

Property Units Test method Test Condition Grade					Heat Resistant					High-heat Resistance		
					200H	300H	400H	500H	600H	X9108	X9102	SZ800
Physical	Specific gravity		ISO 1183	23°C	1.06	1.06	1.06	1.06	1.06	1.07	1.07	1.10
	Moisture Absorption	%	ISO 62	Immersion 24 hours	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Thermal	Temperature of Deflection Under Load(TDUL)	°C	ISO 75-1	1.80MPa	83	94	104	114	124	144	164	144
			ASTM D 648	1.82MPa	90	100	110	120	130	150	170	150
	Coefficient Linear Thermal Expansion	mm/mm/°C	ISO 11359	-30°C ~65°C	7.5×10 ⁻⁵	8.0×10 ⁻⁵	8.0×10 ⁻⁵	7.0×10 ⁻⁵	7.0×10 ⁻⁵	6.5×10 ⁻⁵	6.5×10 ⁻⁵	6.5×10 ⁻⁵
	Moulding shrinkage	%	ISO 294-4									
			ASTM D 955		0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7	0.8~1.0	0.8~1.0	0.8~1.0
	Flammability		UL 94	1.6mm	HB	HB	HB	HB	HB	HB	HB	V-0
				3.2mm	HB	HB	HB	HB	HB	HB	HB	V-0
Electrical	Dielectric Constant		IEC 60250	100 Hz	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
				1 MHz	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	Dissipation Factor		IEC 60250	100 Hz	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0027
				1 MHz	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0027
	Volume Resistivity	Ω • cm	IEC 60250	23°C 50% RH	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶
	Surface Resistivity	Ω	IEC 60093	23°C 50% RH	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶
	Dielectric Strength	kV/mm	IEC 60243	Short time, 2mm	29	29	29	30	30	30	30	30
	Comparative Tracking Index	V	IEC 60112	3mm	–	230	235	210	190	–	–	200
Mechanical	Tensile Strength	MPa	ISO 527	23°C 50% RH	46	53	54	55	60	62	67	76
	(Nominal) Tensile Strain	%	ISO 527	23°C 50% RH	(20)	(25)	(20)	(25)	(20)	(25)	(25)	(35)
	Flexural Strength	MPa	ISO 178	23°C 50% RH	50	73	77	82	87	82	82	109
	Flexural Modulus	MPa	ISO 178	23°C 50% RH	2230	2320	2370	2430	2480	2040	2120	2480
	Charpy Impact Strength(notched)	kJ/m ²	ISO 179	4mm 23°C	14	14	14	14	10	20	8	18
	Izod Impact Strength (notched)	J/m	ASTM D 256	6.4mm 23°C	147	147	147	147	98	196	78	176
				3.2mm 23°C	196	216	216	216	147	245	98	–
Molding Conditions	Resin Temperature	°C			220~270	230~280	230~290	240~290	250~310	290~320	290~320	280~320
	Mold Temperature	°C			40~70	50~80	60~90	70~100	70~100	80~120	80~120	80~120
	Pre-Drying Temperature	°C			80~90	80~90	90~100	90~100	90~100	90~100	90~100	90~120
	Drying Time	Hr			2~4	2~4	2~4	2~4	2~4	2~4	2~4	2~4

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Property Units Test method Test Condition Grade					Flame Retardant							
					100V	100Z	140V	140Z	220V	220Z	240W	240V
Physical	Specific gravity		ISO 1183	23°C	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08
	Moisture Absorption	%	ISO 62	Immersion 24 hours	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Thermal	Temperature of Deflection Under Load(TDUL)	°C	ISO 75-1	1.80MPa	78	78	78	78	83	83	83	83
			ASTM D 648	1.82MPa	85	85	85	85	90	90	90	90
	Coefficient Linear Thermal Expansion	mm/mm/°C	ISO 11359	-30°C ~65°C	8.0×10 ⁻⁵	8.0×10 ⁻⁵	8.0×10 ⁻⁵	8.0×10 ⁻⁵	8.0×10 ⁻⁵	8.0×10 ⁻⁵	7.5×10 ⁻⁵	7.5×10 ⁻⁵
