Elastomer Guide

Butyl Rubber (IIR)

Butyl rubber is composed by copolymerizing isobutylene having a small amount of isoprene. Butyl Rubber has excellent resistance to chemical and polar fluid, outstanding electrical insulation and good ozone resistance. Other advantages of Butyl are low gas and moisture permeability and high shock absorption.

Cure system - Sulfur-Cured

Standard IIRs are sulfur-cured.

Other Common Variations

- IIRs can be formulated with only "white list" ingredients as specified in 21.CFR 177.2600, for use in applications where the elastomer will be in contact with food or beverages, ex. bottle top seal for alcohol or medical.

General Information	
ASTM D1418 Designation	IIR, CIIR, BIIR
ISO/DIN 1629 Designation	IIR, CIIR, BIIR
ASTM D2000 / SAE J 200 Codes	AA, BA
Standard Color(s)	Black
Hardness Range	50 to 80 Shore A
Relative Cost	Low

Service Temperatures	
Standard Low Temperature	-55°C -65°F
Standard High Temperature	100°C 212°F

Performs Well In...

- Alcohols
- Ketones
- Dilute acids and alkalis
- Silicone oils & greases
- Water and Steam
- Phosphate ester based hydraulic fluids - Skydrol®
- Ozone, aging & weathering

Doesn't Perform Well In...

- Aliphatic & aromatic hydrocarbons
- Halogenated solvents
- Mineral oil & greases

Elastomer Guide

Carboxylated Nitrile (XNBR)

Carboxylated Nitrile is similar to Nitrile rubber, but the polymer backbone has been chemically modified with Carboxylic Acid containing group. This result is XNBR with more excellent abrasion and tear resistance than traditional NBR. For this reason, XNBR based parts are usually applied in dynamic assembly such as seals and rod wipers.

Cure system - Sulfur-Cured

Standard XNBR compounds are sulfur-cured.

General Information

ASTM D1418 Designation	XNBR
ISO/DIN 1629 Designation	XNBR
ASTM D2000 / SAE J 200 Codes	BG, BK, CH
Standard Color(s)	Black
Hardness Range	50 to 90 Shore A
Relative Cost	Low

Service Temperatures

Standard Low Temperature	-18°C -4°F
Standard High Temperature	100°C 212°F
Special Compound Low Temperature	-46°C -50°F
Special Compound High Temperature	125°C 257°F

Performs Well In...

- Aliphatic hydrocarbon
- Vegetables and mineral oils and grease
- Diesel
- Water
- Dilute acids, alkali and salt solutions

Doesn't Perform Well In...

- Aromatic hydrocarbon
- Chlorinated hydrocarbon
- Ketones
- Acetic acid
- Ethylene ester
- Strong acids
- Brake fluid with glycol base

Elastomer Guide

Chloroprene Rubber (CR)

Chloroprene was one of the first successful synthetic elastomers in 1931 made by Dupont, and the trade name is Neoprene®. It is prepared by emulsion polymerization of chloroprene, or 2-chlorobutadiene. CR is a multi-purposed elastomer which yields a balanced combination of properties. It has good resistance to sun, ozone, weather, and performs well in contact with oils and many chemicals. It also displays outstanding physical toughness and good resistance to fire.

Cure system - Metal oxide cured

Standard CRs are metal oxides & organic accelerators.

Other Common Variations

- Chloroprene has been used in thousands of diverse environments, including automotive, wire and cable industries.
- CR is usually used in air condition systems, especially old refrigerated media like R12 or R22 and lubricant with mineral oil.

General Information

ASTM D1418 Designation	CR
ISO/DIN 1629 Designation	CR
ASTM D2000 / SAE J 200 Codes	BC, BE
Standard Color(s)	Black
Hardness Range	30 to 90 Shore A
Relative Cost	Low

Service Temperatures

Standard Low Temperature	-40°C -40°F
Standard High Temperature	100°C 212°F
Special Compound Low Temperature	-55°C -67°F
Special Compound High Temperature	125°C 257°F

Performs Well In...

