Manufacturers and distributors of sealing and jointing products

RUBBER HANDBOOK

Rubber has been used in engineering applications for well over one hundred years. Yet engineers and designers have difficulty in correlating the terms and expressions used by the rubber technologist with those they use themselves. Tensile strength, hardness, elongation and creep, for example are terms familiar to engineers but their meaning in rubber technology can often be quite different.

What is rubber?

Rubbers are loosely described as materials which show ‘elastic’ properties. Such materials are generally long chain molecules known as ‘polymers’ and the combination of elastic and polymer has led to the alternative name of ‘elastomers’. Rubbers and elastomers will be considered to be synonymous in this work.

One easily understood definition of a rubber or elastomers is a material which at room temperature can be stretched repeatedly to at least twice its original length and upon immediate release of the stress, will return with force to approximately its original length.

Natural and Synthetic

Natural rubber (NR) is generated in the Hevea brasiliensis tree as an emulsion of cis-poly-isoprene and water known as latex. The milky liquid is exuded from the tree when it is cut and is collected in small cups. Latex is also obtained in small quantities from the Guayule shrub. The latex is coagulated and then dried to produce clear crepe rubber. If it is dried in the presence of smoke it becomes a light brown colour and is called smoked sheet. Natural rubber was the only rubber available for more than a century but the growth in the demand for tyres has outstripped the available supply and today NR represents less than 33% of the total usage of rubber.

Synthetic rubber is prepared by reacting suitable monomers to form polymers and can be obtained as a water emulsion or as a suspension in water or solvents. Small quantities of methyl rubbers were made during the First World War but the first commercially successful synthetic rubber was Du Pont’s Neoprene, polychloroprene introduced in 1931. Since that time, Du Pont alone has introduced nine distinct groups of synthetic elastomers and there are no less than eight general classes of synthetic rubber, with 44 sub-classes, listed by American Society for Testing and Materials (ASME).

Compounding

The raw or base polymers vary from soft plastic materials to tough gristly substances and generally, they are not suitable for use in the form in which they are supplied. Their elastomeric properties have to be developed by further compounding and the possible permutations and combinations are infinite. Fillers such as carbon black and finely ground silica can be used to provide reinforcement; oils, waxes and fatty acids can be used to improve processability and colours can be obtained by incorporating suitable pigments. Other additives are used to improve chemical resistance and to assist in the curing process. Rubber compounds usually contain less than 50% of the raw polymer and in some cases, e.g. flooring, the rubber content can be less than 25%.

Vulcanisation

Most rubbers when they have been compounded need to be vulcanized or cured. Chemically the process produces crosslink's in the molecular structure, which provide the physical properties required and which give the finished rubber, chemical and thermal suitability. However there is one group of rubbers, the thermoplastic elastomers (TPE), which do not require vulcanizing. Examples include Du Pont's HYTREL engineering thermoplastic elastomer and ALCRYN melt-processable, halogenated polyolefin rubber.

Processing

Rubber compounding is generally carried out on open rubber mills or large internal mixers. Open mills consist of two roller (typically 2M across and 0.6mm in diameter) which rotate in opposite directions. The rolls can be heated or cooled as necessary. The rubber is placed on the rolls and mixing is achieved by the shearing action induced at the 'nip' between the rolls. Additives are added in carefully weighed quantities during the the mixing process. After the mixing operation is complete, the compound is removed from the mill in the form of sheet.

Internal mixers have an enclosed chamber in which two rotors with helical blades turn in opposite directions at slightly different speeds. The blades impart a shearing action to the rubber which quickly produces a homogeneous mix. Cooling water or steam is circulated through the rotors and various parts of the casing to maintain the optimum temperature conditions. Mixing is by batch and the compound is dropped from the bottom of the internal mixer onto an open mill and then removed as sheet. The sheet generally requires pre-shaping into blanks of suitable dimensions for moulding into finished parts.

