame Retardant EXCELLOY SXF321	
					(Dry)	(Cond1.6%)	(Dry)	(Cond2.5%)									
Tensile Strength	ISO 527	M Pa	52	56	50	39	41	30		40	38	41	45	42	41	42	36
Flexural Strength	ISO 178	M Pa	74	83	75	55	59	32		60	55	61	68	61	65	63	60
Flexural Modulus	ISO 178	M Pa	1,920	2,100	2,090	1,610	1,610	680		1,870	1,530	1,830	2,150	1,960	2,070	2,110	1,950
Charpy Impact	ISO 179	KJ/m2	33	40	11	24	69	76		28	55	7	20	12	15	9	8
Rockwell Hardness	ISO 2039	-	R107	R112	R109	R100	R101	R90		R104	R98	R104	R104	R104	R102	R101	R100
Melt Mass Flow Rate	ISO 1133	g/10Min. Test condition	44.0 240°C,98N	30.0 240°C,98N	35.0 260°C,98N		30.0 260°C,98N			12.0 240°C,98N	7.0 240°C,98N	50.0 240°C,98N	11.0 220°C,98N	4.0 220°C,98N	10.0 220°C,98N	4.0 220°C,98N	55.0 220°C,98N
Temp. of Deflection	ISO 75 (Under Load)	°C	93	102	78	72	65	57		83	77	77	82	91	81	92	74
Density	ISO 1183	-	1.11	1.15	1.05		1.06			1.08	1.10	1.11	1.05	1.05	1.06	1.06	1.12
Molding Shrinkage	ISO 294-4	Low High	0.40 0.60	0.40 0.70	0.40 0.70		0.70 1.00			0.40 0.70	0.40 0.70	0.40 0.70	0.50 0.70	0.50 0.70	0.50 0.70	0.50 0.80	0.40 0.60
Flammability	UL94	Min. Thick (mm) Flame Class  color											HB  ALL	HB  ALL	HB  ALL	HB  ALL	1.6-2.5mm V-2  ALL
Surface Resistivity	ASTM D257	Ω															
Static Voltage	JIS L1094	V															
JHOPA	JHOPA	-															
Tensile Strength	ASTM D638	M Pa kgf/cm2	53.9 550	58.8 600	52.0 530	40.2 410	42.2 430	30.4 310		41.2 420	39.2 400	41.2 420	43.1 440	43.1 440	45.1 460	43.1 440	
Flexural Strength	ASTM D790	M Pa kgf/cm2	83.4 850	93.2 950	84.3 860	63.7 650	67.7 690	40.2 410		69.6 710	63.7 650	68.6 700	71.6 730	68.6 700	75.5 770	72.6 740	
Flexural Modulus	ASTM D790	M Pa kgf/cm2	2,300 23,500	2,500 25,500	2,500 25,500	1,960 20,000	1,960 20,000	900 9,200		2,260 23,000	1,860 19,000	2,260 23,000	2,350 24,000	2,350 24,000	2,550 26,000	2,520 25,700	
Izod Impact	ASTM D256	kgf cm/cm J/m	35 343	50 490	12 118	26 255	75 735	83 814		30 294	60 588	6 59	25 245	13 127	14 137	13 127	
Rockwell Hardness	ASTM D785	-	R108	R115	R110	R101	R102	R91		R105	R99	R106	R104	R105	R105	R102	
Deflection Temp.	ASTM D648	°C	105	116	92	85	78	70		99	93	94	96	105	95	106	
Density	ASTM D792	-	1.11	1.15	1.05		1.06			1.08	1.10	1.11	1.05	1.05	1.06	1.06	

**Typical molding condition**

Predrying temperature	F	F	B	-	B	-		B	B	B	D	D	D	D	A
temperature	5	5	6	-	6	-		5	5	5	4	4	4	4	3
Mold temperature	U	U	T	-	T	-		T	T	T	T	T	T	T	T

Information of typical molding condition are showed on page 29 and 30.