- Refrigerants
- Ammonia
- Water
- Silicone grease and oils
- High aniline point mineral oil

Doesn't Perform Well In...

- Aromatic hydrocarbons
- Ketones
- Esters
- Ethers
- Strong oxidizing acids
- Chlorinated hydrocarbons

Elastomer Guide

Epichlorohydrin (CO, ECO, GECO)

Hydrin® is the trade name of epichlorohydrin elastomers made by Zeon Chemicals. epichlorohydrin elastomers are available as a homopolymer (CO), copolymer (ECO, GCO), and terpolmer (GECO). All epichlorohydrin rubbers offer low temperature flexibilities; resistance to oils, fuel and common solvents; higher temperature resistance than NBR; good weather ability and good dynamic properties.

Cure system - Sulfur-Cured vs. Peroxide-Cured

ECO are usually Peroxide-cured for standard compounds. Sulfur curing of ECO will improve flexible properties in dynamic systems but will reduce the heat resistance and increase compression set.

Other Common Variations

- The typical applications of epichlorohydrin are fuels or LPG system in automotive.

General Information	
ASTM D1418 Designation	CO, ECO GECO
ISO/DIN 1629 Designation	CO, ECO GECO
ASTM D2000 / SAE J 200 Codes	CH
Standard Color(s)	Black
Hardness Range	50 to 80 Shore A
Relative Cost	Medium

Service Temperatures	
Standard Low Temperature	-40°C -40°F
Standard High Temperature	125°C 257°F
Special Compound High Temperature	135°C 257°F

Performs Well In...

- Mineral oil and grease
- LPG, fuels
- Silicone oil and grease
- Ozone, weather

Doesn't Perform Well In...

- Ketones and esters
- Aromatic and chlorinated hydrocarbon
- Brake fluids
- Aldehydes

Elastomer Guide

Ethylene Propylene Rubber (EPR, EPDM)

EPDM is a Copolymer of ethylene and propylene, and further a terpolymer of ethylene and propylene with a small amount of a third monomer (usually a diolefin) to permit vulcanization with sulfur. Generally Ethylene Propylene Rubber possesses excellent resistance to ozone, sunlight and weathering, and has very good flexibility at low temperature, good chemical resistance (many dilute acids and alkalis, polar solvents), and good electrical insulation property.

Cure system - Sulfur-Cured vs. Peroxide-Cured

Standard EPDMs are usually sulfur-cured. Sulfur-cured compounds offer better flexible properties but are more prone to hardening and poorer compression set with high temperature. Peroxide-cured EPDMs have better heat resistance and lower compression set. Peroxide cured EPDMs are both more expensive and more difficult to produce than the sulfur-cured.

Other Common Variations

- EPDMs are often internally lubricated to improve ease of installation or reduce friction for dynamic applications.
- EPDMs can be formulated with only "white list" ingredients as specified in 21.CFR 177.2600, for use in applications where the elastomer will be in contact with food or beverages.
- EPDMs can be submitted for approval by the National Sanitation Foundation (NSF) for use in drinking water applications.
- EPDMs are usually used in automotive air conditioning system where R134a refrigerant gas and POE or PAG lubricant and new refrigerant for environment protection R744 are used. In a R744 air conditioning system, it requires excellent resistance to explosive decompression in hydrogen dioxide at high pressure and high temperature.
- EPDMs are usually used in phosphate ester type hydraulic fluids.

General Information

ASTM D1418 Designation	EPM, EPDM
ISO/DIN 1629 Designation	EPM, EPDM
ASTM D2000 / SAE J 200 Codes	AA, BA CA, DA
Standard Color(s)	Black
Hardness Range	30 to 90 Shore A
Relative Cost	Low

Service Temperatures

Standard Low Temperature	-55°C -67°F
Standard High Temperature	125°C 257°F
Special Low Temperature	-55°C -67°F
Special High Temperature	150°C 302°F

Performs Well In...