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White Hygenic

Description: Natural Rubber especially formulated for use within the Food Industry, meeting the requirements of FDA regulations part 177

Specification:

Hardness	Shore A 50
Specific Gravity	1.31
Working Temperature	-40°C to 80°C
Tensile Strength	10Mpa
Elongation	500%

Properties:

Excellent Mechanical & Dynamic properties

Low Compression Set & High Resilience

Moderate ozone resistance

Good resistance to Dilute Acids & Oils, but not adequate for use with Hydrocarbons & Solvents

Good Abrasion resistance

Use as a guide only

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Nitrile

Description: Nitrile rubber or acrylonitrile-butadiene is a copolymer of butadiene & acrylonitrile

Specification:

Hardness	Shore A 60
Specific Gravity	1.28
Working Temperature	-30°C to 120°C
Tensile Strength	10Mpa
Elongation	350%

Properties:

Resistance to Oils

Good mechanical properties, like traction, compression & impermeability to gases

Ages moderately well

Good adhesion to metal

Moderate resistance to cold

Resistance to Chemicals; good resistance to inorganic chemical products-with the exception of antioxidant agents & chlorine. In general, have satisfactory resistance to hydrocarbons, but limited resistance to aromatics

Use as a guide only

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Natural Rubber Insertion

Description: Natural Rubber is CIS-Polyisoprene an extract of latex of Hevea Basiliensis. An insert of either Polyester or Cotton is included

Specification:

Hardness	Shore A 65
Specific Gravity	1.49
Working Temperature	-25°C to 70°C
Tensile Strength	4.5Mpa
Elongation	350%

Properties:

Excellent Mechanical properties

Low Compression Set & High Resilience

Dynamic properties are excellent

Good ozone, acid & alkali resistance, but not adequate for use with oils & solvents

Use as a guide only

Manufacturers and distributors of sealing and jointing products

Neoprene

Description: Neoprene is a homopolymer of Chloroprene (chlorobutadiene)

Specification:

Hardness	Shore A 65
Specific Gravity	1.49
Working Temperature	-25°C to 90°C
Tensile Strength	4Mpa
Elongation	200%

Properties:

Excellent Mechanical properties

Good resistance to heat, ozone & the elements

Fireproof properties

Good adhesion to metal

Resistant to most chemical products, except oxidant acids & halogens. Not resistant to most organic compounds, except alcohol. Moderately resistance to aliphatic hydrocarbons

Use as a guide only

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EPDM POTABLE WATER

Description: EPDM is a terpolymer of ethylene, propylene & diene

Specification:

Hardness	Shore A 70
Specific Gravity	1.18
Working Temperature	-45°C to 120°C
Tensile Strength	11Mpa
Elongation	250%

Properties:

Excellent resistance to ageing, ozone & numerous corrosive chemical products

Excellent electrical properties

Not resistant to oils & damaged by aliphatic hydrocarbons, aromatics & halogenated solvent

Moderate adhesion to metal & different substrates

Very good results with hot water & high pressure steam

Resistant to most inorganic chemical products. Limited resistance to oxidant acids but highly resistant to mineral acids, alcohol and detergents

Certified to AS/NZ 4020:2002 as a product for use in contact with drinking water. In particular, in terms of taste, appearance, Non growth of micro organisms, non growth of Cytotoxic activity & no mutagenic effect

Use as a guide only

Manufacturers and distributors of sealing and jointing products

EPDM

Description: EPDM is a terpolymer of ethylene, propylene & diene

Specification:

Hardness	Shore A 70
Specific Gravity	1.31
Working Temperature	-45°C to 120°C
Tensile Strength	7Mpa
Elongation	300%

Properties:

Excellent resistance to ageing, ozone & numerous corrosive chemical products

Excellent electrical properties

Not resistant to oils & damaged by aliphatic hydrocarbons, aromatics & halogenated solvent

Moderate adhesion to metal & different substrates

Very good results with hot water & high pressure steam

Resistant to most inorganic chemical products. Limited resistance to oxidant acids but highly resistant to mineral acids, alcohol and detergents

Use as a guide only

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Silicone

Description:	Silicone Rubber – Red or White	
Specification:	Hardness	Shore A 60
	Specific Gravity	1.28
	Working Temperature	-60°C to 200°C
	Tensile Strength	7.5Mpa
	Elongation	300%
	Tear Strength	17 N/mm

Properties:

Excellent resistance to heat (dry air) at 200°C continuous & 250°C intermittent.

