Saga®
Elastomer Pvt Ltd.
Unveiling the Artistry in Polymers

Saga Elastomer℠

Unveiling the Artistry in Polymers

EXTRUDED & MOLDED RUBBER PRODUCTS

www.sagaelastomer.com

About Us

Saga Elastomer is an ISO 9001:2015 accredited company having a working culture that is highly systematic and process oriented. A highly sophisticated plant with latest machinery, equipment, testing facilities, an experienced & well-trained team, perfectly documented processes and traceable product tools & batches form the very backbone of our systems.

Our customers vouch for our passion for precision, inclination for innovation and moreover, with the humility that we do our business. Our customers have highest regards for our values, ethics, knowledge and capabilities and hence have been with us for longer period of time.

When you chose Saga, you know all your demands will be fulfilled with utmost care, superior quality, precision, meeting your timelines and most importantly, maintaining transparency & communication.

Vision

To become the preferred supplier of high precision, customized rubber products for quality & precision conscious companies in non- tire segment across the globe.

Mission

- To delight our customers through precise & timely product delivery at highest quality.
- To collaborate with customers and develop & execute highly customized & niche products in the non-tire category with primary focus on value creation.
- To be flexible in accommodating challenging designs of customers and co execute into products.
- Strive for excellence in standards of production and processes for non-tire category.
- To maintain complete transparency and integrity in all our transactions, internally & externally.
- To contribute to society by
  - o generating employment
  - o adding quality to lives of all the team members associated with us internally & externally.
  - o being environmentally responsible

Values

Committed to

- innovate
- strive for excellence in quality & performance standards
- focus on value creation internally and externally
- being flexible & maintain complete transparency
- being honest & have integrity
- being humble
- being environment friendly

Primary services and infrastructure

Saga thrives to serve not as a mere service provider, but as a caring partner on our clients' journey to success.

Our ability to ideate, design and precisely manufacture the challenging products for various industries has been a pathbreaker for our clients.

We manufacture and export high quality custom extruded rubber products to various industries like Architectural industry, Civil Engineering industry, Infrastructure industry, Thermal, Electrical, Solar, Hydro power industries, Rail & Road transport, Shipping & Marine, Mining, Chemical, Oil, Gas, Water distribution and Automotive industry. We also work very closely with contractors for road & bridges construction, glass facades, curtain walls & structural glazing, door and aluminium as well as uPVC windows manufacturers.

Saga infrastructure:

Manufacturing

Our up-to-date in-house manufacturing capabilities are based on not only the 2000 Square Metres of own land but our vision to meet our customers' needs from prototype to large run production parts, saving time, energy and money for them. Major strength of Saga lies in our own compounding operations which has been developed with continuous efforts and precision. Our latest machinery comprises of multiple mixing mills, kneaders, continuous vulcanising lines, conventional extruders, autoclaves, boilers, etc. All of the products undergo stringent quality checks during and post manufacturing through our latest testing instruments.

We source high grade raw material directly from international companies to ensure impeccable quality and consistency. These virgin materials and other ingredients are processed under computer control into specified formulations to meet stringent quality and product precision requirements. We also ensure to upgrade our machinery to process & manufacture to latest technology.

Our team responsible for packing and shipping ensures safety of products and maintains continuous communication flow with our customers.

Our customer support team is always eager & proactive to solve queries & issues being faced by our customers.

The strength of Saga is in its belief in continuous learning and Team Saga is always open for suggestions which we treat as value additions to our business.

Director's profile

A passionate & experienced Team Saga led by Milind Laddha who has a track record of taking on challenging designs and executing into products. It was a vision of Mr. Laddha that led to establish a plant near Mumbai and invest in Microwave technology for extruded rubber products.