- Alcohols
- Automotive brake fluid
- Ketones
- Dilute acids and alkalis
- Silicone oils & greases
- Steam to 400°F
- Water
- Phosphate ester based hydraulic fluids - Skydrol®
- Ozone, aging & weathering

Doesn't Perform Well In...

- Aliphatic & aromatic hydrocarbons
- Di-ester based lubricants
- Halogenated solvents
- Petroleum based oils & greases

Elastomer Guide

Ethylene/Acrylic elastomer (AEM)

Ethylene/acrylic elastomer is a copolymer of ethylene and methyl acrylate plus a small amount of a cure-site monomer containing carboxylic acid groups. AEM is a tough, low-compression-set rubber with excellent resistance to high temperatures, hot mineral oil, fluids and weathering. The low temperature flexibility and mechanic properties are better than ACM, but it is not resistant to low aniline oil (like ASTM IRM 903 oil) and polar solvents. AEM is typically chosen for applications requiring improved performance versus Nitrile rubber, Neoprene or reduced cost versus higher-end elastomers such as HNBR, FKM. It also usually is applied in the automatic industry.

Cure system - Amine-Cured

Standard AEM compounds are Amine based vulcanization system.

Other Common Variations

- AEM has good flexibility and good tear resistance, abrasion and compression set, and it usually is used in shaft lip seals especially in automatic transmission fluids.
- Special VAMAC® compounds can improve oil resistance but will sacrifice some low temperature properties

General Information	
ASTM D1418 Designation	AEM
ISO/DIN 1629 Designation	AEM
ASTM D2000 / SAE J 200 Codes	EE
Standard Color(s)	Black
Hardness Range	40 to 85 Shore A
Relative Cost	Medium-High

Service Temperatures	
Standard Low Temperature	-30°C -22°F
Standard High Temperature	150°C 300°F
Special Compound Low Temperature	-40°C -40°F
Special Compound High Temperature	175°C 345°F

Performs Well In...

- Ozone, weather and hot air.
- Automatic transmission fluids (ATF) and Power steering fluids
- Water

Doesn't Perform Well In...

- Ketones
- Fuels
- Brake fluids

Elastomer Guide

Fluorocarbon (FPM, FKM)

Fluorocarbon is a well-known high performance rubber, and has excellent resistance to high temperature, ozone, weather, oxygen, mineral oil, fuels, hydraulic fluids, aromatics and many organic solvents and chemicals.

Fluorine Content

Viton® system gum like general type (A-TYPE, 66% fluorine), middle fluorine content type (B-, GBL-TYPE, 67~68.5% fluorine), high fluorine content type (F-, GF-TYPE,70% fluorine), improving low temperature flexibility type (GLT-, GFLT) and excellent resistance to more chemicals and solvents-- Viton® ETP Extreme. We also can supply excellent acid and alkali resistance parts made with Viton® TBR.

Cure system Bisphenol cured vs. Peroxide-Cured

Standard FKM compounds are Bisphenol cured. FKM compounds with peroxide-cured possess better acid solution resistance than the bisphenol cured, and can replace litharge-cured applied in acid solution. In some lubricants adding a few organic amide or amine, choosing peroxide curing system Viton® will be better than bisphenol curing system.

Other Common Variations

- FKM can also be submitted for approval to Underwriters Laboratories (UL) for use in applications as prescribed in UL157.
- FKM has excellent resistance to high temperature, oil, solvent, flame, chemical and weather, and is usually used in automotive, chemical processing, aerospace and many other high performance applications.
- Viton® GLT is broadly used in thermal range of -40°C to +250°C and it has outstanding resistance to aggressive HTS-type oils which are commonly used in the aerospace industry.
- Viton® ETP is usually applied in the chemical industry.
- In some fuels adding several methanol, Viton® F and B-type are more usable than A-type especially F-type. If it requires lower temperature, GFLT and GBLT will be available.
- Viton® TBR 605C (TFE/propylene polymer) is better base and steam resistant than other general Vitons. It can be use in amine, amide and some bases.