Remains flexible at low temperature of –60°C

Resistant to UV, ozone & weathering

Exhibits low flammability & low smoke toxicity

Good Electrical insulation properties

Conform to BS:EN:2260:1995 & FDA regulations FDA CFR 177.2600

Have comparatively low mechanical properties, tensile strength, elongation & tear strength - however they keep constant even at high temperatures

Resistant to a range of general chemical products, but acids, alkalis, esters & ketone should be avoided

Use as a guide only

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Viton A

Description:	Viton is Hexafluoropropylene Vinylidene Fluoride	
Specification:	Hardness	Shore A 72
	Specific Gravity	1.98
	Working Temperature	-30°C up to 250°C
	Tensile Strength	5Mpa
	Elongation	220%

Properties:

Extraordinary resistance to heat, with continuous heat up to 250°C

Resistance also to low temperature – minus 30°C

Self extinguishing & resistance to ozone & the elements

Excellent compression set in compression at high temperatures

Resistance to chemicals. Of all synthetic rubber types, viton is the most resistant to hydrocarbons, aliphatic as well as aromatics & chlorinated. Extremely resistant to alkalis, including oxidants

Use as a guide only

Manufacturers and distributors of sealing and jointing materials

SKIRTING RUBBER

Description:	Natural rubber & Styrene Butadiene Rubber	
Specification:	Hardness	Shore A 65
	Specific Gravity	1.38
	Working Temperature	-25°C to 70°C
	Tensile Strength	7Mpa
	Elongation	350%
Properties:	Good mechanical properties	
	Low compression set	
	Dynamic properties are very good	
	Good ozone resistance but not suitable for use with oils & solvents	
	Ideally use is or conveyor belting skirting & dry scraping applications	

Use as a guide only

Manufacturers and distributors of sealing and jointing materials

NEOPRENE DIAPHRAGM SHEETING

ELASTOMER CHARACTERISTICS

Description:	1.5mmThick Neoprene/Nylon 1 ply
Elastomer:	CR-Neo #3249
Colour:	Black
Gravity:	1.36
Hardness:	55 Shore A (+/-5°)
Tensile Strength:	11 Mpa
Elongation:	500%
Maximum Operating Temperature:	90°C

FABRIC CHARACTERISTICS

Material:	100% Nylon (2/940 Warp & Weft)
Weight:	368 gm/m2
Thickness:	0.7mm
Cord Count:	9 – 1 Warp
	8 – 6 Weft

COATED FABRIC CHARACTERISTICS

Thickness:	1.5mm $\pm$0.3
Weight:	1.8 Kg/m2
Tensile Strength:	100 Weft
	110 Warp
Mullins Burst:	>7500 Kpa

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Manufacturers and distributors of sealing and jointing materials

NEOPRENE DIAPHRAGM SHEETING

ELASTOMER CHARACTERISTICS

Description:	3.0mmThick Neoprene/Nylon 1 ply
Elastomer:	CR-Neo #3249
Colour:	Black
Gravity:	1.36
Hardness:	55 Shore A (+/-5°)
Tensile Strength:	11 Mpa
Elongation:	500%
Maximum Operating Temperature:	90°C

FABRIC CHARACTERISTICS

Material:	100% Nylon (2/940 Warp & Weft)
Weight:	368 gm/m2
Thickness:	0.7mm
Cord Count:	9 – 1 Warp
	8 – 6 Weft

COATED FABRIC CHARACTERISTICS

Thickness:	3.0mm ±0.3
Weight:	3.8 Kg/m2
Tensile Strength:	100 Weft
	110 Warp
Mullins Burst:	>7500 Kpa

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Manufacturers and distributors of sealing and jointing materials

NEOPRENE DIAPHRAGM SHEETING

ELASTOMER CHARACTERISTICS

Description:	4.5mmThick Neoprene/Nylon 2 ply
Elastomer:	CR-Neo #3249
Colour:	Black
Gravity:	1.36
Hardness:	55 Shore A (+/-5°)
Tensile Strength:	11 Mpa
Elongation:	500%
Maximum Operating Temperature:	90°C

FABRIC CHARACTERISTICS

Material:	100% Nylon (2/940 Warp & Weft)
Weight:	368 gm/m2
Thickness:	0.7mm
Cord Count:	9 – 1 Warp
	8 – 6 Weft

