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Technical Data Sheet

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ABS

HI100 / HI100H / HI121 / HI121H, HF380 / HF380G

Properties	Test Method (ASTM)	Test Condition	Unit	General ABS					
				High Impact				High Flow	
				HI100	**HI100H**	**HI121**	**HI121H**	**HF380**	**HF380G**
Mechanical Properites									
Tensile Strength @Yield	D638	50mm/min	kg/cm²	380	400	460	500	450	440
			MPa	37	39	45	49	44	43
			lb/in²	5,400	5,700	6,500	7,100	6,400	6,300
Tensile Modulus	D638	1mm/min	kg/cm²						
			MPa						
			lb/in²						
Elongation @Yield	D638	50mm/min	%						
Elongation @Break	D638	50mm/min	%	25	30	25	20	15	15
Flexural Strength @Yield	D790	15mm/min	kg/cm²	580	630	740	780	720	710
			MPa	57	62	73	76	71	70
			lb/in²	8,200	8,900	10,500	11,100	10,200	10,100
Flexural Modulus	D790	15mm/min	kg/cm²	19,000	20,000	25,000	26,000	24,000	24,500
			MPa	1,860	1,960	2,450	2,550	2,350	2,400
			lb/in²	270,000	284,000	356,000	370,000	341,000	348,000
Izod Impact Strength	D256	1/4", 23°C	kg·cm/cm	45	45	33	23	25	25
			J/m	440	440	320	230	245	245
			ft·lb/in	8.3	8.3	6.1	4.2	4.6	4.6
		1/4", -30°C	kg·cm/cm	25	25	16	9	12	12
			J/m	250	250	160	90	118	118
			ft·lb/in	4.6	4.6	2.9	1.7	2.2	2.2
	D256	1/8", 23°C	kg·cm/cm	48	48	33	23	25	25
			J/m	470	470	320	225	245	245
			ft·lb/in	8.8	8.8	6.1	4.2	4.6	4.6
		1/8", -30°C	kg·cm/cm	25	25	16	9	12	12
			J/m	250	250	160	90	118	118
			ft·lb/in	4.6	4.6	2.9	1.7	2.2	2.2
Rockwell Hardness	D785	R-Scale	-	92	94	108	110	106	106
Thermal Properties									
Heat Deflection Temp. (Annealed)	D648	18.5kg/cm² 1/4"	°C						
			°F						
Heat Deflection Temp. (Unannealed)	D648	18.5kg/cm² 1/4"	°C	84	84	85	86	85	85
			°F	183	183	185	187	185	185
Heat Deflection Temp. (Annealed)	D648	4.6kg/cm² 1/4"	°C						
			°F						
Heat Deflection Temp. (Unannealed)	D648	4.6kg/cm² 1/4"	°C						
			°F						
Vicat Softening Temp.	D1525	5kg, 50°C/h	°C	90	92	93	94	93	93
			°F	194	198	199	201	199	199
Flammability	UL94	1/8"	class	HB	HB	HB	HB	HB	HB
		1/10"	class						
		1/12"	class						
		1/16"	class	HB	HB	HB	HB	HB	HB
	IEC707	1/8"	mm/min	FH3-33		FH3-34	FH3-34	FH3-35	
		1/16"	mm/min						
Physical Properties									
Specific Gravity	D792		-	1.02	1.02	1.04	1.05	1.04	1.04
Molding Shrinkage	D955		%	0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7
Melt Flow Index	D1238(G)	200°C/5kg	g/10min						
	-	220°C/10kg	g/10min	11.00	10.00	21.00	23.00	42.00	52.00
	D1238(I)	230°C/3.8kg	g/10min						
Optical									
Gloss	D2457	45°	-						
Characteristics				Super High Impact	Super High Impact	High Impact	High Impact, High Whitness	High Flow, High Impact	Super High Flow

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ABS

HG173 / SG175, AP163 / AP163A, HF380I / PT270, HT700

General ABS						
High Gloss		Antistatic		Painting		Stiffness
HG173	**SG175**	**AP163**	**AP163A**	**HF380I**	**PT270**	**HT700**
470	500	420	440	440	400	520
46	49	41	43	43	39	51
6,700	7,100	6,000	6,300	6,300	5,700	7,400
20	20	30	40	20	30	15
740	800	680	710	710	640	850
73	78	67	70	70	63	84
10,500	11,400	9,700	10,100	10,100	9,100	12,000
25,500	26,500	21,000	23,000	24,500	22,000	28,000
2,500	2,600	2,050	2,250	2,400	2,160	2,750
363,000	377,000	299,000	327,000	348,000	313,000	397,000
24	20			28	36	20
240	200			270	350	196
4.4	3.7			5.1	6.6	3.7
10	8			14	20	7
100	78			140	200	69
1.8	1.5			2.6	3.7	1.3
24	23	45	14	28	40	20
240	225	441	137	270	392	196
4.4	4.2	8.3	2.6	5.1	7.3	3.7
10	8			14	20	7
100	78			140	200	69
1.8	1.7			2.6	3.7	1.3
109	110	98	101	106	100	113
85	86	83	85	85	84	88
185	187	181	185	185	183	190
93	94			93	92	95
199	201			199	198	203
HB	HB	HB	HB	HB	HB	HB
HB	HB	HB	HB	HB	HB	HB
FH3-30	FH3-30	FH3-30	FH3-30	FH3-35	FH3-34	FH3-33
1.05	1.05	1.06	1.07	1.04	1.04	1.05
0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7
23.00	33.00	30.00	43.00	38.00	28.00	18.00
High Gloss, High Impact	High Strength, Super High Gloss	Permanent Antistatic, High Impact	Surface Resistance	High Flow, High Impact	Chemical Resistance, High Impact	High Strength, Scratch Resistance