	Moulding shrinkage	%	ISO 294-4									
			ASTM D 955		0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7
	Flammability		UL 94	1.6mm	V-1	V-0	V-1	V-0	V-1	V-0	V-2	V-1
				3.2mm	V-1	V-0 *	V-1	V-0 *	V-1	V-0 *	V-2	V-1
Electrical	Dielectric Constant		IEC 60250	100 Hz	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
				1 MHz	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
	Dissipation Factor		IEC 60250	100 Hz	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
				1 MHz	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
	Volume Resistivity	Ω • cm	IEC 60250	23°C 50% RH	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶
	Surface Resistivity	Ω	IEC 60093	23°C 50% RH	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶
	Dielectric Strength	kV/mm	IEC 60243	Short time, 2mm	29	29	29	29	29	29	29	29
	Comparative Tracking Index	V	IEC 60112	3mm	235	190	235	190	250	200	–	250
Mechanical	Tensile Strength	MPa	ISO 527	23°C 50% RH	44	44	45	45	47	47	51	51
	(Nominal) Tensile Strain	%	ISO 527	23°C 50% RH	(20)	(20)	(20)	(20)	(25)	(25)	(25)	(25)
	Flexural Strength	MPa	ISO 178	23°C 50% RH	50	50	59	59	59	59	71	71
	Flexural Modulus	MPa	ISO 178	23°C 50% RH	2370	2370	2250	2250	2420	2420	2300	2300
	Charpy Impact Strength(notched)	kJ/m ²	ISO 179	4mm 23°C	14	14	12	12	14	14	14	14
	Izod Impact Strength (notched)	J/m	ASTM D 256	6.4mm 23°C	147	147	118	118	147	147	147	147
				3.2mm 23°C	196	196	176	176	216	216	196	196
Molding Conditions	Resin Temperature	°C			220~270	220~270	220~270	220~270	220~270	220~270	220~270	220~270
	Mold Temperature	°C			40~70	40~70	40~70	40~70	40~70	40~70	40~70	40~70
	Pre-Drying Temperature	°C			70~80	70~80	70~80	70~80	80~90	80~90	80~90	80~90
	Drying Time	Hr			2~4	2~4	2~4	2~4	2~4	2~4	2~4	2~4
					★3.0mm5VA		★3.0mm5VA		★2.5mm5VA			

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Property Units Test method Test Condition Grade					Flame Retardant							
					240Z	300V	300Z	340W	340V	340Z	500V	500Z
Physical	Specific gravity		ISO 1183	23℃	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08
	Moisture Absorption	%	ISO 62	Immersion 24 hours	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Thermal	Temperature of Deflection Under Load(TDUL)	℃	ISO 75-1	1.80MPa	83	94	94	94	94	94	114	114
			ASTM D 648	1.82MPa	90	100	100	100	100	100	120	120
	Coefficient Linear Thermal Expansion	mm/mm/℃	ISO 11359	-30℃ ~65℃	7.5×10 ⁻⁵	7.5×10 ⁻⁵	7.5×10 ⁻⁵	7.5×10 ⁻⁵	7.5×10 ⁻⁵	7.5×10 ⁻⁵	7.0×10 ⁻⁵	7.0×10 ⁻⁵
	Moulding shrinkage	%	ISO 294-4									
			ASTM D 955		0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7
	Flammability		UL 94	1.6mm	V-0	V-1	V-0	V-2	V-1	V-0	V-1	V-0
3.2mm				V-0 *	V-1	V-0 *	V-2	V-1	V-0 *	V-1	V-0 *	
Electrical	Dielectric Constant		IEC 60250	100 Hz	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
				1 MHz	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
	Dissipation Factor		IEC 60250	100 Hz	0.003	0.0003	0.0003	0.0003	0.003	0.003	0.0003	0.0003
				1 MHz	0.004	0.0004	0.0004	0.0004	0.004	0.004	0.0004	0.0004
	Volume Resistivity	Ω • cm	IEC 60250	23℃ 50% RH	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶
	Surface Resistivity	Ω	IEC 60093	23℃ 50% RH	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶
	Dielectric Strength	kV/mm	IEC 60243	Short time, 2mm	29	25	25	25	29	29	25	25
	Comparative Tracking Index	V	IEC 60112	3mm	200	315	250	—	315	250	400	190
Mechanical	Tensile Strength	MPa	ISO 527	23℃ 50% RH	51	45	45	45	62	62	59	59
	(Nominal) Tensile Strain	%	ISO 527	23℃ 50% RH	(25)	(25)	(25)	(25)	(20)	(20)	(25)	(25)
	Flexural Strength	MPa	ISO 178	23℃ 50% RH	71	66	66	66	71	71	76	76
	Flexural Modulus	MPa	ISO 178	23℃ 50% RH	2300	2300	2300	2300	2390	2390	2340	2340
	Charpy Impact Strength(notched)	kJ/m ²	ISO 179	4mm 23℃	14	18	18	18	15	15	15	15
	Izod Impact Strength (notched)	J/m	ASTM D 256	6.4mm 23℃	147	176	176	176	147	147	147	147
				3.2mm 23℃	196	230	230	230	—	—	196	196
Molding Conditions	Resin Temperature	℃			220~270	220~270	220~270	220~270	240~270	240~270	240~270	240~270
	Mold Temperature	℃			40~70	50~80	50~80	50~80	50~80	50~80	50~80	50~80
	Pre-Drying Temperature	℃			80~90	90~100	90~100	90~100	90~100	90~100	90~100	90~100
	Drying Time	Hr			2~4	2~4	2~4	2~4	2~4	2~4	2~4	2~4
					★2.5mm5VA		★2.5mm5VA			★2.5mm5VA		★2.5mm5VA

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Property Units Test method Test Condition Grade					Flame Retardant					Automotive		
					540V	540Z	640V	640Z	740V	X0700	X0715	X0718
Physical	Specific gravity		ISO 1183	23°C	1.08	1.08	1.08	1.08	1.08	1.06	1.05	1.07
	Moisture Absorption	%	ISO 62	Immersion 24 hours	0.10	0.10	0.10	0.10	0.10	0.10	0.09	0.09
Thermal	Temperature of Deflection Under Load(TDUL)	°C	ISO 75-1	1.80MPa	114	114	124	124	134	105	108	110
			ASTM D 648	1.82MPa	120	120	130	130	140	110	113	115
	Coefficient Linear Thermal Expansion	mm/mm/°C	ISO 11359	-30°C ~65°C	7.0×10 ⁻⁵	7.0×10 ⁻⁵	7.0×10 ⁻⁵	7.0×10 ⁻⁵	7.0×10 ⁻⁵	7.5×10 ⁻⁵	7.5×10 ⁻⁵	7.5×10 ⁻⁵
	Moulding shrinkage	%	ISO 294-4							0.6~0.8	0.6~0.8	0.6~0.8
			ASTM D 955		0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7	0.5~0.7	0.6~0.8	0.6~0.8	0.6~0.8
	Flammability		UL 94	1.6mm	V-1	V-0	V-1	V-0	V-1	Eq. to HB	Eq. to HB	Eq. to HB
				3.2mm	V-1	V-0*	V-0	V-2	V-1	Eq. to HB	Eq. to HB	Eq. to HB
Electrical	Dielectric Constant		IEC 60250	100 Hz	2.9	2.9	2.9	2.9	2.9	–	–	–
				1 MHz	2.9	2.9	2.9	2.9	2.9	–	–	–
	Dissipation Factor		IEC 60250	100 Hz	0.003	0.003	0.0003	0.0003	0.0003	–	–	–
				1 MHz	0.004	0.004	0.0004	0.0004	0.0004	–	–	–
	Volume Resistivity	Ω • cm	IEC 60250	23°C 50% RH	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	–	–	–
	Surface Resistivity	Ω	IEC 60093	23°C 50% RH	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	–	–	–
	Dielectric Strength	kV/mm	IEC 60243	Short time, 2mm	29	29	29	29	29	–	–	–
	Comparative Tracking Index	V	IEC 60112	3mm	400	190	–	–	600	–	–	–
Mechanical	Tensile Strength	MPa	ISO 527	23°C 50% RH	67	67	74	74	75	41	43	44
	(Nominal) Tensile Strain	%	ISO 527	23°C 50% RH	(20)	(20)	(20)	(20)	(20)	(30)	(40)	(35)
	Flexural Strength	MPa	ISO 178	23°C 50% RH	99	99	108	108	109	70	60	65
	Flexural Modulus	MPa	ISO 178	23°C 50% RH	2430	2430	2470	2470	2470	2120	1920	2090
