

Property Units Test method Test Condition Grade					Heat Resistant					High-heat Resistance		
					200H	300H	400H	500H	600H	X9108	X9102	SZ800
Physical	Specific gravity		ASTM D 792	23°C	1.06	1.06	1.06	1.06	1.06	1.07	1.07	1.10
	Moisture Absorption	%	ASTM D 570	23°C 50%RH 24Hr.	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Thermal	Heat Deflection Temperature	°C	ASTM D 648	1.82MPa	90	100	110	120	130	150	170	150
	Coefficient Linear Thermal Expansion	mm/mm/°C	ASTM D 696	-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	%	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		ASTM D 150	23°C 50%RH 60Hz	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
				23°C 50%RH 10 ⁶ Hz	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	Dissipation Factor		ASTM D 150	23°C 50%RH 60Hz	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0027
				23°C 50%RH 10 ⁶ Hz	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0027
	Volume Resistivity	Ω • cm	ASTM D 257	23°C 50% RH	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶
	Surface Resistivity	Ω	ASTM D 257	23°C 50% RH	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶
	Dielectric Strength	kV/mm	ASTM D 149	Short time, 2mm	29	29	29	30	30	30	30	30
	Arc Resistance	sec	ASTM D 495	Tungsten	70	70	70	80	80	80	80	80
Mechanical	Tensile Strength	MPa	ASTM D 638	23°C 50% RH	39	47	48	49	55	59	64	72
	Elongation at Break	%	ASTM D 638	23°C 50% RH	40	50	45	50	40	50	50	70
	Flexural Strength	MPa	ASTM D 790	23°C 50% RH	56	76	79	83	88	83	83	107
	Flexural Modulus	MPa	ASTM D 790	23°C 50% RH	2160	2250	2300	2350	2400	2060	2160	2550
	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		ASTM D 792	23°C	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08
	Moisture Absorption	%	ASTM D 570	23°C 50%RH 24Hr.	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Thermal	Heat Deflection Temperature	°C	ASTM D 648	1.82MPa	85	85	85	85	90	90	90	90
	Coefficient Linear Thermal Expansion	mm/mm/°C	ASTM D 696	-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	%	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		ASTM D 150	23°C 50%RH 60Hz	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
				23°C 50%RH 10 ⁶ Hz	2.9	2.9 *	2.9	2.9 *	2.9	2.9 *	2.9	2.9
	Dissipation Factor		ASTM D 150	23°C 50%RH 60Hz	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
				23°C 50%RH 10 ⁶ Hz	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
	Volume Resistivity	Ω • cm	ASTM D 257	23°C 50% RH	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶
	Surface Resistivity	Ω	ASTM D 257	23°C 50% RH	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶
	Dielectric Strength	kV/mm	ASTM D 149	Short time, 2mm	29	29	29	29	29	29	29	29
	Arc Resistance	sec	ASTM D 495	Tungsten	100	80	100	80	100	80	80	100
Mechanical	Tensile Strength	MPa	ASTM D 638	23°C 50% RH	37	39	44	46	40	43	44	49
	Elongation at Break	%	ASTM D 638	23°C 50% RH	40	40	40	40	50	50	40	50
	Flexural Strength	MPa	ASTM D 790	23°C 50% RH	56	59	64	67	64	69	70	74
	Flexural Modulus	MPa	ASTM D 790	23°C 50% RH	2300	2350	2300	2350	2350	2400	2400	2350
	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		ASTM D 792	23°C	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08
	Moisture Absorption	%	ASTM D 570	23°C 50%RH 24Hr.	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Thermal	Heat Deflection Temperature	°C	ASTM D 648	1.82MPa	90	100	100	100	100	100	120	120
	Coefficient Linear Thermal Expansion	mm/mm/°C	ASTM D 696	-30°C ~65°C	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	%	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		ASTM D 150	23°C 50%RH 60Hz	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
				23°C 50%RH 10 ⁶ Hz	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
	Dissipation Factor		ASTM D 150	23°C 50%RH 60Hz	0.003	0.0003	0.0003	0.0003	0.003	0.003	0.0003	0.0003
				23°C 50%RH 10 ⁶ Hz	0.004	0.0004	0.0004	0.0004	0.004	0.004	0.0004	0.0004