Property	Test Method	Unit	Vibration Damping		Lasting Antistatic/ Conducting Material				Lasting Antistatic/ Conducting Material			Glass Reinforced ABS				
			Standard	Standard	Standard	Transparent	2.5mm V-0 Flame Retardant		1.5mm V-0 Flame Retardant	CF Reinforced	Sliding	Standard	Standard	Standard	1.5mm V-0 Flame Retardant	1.5mm V-0 Flame Retardant
			EXCELLOY DX220	EXCELLOY EK10 (HK101)	EXCELLOY EK50 (HK141)	EXCELLOY EK81(D5)	EXCELLOY EKF54		EXCELLOY EKF55	EXCELLOY EK13C8	EXCELLOY SXJ220 (SXH105)	TECHNO ABS 130G10 (15G10)	TECHNO ABS 130G20 (15G20)	TECHNO ABS 130G30 (15G30)	TECHNO ABS F5330G10 (NC100G10)	TECHNO ABS F5330G20 (NC100G20)
Tensile Strength	ISO 527	M Pa	47	44	41	41	44		44	65	47	63	77	91	56	82
Flexural Strength	ISO 178	M Pa	67	68	64	59	62		62	85	72	98	118	136	91	132
Flexural Modulus	ISO 178	M Pa	1,870	2,040	2,000	1,840	2,100		2,130	4,500	2,050	3,620	5,420	7,090	3,840	5,720
Charpy Impact	ISO 179	KJ/m2	9	20	12	12	9		7	7	18	8	8	7	8	7
Rockwell Hardness	ISO 2039	-	R84	R102	R98	R102	R100		R100	R103	R103	R112	R113	R113	R108	R110
Melt Mass Flow Rate	ISO 1133	g/10Min. Test condition	30.0 220°C,98N	29.0 220°C,98N	15.0 220°C,98N	42.0 220°C,98N	45.0 220°C,98N		60.0 220°C,98N	13.0 220°C,98N	21.0 220°C,98N	18.0 220°C,98N	11.0 220°C,98N	10.0 220°C,98N	96.0 220°C,98N	70.0 220°C,98N
Temp. of Deflection	ISO 75 (Under Load)	°C	72	80	87	69	80		78	97	78	93	93	94	80	82
Density	ISO 1183	-	1.07	1.07	1.07	1.09	1.22		1.22	1.10	1.08	1.10	1.17	1.25	1.25	1.33
Molding Shrinkage	ISO 294-4	Low High	0.40 0.60	0.40 0.60	0.40 0.60	0.40 0.60	0.40 0.70		0.40 0.70	0.20 0.40	0.50 0.70	0.20 0.40	0.15 0.35	0.10 0.30	0.30 0.50	0.20 0.40
Flammability	UL94	Min. Thick (mm) Flame Class	HB	HB	HB	HB	2.5mm V-0		1.5mm V-0		HB	HB	HB	HB	2.5mm 5VA 1.5mm V0	2.5mm 5VA 1.5mm V0
		color	ALL	ALL	ALL	ALL	ALL		ALL		ALL	ALL	ALL	ALL	ALL	ALL
Surface Resistivity	ASTM D257	Ω		3×10 <sup>11</sup>	3×10 <sup>11</sup>		1×10 <sup>11</sup>		3×10 <sup>10</sup>	1×10 <sup>4</sup>	1×10 <sup>11</sup>					
Static Voltage	JIS L1094	V		170	200						750					
JHOPA	JHOPA	-														
Tensile Strength	ASTM D638	M Pa kgf/cm2	49.0 500	45.1 460	39.2 400	45.1 460				74.0 760	47.1 480	63.7 650	88.3 900	98.1 1,000		
Flexural Strength	ASTM D790	M Pa kgf/cm2	76.5 780	75.5 770	68.6 700	75.5 770				92.0 940	76.5 780	98.1 1,000	118.0 1,200	137.0 1,400		
Flexural Modulus	ASTM D790	M Pa kgf/cm2	2,260 23,000	2,350 24,000	2,350 24,000	2,260 23,000				4,520 46,100	2,450 25,000	3,820 39,000	5,590 57,000	7,350 75,000		
Izod Impact	ASTM D256	kgf cm/cm J/m	9 88	22 216	12 118	10 98				7 69	19 186	7 69	7 69	6 59		
Rockwell Hardness	ASTM D785	-	R85	R104	R100	R104				R102	R103	R113	R115	R115		
Deflection Temp.	ASTM D648	°C	85	94	100	84				102	89	100	101	103		
Density	ASTM D792	-	1.07	1.07	1.07	1.09				1.10	1.08	1.10	1.17	1.25		

**Typical molding condition**

Predrying temperature	B	C	C	C	A		A	C	B	B	B	B	B	B
temperature	4	4	4	4	3		3	4	4	4	4	4	2	2
Mold temperature	T	T	T	T	T		T	T	T	T	T	T	U	U

Information of typical molding condition are showed on page 29 and 30.