COATED FABRIC CHARACTERISTICS

Thickness:	4.5mm $\pm$0.4
Weight:	5.3 Kg/m2
Tensile Strength:	180 Weft
	190 Warp
Mullins Burst:	>7500 Kpa

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Manufacturers and distributors of sealing and jointing materials

NEOPRENE DIAPHRAGM SHEETING

ELASTOMER CHARACTERISTICS

Description:	6.0mmThick Neoprene/Nylon 2 ply
Elastomer:	CR-Neo #3249
Colour:	Black
Gravity:	1.36
Hardness:	55 Shore A (+/-5°)
Tensile Strength:	11 Mpa
Elongation:	500%
Maximum Operating Temperature:	90°C

FABRIC CHARACTERISTICS

Material:	100% Nylon (2/940 Warp & Weft)
Weight:	368 gm/m2
Thickness:	0.7mm
Cord Count:	9 – 1 Warp
	8 – 6 Weft

COATED FABRIC CHARACTERISTICS

Thickness:	6.0mm ±0.5
Weight:	7.6 Kg/m2
Tensile Strength:	180 Weft
	190 Warp
Mullins Burst:	>7500 Kpa

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VITON RUBBER
1 PLY REINFORCED NOMEX FABRIC INSERTION

SPECIFICATION-TD70NC 1

Elastomer Compound:	Viton ‘A’ Grade
Hardness:	75° Shore ‘A’ (+/-5)
Maximum:	204°C
Tensile Strength:	84 Kgs/cm2
Elongation @ Break:	200 % (min)
Specific Gravity:	1.85 gr/cm
Reinforcing Fabric:	Square Woven (Plain Weave Spun Nomex)
Construction:	37.5 X 37 yarns/inch (Warp X Fill)
Weight:	7 oz/sq.yd
Thickness:	1.5mm
Tensile Strength:	250 X 250 lbs/inch (minimum)

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Information on rubber quality

Tensile strength: The bigger the value the better the quality

0-40=Bad 40-100=Average 100-180=Very good +180=Excellent

Elongation: Bigger the value the better

Abrasion: Lower the figure the better the quality

Compression set: Less the better

Tear resistance: Greater the better

Higher than 30 is good

Less than 20 is bad

Specific weight: Less weight the better

Natural Rubber 1.0 to 1.2 is Good

Viton Less than 1.8 no good 2 is Good

Silicone 1.2 is no good & 1.8 is good

TO FIND THE LENGTH OF MATERIAL

E.G: Ø200 OD MINUS Ø60 ID X 18 LAYERS
=Ø140 DIVIDE BY 2 = 70
=Ø200 MINUS 70 = 130
130 X 3.14285 X NO. OF LAYERS = METRES IN LENGTH

TO FIND THE HOLE DISTANCE

PCD X 3.14285 DIVIDE BY THE NUMBER OF HOLES ON GASKET

PCD X3.14285 DIVIDE BY 360°=1°Xbolt hole degree

TO FIND THE LENGTH OF A DIAMETER = DIAMETER X 3.14285

Manufacturers and distributors of sealing and jointing materials

SPECIFICATION

NEOPRENE SPONGE CLOSED CELL SCE42

All material tests conducted to JISK 6301-1975

Tensile Strength:	Min. 6kg/cm2
Elongation:	Min.120%
Specific gravity:	0.15±0.03g/cm3
Water absorption:	Max.3%
Compression set:	Max.30%
25% Deflection weight:	352-630g/cm3
Ageing test in Hot air deflection change:	±30%

Ozone resistance test 55PPHM X 30°C 120hours (20% stretch non crack)

Hardness: 15 + 5 hs (c Type)

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Neoprene Sponge CR 160

Base Polymer:	Polychloroprene
Specific Gravity:	160kg/m3 +/-30kg/m3
Tensile Strength:	4.0kg/cm2 min.
Operating Temperature: (indirect heat)	-30°C to +100°C
Hardness:	HS (c- type) 25 +5
Elongation:	150% min.
Compression Strength:	(25%) 30kg/100cm2 +/-10
Water Absorption:	0.005g/cm2 max
Compression Set:	(50%, 20°C x 22hrs) 25% max
Heat Shrinkage:	(70°C x 4hrs) 4% max
Fire Retardent:	UL 94HF 1
Test Method:	M 3014 & M 6550

The data in this table is typical value only.