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ABS

MA201 / MA221, XG569C / XG570

Properties	Test Method (ASTM)	Test Condition	Unit	MA		Anti Scratch	
				MA201	MA221	XG569C	XG570
Mechanical Properites							
Tensile Strength @Yield	D638	50mm/min	kg/cm²	500	420	600	500
			MPa	49	41	59	49
			lb/in²	7,100	6,000	8,500	7,100
Tensile Modulus	D638	1mm/min	kg/cm²			28,500	30,000
			MPa			2,790	2,940
			lb/in²			405,000	426,000
Elongation @Yield	D638	50mm/min	%				
Elongation @Break	D638	50mm/min	%	30	50	30	30
Flexural Strength @Yield	D790	15mm/min	kg/cm²	750	630	980	840
			MPa	74	62	96	82
			lb/in²	10,700	9,000	13,900	11,900
Flexural Modulus	D790	15mm/min	kg/cm²	26,000	23,000	29,000	29,000
			MPa	2,550	2,260	2,842	2,840
			lb/in²	369,000	327,000	411,800	412,000
Izod Impact Strength	D256	1/4", 23°C	kg·cm/cm	25	31	10	17
			J/m	250	300	98	167
			ft·lb/in	4.6	5.7	2.0	3.0
		1/4", -30°C	kg·cm/cm	11	13	5	8
			J/m	108	127	49	78
			ft·lb/in	2.0	2.4	0.9	1.5
	D256	1/8", 23°C	kg·cm/cm	40	55	10	17
			J/m	390	540	98	167
			ft·lb/in	7.3	10.1	2.0	3.0
		1/8", -30°C	kg·cm/cm	19	30	5	8
			J/m	186	294	49	78
			ft·lb/in	3.5	5.5	0.9	1.5
Rockwell Hardness	D785	R-Scale	-	107	102	118	115
Thermal Properties							
Heat Deflection Temp. (Annealed)	D648	18.5kg/cm² 1/4"	°C	90	88	85	89
			°F	194	190	185	192
Heat Deflection Temp. (Unannealed)	D648	18.5kg/cm² 1/4"	°C	91	90	84	88
			°F	196	194	183	190
Heat Deflection Temp. (Annealed)	D648	4.6kg/cm² 1/4"	°C			88	90
			°F			190	194
Heat Deflection Temp. (Unannealed)	D648	4.6kg/cm² 1/4"	°C			86	90
			°F			187	194
Vicat Softening Temp.	D1525	5kg, 50°C/h	°C			95	94
			°F			203	201
Flammability	UL94	1/8"	class	HB	HB	HB	HB
		1/10"	class				
		1/12"	class				
		1/16"	class	HB	HB	HB	HB
	IEC707	1/8"	mm/min				
		1/16"	mm/min				
Physical Properties							
Specific Gravity	D792		-	1.04	1.04	1.11	1.06
Molding Shrinkage	D955		%	0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7
Melt Flow Index	D1238(G)	200°C/5kg	g/10min			1.20	2.10
	-	220°C/10kg	g/10min	7.50	5.00	11.00	22.00
	D1238(I)	230°C/3.8kg	g/10min			6.20	7.00
Optical							
Gloss	D2457	45°	-				
Characteristics				General Extrusion	High Impact, Extrusion	Anti-Scratch, Super Gloss Transparent	Anti-Scratch, High Gloss High Impact

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RS650 / RS670 / RS800M / SH610A, BM662B

	Extrusion			Blow Molding
RS650	**RS670**	**RS800M**	**SH610A**	**BM662B**
490	500	450	420	470
48	49	44	41	46
7,000	7,100	6,400	6,000	6,700
24,000	24,000	21,200	19,200	19,500
2,300	2,300	2,080	1,880	1,910
327,000	334,000	301,000	273,000	277,000
6	6	6	6	
30	35	35	35	15
800	790	740	640	710
78	77	73	63	70
11,400	11,200	10,600	9,100	10,100
25,500	25,500	23,000	21,000	21,000
2,500	2,500	2,200	2,100	2,060
363,000	363,000	327,000	299,000	299,000
30	30	35	44	16
290	294	343	431	157
5.5	5.5	6.4	8.1	2.9
11	11	15	23	6
108	108	147	225	59
2.0	2.0	2.8	4.2	1.1
33	32	40	45	16
320	310	390	440	157
6.0	6.0	7.0	8.0	2.9
12	12	18	25	7
118	118	176	245	70
2.2	2.2	3.3	4.6	1.3
107	106	100	100	100
88	90	88	88	110
190	194	190	190	230
87	89	87	87	103
189	192	189	189	217
95	96	94	94	116
203	205	201	201	241
94	94	92	92	110
201	201	198	198	230
95	96	94	94	110
203	205	201	201	230
HB	HB	HB	HB	
HB	HB	HB	HB	
1.04	1.04	1.04	1.04	1.05
0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7
				0.20
6.50	4.50	6.00	5.00	2.00
				0.60
General Purpose	Cyclopentance Extrusion ABS	High Impact, HCFC Resistance	High Impact, High Whiteness	Heat Resistance, Blow Molding

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ABS

ER460 / ER461 / XR401 / XR404(General) / XR404(Auto)