Property	Test Method	Unit	Glass Reinforced ABS					Glass Reinforced Alloy									
			1.5mm V-0 Flame Retardant	2.1mm V-0 Flame Retardant	2.1mm V-0 Flame Retardant	2.1mm V-0 Flame Retardant	1.5mm V-2 Flame Retardant	ABS/PC Alloy	ABS/PC Alloy	ABS/PC Alloy	ABS/PA Alloy		ABS/PBT Alloy	ABS/PC Flame Retardant	ABS/PC Flame Retardant		
			TECHNO ABS F5330G30 (NC100G30)	TECHNO ABS F5451G10 (NC411G10)	TECHNO ABS F5451G20 (NC411G20)	TECHNO ABS F5451G30 (NC411G30)	TECHNO ABS F1350G10 (NC471G10)	EXCELLOY CK10G10 (CB10G10)	EXCELLOY CK10G20 (CB10G20)	EXCELLOY CK10G30 (CB10G30)	EXCELLOY AK12G20 (AK602G20)		EXCELLOY TK12G20	EXCELLOY CKF51G10	EXCELLOY CKF51G20		
									(Dry)	(Cond2.2%)							
Tensile Strength	ISO 527	M Pa	108	63	77	91	61		59	76	91	97	82	84	75	95	
Flexural Strength	ISO 178	M Pa	165	94	118	130	103		94	117	128	167	117	138	105	128	
Flexural Modulus	ISO 178	M Pa	7,870	3,690	5,210	7,260	3,780		3,340	4,910	5,670	4,750	3,390	5,080	3,780	5,760	
Charpy Impact	ISO 179	KJ/m2	7	6	6	6	8		14	13	9	15	28	13	8	7	
Rockwell Hardness	ISO 2039	-	R109	R110	R111	R112	R109		R108	R109	R109	R115	R111	R111	R114	R114	
Melt Mass Flow Rate	ISO 1133	g/10Min. Test condition	42.0 220°C,98N	24.0 220°C,98N	18.0 220°C,98N	9.0 220°C,98N	21.0 220°C,98N		10.0 240°C,98N	7.0 240°C,98N	6.0 240°C,98N	38.0 260°C,98N		40.0 260°C,98N	23.0 240°C,98N	17.0 240°C,98N	
Temp. of Deflection	ISO 75 (Under Load)	°C	83	90	95	95	96		110	115	120	135	128	120	104	111	
Density	ISO 1183	-	1.42	1.25	1.33	1.42	1.18		1.15	1.23	1.32	1.22		1.28	1.27	1.34	
Molding Shrinkage	ISO 294-4	Low High	0.10 0.30	0.30 0.50	0.20 0.40	0.10 0.30	0.30 0.50		0.20 0.40	0.10 0.30	0.10 0.20	0.10 0.40		0.20 0.50	0.20 0.40	0.10 0.30	
Flammability	UL94	Min. Thick (mm) Flame Class	2.5mm 5VA 1.5mm V-0	2.5mm 5VA 2.1mm V-0	2.5mm 5VA 2.1mm V-0	2.5mm 5VA 2.1mm V-0	1.5mm-2.1mm V-2		HB	HB	HB			HB	2.5mm 5VB 1.5mm V-0	2.5mm 5VB 1.5mm V-0	
		color	ALL	ALL	ALL	ALL	ALL		ALL	ALL	ALL			NC	ALL	ALL	
Surface Resistivity	ASTM D257	Ω															
Static Voltage	JIS L1094	V															
JHOPA	JHOPA	-															
Tensile Strength	ASTM D638	M Pa kgf/cm2		58.8 600	88.3 900	98.1 1,000			58.8 600	83.4 850	88.3 900	103.0 1,050	89.2 910	90.2 920			
Flexural Strength	ASTM D790	M Pa kgf/cm2		98.1 1,000	117.7 1,200	127.5 1,300			98.1 1,000	117.7 1,200	127.5 1,300	156.9 1,600	117.7 1,200	134.4 1,370			
Flexural Modulus	ASTM D790	M Pa kgf/cm2		4,020 41,000	6,280 64,000	8,040 82,000			3,330 34,000	5,300 54,000	6,180 63,000	5,100 52,000	3,510 35,800	5,490 56,000			
Izod Impact	ASTM D256	kgf cm/cm J/m		6 59	6 59	5 49			13 127	11 108	9 88	13 127	24 235	11 108			
Rockwell Hardness	ASTM D785	-		R112	R113	R113			R111	R112	R112	R116	R112	R113			
Deflection Temp.	ASTM D648	°C		98	102	102			115	123	125	142	136	124			
Density	ASTM D792	-		1.25	1.33	1.42			1.15	1.23	1.32	1.22		1.28			