General Information

ASTM D1418 Designation	FKM
ISO/DIN 1629 Designation	FKM
ASTM D2000 / SAE J 200 Codes	HK
Standard Color(s)	Black
Hardness Range	50 to 90 Shore A
Relative Cost	High

Service Temperatures

Standard Low Temperature	-26°C -15°F
Standard High Temperature	232°C 400°F
Special Compound Low Temperature	-40°C -40°F
Special Compound High Temperature	275°C 527°F

Performs Well In...

- Petroleum products
- Fuel or blend with methanol or ethanol
- Diesel or blend with biodiesel
- Mineral oil and grease
- Silicone oil and grease
- High vacuum
- Ozone, weather and very high temperature air
- Strong acid

Doesn't Perform Well In...

- Ketones
- Low molecular weight organic acids (formic and acetic acids)
- Super heat steam
- Low molecular weight esters and ethers.
- Phosphate ester based hydraulic fluids - Skydrol®

Elastomer Guide

Fluorosilicone Rubber (FVMQ)

Fluorosilicone is like silicone rubber, bonding trifluoropropyl, methyl, and vinyl as side chains. The mechanical and physical properties are similar to VMQ. However, FVMQ offers improved fuel and mineral oil resistance, but less resistant to hot air then standard VMQ.

Cure system - Peroxide-Cured

Standard FVMQ compounds are peroxide-cured.

Other Common Variations

- FVMQ offers excellent low-temperature flexibility and good resistance to fuel and aromatic mineral oil. Applications for FVMQ include jet and automotive fuels, most solvents, and engine oils.
- FVMQ compounds meet MIL-R-25988 specification.

General Information

ASTM D1418 Designation	FVMQ
ISO/DIN 1629 Designation	FVMQ
ASTM D2000 / SAE J 200 Codes	FK
Standard Color(s)	Blue
Hardness Range	40 to 85 Shore A
Relative Cost	High

Service Temperatures

Standard Low Temperature	-60°C -76°F
Standard High Temperature	177°C 350°F
Special Compound Low Temperature	-60°C -76°F
Special Compound High Temperature	232°C 450°F

Performs Well In...

- Fuels
- Aromatic mineral oils
- Benzene, Toluene
- Ozone and weather

Doesn't Perform Well In...

- Brake Fluids
- Ketones
- Hydrazine

Elastomer Guide

Hydrogenated Nitrile Rubber (HNBR)

Hydrogenated Nitrile (HNBR) is a synthetic polymer that is obtained by saturating the double bonds in nitrile=s butadiene segments with hydrogen, and it is also called HSN (Highly Saturated Nitrile). This special hydrogenation process reduces lots of double bonds in main chains of NBR polymer. Thus, HNBR possesses superior heat, ozone, chemical resistance and mechanical characteristics over standard Nitrile.

Acrylonitrile Content

As with NBR, there are different levels of Acrylonitrile (ACN) content in different HNBR polymers. The ACN content can be varied from 17% to 49%. Lower ACN content gives better low temperature properties but poorer fuels and polar lubricants. Higher ACN content gives poorer low temperature properties but improves fuels and polar lubricants resistance. Standard HNBRs typically have 36% ACN content.

Cure system - Peroxide-Cured

HNBRs are usually Peroxide-cured for standard compounds. They also can be Sulfur-cured to improve flexible properties in dynamic systems but that will reduce the heat resistance and cause poorer compression sets.

Other Common Variations

- HNBRs are often internally lubricated to improve ease of installation or reduce friction for dynamic applications.
- HNBRs can be formulated with only "white list" ingredients as specified in 21.CFR 177.2600, when used in applications where the elastomer will be in contact with food or beverages.
- HNBRs are usually used in automotive air conditioning system where R134a refrigerant gas or new refrigerant for environment protection like R401a, R404a, R410a, R507 and R744 is used.
- HNBRs are also used in automotive shaft system because of their excellent abrasion resistance.
- Downhole applications require material resistance to heat, crude oil, hydrogen sulfide, steam and explosive decompression, etc. Special compounds using HNBR can be formulated to meet these requirements.