Properties	Test Method (ASTM)	Test Condition	Unit	Heat Resistance				
				ER460	ER461	XR401	XR404(General)	XR404(Auto)
Mechanical Properites								
Tensile Strength @Yield	D638	50mm/min	kg/cm²	460	500	500	500	530
			MPa	45	49	49	49	51
			lb/in²	6,500	7,100	7,100	7,100	7,500
Tensile Modulus	D638	1mm/min	kg/cm²		20,900	22,400	22,500	22,500
			MPa		2,050	2,200	2,210	2,210
			lb/in²		297,000	318,000	320,000	320,000
Elongation @Yield	D638	50mm/min	%					
Elongation @Break	D638	50mm/min	%	15	25	20	20	20
Flexural Strength @Yield	D790	15mm/min	kg/cm²	780	800	800	800	860
			MPa	76	78	78	78	84
			lb/in²	11,000	11,400	11,400	11,400	12,200
Flexural Modulus	D790	15mm/min	kg/cm²	26,000	26,000	26,000	26,000	27,000
			MPa	2,550	2,550	2,550	2,550	2,650
			lb/in²	369,000	370,000	369,000	370,000	383,000
Izod Impact Strength	D256	1/4", 23°C	kg·cm/cm	25	28	25	20	14
			J/m	245	274	245	200	137
			ft·lb/in	4.6	5.2	4.6	3.7	2.6
		1/4", -30°C	kg·cm/cm	10	10	8	7	5
			J/m	98	98	78	69	49
			ft·lb/in	1.8	1.8	1.5	1.3	0.9
	D256	1/8", 23°C	kg·cm/cm	25	30	27	22	16
			J/m	245	294	265	216	157
			ft·lb/in	4.6	5.5	5.0	4.1	2.9
		1/8", -30°C	kg·cm/cm	10	10	9	8	6
			J/m	98	98	88	78	59
			ft·lb/in	1.8	1.8	1.7	1.5	1.1
Rockwell Hardness	D785	R-Scale	-	110	110	110	108	112
Thermal Properties								
Heat Deflection Temp. (Annealed)	D648	18.5kg/cm² 1/4"	°C		100	105	108	110
			°F		212	221	226	230
Heat Deflection Temp. (Unannealed)	D648	18.5kg/cm² 1/4"	°C	90	93	97	100	102
			°F	194	199	207	212	216
Heat Deflection Temp. (Annealed)	D648	4.6kg/cm² 1/4"	°C		105	112	115	117
			°F		221	234	239	243
Heat Deflection Temp. (Unannealed)	D648	4.6kg/cm² 1/4"	°C		100	106	108	111
			°F		212	223	226	232
Vicat Softening Temp.	D1525	5kg, 50°C/h	°C	97	100	106	109	112
			°F	207	212	223	228	234
Flammability	UL94	1/8"	class		HB	HB	HB	HB
		1/10"	class					
		1/12"	class					
		1/16"	class		HB	HB	HB	HB
	IEC707	1/8"	mm/min		FH3-34	FH3-33	FH3-34	FH3-34
		1/16"	mm/min					
Physical Properties								
Specific Gravity	D792		-	1.04	1.05	1.05	1.05	1.05
Molding Shrinkage	D955		%	0.4~0.7	0.4~0.8	0.4~0.8	0.4~0.8	0.4~0.8
Melt Flow Index	D1238(G)	200°C/5kg	g/10min		2.00	1.00	1.00	0.90
	-	220°C/10kg	g/10min	22.00	14.00	9.00	7.00	8.00
	D1238(I)	230°C/3.8kg	g/10min		6.00	3.00	2.40	2.50
Optical								
Gloss	D2457	45°	-					
Characteristics				Medium Heat Resistance	Heat Resistance, High Impact Resistance	General, Heat Resistance	General, High Heat Resistance	Auto, High Heat Resistance

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ABS

XR409H / XR474, LG713 / LG703W / LG704W / LG709W / LG749W, MP211 / MP220

Heat Resistance		Low Gloss					Metal Plating	
XR409H	**XR474**	**LG713**	**LG703W**	**LG704W**	**LG709W**	**LG749W**	**MP211**	**MP220**
500	480	390	470	540	440	480	440	470
49	47	38	46	53	43	47	43	46
7,100	6,800	5,500	6,700	7,700	6,300	6,800	6,300	6,700
22,700	23,800	18,500	20,100	24,000	22,100	23,000		
2,220	2,330	1,810	1,970	2,350	2,170	2,250		
320,000	338,000	263,000	285,000	341,000	314,000	327,000		
20	15	30	15	15	15	15	25	25
800	780	580	730	860	710	750	720	760
78	76	57	72	84	70	74	71	74
11,400	11,100	8,200	10,400	12,200	10,100	10,700	10,200	10,700
26,000	25,000	19,000	23,500	26,500	22,200	24,000	23,500	25,000
2,550	2,450	1,860	2,300	2,600	2,180	2,350	2,300	2,450
370,000	356,000	270,000	334,000	377,000	315,000	341,000	334,000	355,000
17	13	24	27	16	14	24	29	27
167	127	235	265	157	137	235	280	265
3.1	2.4	4.4	5.0	3.0	2.6	4.4	5.3	4.9
6	5	10	9	5	5	9	13	12
59	49	98	90	49	49	90	130	120
1.1	0.9	1.8	1.7	0.9	0.9	1.7	2.4	2.2
18	14	27	30	18	16	27	31	31
176	137	265	294	176	157	265	300	300
3.3	2.6	5.0	5.5	3.3	3.0	5.0	5.6	5.6
7	6	11	10	6	6	10	16	14
69	59	108	100	59	59	100	160	140
1.3	1.1	2.0	1.8	1.1	1.1	1.8	2.9	2.6
111	113	99	105	111	108	106	105	107
114	120	95	98	104	114	100	90	92
237	248	203	208	219	237	212	194	197
106	112	90	90	97	106	92	85	86
223	234	194	194	207	223	198	185	187
121	127	99	105	113	121	106		
250	261	210	221	235	250	223		
115	120	97	98	106	114	100		
239	248	207	208	223	237	212		
116	122	95	98	106	114	100	95	97
241	252	203	208	223	237	212	203	207
HB	HB		HB				HB	HB
HB	HB		HB				HB	HB
FH3-34	FH3-34						FH3-33	FH3-34
1.06	1.07	1.04	1.04	1.04	1.04	1.04	1.05	1.05
0.4~0.8	0.4~0.8	0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7
0.16	0.15	1.00	1.00	0.20	0.16	0.20	2.20	2.00
3.00	3.00	4.00	9.00	7.00	3.00	6.00	27.00	20.00
1.00	1.00	1.00	3.00	2.80	1.00	2.00		
Super High Heat Resistance	PMI, Super High Heat Resistance	Extrusion Low Gloss	General Low Gloss	Heat Resistance Low Gloss	Super High Heat Resistance, Low Gloss	High Heat Resistance, Low Gloss	Matal Plating, High Flow	Metal Plating, Good Adhesion