**Typical molding condition**

Predrying temperature	B	B	B	B	B		F	F	F	F	-	B	F	F
temperature	2	3	3	3	3		6	6	6	6	-	5	4	4
Mold temperature	U	U	U	U	U		U	U	U	U	-	T	T	T

Information of typical molding condition are showed on page 29 and 30.

Property	Test Method	Unit	Glass Reinforced Alloy	SAN Resin								SAN Resin			
			ABS/PC Flame Retardant	Standard	High Flow	High Flow& High Rigidity	High Flow& High Rigidity		High Rigidity	1.5mm V-2 Flame Retardant	1.5mm V-0 Flame Retardant	Glass Reinforced	Glass Reinforced	Glass Reinforced	Glass Reinforced
			EXCELLOY CKF51G30	SANREX SAN-C <S10>	SANREX SAN-R <S20>	SANREX SAN-T <S40>	SANREX SAN-L <S45>		SANREX SAN-H <S90>	SANREX SF10 <SAN-AK>	SANREX CLM-AM25	SANREX S10G12 (CLM-S315)	SANREX S10G15 (CLM-S320)	SANREX S10G20 (CLM-S325)	SANREX S10G32 (CLM-S340)
Tensile Strength	ISO 527	M Pa	106	71	64	79	76		78	69	113	99	109	118	123
Flexural Strength	ISO 178	M Pa	140	88	87	107	97		97	97	155	133	145	158	164
Flexural Modulus	ISO 178	M Pa	7,430	3,050	2,970	3,210	3,130		3,130	3,210	6,850	4,780	5,750	6,230	8,350
Charpy Impact	ISO 179	KJ/m2	6	1.3	1.3	1.7	1.5		1.6	1.1	6.0	3.8	4.7	5.2	5.2
Rockwell Hardness	ISO 2039	-	R115	M82	M82	M82	M82		M82	M82	R120	M86	M89	M91	M93
Melt Mass Flow Rate	ISO 1133	g/10Min. Test condition	13.0 240°C,98N	25.0 220°C,98N	44.0 220°C,98N	14.0 220°C,98N	22.0 220°C,98N		5.0 220°C,98N	35.0 220°C,98N	6.0 220°C,98N	7.0 220°C,98N	6.0 220°C,98N	5.0 220°C,98N	3.0 220°C,98N
Temp. of Deflection	ISO 75 (Under Load)	°C	111	85	83	87	87		90	82	98	97	99	100	101
Density	ISO 1183	-	1.42	1.08	1.08	1.08	1.08		1.08	1.11	1.36	1.17	1.20	1.23	1.29
Molding Shrinkage	ISO 294-4	Low High	0.10 0.20	0.20 0.50	0.20 0.50	0.20 0.50	0.20 0.50		0.20 0.50	0.20 0.50	0.20 0.40	0.20 0.40	0.20 0.40	0.10 0.30	0.10 0.30
Flammability	UL94	Min. Thick (mm) Flame Class	2.5mm 5VB 1.5mm V-0	HB		HB	HB		HB	1.5mm V-2	2.5mm 5VA 1.5mm V-0	HB	HB	HB	HB
		color	ALL	ALL		ALL	ALL		ALL	ALL	ALL	ALL	ALL	ALL	ALL
Surface Resistivity	ASTM D257	Ω													
Static Voltage	JIS L1094	V													
JHOPA	JHOPA	-													
Tensile Strength	ASTM D638	M Pa kgf/cm2		79.4 810	70.6 720	90.2 920	85.3 870		88.2 900	77.5 790		105.9 1,080	115.7 1,180	124.5 1,270	129.4 1,320
Flexural Strength	ASTM D790	M Pa kgf/cm2		107.9 1,100	107.9 1,100	127.5 1,300	117.7 1,200		141.2 1,440	141.2 1,440		135.3 1,380	144.1 1,470	153.9 1,570	158.8 1,620
Flexural Modulus	ASTM D790	M Pa kgf/cm2		3,630 37,000	3,530 36,000	3,820 39,000	3,730 38,000		3,760 38,400	3,820 39,000		4,810 49,000	5,590 57,000	5,980 61,000	7,650 78,000
Izod Impact	ASTM D256	kgf cm/cm J/m		1.4 14	1.4 14	1.6 16	1.5 15		1.6 16	1.2 11		4.4 43	5.5 54	6.1 60	6.1 60
Rockwell Hardness	ASTM D785	-		M83	M83	M83	M83		M83	M83		M87	M90	M92	M94
Deflection Temp.	ASTM D648	°C		95	94	96	96		99	93		102	103	104	105
Density	ASTM D792	-		1.08	1.08	1.08	1.08		1.08	1.11		1.17	1.20	1.23	1.29