General Information

ASTM D1418 Designation	HNBR
ISO/DIN 1629 Designation	HNBR or NBM
ASTM D2000 / SAE J 200 Codes	CH, DF, DH
Standard Color(s)	Black Green
Hardness Range	50 to 90 Shore A
Relative Cost	High

Service Temperatures

Standard Low Temperature	-40°C -40°F
Standard High Temperature	150°C 300°F
Special Compound Low Temperature	-55°C -67°F
Special Compound High Temperature	165°C 330°F

Performs Well In...

- Petroleum based oils & fuels
- Aliphatic hydrocarbons
- Vegetable oils
- Silicone oils & greases
- Ethylene glycol
- Dilute acids, bases & salt solutions to moderate temperatures
- Water & steam to 150°C (300°F)

Doesn't Perform Well In...

- Chlorinated hydrocarbons
- Ketones
- Ethers
- Esters
- Strong acids

Elastomer Guide

Natural Rubber (NR)

Natural rubber is produced from the latex of the Hevea brasiliensis, the chemical name of this polymer is polyisoprene. Polyisoprene also can be synthesized by polymerization from its monomer isoprene. Natural rubber possesses many excellent physical properties including high resilience and strength and good abrasion resistance. NR is not suitable for applications involved with hydrocarbon oil, UV, oxygen and ozone. Modifications can be made to increase ozone resistance.

Cure system - Sulfur-Cured

Standard NR compounds are sulfur-cured.

Other Common Variations

- NR is usually mixed with SBR and BR and applied in tire productions.

General Information	
ASTM D1418 Designation	NR
ISO/DIN 1629 Designation	NR
ASTM D2000 / SAE J 200 Codes	AA
Standard Color(s)	Black
Hardness Range	40 to 90 Shore A
Relative Cost	Low

Service Temperatures	
Standard Low Temperature	-50°C -58°F
Standard High Temperature	70°C 158°F

Performs Well In...

- Alcohols
- Organic acids

Doesn't Perform Well In...

- Ozone
- Petroleum oils
- Aromatic, aliphatic, or halogenated hydrocarbons

Elastomer Guide

Nitrile Rubber (NBR)

Nitrile rubber, also known as NBR or Buna N, is one of the most commonly used sealing elastomers, due to its resistance to petroleum based fuels and lubricants and its relatively low price. Nitrile elastomers are copolymers of acrylonitrile and butadiene. There are a number of common variations of nitrile compounds.

Acrylonitrile Content

The acrylonitrile (ACN) content of the polymer chains can be varied from 18% to 50%. Lower ACN content gives better low temperature properties but poorer fuels and polar lubricants resistance. Higher ACN content gives poorer low temperature properties but improved fuels and polar lubricants resistance. Standard NBRs typically have 34% ACN content.

Cure system - Sulfur-Cured vs. Peroxide-Cured

Standard Nitriles are usually sulfur-cured. Sulfur-cured compounds offer better low temperature properties but are more prone to hardening with high temperatures. Peroxide-cured nitriles have better heat resistance and lower compression sets but are more expensive and are more difficult to process.

Other Common Variations

- Nitriles are often internally lubricated to improve ease of installation or reduce friction for dynamic applications.
- Nitriles can be formulated with only "white list" ingredients as specified in 21.CFR 177.2600, when used in applications where the elastomer will be in contact with food or beverages.
- Nitriles can be submitted for approval by the National Sanitation Foundation (NSF) for use in drinking water applications.
- Nitriles can also be submitted for approval to Underwriters Laboratories (UL) for use in applications as prescribed in UL157.
- Nitrile rubber can be combined with polyvinyl chloride (PVC) to create fuel, ozone and weathering resistance NBR-PVC blends.