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HIGH DENSITY POLYETYLENE (H.D.P.E)

H.D.P.E. has very good chemical resistance although it is affected by aggressive oxidising agents (nitric acid) and aromatic hydrocarbons (xylene). It does not absorb moisture and has good electrical properties. Although having similar mechanical properties to U.H.M.W.P.E it does not have the same abrasion, impact or resistance to environmental stress cracking.

Applications include chemical tanks, low duty bearings, wear strips, orthotic and prosthetic supports.

- Additional properties can be obtained with the introduction of fillers
- Can be thermoformed and hot air welded
- Good low friction properties

STANDARD COLOURS

Natural

Black: U.V. stabilised

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Manufacturers and distributors of sealing and jointing materials

P.T.F.E (TEFLON)

P.T.F.E. is well known for its anti stick and low friction properties. It has excellent electrical properties, is virtually unaffected by weather and is chemically inert. Under light loads its working temperature range is –110°C to +145°C although this upper limit can be increase to 260°C by utilising certain additional fillers.

- Glass fibre fillers increase mechanical properties, rigidity and hardness
- Graphite & molybdenum adds to strength & wear resistance
- Bronze fillers give high thermal conductivity, greatly improve mechanical properties and create an electrically conductive material
- Rulon greatly improves the P.V. wear limits of P.T.F.E
- All fillers reduce creep and improve dimensional stability
- Typical applications include seals, 'O' rings, bushing & bearing

STANDARD GRADES

Virgin – unfilled

23%=2% glass & molybdenum disulphide

25% glass

25% carbon

60% bronze

Rulon (higher load, low wear)

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Manufacturers and distributors of sealing and jointing materials

P.V.C. (RIGID UNPLASTICISED)

Polyvinylchloride exhibits little or no water absorption, is non-corrosive and has a high resistance to chemicals. Rigid grades are easily formable and are resistant to weather. With excellent electrical properties and its ability to not support combustion and its comparative low cost, makes P.V.C. the popular choice for applications in the chemical industry, electroplating and laboratory market.

- Thermoformable
- Excellent chemical resistance
- Working temperature range of –30°C to +60°C
- Low cost
- Applications: fume cupboards & ducting, plating tanks, sinks & troughs

STANDARD GRADES

Normal impact
High impact

STANDARD COLOURS

Grey
Transparent (non U.V. resistant)
White

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Manufacturers and distributors of sealing and jointing materials

ULTRA HIGH MOLECULAR WEIGHT POLYETHYLENE

This material is a high density polyethylene with an average molecular weight of 6,000,000 which results in this material having high physical strength and increased chemical stability. The properties that make this superior to other plastics are abrasion resistance, impact resistance, extremely low coefficient to friction, self lubrication and chemical resistance, with a wide working temperature range of –269°C to +80°C.

- F.D.A. approval for food and drug industries
- Excellent general purpose material
- Superior wear resistance and friction properties
- Typical applications include hopper lining, chain wear strip, rollers, bottle stars and feed screws, cryogenic parts

STANDARD COLOURS

White

Black

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Manufacturers and distributors of sealing and jointing materials

HIGH PRESSURE LAMINATES NOVASTEEN/BAKELITE

A range of industrial laminates manufactured from phenolic, epoxy, polyester or silicone resins and reinforced with a fine, medium or coarse weave cotton fabric, Kraft paper or woven fibreglass. Each resin and reinforcement combination produces a material with varying characteristics of mechanical, electrical, thermal properties and chemical resistance.

- Shock loading
- High flatwise and edgewise compression
- Excellent rigidity
- High strength to weight ratio
- Useful working temperature range from cryogenic to +150°C
- Typical applications are heavy duty gear, pump bearings, impact dollies, electrical insulating components

STANDARD GRADES

Phenolic fabric, paper or glass fabric

Epoxy fabric, paper or glass fabric

Silicone glass fabric

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Manufacturers and distributors of sealing and jointing materials

NYLON (P.A. – POLYAMIDE)

As the workhorse of engineering plastics, due to its wide variety of mechanical properties, nylon has been in demand for a number of years as a bearing material. Because of its good abrasion resistance, chemical, thermal and low friction properties, it has earned a reputation for its resistance to wear. Hardness and strength, yet toughness and tenacity are the combination that makes nylon so versatile and the chosen product for many applications.