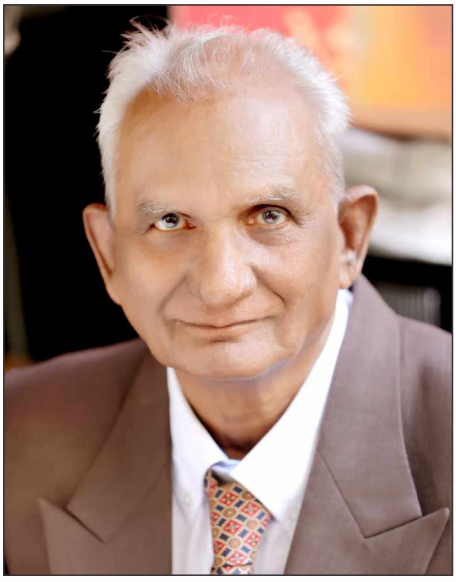
One of the pioneers in using microwave technology for extruded rubber products, Milind Laddha is a bright engineer from VJTI, Matunga 1993 batch and has nearly 3 decades of experience in the field of rubber products. He has a keen eye for learning and adopting new technologies. He started his business journey with flocking on rubber and then very early in his career, he did backward integration to move on to manufacturing of extruded rubber products. To get deeper insight into the rubber manufacturing, he equipped himself with a formal also did a course at the UDCT (now ICT) in rubber technology conducted by the AIRIA. Using this education and economic acumen, he has successfully guided the company to manufacturing a wide range of high-quality products catering to various industries. Milind Laddha has inculcated & maintained entrepreneurial & Customer First culture in each member of Team Saga. He is a visionary and with his leadership, Team Saga is constantly looking at adding value to our partners in progress, you.

Mr. Milind Laddha
Director

Chairman's profile

A major guiding force, mentor and extremely hard working, Mr. M J Laddha's experience and expertise has been adding a lot of value specially in operations, HR & finance. Under his guidance, Team Saga has become a lean, productive & efficient organization with continual improvement. His vision, strategies and execution ensure sustainable growth for us & our esteemed customers.

An Engineering graduate of 1967 batch, he has had a highly successful career outside Saga as well. He worked professionally as Director with Prabhat Udyog (Manufacturers of domestic appliances), CEO with Orbit Exports Ltd (Manufacturers & exporters of textiles) & Eden Agencies (Manufacturers & exporters of textile upholstery & curtains) prior to joining Milind's vision.



Mr. M J Laddha
Chairman

Our key strengths are

Precision

Flexibility

Timelines

Quality

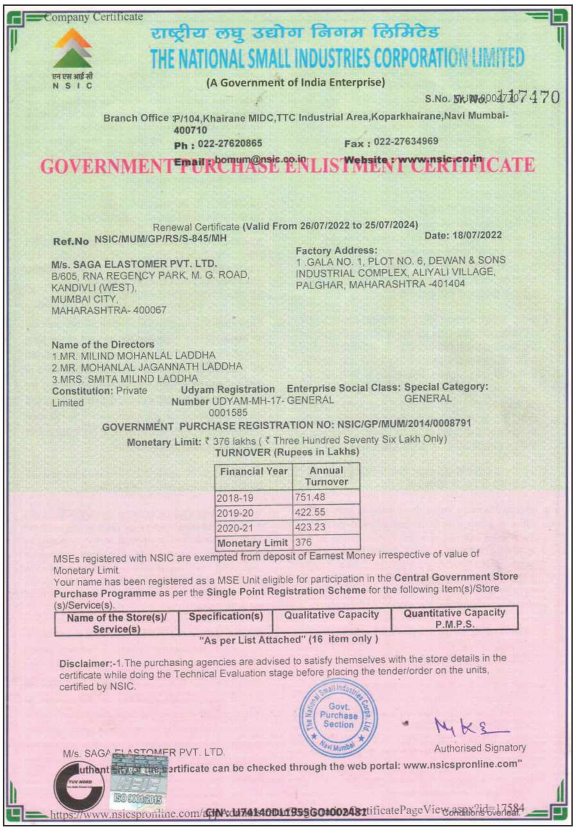
Partners

Innovation

Experience

Relations

Certifications



Company Certificate

राष्ट्रीय लघु उद्योग निगम लिमिटेड

THE NATIONAL SMALL INDUSTRIES CORPORATION LIMITED

(A Government of India Enterprise)

S.No. 117470

Branch Office :P/104,Khairane MIDC,TTC Industrial Area,Koparkhairane,Navi Mumbai-400710

