

TYPICAL PROPERTIES OF ACRYLONITE-BUTADIENE-STYRE AND STYRENE-ACRYLONITRILE COPOLYMER (ABS AND SAN)

ASTM or UL Test	Property	— STANDARD ABS GRADES —			— SPECIAL-PURPOSE ABS GRADES —					SAN Grades
		High Impact	Superhigh Impact	Medium Impact	High Heat	Flame Retardant	Clear	Expandable	Plating	
PHYSICAL										
D792	Specific gravity	1.01-1.05	1.02-1.05	1.04-1.06	1.04-1.06	1.19-1.22	1.05	0.55-0.85	1.05-1.07	1.07-1.08
D792	Specific volume (in ³ /lb)	27	27	28	28	—	26	—	26	26
MECHANICAL										
D638	Tensile strength (psi)	6,000	5,000- 6,300	6,000- 7,500	6,000- 7,500	5,500- 10,000	5,800- 6,300	3,000- 4,000	5,500- 6,600	9,000- 12,000
D638	Elongation (%)	5-20	5-70	5-25	3-20	5-25	25-75	—	—	1-4
D638	Tensile modulus (10 ⁵ psi)	3.3	2.0-3.4	3.6-3.8	3.0-4.0	3.2-3.7	3.0-3.3	1.0-2.5	3.0-3.8	4.5-5.6
D790	Flexural strength (psi)	10,500	6,000- 11,500	11,500	10,000- 13,000	9,000- 12,250	10,500	3,000- 8,000	8,700- 11,500	14,000- 17,000
D790	Flexural modulus (10 ⁵ psi)	3.4	2.0-3.5	3.6-4.0	3.1-4.0	3.0-3.4	3.4-3.9	1.4-2.8	3.0-3.8	5.5
D256	Impact strength, Izod (ft-lb/in of notch)	6.5	7.0-8.0	4.0-5.5	2.3-6.0	4.0-13.0	2.5-4.0	—	5.0-7.0	0.35-0.50
D785	Hardness, Rockwell R	103	69-105	107	111	90-117	100-105	60-70*	103-109	M85
THERMAL										
D696	Coefficient of thermal expansion (10 ⁻⁵ in/in-°F)	5.3	5.6	4.6	3.9-5.1	3.7-4.6	4.6	4.9	4.7-5.3	3.0
D648	Deflection temp.† *(°F)									
	At 264 psi	188	192	184	220-240	180-220	168	160	189	210
	At 66 psi	203	208	201	230-245	198-238	180-185	185	214	—
UL 94	Flammability rating	HB	HB	HB	HB	V-0 to V-1§	HB	HB-V-0	HB	HB
ELECTRICAL										
D149	Dielectric strength (V/mil)									
	Short time, 1/8-in thk	400	350-500	350-500	350-500	400+	400	—	—	—
D495	Arc resistance (s)	89	50-85	50-85	50-85	20-60	120-130	—	—	—

*Density has a marked effect. †Unannealed. §0.060-in thick samples.

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ISO or UL Test	Property	— STANDARD ABS GRADES —			— SPECIAL-PURPOSE ABS GRADES —					SAN Grades
		High Impact	Superhigh Impact	Medium Impact	High Heat	Flame Retardant	Clear	Expandable	Plating	
PHYSICAL										
ISO1183	Specific gravity	1.01-1.05	1.02-1.05	1.04-1.06	1.04-1.06	1.19-1.22	1.05	0.55-0.85	1.05-1.07	1.07-1.08
ISO1183	Specific volume (cm ³ /g)	0.97	0.97	1.01	1.01	—	0.94	—	0.94	0.94
MECHANICAL										
ISO527	Tensile strength (MPa)	41	34-43	41-52	41-52	38-69	40-43	21-28	38-46	62-83
ISO527	Elongation (%)	5-20	5-70	5-25	3-20	5-25	25-75	—	—	1-4
ISO527	Tensile modulus (MPa)	2,275	1,378-	2,482-	2,068-	2,206-	2,068-	689-	2,068-	3,102-
			2,344	2,620	2,757	2,551	2,275	1,723	2,620	3,861
ISO178	Flexural strength (MPa)	72	41-80	79	69-90	62-84	72	21-55	60-79	96-117
ISO178	Flexural modulus (10 ³ MPa)	2.34	1.38-2.41	2.48-2.76	2.14-2.76	2.07-2.34	2.34-2.69	0.96-1.93	2.07-2.62	3.79
ISO180	Notched izod impact strength (J/m)	347	374-427	214-294	123-320	214-694	133-214	—	267-374	19-27
ISO2039	Hardness, Rockwell R	103	69-105	107	111	90-117	100-105	60-70*	103-109	M85
THERMAL										
ISO11359	Coefficient of thermal expansion (10 ⁻⁴ m/m/°C)	0.83	1.0	0.83	0.70-0.92	0.67-0.92	0.83	0.88	0.85-0.95	0.67
ISO75	Deflection temp.† *(°C)									
	At 1.80 MPa	87	89	84	104-115	82-104	75	71	87	99
	At 0.45 MPa	95	98	94	110-118	92-114	82-85	85	101	—
UL 94	Flammability rating	HB	HB	HB	HB	V-0 to V-1§	HB	HB-V-0	HB	HB
ELECTRICAL										
IEC243	Dielectric strength (kV/mm)									
	Short time, 3 mm thk	15.7	13.7-19.7	13.7-19.7	13.7-19.7	15.7+	15.7	—	—	—
ASTM D495	Arc resistance (s)	89	50-85	50-85	50-85	20-60	120-130	—	—	—

*Density has a marked effect. †Unannealed. §25-mm thick samples.