	Volume Resistivity	Ω • cm	ASTM D 257	23°C 50% RH	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶
	Surface Resistivity	Ω	ASTM D 257	23°C 50% RH	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶
	Dielectric Strength	kV/mm	ASTM D 149	Short time, 2mm	29	25	25	25	29	29	25	25
	Arc Resistance	sec	ASTM D 495	Tungsten	80	70	70	70	70	70	70	70
Mechanical	Tensile Strength	MPa	ASTM D 638	23°C 50% RH	52	44	45	51	59	64	54	57
	Elongation at Break	%	ASTM D 638	23°C 50% RH	50	50	50	40	40	40	40	50
	Flexural Strength	MPa	ASTM D 790	23°C 50% RH	78	70	78	79	75	98	78	93
	Flexural Modulus	MPa	ASTM D 790	23°C 50% RH	2400	2350	2400	2480	2400	2450	2400	2450
	Izod Impact Strength (notched)	J/m	ASTM D 256	6.4mm 23°C	147	176	176	176	147	147	147	147
				3.2mm 23°C	196	230	230	230	–	–	196	196
Molding Conditions	Resin Temperature	°C			220~270	220~270	220~270	220~270	240~270	240~270	240~270	240~270
	Mold Temperature	°C			40~70	50~80	50~80	50~80	50~80	50~80	50~80	50~80
	Pre-Drying Temperature	°C			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		ASTM D 792	23°C	1.08	1.08	1.08	1.08	1.08	1.06	1.05	1.07
	Moisture Absorption	%	ASTM D 570	23°C 50%RH 24Hr.	0.10	0.10	0.10	0.10	0.10	0.10	0.09	0.09
Thermal	Heat Deflection Temperature	°C	ASTM D 648	1.82MPa	120	120	130	130	140	110	113	115
	Coefficient Linear Thermal Expansion	mm/mm/°C	ASTM D 696	-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	%	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		ASTM D 150	23°C 50%RH 60Hz	2.9	2.9	2.9	2.9	2.9	–	–	–
				23°C 50%RH 10 ⁶ Hz	2.9	2.9	2.9	2.9	2.9	–	–	–
	Dissipation Factor		ASTM D 150	23°C 50%RH 60Hz	0.003	0.003	0.0003	0.0003	0.0003	–	–	–
				23°C 50%RH 10 ⁶ Hz	0.004	0.004	0.0004	0.0004	0.0004	–	–	–
	Volume Resistivity	Ω • cm	ASTM D 257	23°C 50% RH	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	–	–	–
	Surface Resistivity	Ω	ASTM D 257	23°C 50% RH	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	10 ¹⁶	–	–	–
	Dielectric Strength	kV/mm	ASTM D 149	Short time, 2mm	29	29	29	29	29	–	–	–
	Arc Resistance	sec	ASTM D 495	Tungsten	80	80	70	70	70	–	–	–
Mechanical	Tensile Strength	MPa	ASTM D 638	23°C 50% RH	64	69	70	73	71	41	43	44
	Elongation at Break	%	ASTM D 638	23°C 50% RH	40	40	40	40	40	60	70	60
	Flexural Strength	MPa	ASTM D 790	23°C 50% RH	98	103	103	105	107	70	60	65
	Flexural Modulus	MPa	ASTM D 790	23°C 50% RH	2500	2550	2550	2550	2550	2120	1920	2090
	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		ASTM D 792	23°C	1.10	1.06	1.08	1.10	1.11	1.09	1.09	1.24	1.08
	Moisture Absorption	%	ASTM D 570	23°C 50%RH 24Hr.	0.09	0.08	0.10	0.10	0.40	0.6	0.4	0.4	0.9
Thermal	Heat Deflection Temperature	°C	ASTM D 648	1.82MPa	120	115	105	150 *	135 *	190 *	120/175*	115/190*	130/175*
	Coefficient Linear Thermal Expansion	mm/mm/°C	ASTM D 696	-30°C ~65°C	7.5x10 ⁻⁵	7.5x10 ⁻⁵	7.5x10 ⁻⁵	9x10 ⁻⁵	10x10 ⁻⁵	9x10 ⁻⁵	8.0x10 ⁻⁵	8.0x10 ⁻⁵	8.0x10 ⁻⁵
	Moulding shrinkage	%	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		ASTM D 150	23°C 50%RH 60Hz	—	—	—	—	—	—	3.5	3.5	—
				23°C 50%RH 10 ⁶ Hz	—	—	—	—	—	—	3.1	3.1	—
	Dissipation Factor		ASTM D 150	23°C 50%RH 60Hz	—	—	—	—	—	—	0.004	0.004	—
				23°C 50%RH 10 ⁶ Hz	—	—	—	—	—	—	0.010	0.010	—
	Volume Resistivity	Ω • cm	ASTM D 257	23°C 50% RH	—	—	—	—	—	—	10 ¹⁵	10 ¹⁵	—
	Surface Resistivity	Ω	ASTM D 257	23°C 50% RH	—	—	—	—	—	—	10 ¹⁵	10 ¹⁵	—
	Dielectric Strength	kV/mm	ASTM D 149	Short time, 2mm	—	—	—	—	—	—	—	—	—
	Arc Resistance	sec	ASTM D 495	Tungsten	—	—	—	—	—	—	—	—	—
Mechanical	Tensile Strength	MPa	ASTM D 638	23°C 50% RH	47	47	41	49	58	68	57	44	46
	Elongation at Break	%	ASTM D 638	23°C 50% RH	50	80	90	98	55	48	35	40	140
	Flexural Strength	MPa	ASTM D 790	23°C 50% RH	67	63	57	74	78	107	76	74	80
	Flexural Modulus	MPa	ASTM D 790	23°C 50% RH	2110	2110	1800	2019	2230	2620	2160	2100	1960
	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:0.46 MPA		

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