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ABS

TR551 / TR552 / TR556 / TR557 / TR558A

Properties	Test Method (ASTM)	Test Condition	Unit	Transparent				
				TR551	TR552	TR556	TR557	TR558A
Mechanical Properites								
Tensile Strength @Yield	D638	50mm/min	kg/cm²	580	400	480	470	510
			MPa	57	39	47	46	50
			lb/in²	8,200	5,700	6,800	6,700	7,200
Tensile Modulus	D638	1mm/min	kg/cm²	28,000	18,000	32,500	21,400	22,200
			MPa	2,740	1,760	3,190	2,100	2,180
			lb/in²	398,000	26,000	462,000	304,000	315,000
Elongation @Yield	D638	50mm/min	%	6	8	6	5	6
Elongation @Break	D638	50mm/min	%	20	25	30	30	30
Flexural Strength @Yield	D790	15mm/min	kg/cm²	940	620	770	700	770
			MPa	92	61	76	69	76
			lb/in²	13,300	8,800	10,900	9,900	10,900
Flexural Modulus	D790	15mm/min	kg/cm²	28,000	18,000	22,500	22,000	25,000
			MPa	2,740	1,760	2,210	2,160	2,450
			lb/in²	398,000	256,000	320,000	312,000	355,000
Izod Impact Strength	D256	1/4", 23°C	kg·cm/cm	12	22	20	17	12
			J/m	118	216	200	167	118
			ft·lb/in	2	4	4	3	2
		1/4", -30°C	kg·cm/cm	6	11	9	9	6
			J/m	59	108	88	88	59
			ft·lb/in	1	2	2	2	1
	D256	1/8", 23°C	kg·cm/cm	13	23	20	17	13
			J/m	127	225	200	167	127
			ft·lb/in	2	4	4	3	2
		1/8", -30°C	kg·cm/cm	6	9	8	8	6
			J/m	59	88	78	78	59
			ft·lb/in	1	2	2	2	1
Rockwell Hardness	D785	R-Scale	-	117	100	109	107	113
Thermal Properties								
Heat Deflection Temp. (Annealed)	D648	18.5kg/cm² 1/4"	°C	88	83	86	82	84
			°F	190	181	187	180	183
Heat Deflection Temp. (Unannealed)	D648	18.5kg/cm² 1/4"	°C	87	82	85	81	83
			°F	189	180	185	178	181
Heat Deflection Temp. (Annealed)	D648	4.6kg/cm² 1/4"	°C	99	92	96	96	97
			°F	210	198	205	205	207
Heat Deflection Temp. (Unannealed)	D648	4.6kg/cm² 1/4"	°C	94	87	92	90	92
			°F	201	189	198	194	198
Vicat Softening Temp.	D1525	5kg, 50°C/h	°C	90	84	90	85	88
			°F	195	183	195	185	190
Flammability	UL94	1/8"	class	HB	HB	HB	HB	HB
		1/10"	class					
		1/12"	class					
		1/16"	class	HB	HB	HB	HB	HB
	IEC707	1/8"	mm/min					
		1/16"	mm/min					
Physical Properties								
Specific Gravity	D792		-	1.11	1.06	1.09	1.09	1.11
Molding Shrinkage	D955		%	0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7
Melt Flow Index	D1238(G)	200°C/5kg	g/10min	1.00	1.00	1.00	2.00	2.00
	-	220°C/10kg	g/10min	8.00	11.00	5.00	21.00	25.00
	D1238(I)	230°C/3.8kg	g/10min	4.00	5.00	2.00	7.00	9.00
Optical								
Gloss	D2457	45°	-					
Characteristics				High Rigidity	High Impact	Extrusion	Mid-Impact	Standard

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ABS

AF312A / AF312B / AF312C / AF364 / AF365 / AF365F / AF366 / EF378L

	Flame Retardant						
AF312A	**AF312B**	**AF312C**	**AF364**	**AF365**	**AF365F**	**AF366**	**EF378L**
450	440	440	430	450	440	400	450
44	43	43	42	44	43	39	44
6,400	6,300	6,300	6,200	6,400	6,300	5,800	6,400
23,000	22,000	22,000	22,000	21,000	22,000	21,000	21,000
2,250	2,160	2,160	2,160	2,060	2,160	2,060	2,060
327,000	312,000	312,000	312,000	298,000	312,000	298,000	298,000
>5	>5	>5	>5	>5	>5	>5	>5
20	20	20	20	20	20	20	20
700	720	700	720	750	680	720	720
69	71	69	71	73	68	71	71
10,000	10,200	10,000	10,200	10,500	9,900	10,200	10,200
26,000	27,000	26,000	24,000	26,000	23,000	2,500	23,000
2,550	2,650	2,550	2,450	2,550	2,400	2,450	2,250
369,000	383,000	369,000	341,000	369,000	327,000	356,000	327,000
21	22	23	16	18	16	18	13
206	216	225	157	176	157	176	127
3.9	4.1	4.2	2.9	3.3	2.9	3.3	2.4
25	27	27	19	24	18	21	17
245	265	265	185	236	176	236	167
4.6	5.0	5.0	3.5	4.4	3.3	4.4	3.1
105	104	104	105	108	106	108	105
82	83	83	98	91	90	89	85
180	181	181	208	196	194	192	185
76	77	77	93	86	84	84	78
169	171	171	199	187	183	183	172
87	88	88	108	97	95	96	91
189	190	190	226	207	203	205	196
83	84	84	103	92	91	90	85
181	183	183	217	198	196	194	185
83	84	84	100	93	91	91	86
181	183	183	212	199	196	196	187
V-0,5VA	V-0,5VA	V-0	V-0, 5VA	V-0, 5VA	V-0,5VA	V-0, 5VA	V-2
V-0,5VA	V-0,5VB	V-0				V-0, 5VA	
V-0,5VB	V-0,5VB		V-0, 5VA	V-0, 5VB	V-0,5VB	V-0, 5VB	
V-0			V-0			V-0	V-2
1.19	1.18	1.18	1.19	1.19	1.18	1.19	1.06
0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7
5.90	5.90	5.90	1.00	2.90	7.30	2.80	5.70
60.00	60.00	60.00	10.00	30.00	75.00	25.00	58.00
19.00	19.00	19.00	3.00	8.00	23.00	8.00	19.00
High Flame Retardant	High Flow, High Impact	High Flow, High Impact	High Heat Resistance	High Heat Stability, High Gloss	High Flow, High Heat Stability, High Gloss	High Heat Stability, High Gloss, High Flame Retardant	V-2 Halogen Free