- Useful working temperature range of –40°C to + 140°C
- Self lubricating properties can be further enhanced with fillers
- Available in a wide variety of grades to suit specific applications
- Typical applications include bushes, bearings, gears, cams, pulleys and wear pads

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Manufacturers and distributors of sealing and jointing materials

POLYCARBONATE

With an excellent balance of toughness, clarity and high-heat deflection, polycarbonate is seen as a versatile engineering thermoplastic. Dimensional stability, excellent electrical properties, and inherent ignition-resistant characteristics are its other outstanding features. Polycarbonate exhibits high impact strength over a wide range of temperatures from -45°C to +132°C.

- Light transmission of 82%-86%
- 250 times the impact strength of glass
- 30 times the impact strength of acrylic
- Long term service temperature of +120°C
- Cold formable
- Typical sheet applications include architectural glazing machine guarding, sight glasses

STANDARD GRADES

Clear – non U.V
Ultra violet stabilised
Fire resistant
Mar resistant

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POLYURETHANE ELASTOMER

Polyurethanes are a unique synthetic elastomeric product which can be formulated into a variety of shapes and having properties of a hard rigid plastic or a soft rubber. Rebound and memory are a major property of this material as well as a high coefficient of friction resulting in excellent grip. High impact resistance, excellent replacement for rubber.

- Low moisture absorption
- Excellent resistance to Gamma radiation
- Easily castable into complex shapes
- Can be coated to metal substrates
- F.D.A. grades available
- Working temperature range of –50°C to +90°C

STANDARD GRADES

Shore A hardness: 50, 60, 70, 75, 80, 85, 90 &95

Shore D hardness: 65, 75 &85

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Manufacturers and distributors of sealing and jointing materials

PHYSICAL PROPERTIES	NR	NEOPRENE	NITRILE	EPDM	BUTYL	VITON	SILICONE	HYPALON
Durometer Hardness (Shore A)	65	60	60	70	60	72	60	60
Tensile Strength (Mpa)	4	4	10	7	8	9	8	8
Nominal Elongation At Break (%)	200	200	350	300	400	160	300	350
Compression Set	E	G	G	E - G	G - F	E - G	G	G - F
Resilience	E	E	G	G	F	F	P	F
Gas Impermeability	G	G	G	G	E	E	F	E
Electrical Resistivity (Polymer)	E	F	F - P	E	E	G	E	G
Maximum Temperature	70°C	90°C	110°C	120°C	100°C	204°C	200°C	110°C
MECHANICAL PROPERTIES								
Impact Strength	E	G	F	G	G	G	F	G
Abrasion Resistance	E	E	E	G	F	G	F	E
Tear Resistance	E	G	G	F	G	G	F	G
Cut Growth	E	G	G	G	E	G	F	G
Bonding to Rigid Material	E	E - G	E - G	F	G	G	G	E
RESISTANCE RATINGS								
Weather- Sunlight Ageing	F - P	G	P	E	E	E	E	E
Oxidation	G	E	G	E	E	E	E	E
Ozone Cracking	N	E	F	E	E	E	E	E
Radiation	G	G	G	G	G	G	G	G
Water	E	G	E	E	E	E	E	G
Alkali-Dilute/Concentrated	E/G	E/E	G/G	E/E	E/E	E/E	E/E	E/E
Acid-Dilute/Concentrated	E/G	E/E	G/G	E/E	E/E	G/F	G/F	E/E
Aliphatic Hydrocarbons (Petrol, Kerosene)	N	F	E	N	N	E	F	F
Aromatic Hydrocarbons (Benzene, Toluene)	N	G	E - G	N	N	E	N	G
Halogenated Hydrocarbons (Degreaser, Solvents)	N	P	G - F	N	N	E	N	P
Alcohol	E - G	E	G - F	G	G	G	G	E
Animal And Vegetable Oils	G - F	G	G	G	E - G	E	E	G

