

Flame - retardant ABS

| Product Introduction |

Kumho's flame-retardant ABS resin is approved by UL and CSA. The flame-retardant ABS resin, which has outstanding, impact strength, weather resistance and chemical resistance, is suitable for home electronics and office automation equipment that require flame- retardant quality, such as computer monitors and TV housings.

| Characteristics & Applications |

	Grade	Characteristics	Applications
General Purpose	HFA 703	High Rigidity	Computer monitors, Copy machine, etc.
	HFA 707	General Purpose	
	HFA 451	High Flammability	
	HFA 452	Low Flammability	
Weather Resistant	HFA 462	Extrusion	Profile, Sheet requiring flammability
	HFA 705	General Purpose	Computer monitors, Copy machine, etc.
Special Purpose	HFA 700HT	Super Heat Resistance	Temperature controller, Electric concent
	HFA 456	Non-Halogen	Non-toxic V-2 application as Home electronics Housing

| Flame - retardant ABS |

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Test Item / Unit	Test Method (ASTM)	Test Condition	General Purpose					Weather Resistance	Special Purpose	
			HFA-703 High Rigidity	HFA-707 General Purpose	HFA-451 High Flammability	HFA-452 Low Flammability	HFA-462 Extrusion	HFA-705 Weather Resistance	HFA-700HT Super Heat Resistance	HFA-456 Non-halogen
Tensile Strength [kg/cm ² (psi)]	D638	23°C	510 (7,250)	420 (5,970)	420 (5,970)	460 (6,540)	520 (7,367)	460 (6,540)	440 (6,260)	520 (7,367)
Elongation [%]	D638	23°C	30	20	20	20	25	20	15	20
Flexural Strength [kg/cm ² (psi)]	D790	23°C	670 (9,530)	600 (8,530)	600 (8,530)	700 (9,960)	630 (8,960)	650 (9,250)	700 (9,950)	700 (9,950)
Flexural Modulus [kg/cm ² (psi)]	D790	23°C	24,000 (341,400)	23,000 (327,000)	23,000 (327,000)	26,000 (370,000)	25,000 (355,000)	24,000 (341,400)	27,000 (384,000)	27,000 (384,000)
IZOD Impact strength [kg·cm/cm (ft·lb/in)]	D256	3.2mm, Notched, 23°C(73°F)	16 (2.9)	22 (4.1)	21 (4.0)	15 (2.8)	22 (4.1)	15 (2.8)	15 (2.8)	15 (2.8)
		6.4mm, Notched, 23°C(73°F)	14 (2.6)	19 (3.5)	18 (3.3)	14 (2.6)	20 (3.7)	14 (2.6)	14 (2.6)	14 (2.6)
		R scale	105	100	100	102	105	102	100	100
Heat Distortion Temp. [°C(°F)]	D648	18.6kg/cm ² (264psi) Unannealed	76(169)	76(169)	76(169)	80(176)	80(176)	78(172)	87(189)	76(169)
Vicat Softening Temp. [°C(°F)]	D1525		91(196)	91(196)	91(196)	96(205)	96(205)	96(205)	101(214)	91(196)
Melt Flow Index [g/10min]	D1238	200°C, 5kg	3	6	6	5.5	1.6	5	2	5
		220°C, 10kg	30	60	60	55	16	50	1.5	50
		200°C, 21.6kg	60	120	120	110	32	90	18	100
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	0.4 ~ 0.7	
Specific Gravity	D792		1.18	1.18	1.18	1.07	1.18	1.18	1.18	1.06
Water Absorption [%]	D570		0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Flammability	UL94*	1.5mm	V-0		V-0	V-2	V-0		V-0	V-2
		2.1mm		V-0	V-0, 5VB			V-0		
		3.0mm	V-0	V-0, 5VB	V-0, 5VB		V-0	V-0	V-0	V-2

(*UL File No. E65424 (CSA File No. LS66457) Note 1) These are typical property values, not specifications.
Note 2) In case of colored products, the values could vary slightly by color.
Note 3) Values are measured at 23°C and in RH of 50% on injection molded specimens.



KUMHO ABS

Acrylonitrile Butadiene Styrene

| Product Introduction |

Whether you require general purpose, plating, low-gloss, flame-retardant, or a heat-resistant grade, Kumho produces the ABS resin for your specific application. Kumho ABS resins are widely used for injection molding, extrusion molding, vacuum forming, thermoforming and blow molding with dimensional stability and high gloss surface. Furthermore, they will grant excellent secondary processing characteristics, such as adhesion, plating, paint and sputtering.



| Characteristics & Applications |

Grade	Characteristics	Applications
plating	ABS 710	General plating
	ABS 710G	Plating, Adhesion strength reinforced
	ABS 720	High rigidity
High rigidity	ABS 720R	High rigidity
	ABS 722P	High rigidity, extrusion molding use
	ABS 722W	Scratch resistance
High gloss	ABS 728	General high gloss
	ABS 728W	High gloss, weather stable
	ABS 740	High impact resistance
High impact strength	ABS 745	Super impact resistance
	ABS 749	Compounding use
	ABS 750	General easy flow
Easy flow, medium impact strength	ABS 750SH	Easy flow, white
	ABS 750SW	Super white
	ABS 780	High flow
High flow	ABS 780M	High flow, Painting use
	ABS 780F	Super flow
	ABS 765	General painting use
Painting	ABS 775	High impact resistance
	ABS 775T	Thin layer use
Refrigerator sheet	ABS 775EG	General extrusion molding use
		Edge bands