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ASA

LI911 / LI912 / LI912-WNPZ / LI918 / LI921NS

Properties	Test Method (ASTM)	Test Condition	Unit	Injection				
				LI911	**LI912**	**LI912-WNPZ**	**LI918**	**LI921NS**
Mechanical Properites								
Tensile Strength @Yield	D638	50mm/min	kg/cm²	500	480	400	490	480
			MPa	49	47	39	48	47
			lb/in²	7,100	6,800	5,700	7,000	6,800
Tensile Modulus	D638	1mm/min	kg/cm²	22,100	21,200			21,500
			MPa	2,167	2,079			2,108
			lb/in²	314,000	302,000			306,000
Elongation @Yield	D638	50mm/min	%	6	6			6
Elongation @Break	D638	50mm/min	%	20	25	50	25	25
Flexural Strength @Yield	D790	15mm/min	kg/cm²	800	770	600	780	760
			MPa	78	76	59	76	75
			lb/in²	11,400	11,000	8,500	11,100	10,800
Flexural Modulus	D790	15mm/min	kg/cm²	23,500	22,500	18,000	22,500	23,000
			MPa	2,305	2,206	1,765	2,206	2,256
			lb/in²	334,000	320,000	256,000	320,000	327,000
Izod Impact Strength	D256	1/4", 23°C	kg·cm/cm	12	16	26	16	12
			J/m	118	157	255	157	118
			ft·lb/in	2	3	5	3	2
		1/4", -30°C	kg·cm/cm	3	4			3
			J/m	29	39			29
			ft·lb/in	1	1			1
	D256	1/8", 23°C	kg·cm/cm	14	18		17	14
			J/m	137	176		167	137
			ft·lb/in	3	3		3	3
		1/8", -30°C	kg·cm/cm	3	4			3
			J/m	29	39			29
			ft·lb/in	1	1			1
Rockwell Hardness	D785	R-Scale	-	107	103	90	104	103
Thermal Properties								
Heat Deflection Temp. (Annealed)	D648	18.5kg/cm² 1/4"	°C	96	97			96
			°F	205	207			205
Heat Deflection Temp. (Unannealed)	D648	18.5kg/cm² 1/4"	°C	87	86	86	86	86
			°F	189	187	187	187	187
Heat Deflection Temp. (Annealed)	D648	4.6kg/cm² 1/4"	°C	101	101			101
			°F	214	214			214
Heat Deflection Temp. (Unannealed)	D648	4.6kg/cm² 1/4"	°C	96	96			96
			°F	205	205			205
Vicat Softening Temp.	D1525	5kg, 50°C/h	°C	96	95			95
			°F	205	203			203
Flammability	UL94	1/8"	class	HB	HB	HB	HB	HB
		1/10"	class					
		1/12"	class					
		1/16"	class			HB	HB	HB
	IEC707	1/8"	mm/min					
		1/16"	mm/min					
Physical Properties								
Specific Gravity	D792		-	1.07	1.07	1.07	1.07	1.07
Molding Shrinkage	D955		%	0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7
Melt Flow Index	D1238(G)	200°C/5kg	g/10min	2.00	1.20		2.00	1.20
	-	220°C/10kg	g/10min	20.00	12.00	7.50	20.00	12.00
	D1238(I)	230°C/3.8kg	g/10min	7.00	3.00		7.00	3.00
Optical								
Gloss	D2457	45°	-					
Characteristics				High Flow Injection	Standard Injection	Excellent Chemical Resistance, High Impact Injection	Good Colorability & Flow Injection	Antistatic Injection

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ASA

LI913 / LI913-H / LI923 / L923P / LI931 / LI931-C

		Extrusion			
LI913	**LI913-H**	**LI923**	**LI923P**	**LI931**	**LI931-C**
410	340	480	520	330	300
40	33	47	51	32	29
5,800	4,800	6,800	7,400	4,700	4,300
17,600		21,900			
1,726		2,148			
250,000		311,000			
5		6			
35	90	25	30	65	30
630	500	760	850	500	420
62	49	75	83	49	41
9,000	7,100	10,800	12,100	7,100	6,000
18,500	15,000	23,000	24,000	15,500	13,500
1,814	1,471	2,256	2,354	1,520	1,324
263,000	213,000	327,000	341,000	220,000	192,000
35	30	18	6	9	7
343	294	176	59	88	69
6	6	3	1	2	1
6		4	2	4	
59		39	20	39	
1		1	1	1	
45		25	5	10	
441		245	49	98	
8		5	1	2	
6		4	2	5	
59		39	20	49	
1		1	1	1	
92	82	103	106	81	80
96		97			
205		207			
86	81	86	86	79	78
187	178	187	187	174	172
102		103			
216		217			
96		97		85	
205		207		185	
94		96		86	
201		205		187	
HB	HB	HB	HB	HB	HB
	HB			HB	HB
1.07	1.07	1.06	1.06	1.07	1.07
0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7
0.50		0.50			
5.00	5.00	5.00	8.00	7.00	6.00
1.40		1.40			
				30	30
High Impact Extrusion	High Tensile Elongation Extrusion	High Stiffness Extrusion	High Hardness Extrusion	Low Gloss Extrusion	Low Gloss, Excellent Weatherability Extrusion

