

Property Table (Glass fiber reinforced,UL94 HB Grade①)

Properties	Test Method	condition	Units	C122	C132	C142	S124	S135	S123	S131	S136	-
ISO Identification Mark				>PS-ST-GF15<	>PS-ST-GF30<	>PS-ST-GF40<	>PS-ST-GF15<	>PS-ST-GF30<	>PS-ST-GF17<	>PS-ST-GF30<	>PS-ST-GF30<	
Physical												
Density	ISO 1183		g/cm ³	1.11	1.25	1.36	1.13	1.26	1.14	1.25	1.25	
Glass Content			wt%	15	30	40	15	30	17	30	30	
Water Absorption	ISO 62	24h 50%RH	%	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	
Mechanical properties												
Tensile Strength at Break			MPa	75	120	130	85	125	85	120	120	
Tensile Modulus	ISO 527		MPa	5,400	9,700	12,600	6,000	9,700	6,000	9,700	9,700	
Tensile Elongation at Break			%	2.7	2.1	1.5	2.5	2	2.5	2.1	2.1	
Flexural Strength			MPa	120	185	195	130	200	130	190	190	
Flexural Modulus	ISO 178		MPa	5,000	9,200	12,400	6,000	9,800	6,000	9,300	9,300	
Izod Impact	ISO 180	Notched at 23°C	kJ/m ²	11	13	10	9	11	9	12	12	
		Unnotched at 23°C		30	36	33	28	32	28	39	39	
Charpy Impact	ISO 179	Notched at 23°C	kJ/m ²	11	13	9	9	12	9	12	12	
		Unnotched at 23°C		35	43	27	34	40	34	44	44	
Thermal properties												
Temperature of deflection under load	ISO 75 A	1.8MPa		140	240	250	210	250	188	245	245	
	ISO 75 B	0.45MPa		260	265	270	260	270	260	265	265	
Linear Thermal Expansion coefficient	TMA	Flow direction, -30~30°C	x10 ⁻⁶ mm/mm/°C	30	18	15	-	18	22	19	19	
		Cross flow direction, -30~30°C		81	39	40	-	43	75	43	43	
Mould Shrinkage	Idemitsu Method	flow direction	%	0.4 - 0.7	0.1 - 0.4	0.1 - 0.4	0.4 - 0.7	0.1 - 0.4	0.5 - 0.7	0.1 - 0.4	0.1 - 0.4	
		cross flow direction		0.5 - 0.8	0.5 - 0.8	0.5 - 0.8	0.6 - 0.9	0.5 - 0.8	0.7 - 0.9	0.3 - 0.8	0.3 - 0.8	
Flammability												
Flammability	UL 94	HB minimum thickness	mm	0.8	0.8	0.8	-	0.8	1.5	0.75	1.5	
		V-0 minimum thickness		-	-	-	-	-	-	-	-	
		5VA minimum thickness		-	-	-	-	-	-	-	-	-
RTI Electrical (Elec)			°C	50	50	50	-	50	-	130	-	
RTI Mechanical with impact (Imp)	UL 746B		°C	50	50	50	-	50	-	120	-	
RTI Mechanical without impact(Str)			°C	50	50	50	-	50	-	130	-	
Comparative Tracking Index(CTI)	IEC 60112, Solution A		PLC level	0 equivalent	1 equivalent	1 equivalent	-	1 equivalent	-	1 equivalent	1 equivalent	
High Voltage Arc Tracking Rate(HVTR)	UL 746A		PLC level	-	-	-	-	-	-	-	-	
Hot Wire Ignition (HWI)	UL 746A	@ 3.0 mm	PLC level	-	-	-	-	-	-	-	-	
		@ 1.5 mm		-	-	-	-	-	-	-	-	
		@ 0.75 mm		-	-	-	-	-	-	-	-	-
High Ampere Arc Resistance (HAI)	UL 746A	@ 3.0 mm	PLC level	-	-	-	-	-	-	-	-	
		@ 1.5 mm		-	-	-	-	-	-	-	-	-
		@ 0.75 mm		-	-	-	-	-	-	-	-	-
Arc Resistance	ASTM D495		PLC level	6 equivalent	6 equivalent	6 equivalent	-	-	-	-		
Electrical properties												
Volume Resistivity	IEC 60093		Ohm-cm	>1E+16	>1E+16	>1E+16	-	>1E+16	>1E+16	>1E+16	>1E+16	
Dielectric Strength	ASTM D149		kV/mm	45	45	45	-	45	-	48	48	
Dielectric Constant	IEC 60250	1MHz		2.8	2.9	3	-	2.9	2.8	2.9	2.9	
Dissipation Factor	IEC 60250	1MHz		< 0.001	< 0.001	< 0.001	-	< 0.001	0.0006	0.001	0.001	
Standard Molding Parameters												
Melt Temperature			°C	280 - 310	280 - 310	280 - 310	280 - 310	280 - 310	280 - 310	280 - 310	280 - 310	
Mold Temperature			°C	130 - 155	130 - 155	130 - 155	130 - 155	130 - 155	130 - 155	130 - 155	130 - 155	
Pre-drying				120°C、3-5hrs	120°C、3-5hrs	120°C、3-5hrs	120°C、3-5hrs	120°C、3-5hrs	120°C、3-5hrs	120°C、3-5hrs	120°C、3-5hrs	

UL File No. : QMF22.E48268 (Company Name: IDEMITSU KOSAN CO LTD, Category Name: Plastics - Component)

◇Data in this Catalogue shows sample figures measured under certain specific conditions.