General Information

ASTM D1418 Designation	NBR
ISO/DIN 1629 Designation	NBR
ASTM D2000 / SAE J 200 Codes	BF, BG BK, CH
Standard Color(s)	Black
Hardness Range	40 to 90 Shore A
Relative Cost	Low

Service Temperatures

Standard Low Temperature	-40°C -30°F
Standard High Temperature	100°C 212°F
Special Compound Low Temperature	-55°C -67°F
Special Compound High Temperature	125°C 275°F

Performs Well In...

- Petroleum based oils & fuels
- Aliphatic hydrocarbons
- Vegetable oils
- Silicone oils & greases
- Ethylene glycol
- Dilute acids
- Water to below 100°C (212°F)

Doesn't Perform Well In...

- Aromatic hydrocarbons
- Automotive brake fluid
- Chlorinated hydrocarbons
- Ketones
- Ethers
- Esters
- Phosphate ester hydraulic fluids
- Strong acids
- Ozone / weathering / sunlight

Elastomer Guide

Polyacrylate (ACM, PA)

Polyacrylates are copolymers having two major components: the backbone (monomeric acid ester of alkyl or alkoxy) and the reactive cure-site. ACM's have good resistance to heat, oil, oxygen and ozone. This compound is not recommended for water and low temperature applications. Special ACM compounding can improve low temperature flexibility to -40°C (TR10 value) without reducing oil and heat resistance.

Cure system - Amine based & metal soaps Cured

Standard ACM compounds are Amine based and metal soaps combined to vulcanize.

Other Common Variations

- Polyacrylates usually are applied in automatic industry, especially in automatic transmission and steering fluids.

General Information

ASTM D1418 Designation	ACM
ISO/DIN 1629 Designation	ACM
ASTM D2000 / SAE J 200 Codes	DF, DH, EH
Standard Color(s)	Black
Hardness Range	45 to 80 Shore A
Relative Cost	Medium-High

Service Temperatures

Standard Low Temperature	-15°C 5°F
Standard High Temperature	150°C 300°F
Special Compound Low Temperature	-40°C -40°F
Special Compound High Temperature	175°C 345°F

Performs Well In...

- Mineral oils (transmission and steering fluids)
- Ozone, weather and hot air.

Doesn't Perform Well In...

- Alcohol
- Aromatics and chlorinated hydrocarbons
- Hot water and steam
- Acids, alkalis and amines
- Brake fluids

Elastomer Guide

Polyurethane (PU, AU, EU)

The millable Polyurethane rubbers are distinguished into two types; one is polyester urethane (AU), the other is polyether urethane (EU). AU type urethanes have outstanding oil, fuel and solvent resistance but can be attacked by hydrolysis, EU type urethanes are not attacked by hydrolysis and still offer a fuel and oil resistance comparable to low ACN (18~22% ACN) Nitriles or HNBRs. Any type polyurethane has excellent wear resistance, high tensile strength and high elasticity in comparison with any other elastomers.

Cure system - Peroxide-Cured

Standard PU compounds are peroxide-cured.

Other Common Variations

- Polyurethane usually is applied in mechanical industry, especially in the place where material must have higher wear resistance and higher strength.
- In some applying environments, moisture condensing will happen on the surface of rubber seal, and this will cause hydrolysis of AU, so choosing EU is better But EU does not resist oil very well, thus higher aniline point oil must be used for lubricant application.
- Applying in hydraulic systems, TPU will be better than millable Polyurethane.

General Information

ASTM D1418 Designation	AU, EU
ISO/DIN 1629 Designation	AU, EU
ASTM D2000 / SAE J 200 Codes	BG
Standard Color(s)	Black
Hardness Range	60 to 93 Shore A
Relative Cost	Medium-High

Service Temperatures

Standard Low Temperature	-40°C -40°F
Standard High Temperature	80°C 176°F
Special Compound Low Temperature	-55°C -67°F
Special Compound High Temperature	100°C 212°F

Performs Well In...

