

# Acrylonite Butadiene Styrene (ABS) and Styrene Acrylonitrile Copolymer (SAN)

## IAPD THERMOPLASTICS RECTANGLE

### AMORPHOUS COMMODITY THERMOPLASTICS

TYPICAL PROPERTIES OF ACRYLONITE BUTADIENE STYRENE (ABS) AND STYRENE ACRYLONITRILE COPOLYMER (SAN)								
ASTM or UL Test	Property	— STANDARD ABS GRADES —			— SPECIAL-PURPOSE ABS GRADES —			
		High	Medium Impact	Impact	Flame	Retardant	SAN Clear	Grades
PHYSICAL								
D792	Specific gravity	1.01-1.05	1.04-1.06		1.19-1.22	1.05	1.07-1.08	
D792	Specific volume (in <sup>3</sup> /lb)	27	28		—	26	26	
MECHANICAL								
D638	Tensile strength (psi)	6,000	6,000- 7,500		5,500- 10,000	5,800- 6,300	9,000- 12,000	
D638	Elongation (%)	5-20	5-25		5-25	25-75	1-4	
D638	Tensile modulus (10 <sup>5</sup> psi)	3.3	3.6-3.8		3.2-3.7	3.0-3.3	4.5-5.6	
D790	Flexural strength (psi)	10,500	11,500		9,000- 12,250	10,500	14,000- 17,000	
D790	Flexural modulus (10 <sup>5</sup> psi)	3.4	3.6-4.0		3.0-3.4	3.4-3.9	5.5	
D256	Impact strength, Izod (ft-lb/in of notch)	6.5	4.0-5.5		4.0-13.0	2.5-4.0	0.35-0.50	
D785	Hardness, Rockwell R	103	107		90-117	100-105	M85	
THERMAL								
D696	Coefficient of thermal expansion (10 <sup>-5</sup> in/in-°F)	5.3	4.6		3.7-4.6	4.6	3.0	
D648	Deflection temp.† *(°F)							
	At 264 psi	188	184		180-220	168	210	
	At 66 psi	203	201		198-238	180-185	—	
UL 94	Flammability rating	HB	HB		V-0 to V-1§	HB	HB	
ELECTRICAL								
D149	Dielectric strength (V/mil)							
	Short time, 1/8-in thk	400	350-500		400+	400	—	
D495	Arc resistance (s)	89	50-85		20-60	120-130	—	

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

**TYPICAL PROPERTIES OF ACRYLONITRILE BUTADIENE STYRENE (ABS) AND STYRENE ACRYLONITRILE COPOLYMER (SAN)**

ISO or UL Test	Property	— STANDARD ABS GRADES —		— SPECIAL-PURPOSE ABS GRADES —		
		High Impact	Medium Impact	Flame Retardant	Clear	SAN Grades
PHYSICAL						
ISO1183	Specific gravity	1.01-1.05	1.04-1.06	1.19-1.22	1.05	1.07-1.08
ISO1183	Specific volume (cm <sup>3</sup> /g)	0.97	1.01	—	0.94	0.94
MECHANICAL						
ISO527	Tensile strength (MPa)	41	41-52	38-69	40-43	62-83
ISO527	Elongation (%)	5-20	5-25	5-25	25-75	1-4
ISO527	Tensile modulus (MPa)	2,275	2,482-	2,206-	2,068-	3,102-
			2,620	2,551	2,275	3,861
ISO178	Flexural strength (MPa)	72	79	62-84	72	96-117
ISO178	Flexural modulus (10 <sup>3</sup> MPa)	2.34	2.48-2.76	2.07-2.34	2.34-2.69	3.79
ISO180	Notched izod impact strength (J/m)	347	214-294	214-694	133-214	19-27
ISO2039	Hardness, Rockwell R	103	107	90-117	100-105	M85
THERMAL						
ISO11359	Coefficient of thermal expansion (10 <sup>-4</sup> /°C)	0.83	0.83	0.67-0.92	0.83	0.67
ISO75	Deflection temp.† *(°C)					
	At 1.80 MPa	87	84	82-104	75	99
	At 0.45 MPa	95	94	92-114	82-85	—
UL 94	Flammability rating	HB	HB	V-0 to V-1§	HB	HB
ELECTRICAL						
IEC243	Dielectric strength (kV/mm)					
	Short time, 3mm thk	15.7	13.7-19.7	15.7+	15.7	—
ASTM D495	Arc resistance (s)	89	50-85	20-60	120-130	—

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