CODE : E = EXCELLENT G = GOOD F = FAIR P = POOR N = NOT RECOMMENDED

23/07/2002* RUBBER SPECIFICATION USAGE GUIDE ONLY *** ACCURATE SPECIFICATION REQUIRED FOR SPECIFIC APPLICATION ***

Manufacturers and distributors of sealing and jointing materials

Description	Hardness Shore (A)	Specific Gravity	Tensile Strength (MPa)	Elongation %	Temp °C	General
Butyl Rubber	55/65	1.15	10	450	90	Chlorobutyl rubber excellent chemical resistance. High resistance to temperature & permeation. Fabric finish both sides.
EPDM Rubber	65/75	1.20	11	250	110	Multi purpose EPDM rubber. Excellent ozone weathering and acid resistance
Hypalon Rubber	55/65	1.45	10	500	125	Excellent ozone weathering and acid resistance coupled with good abrasion resistance and heat resistant qualities. Fabric finish one side.
Insertion Natural Rubber	62/72	1.27	6	300	70	Osnaberg fabric is included to improve tear resistance.
Neoprene Rubber	65/75	1.55	6	300	90	General purpose black Neoprene in roll form. Superior to natural rubber in weathering, heat resistance, fire resistance and resistance to petroleum based fluids.
Nitrile Rubber	60/70	1.21	16	520	90	Very good resistance to petroleum based fluids. Good resistance to aromatics.
Redback 45	45	1.05	22	700	60	Premium black, ozone and abrasion resistant lining rubber with a red surface bonding layer for cold bonding that does not require any surface buffing. Suitable for use with standard adhesive systems.
Skirting Natural Rubber	55/65	1.33	5	300	70	Use as conveyor skirting or similar application.
White Hygienic Rubber	45/55	1.38	12.5	670	70	Especially formulated from natural rubber for use in the food industry.

21/08/2001 Accurate Specification Required for Specific Application

Manufacturers and distributors of sealing and jointing materials

RECOMMENDED RUBBER	**BUTYL**	**EPDM**	***NATURAL***	**NEOPRENE**	***NITRILE***	***SILICONE***	***VITON***
Specific weight	0.92	0.86	0.93	1.23	1.00	1.14-2.05	1.85
Hardness range of the vulcanized (shore A)	30-90	40-90	30-95	40-95	40-95	40-85	55-95
Tensile strength with no filler	Good	Bad	Excellent	V. Good	Bad	Bad	Good
Tensile strength with reinforcing filler	Good	Good	Excellent	V. Good	V. Good	Good	Good
Tear strength resistance	Good	Good	V. Good	V. Good	Good	V. Bad	Bad
Abrasion resistance	Good	Good	V. Good	Good	V. Good	V. Bad	Bad
Resilience at low temperature	V. Bad	V. Good	Excellent	V. Good	Good	Excellent	Regular
Resilience at high temperature	V. Good	V. Good	Excellent	V. Good	Good	Excellent	Good
Compression set at -40°C	Bad	Regular	Good	Bad	Good	Good	V. Bad
Compression set at 23°C	Regular	Good	V. Good	Good	V. Good	V. Good	Regular
Compression set at 100°C	V. Good	V. Good	V. Bad	Regular	Good	Excellent	Good
Heat resistance	Good	V. Good	Regular	Good	Good	Excellent	Excellent
Cold resistance	V. Good	V. Good	V. Good	Good	Good	Excellent	Excellent
Sunlight resistance	V. Good	Excellent	Regular	V. Good	Good	Excellent	Excellent
Ozone resistance	V. Good	Excellent	Bad	V. Good	Bad	Excellent	Excellent
Oxidation resistance	Excellent	Excellent	Regular	V. Good	Good	Excellent	Excellent
Water resistance	V. Good	V. Good	V. Good	Regular	Good	Excellent	Excellent
Aliphatic hydrocarbons resistance	V. Bad	Bad	V. Bad	Regular	V. Good	Regular	Excellent
Aromatic hydrocarbons resistance	V. Bad	V. Bad	V. Bad	Bad	Good	V. Bad	Excellent
Vegetable and animal oils resistance	V. Good	Good	Bad	Good	V. Good	V. Good	Excellent
Ethers and cetones resistance	Good	Good	Good	V. Bad	V. Bad	Bad	Bad
Gas permeability	Excellent	Regular	Regular	V. Good	V. Good	V. Bad	Good
Flame resistance	V. Bad	V. Bad	V. Bad	Good	V. Bad	Regular	Excellent
Electrical insolation	V. Good	V. Good	Excellent	Regular	Bad	V. Good	Regular
Metals bonding	Good	Good	Excellent	Excellent	Excellent	V. Good	Good
Cloths bondings	Good	Regular	Excellent	Excellent	Good	Excellent	Good

