

## COMPARATIVE PROPERTIES OF TYPICAL COMMERCIAL ELASTOMERS

	CHEMICAL NAME	Polyisoprene	Butadiene styrene	Isobutylene isoprene	Butadiene acrylonitrile	Polychloroprene
PROPERTIES	COMMON NAME	Natural Rubber	SBR or GR-S or Buna S	Butyl	Nitrile (Buna N)	Neoprene
<b>Material Designation</b> (ASTM D-2000, SE J200 Classification)		AA	AA	AA	BF, BG, BK, CH	BC, BE
<b>Tensile Strength, Mpa (psi)</b>	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)
	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)
<b>Hardness Range</b> (Durom, A)		30-90	40-90	40-75	40-95	40-95
<b>Specific Gravity</b> (Base Material)		0,93	0,94	0,92	1,00	1,23
<b>Adhesion to Metals</b>		Excellent	Excellent	Good	Excellent	Excellent
<b>Adhesion to Fabrics</b>		Excellent	Good	Good	Good	Excellent
<b>Tear Resistance</b>		Good to Very Good	Fair	Good	Fair	Good
<b>Abrasion Resistance</b>		Excellent	Good to Excellent	Good	Good	Excellent
<b>Compression Set</b>		Good	Good	Fair	Good	Fair to Good
<b>Rebound</b>	Cold	Excellent	Good	Poor	Good	Very Good
	Hot	Excellent	Good	Very Good	Good	Very Good
<b>Dielectric Strength</b>		Excellent	Excellent	Excellent	Poor	Good
<b>Electrical Insulation</b>		Good to Excellent	Good to Excellent	Good to Excellent	Poor	Fair to Good
<b>Permeability to Gases</b>		Fairly Low	Fairly Low	Very Low	Low	Low
<b>Acid Resistance</b>	Dilute	Fair to Good	Fair to Good	Excellent	Good	Excellent
	Concentrated	Fair to Good	Fair to Good	Good	Good	Good
<b>Solvent Resistance</b>	Aliphatic hydrocarbons	Poor	Poor	Poor	Excellent	Fair to Good
	Aromatic hydrocarbons	Poor	Poor	Poor	Good	Fair
	Oxygenated (Ketones, etc.)	Fair to Good	Good	Good	Poor	Poor
	Lacquer solvents	Poor	Poor	Fair to Good	Fair	Poor
<b>Resistance To:</b>	Swelling in lubricating oil	Poor	Poor	Poor	Very Good	Good
	Oil and gasoline	Poor	Poor	Poor	Excellent	Good
	Animal and vegetable oils	Poor to Good	Poor to Good	Very Good	Very Good	Good
	Water absorption	Very Good	Good to Very Good	Very Good	Good	Good
	Oxidation	Good	Fair	Excellent	Good	Very Good to Exc.
	Ozone	Poor to Fair	Poor	Excellent	Fair	Very Good to Exc.
	Sunlight aging	Poor	Poor	Very Good	Poor	Very 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)
	Flame	Poor	Poor	Poor	Poor	Good
	Heat	Good	Fair to Good	Very Good	Good	Very Good
	Cold	Excellent	Very Good	Good	Fair to Good	Good