◇USAGE OF THE PRODUCTS IN THIS CATALOGUE DOES NOT WARRANT ANY SUCCESSFUL RESULTS OF APPLICATIONS OF THE PRODUCTS FOR SPECIFIC USAGE.

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◇Please verify whether products using raw materials supplied by Idemitsu with applicable laws and ordinances.

◇PLEASE AGREE TO THE QUALITY SPECIFICATION IN ADVANCE IF YOU PURCHASE OUR PRODUCTS.

◇Figures of physical characteristics of other producer's resins have been referred from their Catalogues and information source thereof.

◇Please note that the content of this Catalogue may be altered from time of time according to the improvement of the products without prior notice.

◇Flammability rating in this Catalogue was evaluated with small-scale test method and it is not intended to reflect fire proof performance in case of actual fire.

Property Table (Glass fiber reinforced,UL94 HB Grade②)

Properties	Test Method	condition	Units	WA 210	WA 212	WA 214LG	WA 552	-	-	-	-	-
ISO Identification Mark				>PS-ST-GF20<	>PS-ST-GF30<	>PS-ST-GF40<	>PS-ST-GF30<					
Physical												
Density	ISO 1183		g/cm ³	1.17	1.25	1.37	1.25					
Glass Content			wt%	20	30	40	30					
Water Absorption	ISO 62	24h 50%RH	%	0.01	0.01	0.01	0.01					
Mechanical properties												
Tensile Strength at Break			MPa	110	125	145	120					
Tensile Modulus	ISO 527		MPa	7,300	9,400	13,700	9,100					
Tensile Elongation at Break			%	2.3	2.2	1.5	2.3					
Flexural Strength			MPa	160	190	220	185					
Flexural Modulus	ISO 178		MPa	7,000	9,200	13,200	8,900					
Izod Impact	ISO 180	Notched at 23°C	kJ/m ²	11	12	11	13					
		Unnotched at 23°C		35	40	40	41					
Charpy Impact	ISO 179	Notched at 23°C	kJ/m ²	11	13	12	14					
		Unnotched at 23°C		40	46	42	50					
Thermal properties												
Temperature of deflection under load	ISO 75 A	1.8MPa		235	240	250	235					
	ISO 75 B	0.45MPa		265	265	270	265					
Linear Thermal Expansion coefficient	TMA	Flow direction, -30~30°C	x10 ⁻⁶ mm/mm/°C	27	21	15	23					
		Cross flow direction, -30~30°C		58	57	38	59					
Mould Shrinkage	Idemitsu Method	flow direction	%	0.2 - 0.4	0.1 - 0.3	0.1 - 0.3	0.1 - 0.4					
		cross flow direction		0.3 - 0.5	0.3 - 0.5	0.2 - 0.4	0.3 - 0.7					
Flammability												
Flammability	UL 94	HB minimum thickness	mm	1.5	1.5	1.5	1.5					
		V-0 minimum thickness		-	-	-	-					
		5VA minimum thickness		-	-	-	-					
RTI Electrical (Elec)				110	110	105	110					
RTI Mechanical with impact (Imp)	UL 746B		°C	110	110	105	110					
RTI Mechanical without impact(Str)				105	110	105	110					
Comparative Tracking Index(CTI)	IEC 60112, Solution A		PLC level	2	0	2	1					
High Voltage Arc Tracking Rate(HVTR)	UL 746A		PLC level	0	0	-	0					
Hot Wire Ignition (HWI)	UL 746A	@ 3.0 mm	PLC level	0	0	1	0					
		@ 1.5 mm		3	2	0	0					
		@ 0.75 mm		-	-	-	-					
High Ampere Arc Resistance (HAI)	UL 746A	@ 3.0 mm	PLC level	0	0	0	0					
		@ 1.5 mm		0	0	0	0					
		@ 0.75 mm		-	-	-	-					
Arc Resistance	ASTM D495		PLC level	5	5	5	5					
Electrical properties												
Volume Resistivity	IEC 60093		Ohm-cm	>1E+16	>1E+16	>1E+16	>1E+16					
Dielectric Strength	ASTM D149		kV/mm	45	45	26	28					
Dielectric Constant	IEC 60250	1MHz		2.9	3.1	3.1	3.1					
Dissipation Factor	IEC 60250	1MHz		0.0009	0.001	0.001	0.001					
Standard Molding Parameters												
Melt Temperature			°C	280 - 310	280 - 310	280 - 310	280 - 310					
Mold Temperature			°C	130 - 155	130 - 155	130 - 155	130 - 155					
Pre-drying				120°C、3-5hrs	120°C、3-5hrs	120°C、3-5hrs	120°C、3-5hrs					

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