Manufacturers and distributors of sealing and jointing materials

RUBBER COMPOUND GUIDE

Product	Gauge Range (mm)	Hardness Shore A	S.G	Temperature Range (C)	Tensile Strength (Mpa)	Elongation %	Abrasion Resistance	Ozone/UV Resistance	Oil Resistance	Acid Resistance	Main Application
atural Rubber	0.8 – 6.0	65(R608A)	1.49	-25 to 70	4.5	350	fair	fair	poor	fair	General purpose
atural Rubber Insertion	1.5 – 9.0	65(R608A)	1.49	-25 to 70	4.5	350	fair	fair	poor	fair	General purpose
hite Faced Insertion	6.0	68(R661)	1.61	-25 to 70	5	350	fair	fair	poor	fair	General purpose
hite Hygienic	1.5 – 6.0	50(R448)	1.31	-40 to 80	10	500	good	fair	fair	fair	Food grade
ure Gum	3.0 – 6.0	35(R399)	0.95	-40 to 80	20	600	excellent	fair	poor	fair	Soft, High Flexibility
Line 40 Red	3.0 – 25.0	40(R394)	1.05	-40 to 70	18.6	600	excellent	poor	fair	fair	Abrasion
Line 35 SY Yellow	3.0 – 6.0	35(R396)	0.97	-40 to 80	20	600	excellent	fair	poor	fair	Soft, High Abrasion
Line 60 Black	6.0 – 25.0	62(R650)	1.12	-50 to 85	18	400	excellent	good	good	good	Abrasion
eoprene Rubbber	0.8 – 25.0	70(C801)	1.42	-20 to 100	6.5	250	fair	good	good	fair	Heat/Oil/Ozone
eoprene Insertion	1.5 – 6.0	70(C801)	1.42	-20 to 100	6.5	250	fair	good	fair	fair	Heat/Oil/Ozone
itrile Rubber	1.5 – 6.0	60(B569)	1.28	-30 to 110	10	350	good	fair	excellent	good	Petrol and Oil
hite Nitrile	1.5 – 6.0	60(B571)	1.4	-35 to 110	8	400	good	fair	excellent	good	Food grade Oil
itrile Insertion	1.5 – 3.0	60(B569)	1.28	-30 to 110	10	350	good	fair	excellent	good	Petrol and Oil
ortable Water EPDM	1.5 – 6.0	70(E645)	1.18	-40 to 120	11	250	fair	excellent	poor	good	Potable water
PDM Rubber	1.5 – 6.0	70(E701)	1.31	-40 to 120	7	300	fair	excellent	poor	good	Heat/Ozone
PDM Insertion	1.5 – 3.0	70(E701)	1.31	-40 to 120	7	300	fair	excellent	poor	good	Heat/Ozone
PDM Dust Cloth	2.0	50(E550)	1.17	-40 to 115	9	450	good	excellent	poor	good	Screen Dust Cloth
utyl Rubber	1.5 – 6.0	60(T600A)	1.27	-40 to 100	8	400	fair	excellent	poor	Very good	Heat/Chemical
ypalon Rubber	1.5 – 6.0	60(H611)	1.32	-35 to 110	8	350	fair	excellent	good	excellent	Heat/Acid/Chemical
iton A Rubber	1.5 – 6.0	72(V737A)	1.98	-18 to 204	9	160	fair	excellent	excellent	excellent	Solvent/Heat/Chemical
iton B Rubber	1.5 – 3.0	70(V725A)	1.8	-18 to 204	8	170	fair	excellent	excellent	excellent	Solvent/Heat/Chemical
ilicone Rubber	1.5 – 6.0	60(S662A)	1.2	-70 to 200	8	300	fair	excellent	good	good	High or Low temp.