## COMPARATIVE PROPERTIES OF TYPICAL COMMERCIAL ELASTOMERS

	CHEMICAL NAME	Chlorosulphanated polyethylene	Chlorinated Ployethylene	Ethylene propylene polymer	Epichlorohydrin Rubber
PROPERTIES	COMMON NAME	Hypalon®		EPDM	
<b>Material Designation</b> (ASTM D-2000, SE J200 Classification)		CE	BC,BE.CE	CA	CH
<b>Tensile Strength, Mpa (psi)</b>	Pure Gum	Over 17.2 (1,500)	Over 10.3 (1,500)	Below 6.9 (1,000)	Below 6.9 (1,000)
	Black loaded stocks	Over 20.7 (3,000)	Over 17.2 (2,500)	Over 20.7 (3,000)	17.2 (2,500)
<b>Hardness Range</b> (Durom, A)		40-95	60-90	40-90	40-90
<b>Specific Gravity</b> (Base Material)		1.12 - 1.28	1.16 - 1.32	0,86	1.36-1.27
<b>Adhesion to Metals</b>		Excellent	Fair to Good	Good to Excellent	Fair to Good
<b>Adhesion to Fabrics</b>		Good	Fair	Good	Fair to Good
<b>Tear Resistance</b>		Fair	Fair	Fair to Good	Fair to Good
<b>Abrasion Resistance</b>		Excellent	Good	Good to Excellent	Fair to Good
<b>Compression Set</b>		Fair	Good	Good	Poor
<b>Rebound</b>	Cold	Fair to Good	Fair	Very Good	Good
	Hot	Good	Good	Very Good	Good
<b>Dielectric Strength</b>		Very Good to Exc.	Excellent	Excellent	Good
<b>Electrical Insulation</b>		Good	Good	Excellent	Good
<b>Permeability to Gases</b>		Low to Very Low	Very Low	Fairly Low	Low to Fairly Low
<b>Acid Resistance</b>	Dilute	Excellent	Excellent	Excellent	Fair to Good
	Concentrated	Very Good to Exc.	Good	Excellent	Fair
<b>Solvent Resistance</b>	Aliphatic hydrocarbons	Fair to Good	Good	Poor	Excellent
	Aromatic hydrocarbons	Fair	Fair	Poor	Good
	Oxygenated (Keytones, etc.)	Poor to Fair	Fair	Good to Very Good	Poor
	Lacquer solvents	Poor	Fair	Poor to Fair	Fair
<b>Resistance To:</b>	Swelling in lubricating oil	Good to Excellent	Good	Poor	Excellent
	Oil and gasoline	Good	Good	Poor	Excellent
	Animal and vegetable oils	Good	Good	Good	Excellent
	Water absorption	Very Good	Very Good	Very Good to Exc.	Good
	Oxidation	Excellent	Excellent	Excellent	Good
	Ozone	Outstanding	Excellent	Outstanding	Excellent
	Sunlight aging	Outstanding	Outstanding	Outstanding	Good
	Heat aging (upper limit cont. service)	135°C (275°F)	120°C (248°F)	145°C (293°F)	135°C (275°F)
	Flame	Good	Good	Poor	Poor to Fair
	Heat	Excellent	Good	Excellent	Very Good
	Cold	Good	Very Good	Excellent	Good to Very Good

## COMPARATIVE PROPERTIES OF TYPICAL COMMERCIAL ELASTOMERS

	CHEMICAL NAME	Ethylene/acrylic elastomer	Polysiloxane polymer	Fluoroelastomer	Perfluoroelastomer
PROPERTIES	COMMON NAME		Silicone		
Material Designation (ASTM D-2000, SE J200 Classification)		Not assigned	GE	HK	FFKM
Tensile Strength, Mpa (psi)	Pure Gum	-	Below 10.3 (1,500)	Over 12.4 (1,800)	Not Applicable
	Black loaded stocks	Over 17.2 (2,500)	Over 10.3 (1,500)	Over 13.8 (2,000)	Over 13.8 (2,000)
Hardness Range (Durom, A)		40-95A	40-85	55-95	65-95A
Specific Gravity (Base Material)		1.08-1.12	1.14 - 2.05	1,85	2,01
Adhesion to Metals		Very Good to Exc.	Excellent	Fair to Good	Fair
Adhesion to Fabrics		Good	Excellent	Good to Excellent	Good
Tear Resistance		Good	Poor	Fair	Fair
Abrasion Resistance		Good	Poor	Good	Good
Compression Set		Good	Fair	Fair to Good (exc. at high temp.)	Fair
Rebound	Cold	Poor	Excellent	Fair to Good	Not Available
	Hot	Fair	Excellent	Good (exc. at high temp.)	Not Available
Dielectric Strength		Good	Good	Good	Excellent
Electrical Insulation		Fair to Good	Excellent	Fair to Good	Excellent
Permeability to Gases		Very Low	Fairly Low	Very Low	Fair
Acid Resistance	Dilute	Good	Excellent	Excellent	Excellent
	Concentrated	Poor	Fair	Excellent	Excellent
Solvent Resistance	Aliphatic hydrocarbons	Good	Poor	Excellent	Excellent
	Aromatic hydrocarbons	Fair	Poor	Excellent	Excellent
	Oxygenated (Ketones, etc.)	Poor	Fair	Poor	Excellent
	Lacquer solvents	Poor	Poor	Poor to Fair	Excellent
Resistance To:	Swelling in lubricating oil	Good	Fair	Excellent	Excellent
	Oil and gasoline	Good	Fair	Excellent	Excellent
	Animal and vegetable oils	Good	Good to Excellent	Excellent	Excellent
	Water absorption	Very Good up to 100°C (212°F)	Excellent	Very Good	Very Good
	Oxidation	Outstanding	Excellent	Outstanding	Outstanding
	Ozone	Outstanding	Excellent	Outstanding	Outstanding
	Sunlight aging	Outstanding	Excellent	Outstanding	Outstanding
	Heat aging (upper limit cont. service)	165°C (329°F)	235°C (455°F)	205°C (401°F)	290°C (554°F)
	Flame	Poor	Fair to Good	Excellent	Excellent
	Heat	Excellent	Outstanding	Outstanding	V. Outstanding
	Cold	Good	Outstanding	Good	Good