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ASA

LI933 / LI968W / LI970 / LI970HF / LI980 / LI980-H

Properties	Test Method (ASTM)	Test Condition	Unit	Co-extrusion					
				LI933	LI968W	LI970	LI970HF	LI980	LI980-H
Mechanical Properites									
Tensile Strength @Yield	D638	50mm/min	kg/cm²	400	480	450	510	400	500
			MPa	39	47	44	50	39	49
			lb/in²	5,700	6,800	6,400	7,300	5,700	7,100
Tensile Modulus	D638	1mm/min	kg/cm²	17,000	21,000	20,000	22,400		
			MPa	1,667	2,059	1,961	2,197		
			lb/in²	242,000	299,000	284,000	319,000		
Elongation @Yield	D638	50mm/min	%	6	6	6	6		
Elongation @Break	D638	50mm/min	%	25	25	25	20	70	45
Flexural Strength @Yield	D790	15mm/min	kg/cm²	650	750	730	780	700	820
			MPa	64	74	72	76	69	80
			lb/in²	9,200	10,700	10,400	11,100	10,000	11,700
Flexural Modulus	D790	15mm/min	kg/cm²	19,500	23,000	21,000	23,000	17,600	22,000
			MPa	1,912	2,256	2,059	2,256	1,726	2,157
			lb/in²	277,000	327,000	299,000	327,000	250,000	313,000
Izod Impact Strength	D256	1/4", 23°C	kg·cm/cm	13	14	13	6	12	8
			J/m	127	137	127	59	118	78
			ft·lb/in	2	3	2	1	2	1
		1/4", -30°C	kg·cm/cm	4	4	4	2		
			J/m	39	39	39	20		
			ft·lb/in	1	1	1	1		
	D256	1/8", 23°C	kg·cm/cm	18	18	18	6		
			J/m	176	176	176	59		
			ft·lb/in	3	3	3	1		
		1/8", -30°C	kg·cm/cm	4	4	4	2		
			J/m	39	39	39	20		
			ft·lb/in	1	1	1	1		
Rockwell Hardness	D785	R-Scale	-	100	102	103	108	96	110
Thermal Properties									
Heat Deflection Temp. (Annealed)	D648	18.5kg/cm² 1/4"	°C	93	96	93	95		
			°F	199	205	199	203		
Heat Deflection Temp. (Unannealed)	D648	18.5kg/cm² 1/4"	°C	84	86	82	85	80	85
			°F	183	187	180	185	176	185
Heat Deflection Temp. (Annealed)	D648	4.6kg/cm² 1/4"	°C	98	101	98	100		
			°F	208	214	208	212		
Heat Deflection Temp. (Unannealed)	D648	4.6kg/cm² 1/4"	°C	93	96	91	95		
			°F	199	205	196	203		
Vicat Softening Temp.	D1525	5kg, 50°C/h	°C	92	93	87	90		
			°F	198	199	189	194		
Flammability	UL94	1/8"	class	HB	HB	HB	HB	HB	HB
		1/10"	class						
		1/12"	class						
		1/16"	class	HB		HB	HB	HB	HB
	IEC707	1/8"	mm/min						
		1/16"	mm/min						
Physical Properties									
Specific Gravity	D792		-	1.07	1.07	1.12	1.12	1.09	1.09
Molding Shrinkage	D955		%	0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7
Melt Flow Index	D1238(G)	200°C/5kg	g/10min	1.20	1.10	1.20	3.00		
	-	220°C/10kg	g/10min	12.00	11.00	12.00	30.00	15.00	30.00
	D1238(I)	230°C/3.8kg	g/10min	3.00	2.80	3.00			
Optical									
Gloss	D2457	45°	-						
Characteristics				Low Gloss Coextrusion	Good Weatherability Coextrusion	Scratch Resistance Coextrusion	High Flow Coextrusion	High Gloss Coextrusion	High Gloss & Flow Coextrusion

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ASA

LI928/ LI941 / LI941V / LI942 / LI945 / LI951

		Automotive			
LI928	**LI941**	**LI941V**	**LI942**	**LI945**	**LI951**
470	480	470	480	580	510
46	47	46	47	57	50
6,600	6,800	6,600	6,800	8,600	7,200
15	20	20	15	15	25
750	770	750	750	950	790
74	76	74	74	94	
10,700	11,000	10,700	10,700		
23,000	23,500	21,500	23,500	27,500	24,000
2,256	2,305	2,100	2,305		2,350
327,000	334,000	310,000	334,000		335,000
8	14	16	9	6	11
78	137	157	88	59	109
1	3	3	2	1	2
105	104	98	105	114	106
88	94	94	99	103	95
190	201	201	210	217	203
97	102	100	105		104
207	216	212	221		219
	HB				
	HB				
1.08	1.08	1.08	1.09	1.09	1.08
0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7	0.4~0.7	0.4-0.7
28.00	6.00	6.00	3.00	4.50	6.00
High Flow	Heat	Super Excellent Weatherability	Low Gloss	Lamp	High Stiffness Extrusion