- Aliphatic hydrocarbon
- Mineral oil and grease
- Silicone oil and grease
- Ozone
- Water up to 50°C (EU type)

Doesn't Perform Well In...

- Ketones
- Alcohols
- Esters
- Ethers
- Hot water and steam
- Alkalis, amines
- Acids
- Glycols

Elastomer Guide

Silicone Rubber (MQ, VMQ, PVMQ)

Physically, silicones are based on silicon, an element derived from quartz. To create this class of synthetic elastomers, pendant organic groups such as methyl, phenyl and vinyl are attached to silicon atoms. The different addition of side chains can achieve significant variations in properties. Silicone rubber performs well in applications involving heat, ozone, many oils, chemicals and solvents. They also have dielectric stability, excellent flexible properties at low temperature and corona resistance. Silicone material possesses low tensile strength, and poor tear and wear resistance. Some of these problems can be helped through specific compound modifications.

Cure system - Peroxide-Cured vs. Platinum cured

Standard silicone compounds are usually peroxide-cured. Platinum-cured compounds offer better flexible properties and very low volatile matter. Platinum-cured silicones usually are applied in medical system or other required low volatile matter, but they need to be produced in clean room and higher cost of platinum catalyzer so they are more expensive than peroxide-cured ones.

Other Common Variations

- Silicones can be formulated with only "white list" ingredients as specified in 21.CFR 177.2600, for use in applications where the elastomer will be in contact with food or beverages.
- Silicones can be submitted for approval by the National Sanitation Foundation (NSF) for use in drinking water applications.
- Silicones are usually used in automotive systems like boots, oil filter valves, etc.
- Silicone parts can be used in medical systems which especially require compliance to USP CLASS VI.

General Information

ASTM D1418 Designation	Q, MQ, VMQ, PVMQ
ISO/DIN 1629 Designation	Q, MQ, VMQ, PVMQ
ASTM D2000 / SAE J 200 Codes	FC, FE, GE
Standard Color(s)	Rust
Hardness Range	25 to 90 Shore A
Relative Cost	Medium-High

Service Temperatures

Standard Low Temperature	-60°C -76°F
Standard High Temperature	225°C 437°F
Special Compound Low Temperature	-100°C -150°F
Special Compound High Temperature	300°C 572°F

Performs Well In...

- Engine and transmission oil (mineral oils)
- Diluted salt solution
- Moderate water
- Dry heat
- Ozone, weather resistance

Doesn't Perform Well In...

- Concentrated acids and alkalis
- Steam over 120°C
- Petroleum oils and fuel
- Ketones

Elastomer Guide

Styrene-Butadiene Rubber (SBR)

The most widely used synthetic rubber in the world is SBR, a copolymer of styrene and butadiene. SBR also was called Buna S (from the first trade name of Bayer). Where SBR rubber is used the most is in tires by blending it with natural rubber and butadiene rubber. SBR is weak and unusable without reinforcement by carbon black, but with carbon black it is strong and abrasion resistant. SBR has a poor resistance to oil and is not suitable in weathering, UV, oxygen, ozone.

Cure system - Sulfur-Cured

Standard SBR compounds are sulfur-cured.

Other Common Variations

- SBR is usually mixed with NR and BR and applied in tire productions.
- SBRs are mostly applied seals for non-mineral oil based brake fluid.

General Information

ASTM D1418 Designation	SBR
ISO/DIN 1629 Designation	SBR
ASTM D2000 / SAE J 200 Codes	AA,BA
Standard Color(s)	Black
Hardness Range	50 to 70 Shore A
Relative Cost	Low

Service Temperatures

Standard Low Temperature	-55°C -67°F
Standard High Temperature	100°C 212°F

Performs Well In...

- Water
- Alcohol
- Silicone oil and grease
- Non-mineral oil based brake fluid
- Weak acids

Doesn't Perform Well In...

- Petroleum oils and fuels
- Aromatic, aliphatic, or halogenated hydrocarbons
- Strong acids
- Mineral oils