Ph : 022-27620865 Fax : 022-27634969

Email : bomum@nsic.co.in Website : www.nsic.co.in

GOVERNMENT PURCHASE ENLISTMENT CERTIFICATE

Renewal Certificate (Valid From 26/07/2022 to 25/07/2024)

Ref.No NSIC/MUM/GP/RS/S-845/MH Date: 18/07/2022

M/s. SAGA ELASTOMER PVT. LTD.
B/605, RNA REGENCY PARK, M. G. ROAD,
KANDIVLI (WEST),
MUMBAI CITY,
MAHARASHTRA- 400067

Factory Address:
1. GALA NO. 1, PLOT NO. 6, DEWAN & SONS INDUSTRIAL COMPLEX, ALIYALI VILLAGE, PALGHAR, MAHARASHTRA -401404

Name of the Directors
1.MR. MILIND MOHANLAL LADDHA
2.MR. MOHANLAL JAGANNATH LADDHA
3.MRS. SMITA MILIND LADDHA

Constitution: Private Limited

Udyam Registration Number UDYAM-MH-17-0001585

Enterprise Social Class: GENERAL

Special Category: GENERAL

GOVERNMENT PURCHASE REGISTRATION NO: NSIC/GP/MUM/2014/0008791

Monetary Limit: ₹ 376 lakhs (₹ Three Hundred Seventy Six Lakh Only)

TURNOVER (Rupees in Lakhs)

Financial Year	Annual Turnover
2018-19	751.48
2019-20	422.55
2020-21	423.23
Monetary Limit	376

MSEs registered with NSIC are exempted from deposit of Earnest Money irrespective of value of Monetary Limit.

Your name has been registered as a MSE Unit eligible for participation in the Central Government Store Purchase Programme as per the Single Point Registration Scheme for the following Item(s)/Store (s)/Service(s).

Name of the Store(s)/ Service(s)	Specification(s)	Qualitative Capacity	Quantitative Capacity P.M.P.S.

"As per List Attached" (16 item only)

Disclaimer:-1.The purchasing agencies are advised to satisfy themselves with the store details in the certificate while doing the Technical Evaluation stage before placing the tender/order on the units, certified by NSIC.

Govt. Purchase Section

Authorised Signatory

M/s. SAGA ELASTOMER PVT. LTD.

"Authenticity of this certificate can be checked through the web portal: www.nsicspronline.com"

CIN: U74140DL1955GOI002481

Certificate of Registration

Certificate No: 211026019101

This is to Certify that the Quality Management System of

SAGA ELASTOMER PRIVATE LIMITED

GALA NO. 1, PLOT NO. 6, DEWAN & SONS INDUSTRIAL COMPLEX, ALIYALI VILLAGE, TALUKA & DIST -PLAGHAR -401404, MAHARASHTRA, INDIA

has been assessed and found to be in accordance with the requirements of standard detailed below

ISO 9001:2015

This Certificate is valid for the following scope

"MANUFACTURE & SUPPLY OF EXTRUDED & FLOCKED RUBBER PROFILES AND MOULDED RUBBER COMPONENTS"

"IAF Group- 14"

Initial Registration Date	26th Oct. 2021	Issue Date	26th Oct. 2021
1st Surveillance on or before	26th Sept. 2022	Valid Until	25th Oct. 2022
2nd Surveillance on or before	26th Sept. 2023	Revision	00

UAF is member of International Accreditation Forum (IAF)

Accreditation No. CB-MS-2207

Pragyesh Singh
TNV Certification Pvt Ltd

Accredited by United Accreditation Foundation (UAF)

Corporate memberships

AIRIA — ALL INDIA RUBBER INDUSTRIES ASSOCIATION 1945

AHK Indo-German Chamber of Commerce
Deutsch-Indische Handelskammer
Mumbai · Delhi · Kolkata · Chennai
Bengaluru · Pune · Düsseldorf