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SAN & PS

80HF(LLHK) / 82TR, 15NFI / 20HRE / 25SPI / 25SPE

Properties	Test Method (ASTM)	Test Condition	Unit	SAN		GPPS			
				80HF(LLHK)	82TR	15NFI	20HRE	25SPI	25SPE
Mechanical Properites									
Tensile Strength @Yield	D638	50mm/min	kg/cm²	770	670	450	480	500	505
			MPa	76	66	44	47	49	50
			lb/in²	10,900	9,500	6,400	6,800	7,100	7,200
Tensile Modulus	D638	1mm/min	kg/cm²	31,400	31,400	29,100	29,200	29,400	29,400
			MPa	3,080	3,080	2,850	2,860	2,880	2,880
			lb/in²	446,000	446,000	413,000	415,000	417,000	417,000
Elongation @Yield	D638	50mm/min	%						
Elongation @Break	D638	50mm/min	%	9	6	5	5	5	5
Flexural Strength @Yield	D790	15mm/min	kg/cm²	1,250	1,150	870	900	1,000	1,050
			MPa	123	113	85	88	98	103
			lb/in²	17,800	16,300	12,400	12,800	14,200	14,900
Flexural Modulus	D790	15mm/min	kg/cm²	38,000	37,500	33,000	33,500	33,300	33,500
			MPa	3,720	3,680	3,230	3,280	3,260	3,280
			lb/in²	540,000	533,000	469,000	476,000	473,000	476,000
Izod Impact Strength	D256	1/4", 23°C	kg·cm/cm	1.0	1.0	1.0	1.0	1.0	1.0
			J/m	10	10	10	10	10	10
			ft·lb/in	0.2	0.2	0.2	0.2	0.2	0.2
		1/4", -30°C	kg·cm/cm	1.0	1.0	1	1	1	1
			J/m	10	10	10	10	10	10
			ft·lb/in	0.2	0.2	0.2	0.2	0.2	0.2
	D256	1/8", 23°C	kg·cm/cm						
			J/m						
			ft·lb/in						
		1/8", -30°C	kg·cm/cm						
			J/m						
			ft·lb/in						
Rockwell Hardness	D785	R-Scale	-	124	123	120	120	120	120
Thermal Properties									
Heat Deflection Temp. (Annealed)	D648	18.5kg/cm² 1/4"	°C	92	89	88	88	88	88
			°F	198	192	190	190	190	192
Heat Deflection Temp. (Unannealed)	D648	18.5kg/cm² 1/4"	°C	89	90	86	87	89	87
			°F	192	194	187	189	192	189
Heat Deflection Temp. (Annealed)	D648	4.6kg/cm² 1/4"	°C	105	103	97	94	96	103
			°F	221	217	207	201	205	217
Heat Deflection Temp. (Unannealed)	D648	4.6kg/cm² 1/4"	°C	99	98	93	93	92	95
			°F	210	208	199	199	198	203
Vicat Softening Temp.	D1525	5kg, 50°C/h	°C	103	101	95	94	93	96
			°F	217	214	203	201	199	205
Flammability	UL94	1/8"	class	HB	HB	HB	HB	HB	HB
		1/10"	class						
		1/12"	class						
		1/16"	class	HB	HB	HB	HB	HB	HB
	IEC707	1/8"	mm/min			FH3-28	FH3-28	FH3-28	FH3-28
		1/16"	mm/min						
Physical Properties									
Specific Gravity	D792		-	1.08	1.07	1.04	1.05	1.05	1.05
Molding Shrinkage	D955		%	0.2~0.6	0.2~0.6	0.4~0.8	0.4~0.8	0.4~0.8	0.4~0.8
Melt Flow Index	D1238(G)	200°C/5kg	g/10min	2.20	5.00	9.50	5.50	3.30	2.90
	-	220°C/10kg	g/10min	25.00	55.00	120.00	73.00	47.00	39.00
	D1238(I)	230°C/3.8kg	g/10min	8.00	18.00	28.00	17.00	10.00	8.00
Optical									
Gloss	D2457	45°	-						
Characteristics				High Strength, ICE Color	High Clarity, Crystal	HigH Flow	Heat Resistance, Extrusion	Heat Strength, Extrusion	Heat Strength, Extrusion

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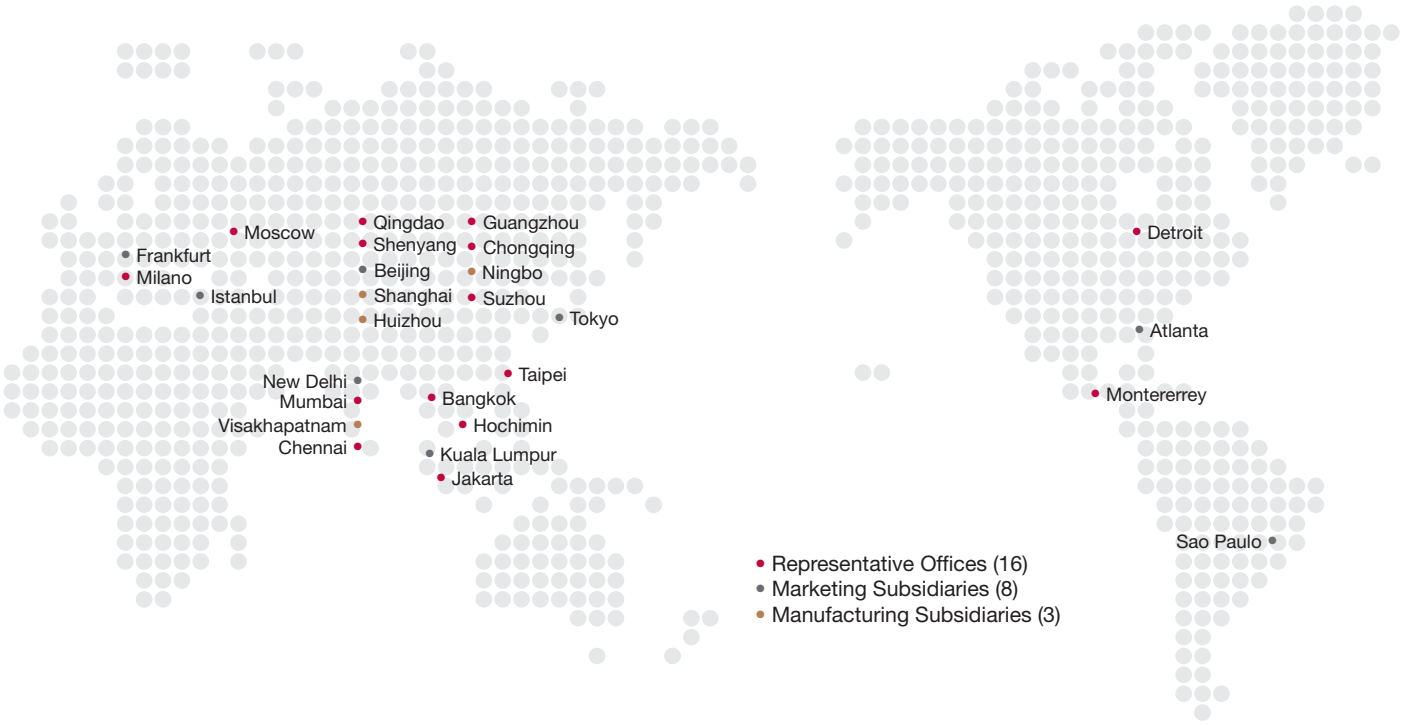
PS