**Typical molding condition**

Predrying temperature	F	A	A	A	A		A	A	A	A	A	A	A	A
temperature	4	4	4	4	4		4	2	2	4	4	4	4	4
Mold temperature	T	S	S	S	S		S	S	S	T	T	T	T	T

Information of typical molding condition are showed on page 29 and 30.

**JHOPA registered grade**

Property	Test Method	Unit	General Use		High Flow	Chemical Resistant	Heat Resistant		Transparent		ABS/PC Alloy	SAN Resin	
			Middle Impact & High Rigidity	High Impact	High Flow	Super High Chemical Resistant	Heat Resistant	High Heat Resistant	Standard	High Rigidity	Standard	Standard	
			TECHNO ABS 130P	TECHNO ABS 150P	TECHNO ABS 330P	TECHNO ABS R790P		TECHNO ABS 500P	TECHNO ABS 546P	TECHNO ABS 810P (55P)	TECHNO ABS 830P (58P)	EXCELLOY CK10P	SANREX SAN-CP <S10P>
Tensile Strength	ISO 527	M Pa	47	43	44	49		49	49	42	53	45	71
Flexural Strength	ISO 178	M Pa	75	69	70	59		79	74	64	80	67	88
Flexural Modulus	ISO 178	M Pa	2,470	2,290	2,320	1,950		2,530	2,320	2,040	2,610	1,800	3,050
Charpy Impact	ISO 179	KJ/m2	20	26	19	23		19	16	15	9	50	1.3
Rockwell Hardness	ISO 2039	-	R109	R105	R108	R99		R111	R107	R105	R114	R106	M82
Melt Mass Flow Rate	ISO 1133	g/10Min. Test condition	18.0 220°C,98N	16.0 220°C,98N	42.0 220°C,98N	16.0 220°C,98N		9.0 220°C,98N	3.9 220°C,98N	26.0 220°C,98N	30.0 220°C,98N	15.0 240°C,98N	25.0 220°C,98N
Temp. of Deflection	ISO 75 (Under Load)	°C	80	79	78	79		83	92	73	74	94	85
Density	ISO 1183	-	1.05	1.04	1.05	1.06		1.05	1.05	1.07	1.09	1.10	1.08
Molding Shrinkage	ISO 294-4	Low High	0.40 0.60	0.40 0.60	0.40 0.60	0.40 0.60		0.40 0.70	0.40 0.70	0.40 0.60	0.40 0.60	0.40 0.60	0.20 0.50
Flammability	UL94	Min. Thick (mm) Flame Class  color							HB  ALL				
Surface Resistivity	ASTM D257	Ω											
Static Voltage	JIS L1094	V											
JHOPA	JHOPA	-	Registered	Registered	Registered	Registered		Registered	Registered	Registered	Registered	Registered	Registered
Tensile Strength	ASTM D638	M Pa kgf/cm2	49.0 500	43.1 440	47.1 480	52.0 530		53.0 540		44.1 450	53.9 550	49.0 500	79.4 810
Flexural Strength	ASTM D790	M Pa kgf/cm2	88.3 900	73.5 750	81.4 830	80.4 820		87.3 890		72.6 740	92.2 940	78.5 800	107.9 1,100
Flexural Modulus	ASTM D790	M Pa kgf/cm2	2,750 28,000	2,350 24,000	2,600 26,500	2,300 23,500		2,750 28,000		2,160 22,000	2,750 28,000	2,260 23,000	3,630 37,000
Izod Impact	ASTM D256	kgf cm/cm J/m	20 196	32 314	18 177	25 245		17 167		16 157	10 98	50 490	1.4 14
Rockwell Hardness	ASTM D785	-	R112	R106	R110	R102		R112		R105	R112	R108	M83
Deflection Temp.	ASTM D648	°C	91	90	90	93		94		87	87	105	95
Density	ASTM D792	-	1.05	1.04	1.05	1.06		1.05		1.07	1.09	1.10	1.08