EU India Chambers

INDO-AFRICAN CHAMBER OF COMMERCE & INDUSTRY

DUN & BRADSTREET D-U-N-S® REGISTERED™

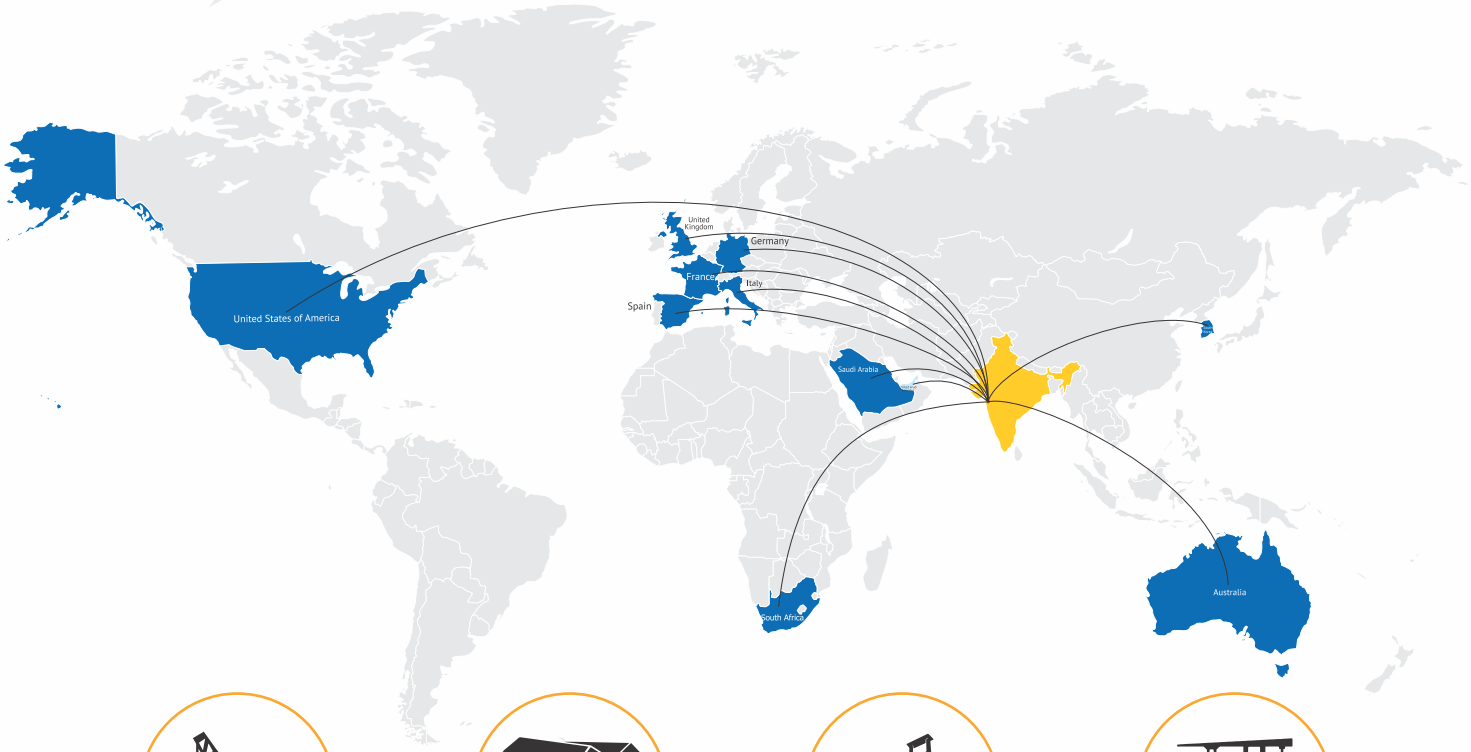
Our Capabilities

We have in house expertise in manufacturing and supplying specific application oriented & bespoke solutions in Solid as well as sponge tubes, chords & profiles. This service is available on request in materials like.

- EPDM
- SBR
- Viton
- Hypalon
- FKM
- Nitrile
- NR
- Silicone
- Neoprene

Team Saga has a vast experience in servicing our customers from every category of industry.