Grade	Characteristics	Applications
Extrusion molding	ABS 795	High impact strength, easy flow
	ER872M	Extrusion molding use
ESCR	ER875	Injection molding use
	BM510	Heat resistance, general use
Blow molding	BM530	High heat resistance
	ABS 770ZH	General extrusion molding use
Low gloss	H2938Z	Heat resistance
	HU650Z	High heat resistance, weather stable
	ABS 730	Semi heat resistance
Heat resistance	H2938	Heat resistance
	H2938L	Heat resistance, painting use
	HU600	High heat resistance
	HU600SKG	High heat resistance, low shrinkage
	HU621	Heat resistance, high impact strength
	HU650	Super heat resistance
	HGX 4500	Ultra high heat resistance
Aluminum Sputtering	H2938DS	Heat resistance, AL sputtering
Odorless heat resistance	HU600DS	High heat resistance, AL sputtering
	HU601	Heat resistance, odorless
	HU651	High heat resistance, odorless

| Typical Properties |

Test Item / Unit	Method (ASTM)	Test condition	Typical Properties																																											
			Electro-plating		High rigidity				High gloss		High impact strength			Painting			High flow			Sheet extrusion for refrigerator			Extrusion molding		ESCR		Blow molding		Low gloss				Heat resistance				Aluminum sputtering		Odorless heat resistance							
			ABS 710	ABS 710G	ABS 720	ABS 720R	ABS 722P	ABS 722W	ABS 728	ABS 728W	ABS 740	ABS 745	ABS 749	ABS 750	ABS 750SH	ABS 750SW	ABS 765	ABS 780	ABS 780M	ABS 780F	ABS 775	ABS 775T	ABS 775EG	ABS 795	ER872M	ER875	BM510	BM530	ABS 770ZH	H2938Z	HU650Z	ABS 730	H2938	H2938L	HU600	HU600SKG	HU621	HU650	HGX4500	H2938DS	HU600DS	HU 601	HU 651			
Tensile Strength [kg/cm²(psi)]	D638	23°C, 50mm	410	440	500	530	550	650	470	470	420	420	320	465	470	485	460	465	460	440	450	480	430	400	430	450	430	430	450	450	480	470	475	500	475	500	480	485	430	480	485	430	480	500	485	485
Elongation [%]	D638	23°C 50mm	25	20	20	15	10	10	20	20	25	25	30	20	15	15	20	20	20	20	25	20	25	25	25	20	25	25	20	15	20	20	15	20	15	20	15	20	20	15	20	15	20	20	20	20
Flexural Strength [kg/cm²(psi)]	D790	23°C, 3mm	600	640	720	750	800	890	650	650	580	580	500	620	660	700	640	620	620	580	630	670	630	520	580	600	620	630	550	700	650	620	640	670	640	670	620	670	620	650	670	650	640	650	640	640
Flexural Modulus [kg/cm²(psi)]	D790	23°C, 3mm	20,000	21,000	25,000	25,500	28,500	30,000	22,000	22,000	20,000	17,500	17,000	21,000	22,500	23,500	21,000	21,500	22,000	20,000	22,000	24,000	22,500	16,500	19,500	20,500	22,000	20,000	17,000	20,000	22,500	21,000	21,500	23,000	22,000	22,000	22,500	22,000	22,500	22,000	21,000	20,500	21,000	20,500		
Rockwell Hardness	D785	R scale	102	102	112	113	118	120	108	108	98	98	94	108	108	109	106	108	108	105	105	107	105	93	98	100	100	102	109	107	105	108	110	111	110	112	101	109	108	110	110	106	105	105		
IZOD Impact strength [Kg · cm/cm (ft · lb/in)]	D256	3,2mm, Notched, 23°C	36	35	25	20	10	12	27	27	36	45	40	30	28	24	36	27	32	22	45	38	38	48	60	30	35	32	24	18	21	30	25	25	24	18	32	20	16	25	21	24	20			
		6,4mm, Notched, 23°C	32	30	20	15	8	10	22	22	30	35	30	24	22	20	32	22	27	18	36	30	30	40	40	24	28	25	18	15	18	24	21	20	18	14	25	18	14	20	18	18	15			
Heat Distortion Temp., [°C(°F)]	D648	18.6kg/cm², Unannealed	83	84	87	89	88	90	86	86	84	84	82	85	85	85	85	85	86	82	87	88	87	83	84	84	92	94	90	95	105	91	95	92	100	99	94	105	110	94	96	96	101			
Vicat Softening Temp., [°C(°F)]	D1525		181	183	189	192	190	194	187	187	183	183	180	185	185	185	185	185	187	180	189	190	189	183	183	198	198	204	203	221	196	203	198	212	210	201	221	230	201	205	205	214				
Melt Flow Index [g/10min]	D1238	220°C, 10.0kg 200°C, 21.6kg	30.0	20.0	20.0	20.0	35.0	28.0	40.0	40.0	25.0	10.0	19.0	30.0	35.0	38.0	20.0	55.0	35.0	80.0	5.0	4.5	5.0	4.0	4.5	32.0	5.0	6.0	4.0	5.0	3.5	12.0	12.0	15.0	8.0	10.0	12.0	4.0	3.0	12.0	9.0	6.0	5.5			
Shrinkage [%]	D955		0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8	0.5~0.8				
Density	D792	23°C	1.04	1.04	1.04	1.04	1.05	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.08	1.08	1.05	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.05	1.04	1.04	1.05	1.05	
Water absorption [%]	D570	24hr, Immersion wate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
UV resistance [Δ E]	D4459	300hr, Ivory	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Withstanding voltage [V/mil]	D149		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Sheet resistance	D257		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Flammability [Rating]	UL94*	1/16"(1.6mm)	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB		
		1/12"(2.2mm)	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB		
		1/8"(3.2mm)	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	

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