**Typical molding condition**

Predrying temperature	B	B	B	B		B	D	B	B	F	A
temperature	4	4	4	4		4	5	4	4	5	4
Mold temperature	T	T	T	T		T	T	T	T	U	S

Information of typical molding condition are showed on page 29 and 30.

Property	Test Method	Unit	Heat Resistant					Heat Resistant					Extrusion & Blow Material
			High Heat Resistant&Middle Impact TECHNO MUH M3100	High Heat Resistant&Middle Impact TECHNO MUH M7205	High Heat Resistant TECHNO MUH C7103	Super High Heat Resistant&Middle Impact TECHNO MUH W3404		Super High Heat Resistant&Middle Impact TECHNO MUH W7403	Super High Heat Resistant TECHNO MUH E7301	Super High Heat Resistant TECHNO MUH E1300	Super High Heat Resistant TECHNO MUH E1500	Blow&Heat Resistant TECHNO MUH BM5602	
Tensile Strength	ISO 527	M Pa	50	41	48	47		40	49	51	50	48	
Flexural Strength	ISO 178	M Pa	72	60	76	69		61	77	77	76	73	
Flexural Modulus	ISO 178	M Pa	2,210	1,830	2,370	2,200		1,850	2,330	2,410	2,410	2,300	
Charpy Impact	ISO 179	KJ/m2	17	16	9	14		16	11	11	11	18	
Rockwell Hardness	ISO 2039	-	R104	R96	R111	R103		R99	R111	R108	R108	R103	
Melt Mass Flow Rate	ISO 1133	g/10Min. Test condition	10.0 240°C,98N	6.0 240°C,98N	21.0 240°C,98N	7.0 240°C,98N		6.0 240°C,98N	16.0 240°C,98N	9.0 240°C,98N	8.0 240°C,98N	1.7 240°C,98N	
Temp. of Deflection	ISO 75 (Under Load)	°C	90	91	93	94		95	95	97	99	95	
Density	ISO 1183	-	1.05	1.05	1.06	1.05		1.05	1.06	1.05	1.05	1.05	
Molding Shrinkage	ISO 294-4	Low High	0.50 0.80	0.60 0.90	0.50 0.80	0.50 0.80		0.60 0.90	0.50 0.80	0.50 0.80	0.50 0.80		
Flammability	UL94	Min. Thick (mm) Flame Class  color											
Surface Resistivity	ASTM D257	Ω											
Static Voltage	JIS L1094	V											
JHOPA	JHOPA	-											
Tensile Strength	ASTM D638	M Pa kgf/cm2											
Flexural Strength	ASTM D790	M Pa kgf/cm2											
Flexural Modulus	ASTM D790	M Pa kgf/cm2											
Izod Impact	ASTM D256	kgf cm/cm J/m											
Rockwell Hardness	ASTM D785	-											
Deflection Temp.	ASTM D648	°C											
Density	ASTM D792	-											

**Typical molding condition**

Predrying temperature	D	D	D	F		E	F	E	F	B
temperature	5	5	5	5		5	5	5	5	210~240°C
Mold temperature	T	T	T	T		T	T	T	T	-

Information of typical molding condition are showed on page 29 and 30.