MI730 / MI750L, 50IS / 60HR / 65IHE, 460AF / 408AF, SG910 / SH860 / SF510 / SG970NSU

MIPS		HIPS			FR HIPS		ALPHALAC			
MI730	**MI750L**	**50IS**	**60HR**	**65IHE**	**460AF**	**408AF**	**SG910**	**SH860**	**SF510**	**SG970NSU**
420	410	240	280	290	220	270	350	290	270	360
41	40	24	27	28	22	27	34	28	27	35
6,000	5,800	3,400	4,000	4,100	3,100	3,900	5,000	4,100	3,800	5,100
25,200	24,200	18,000	18,200	18,300	18,000	19,000	21,300	22,000	215,000	21,000
2,470	2,370	1,760	1,780	1,790	1,760	1,860	2,090	2,160	2,110	2,060
358,000	344,000	256,000	258,000	260,000	256,000	270,000	302,000	312,000	305,000	298,000
6	5	5	5	5	5	5	6	5	5	5
34	67	65	65	70	60	60	40	120	50	50
750	620	380	440	480	400	400	540	460	400	550
74	61	37	43	47	39	39	53	45	39	54
10,700	8,800	5,400	6,200	6,800	5,700	5,700	7,700	6,500	5,700	7,800
29,200	29,200	22,000	22,000	22,500	20,000	22,000	22,500	17,000	23,500	26,000
2,860	2,860	2,160	2,160	2,210	1,960	2,160	2,210	1,670	2,300	2,550
415,000	415,000	312,000	312,000	320,000	284,000	312,000	320,000	241,000	334,000	369,000
4.0	8.0	8.5	9.0	9.5	9.0	9.0	11.0	9.5	10.0	10.0
39	78	83	88	93	88	88	108	93	98	98
0.7	1.5	1.6	1.7	1.7	1.7	1.7	2.0	1.7	1.8	1.8
2	2	5	5	6	4	4	6	6	5	4
20	20	49	49	59	39	39	59	59	49	39
0.4	0.4	0.9	0.9	1.1	0.7	0.7	1.1	1.1	0.9	0.7
4	13	12	12	13	11	13	17	13	14	12
39	127	120	120	130	108	130	170	130	140	120
0.7	2.4	2.2	2.2	2.4	2.0	2.4	3.1	2.4	2.6	2.2
3	4	6	6	7	4	7	6	7	7	5
29	39	59	59	69	39	69	59	69	69	49
0.6	0.7	1.1	1.1	1.3	0.7	0.7	1.1	1.3	1.3	0.9
117	112	92	97	99	90	94	102	85	98	110
85	86	79	80	81	83	84	82	81	80	83
185	187	174	176	178	181	183	180	178	176	181
83	82	80	83	83	79	81	85	83	80	84
181	180	176	181	181	174	178	185	181	176	183
94	94	91	95	97	89	91	94	95	91	93
201	201	196	203	207	192	196	201	203	196	91
91	91	88	93	92	85	87	93	93	89	91
196	196	190	199	198	185	189	199	199	192	196
95	93	87	92	92	85	84	92	92	88	91
203	199	189	198	198	185	183	198	198	190	196
HB	HB	HB	HB	HB	V-0	V-2	HB	HB	HB	HB
HB	HB	HB	HB	HB	V-0	V-2(0.8T)	HB	HB	HB	HB
		FH3-31	FH3-28	FH3-30					FH3-28	
1.05	1.05	1.03	1.03	1.03	1.16	1.10	1.04	1.03	1.04	1.05
0.4~0.8	0.4~0.8	0.4~0.8	0.4~0.8	0.4~0.8	0.4~0.8	0.4~0.8	0.4~0.8	0.4~0.8	0.4~0.8	
8.00	4.00	8.50	5.50	3.00	15.00	6.50	3.70	3.00	12.00	6.50
99.00	51.00	80.00	65.00	37.00	153.00	65.00	46.00	43.00	137.00	79.00
23.00	12.00	19.00	15.00	8.00	38.00		10.00	10.00	34.00	16.00
Medium Impact	High Impact, High Flow	General Purpose	Heat Resistance	High Impact, Extrusion	Non-BEO	UL 94 V-2	Super High Impact, Super High Gloss	Chemical Resistance, Extrusion	Super High Flow, High Impact	Super High Gloss, Super High Impact

Disclaimer 1) Typical values are only for material selection purpose, and variation within normal tolerances are for various colors.
2) Values given in the table should not be interpreted as material specification and it can not be used for part or tool design.



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