	Charpy Impact Strength(notched)	kJ/m ²	ISO 179	4mm 23°C	15	15	15	15	15	25	30	18
	Izod Impact Strength (notched)	J/m	ASTM D 256	6.4mm 23°C	147	147	147	147	147	196	294	176
				3.2mm 23°C	–	–	–	–	–			
Molding Conditions	Resin Temperature	°C			240~290	240~290	240~300	240~300	240~300	220~250	240~290	240~290
	Mold Temperature	°C			50~80	50~80	60~90	60~90	60~100	50~80	50~80	50~80
	Pre-Drying Temperature	°C			90~100	90~100	90~100	90~100	90~100	90~100	90~100	90~100
	Drying Time	Hr			2~4	2~4	2~4	2~4	2~4	2~4	2~4	2~4

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Property Units Test method Test Condition Grade					Automotive			(PPE/PA) Automotive			(PPE/PA) Oil Resistant		
					X0722	X5516	X9653	A0100	A0501	A0210	X5402	X5403	A1400
Physical	Specific gravity		ISO 1183	23°C	1.10	1.06	1.08	1.10	1.11	1.09	1.09	1.24	1.08
	Moisture Absorption	%	ISO 62	Immersion 24 hours	0.09	0.08	0.10	0.10	0.40	0.6	0.4	0.4	0.9
Thermal	Temperature of Deflection Under Load(TDUL)	°C	ISO 75-1	1.80MPa	115			149**	134 **	188 **	–	–	–
			ASTM D 648	1.82MPa	120	115	105	150 *	135 *	190 *	120/175*	115/190*	130/175*
	Coefficient Linear Thermal Expansion	mm/mm/°C	ISO 11359	–30°C ~65°C	7.5×10 ⁻⁵	7.5×10 ⁻⁵	7.5×10 ⁻⁵	9×10 ⁻⁵	10×10 ⁻⁵	9×10 ⁻⁵	8.0×10 ⁻⁵	8.0×10 ⁻⁵	8.0×10 ⁻⁵
	Moulding shrinkage	%	ISO 294-4		0.6~0.8								
			ASTM D 955		0.6~0.8	0.6~0.8	0.6~0.8	1.1~1.4	1.1~1.4	1.1~1.4	1.10~1.40	1.10~1.40	1.20~1.60
	Flammability		UL 94	1.6mm	Eq. to HB	Eq. to HB	Eq. to HB	Eq. to HB	Eq. to HB	Eq. to HB	HB	V-0	HB
				3.2mm	Eq. to HB	Eq. to HB	Eq. to HB	Eq. to HB	Eq. to HB	Eq. to HB	HB	V-0	HB
Electrical	Dielectric Constant		IEC 60250	100 Hz	–	–	–	–	–	–	3.5	3.5	–
				1 MHz	–	–	–	–	–	–	3.1	3.1	–
	Dissipation Factor		IEC 60250	100 Hz	–	–	–	–	–	–	0.004	0.004	–
				1 MHz	–	–	–	–	–	–	0.010	0.010	–
	Volume Resistivity	Ω • cm	IEC 60250	23°C 50% RH	–	–	–	–	–	–	10 ¹⁵	10 ¹⁵	–
	Surface Resistivity	Ω	IEC 60093	23°C 50% RH	–	–	–	–	–	–	10 ¹⁵	10 ¹⁵	–
	Dielectric Strength	kV/mm	IEC 60243	Short time, 2mm	–	–	–	–	–	–	–	–	–
	Comparative Tracking Index	V	IEC 60112	3mm	–	–	–	–	–	–	–	–	–
Mechanical	Tensile Strength	MPa	ISO 527	23°C 50% RH	47	47	41	53	56	62	61	48	50
	(Nominal) Tensile Strain	%	ISO 527	23°C 50% RH	(30)	(45)	(50)	68	43	41	(17)	(20)	(70)
	Flexural Strength	MPa	ISO 178	23°C 50% RH	67	63	57	79	81	92	82	80	86
	Flexural Modulus	MPa	ISO 178	23°C 50% RH	2110	2110	1800	2200	2300	2300	2210	2150	2000
	Charpy Impact Strength(notched)	kJ/m ²	ISO 179	4mm 23°C	25	28	37	50	14	25	10	6	30
	Izod Impact Strength (notched)	J/m	ASTM D 256	6.4mm 23°C	245	274	353				98	69	–
				3.2mm 23°C				735	147	250	120	69	343
Molding Conditions	Resin Temperature	°C			250~300	240~290	240~290	260~280	250~280	280~300	260~300	260~290	270~290
	Mold Temperature	°C			70~100	50~80	50~80	60~100	60~100	60~100	60~100	60~100	60~90
	Pre-Drying Temperature	°C			90~120	90~100	90~100	100~110	100~110	100~110	90~100	90~100	100~110
	Drying Time	Hr			2~4	2~4	2~4	3~4	3~4	3~4	3~4	3~4	3~4
								★ load:0.46 MPA ★★ load:0.45 MPA			★ load:0.46 MPA		

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