## COMPARATIVE PROPERTIES OF TYPICAL COMMERCIAL ELASTOMERS

	CHEMICAL NAME	Urethane rubber	Polyester elastomer			
PROPERTIES	COMMON NAME		HYTREL			
<b>Material Designation</b> (ASTM D-2000, SE J200 Classification)		BG	Not Assigned			
<b>Tensile Strength, Mpa (psi)</b>	Pure Gum	Over 27.6 (4,000)	40.7 (5,900)	44.1 (6,400)	40.0 (5,800)	40.0 (5,800)
	Black loaded stocks	-	-	-	-	-
<b>Hardness Range</b> (Durom, A)		60-99+A (up to 80D)	92A	55D	63D	72D
<b>Specific Gravity</b> (Base Material)		1,06	1,17	1,20	1,22	1,25
<b>Adhesion to Metals</b>		Excellent	Good	Good	Good	Good
<b>Adhesion to Fabrics</b>		Very Good to Exc.	Good	Good	Good	Good
<b>Tear Resistance</b>		Excellent	Excellent	Oustanding	Oustanding	Oustanding
<b>Abrasion Resistance</b>		Outstanding	Outstanding	V. Outstanding	V. Outstanding	V. Outstanding
<b>Compression Set</b>		Fair	Fair	Fair	Poor	Poor
<b>Rebound</b>	Cold	Good (Poor at low temp.)	Very Good	Good	Fair	Fair
	Hot	Good at R.T	Excellent	Very Good	Good	Good
<b>Dielectric Strength</b>		Excellent	Fair to Good	Fair to Good	Fair to Good	Good
<b>Electrical Insulation</b>		Fair to Good	Fair to Good	Fair to Good	Fair to Good	Good
<b>Permeability to Gases</b>		Fairly Low	Fair	Fair	Fair	Good
<b>Acid Resistance</b>	Dilute	Fair	Fair	Fair	Fair	Fair
	Concentrated	Poor	Poor	Poor	Poor	Poor
<b>Solvent Resistance</b>	Aliphatic hydrocarbons	Good to Excellent	Excellent	Excellent	Excellent	Excellent
	Aromatic hydrocarbons	Fair to Good	Good	Good	Good	Good
	Oxygenated (Keytones, etc.)	Poor	Fair	Good	Good	Good
	Lacquer solvents	Poor	Fair	Fair to Good	Good	Good
<b>Resistance To:</b>	Swelling in lubricating oil	Good to Excellent	Good	Excellent	Excellent	Excellent
	Oil and gasoline	Good to Excellent	Very Good	Excellent	Excellent	Excellent
	Animal and vegetable oils	Good to Excellent	Very Good	Excellent	Excellent	Excellent
	Water absorption	Good at R.T. Poor at 100°C (212°F)	V. Good up to 100°C (212°F)	V. Good up to 100°C (212°F)	V. Good up to 100°C (212°F)	V. Good up to 100°C (212°F)
	Oxidation	Excellent	Excellent	Excellent	Excellent	Excellent
	Ozone	Excellent	Excellent	Excellent	Excellent	Excellent
	Sunlight aging	Good	Very Good	Very Good	Very Good	Very Good
	Heat aging (upper limit cont. service)	85°C (185°F)	100°C (212°F)	110°C (230°F)	110°C (230°F)	110°C (230°F)
	Flame	Fair (will melt)	Good (will melt)			
	Heat	Good	Very Good	Excellent	Excellent	Excellent
	Cold	Excellent	Excellent	Excellent	Excellent	Excellent