Property	Test Method	Unit	Squeek noise Reduction	Low Gloss				ABS/PC Alloy	ABS/PA Alloy	Glass Reinforced Alloy	Glass Reinforced ABS
			Super High Heat Resistant TECHNO MUH DN1300	Heat Resistant TECHNO MUH LG5534	Super High Heat Resistant TECHNO MUH LG5053	ABS/PC Alloy TECHNO ALPHALOY MPC2501LG		Heat Resistant TECHNO ALPHALOY MPC6801	ChemicalResistant TECHNO ALPHALOY MPA1601	ABS/PA Alloy TECHNO ALPHALOY MPA G101	Standard TECHNO MUH GF5202
Tensile Strength	ISO 527	M Pa	42	57	49	52		59	55	80	88
Flexural Strength	ISO 178	M Pa	64	71	73	79		87	80	122	119
Flexural Modulus	ISO 178	M Pa	2,280	2,260	2,310	2,290		2,290	2,190	4,010	5,890
Charpy Impact	ISO 179	KJ/m2	11	15	12	33		62	16	5	5
Rockwell Hardness	ISO 2039	-	R103	R106	R106	R113		R117	R111	R118	R116
Melt Mass Flow Rate	ISO 1133	g/10Min. Test condition	10.0 240°C,98N	7.0 240°C,98N	4.0 240°C,98N	22.0 240°C,98N		20.0 240°C,98N	18.0 240°C,98N	10.0 240°C,98N	13.0 240°C,98N
Temp. of Deflection	ISO 75 (Under Load)	°C	97	89	96	92		109	71	117	115
Density	ISO 1183	-	1.05	1.05	1.05	1.11		1.14	1.09	1.14	1.20
Molding Shrinkage	ISO 294-4	Low High	0.50 0.80	0.50 0.80	0.50 0.80	0.50 0.80		0.50 0.80	0.60 0.90	0.30 0.60	0.20 0.40
Flammability	UL94	Min. Thick (mm) Flame Class  color									
Surface Resistivity	ASTM D257	Ω									
Static Voltage	JIS L1094	V									
JHOPA	JHOPA	-									
Tensile Strength	ASTM D638	M Pa kgf/cm2									
Flexural Strength	ASTM D790	M Pa kgf/cm2									
Flexural Modulus	ASTM D790	M Pa kgf/cm2									
Izod Impact	ASTM D256	kgf cm/cm J/m									
Rockwell Hardness	ASTM D785	-									
Deflection Temp.	ASTM D648	°C									
Density	ASTM D792	-									

**Typical molding condition**

Predrying temperature		D	F	F		F	B	F	F
temperature		5	5	5		5	6	6	4
Mold temperature		T	T	T		U	T	U	U

Information of typical molding condition are showed on page 29 and 30.

Property	Test Method	Unit	General Use			Heat Resistant	Flame Retardant
			High Impact	Middle Impact & High Rigidity	High Rigidity	Heat Resistant	1.2mm V2 Standard
			BIOLLOY KG320	BIOLLOY KG330	BIOLLOY KG340	BIOLLOY KH420	BIOLLOY KF1380
Registration Number(JBPA *1)	-	-	C00093	C00094	C00095		C00099
Tensile Strength	ISO 527	M Pa	55	49	68	63	50
Flexural Strength	ISO 178	M Pa	82	87	95	95	72
Flexural Modulus	ISO 178	M Pa	2,630	2,950	3,270	2,840	2,210
Charpy Impact	ISO 179	KJ/m2	31	17	6	17	17
Rockwell Hardness	ISO 2039	-	R116	R116	R117	R118	R104
Melt Mass Flow Rate	ISO 1133	g/10Min. Test condition	20.0 220°C,98N	43.0 220°C,98N	690 220°C,98N	20.0 220°C,98N	50.0 240°C,98N
Temp. of Deflection	ISO 75 (Under Load)	°C	78 0.45MPa	63 0.45MPa	56 0.45MPa	106 0.45MPa	80 0.45MPa
		°C	66 1.8MPa	58 1.8MPa	- 1.8MPa	78 1.8MPa	65 1.8MPa
Density	ISO 1183	-	1.13	1.17	1.21	1.17	1.17
Molding Shrinkage	ISO 294-4	Low High	0.40 0.60	0.50 0.70	0.60 0.80	0.50 0.80	0.50 0.80
Flammability	UL94	Min. Thick (mm) Flame Class	HB			HB	1.2mm V-2
		color	ALL			ALL	ALL

\*1:Japam Bio Plastics Association

\*Notice

Each numerical value shown in this catalogue is a typical value based on the specified testing method.

