



RUBBER COMPOUNDS

Measuring Performance Characteristics

Test methods have been established by the American Society for Testing Materials (ASTM) and the Society of Automotive Engineers (SAE) for measuring physical and chemical properties of products made from elastomers. Properly used and interpreted, these tests provide an excellent basis for specifying to the rubber supplier the performance characteristics you require in a rubber product. A complete description of testing procedures is contained in the publication, ASTM Standards on Rubber Products, issued by: ASTM 1916 Race Street Philadelphia, PA 19103

CHEMICAL NAME	Natural Rubber Polyisoprene	SBR or GR-S or Buna S Butadiene styrene	Butyl Isobutylene isoprene	Nitrile (Buna N) Butadiene acrylonitrile	Neoprene Polychloroprene	HYPALON* Chlorosulfonated Polyethylene	Chlorinated Polyethylene	(EPDM Rubber) Ethylene propylene polymer	Silicone Polysiloxane polymer	VITON* Fluoroelastomer	ADIPRENE* Urethane rubber
PROPERTIES											
MATERIAL DESIGNATION (ASTM D-2000, SAE J200 Classification)	AA	AA	AA	BF, BG, BK, CH	BC, BE	CE	BC, BE, CE	CA	GE	HK	BG
TENSILE STRENGTH, MPa (psi)											
Pure Gum	Over 20.7 (3,000)	Below 6.9 (1,000)	Over 10.3 (1,500)	Below 6.9 (1,000)	Over 20.7 (3,000)	Over 17.2 (2,500)	Over 10.3 (1,500)	Below 6.9 (1,000)	Below 10.3 (1,500)	Over 12.4 (1,800)	Over 27.6 (4,000)
Black Loaded Stocks	Over 20.7 (3,000)	Over 13.8 (2,000)	Over 13.8 (2,000)	Over 13.8 (2,000)	Over 20.7 (3,000)	Over 20.7 (3,000)	Over 17.2 (2,500)	Over 20.7 (3,000)	Over 10.3 (1,500)	Over 13.8 (2,000)	—
HARDNESS RANGE (Durometer A)	30-90	40-90	40-75	40-95	40-95	40-95	60-90	40-90	40-85	55-95	60-99 + A (up to 80D)
SPECIFIC GRAVITY (Base Material)	0.93	0.94	0.92	1.00	1.23	1.12-1.28	1.16-1.32	0.86	1.14-2.05	1.85	1.06
ADHESION											
To Metals	Excellent	Excellent	Good	Excellent	Excellent	Excellent	Fair to Good	Good to Excellent	Excellent	Fair to Good	Excellent
To Fabrics	Excellent	Good	Good	Good	Excellent	Good	Fair	Good	Excellent	Good to Excellent	Very Good to Excellent
TEAR RESISTANCE	Good to Very Good	Fair	Good	Fair	Good	Fair	Fair	Fair to Good	Poor	Fair	Excellent
ABRASION RESISTANCE	Excellent	Good to Excellent	Good	Good	Excellent	Excellent	Good	Good to Excellent	Poor	Good	Outstanding
COMPRESSION SET	Good	Good	Fair	Good	Fair to Good	Fair	Good	Good	Fair	Fair to Good	Fair
REBOUND											
Cold	Excellent	Good	Poor	Good	Very Good	Fair to Good	Fair	Very Good	Excellent	Fair to Good	Good (Poor at very low temp.)
Hot	Excellent	Good	Very Good	Good	Very Good	Good	Good	Very Good	Excellent	Good (Exc. at high temp.)	Good at R.T.
DIELECTRIC STRENGTH	Excellent	Excellent	Excellent	Poor	Good	Very Good to Exc.	Excellent	Excellent	Good	Good	Excellent
ELECTRICAL INSULATION	Good to Excellent	Good to Excellent	Good to Excellent	Poor	Fair to Good	Good	Good	Excellent	Excellent	Fair to Good	Fair to Good
PERMEABILITY TO GASES	Fairly Low	Fairly Low	Very Low	Low	Low	Low to Very Low	Very Low	Fairly Low	Fairly Low	Very Low	Fairly Low
ACID RESISTANCE											
Diluted	Fair to Good	Fair to Good	Excellent	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Fair
Concentrated	Fair to Good	Fair to Good	Good	Good	Good	Very Good	Good	Excellent	Fair	Excellent	Poor
SOLVENT RESISTANCE											
Aliphatic Hydrocarbons	Poor	Poor	Poor	Excellent	Fair to Good	Fair to Good	Good	Poor	Poor	Excellent	Good to Excellent
Aromatic Hydrocarbons	Poor	Poor	Poor	Good	Fair	Fair	Fair	Poor	Poor	Excellent	Fair to Good
Oxygenated (Ketones, etc.)	Fair to Good	Good	Good	Poor	Poor	Poor to Fair	Fair	Good to Very Good	Fair	Poor	Poor
Lacquer Solvents	Poor	Poor	Fair to Good	Fair	Poor	Poor	Fair	Poor to Fair	Poor	Poor to Fair	Poor
RESISTANCE TO:											
Swelling in Lubricating Oil	Poor	Poor	Poor	Very Good	Good	Good to Excellent	Good	Poor	Fair	Excellent	Good to Excellent
Oil and Gasoline	Poor	Poor	Poor	Excellent	Good	Good	Good	Poor	Fair	Excellent	Good to Excellent
Animal and Vegetable Oils	Poor to Good	Poor to Good	Very Good	Very Good	Good	Good	Good	Good	Good to Exc.	Excellent	Good to Excellent
Water Absorption	Very Good	Good to Very Good	Very Good	Good	Good	Very Good	Very Good	Very Good to Exc.	Excellent	Very Good	Good at R.T. Poor at 100°C (212°F)
Oxidation	Good	Fair	Excellent	Good	Very Good to Exc.	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
Ozone	Poor to Fair	Poor	Excellent	Fair	Very Good to Exc.	Outstanding	Excellent	Outstanding	Excellent	Outstanding	Excellent
Sunlight Aging	Poor	Poor	Very Good	Poor	Very Good	Outstanding	Outstanding	Outstanding	Excellent	Outstanding	Good
Heat Aging (upper limit cont. service)	85°C (185°F)	90°C (194°F)	120°C (248°F)	115°C (239°F)	95°C (203°F)	135°C (275°F)	120°C (248°F)	145°C (293°F)	235°C (455°F)	205°C (401°F)	85°C (185°F)
Flame ³	Poor	Poor	Poor	Poor	Good	Good	Good	Poor	Fair to Good	Excellent	Fair (will melt)
Heat	Good	Fair to Good	Very Good	Good	Very Good	Excellent	Good	Excellent	Outstanding	Outstanding	Good
Cold	Excellent	Very Good	Good	Fair to Good	Good	Good	Very Good	Excellent	Outstanding	Good	Excellent

³These evaluations are qualitative and comparative only. They should not be construed as recommendations. Specific compounding is required to optimize performance. Elastomer choice should be based upon a practical consideration of the potential fire hazards involved in each individual case and, if applicable, the results of appropriate flame tests.

* Reg. U.S. Pat. & TM Off.