The data and descriptions may be revised without notice based on new information.

Before handling the materials in this catalogue, refer to the material safety data sheet (MSDS) for complete details regarding handling and safety.

The material should be stored in a dry place out of direct sunlight, rain, excess humidity, heat, and ignition sources.

Do not inhale the generated gas when the material is processed. Adopt local vent system in the processing room.

The material should be buried in the ground or burned according to all the regulations or laws where applicable.

The user of the material is responsible solely for the final determination of safety and suitability.

When using with specialized applications such as those for the medical devices, food devices, or toys for infant, please consult TechnoPolymer in advance.

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#### Typical molding condition

Predrying temperature	75	70	65		80	75
temperature	4	4	4		4	4
Mold temperature	T	T	T		T	T

Information of typical molding condition are showed on page 29 and 30.

## Molding Conditions

Our resin products represented by TECHNO ABS are materials having excellent moldability and can be molded by general molding machines/molding methods. Selection of molding conditions will further contribute to acquisition of excellent molding appearance or physical properties.

### Conditions for Predrying

Since ABS Resin are hygroscopic, pre-drying of ABS pellet is necessary to achieve excellent molding appearance. Although the situation will vary depending on performance or specification of a drier to be used, etc., insufficient drying temperature and drying time, etc. may cause poor appearance (silver streak, etc.).

In general, temperature 5 to 10 °C higher than ISO load heat distortion temperature (i.e., temperature 5 to 10°C lower than ASTM load heat distortion temperature) of corresponding grade is suitable as the drying temperature (actual temperature), drying at temperature exceeding it may lead to blocking in a drier such as a hopper, etc. In the case of drying actual temperature lower than ISO load heat distortion temperature, it may cause poor appearance in spite of long dryness time. For materials of NY alloy, in particular, we recommend that you use a dehumidifying drier.

There are many factors in pre-drying conditions, such as a setting balance of drying temperature and drying time, the humid atmosphere in the rainy season, the opening of an air intake of drier and the clogging of a filter of a drier, etc. When the poor appearance by moisture absorption occurs in spite of pre-drying, please perform optimization of drying temperature and drying time after performing equipment check of a drier.

Typical standard conditions for pre-drying by type are as follows, while drying conditions of each grade are listed under the physical property table in this catalogue:

Type	Drying temperature (°C)	Drying time (Hrs)
A	75~85	2~5
B	80~90	2~5
C	80~90	3~6
D	85~95	2~5
E	90~100	2~5
F	100~110	2~5

### Conditions for Molding Temperature (Cylinder Set Temperature)

The molding conditions for obtaining excellent moldings differ depending on a type/capability of molding machine, mold structure, shape/thickness of a molding, etc. Low molding temperature may cause conspicuous short shot/weld line or substantial molding strain, etc. In contrast, high molding temperature may lead to burr/discoloration/resin decomposition (burn), etc.

Typical standard conditions for molding temperatures by type are as follows, while molding temperatures (cylinder set temperatures) of each grade are listed under the physical property table in this catalogue:

Type	Cylinder temperature (°C)
1	170~240
2	180~210
3	180~230
4	190~260
5	220~270
6	240~280

### Mold Temperature

When temperature of a mold is too low, a flow mark, reduced gloss of a surface, inadequate burn-in of welds, etc. may occur. When it is too high, a surface sink may occur.

Typical standard conditions for die temperatures by type are as follows, while die temperatures of each grade are listed under the physical property table in this catalogue:

Type	Mold temperature (°C)
S	20~80
T	40~80
U	50~100

### Recycling

In general, no substantial change in physical properties of ABS and AS series products is observed even when recycled items are used and mixed. If UL-746D "Standard of polymeric materials-work" is applied, recycled items can be added up to 25 weight percent. However, since addition of recycled items may cause poor appearance, change in color tone, etc., by checking actually molded items for any change including strength, you should try to adjust volume of recycled items to be added to appropriate level.

Note, however, that as alloy products with engineering plastics such as PC may experience a substantial change in physical property, appearance, etc., depending on storage or thermal history, etc., be sure to check actually molded items for strength to maintain volume of recycled items to be added to appropriate level. When using recycled items, pay attention so that recycled items will be predried without fail.



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