Some of the industries we service are



Construction Industry

Architectural Industry

Infrastructure Industry

Civil Engineering Industry

Water distribution Industry

Marine & Shipping industry

Automotive Industry

Chemical, Oil & Gas distribution

Power distribution

Mining

Rail & Road transportation

Product information

Saga bespoke products

Saga flame retardant profiles for coaches in railways, metros as well as interior applications

Saga has been able to develop a superior & high-performance elastomeric flame retardant compound. The profiles manufactured using this specialized compound has excellent flame retardance properties and low smoke emissions. This makes it ideal in applications where flame retardancy properties are required.

e.g., Windows and door seals of coaches in Railways, Metros. Interior applications such as window seals as well as glazing facades.

a. Saga sponge protective profiles

Saga sponge seals are highly versatile. Saga seals manufactured in various materials like EPDM, Silicone, Neoprene, etc offer highly durable sealing solution making it ideal for use in a wide range of applications.

Features & benefits

- Helps maintaining internal temperature.
- Prevention of dust & water seepages.
- Resistant to lot of chemicals
- Good anti-ageing properties
- High durability-Zero or minimal replacement costs
- Wide range
- Customization options available.

b. Saga EPDM sponge chords/profiles

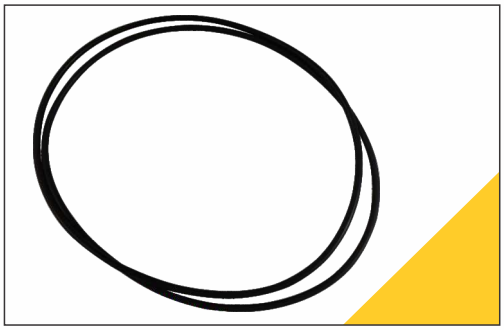
Saga EPDM sponge chords are manufactured with great focus to precision and accuracy. It has a wide application base.

Features & benefits

- Works as seal
- Prevention of dust & water seepages.
- Good anti-ageing properties
- High durability-Zero or minimal replacement costs
- Wide range
- Customization options available.

c. Saga drum seals

Team Saga has been striving to offer a large variety of drum seals in different materials and various applications.



Features & benefits

- Made of high-quality EPDM
- Provide excellent resistant against heat, steam, cracking and corrosion.
- Maintains temperature within.
- Prevents dust and water leakages
- Good anti-ageing properties
- Available in various sizes
- Customization possible.

Water distribution

Water distribution systems consist of an interconnected series of components of which pipes is a major component. Water quality and distribution depends majorly on the pipe sizes, material and construction methods. A water pipe is any pipe or tube designed to transport treated drinking water to consumers. The varieties include large diameter main pipes, which supply entire towns, smaller branch lines that supply a street or group of buildings, or small diameter pipes located within individual buildings. Materials commonly used to construct water pipes include cast iron, polyvinyl chloride (PVC), GRP, copper, steel, clay or concrete. In pipes, the seals play a critical role.

a. Saga pipe seals & gaskets

Saga pipe sealing rings are manufactured with high quality materials and conform to highest quality standards. Saga manufactures bespoke pipe seals for application like- Water transmission and distribution (potable and raw water), Sanitary sewerage collection and outfalls, Storm sewers and drainage, Seawater intake, outfalls and cooling water lines, Industrial effluents.

b. Saga low hardness Chords for pipes

Saga low hardness chords are special products developed by Team Saga after years of research and dedicated trials. The low hardness chords are perfect for sealing and available in hardness as low as 40 Shore A.

Saga pipe seals can be supplied in a number of stock elastomeric compounds EPDM, SBR, Neoprene, Nitrile designed to meet your every need.

Features & benefits

- Provide tight, efficient joints
- Designed to eliminate infiltration and exfiltration
- Suitable for automatic assembly
- Function well under extreme conditions
- Highly durable.
- Customization options available
- Need low insertion force
- Provide vacuum tight seal
- Wide range

Chemical, Oil & Gas distribution

Storage tanks are used throughout the chemical, oil and gas industry for the bulk containment of fluids at different stages of the refinery process. Most often, products are stored for a short time before being transported for further processing.

Saga wiper tip for internal floating roof tanks (IFRT)

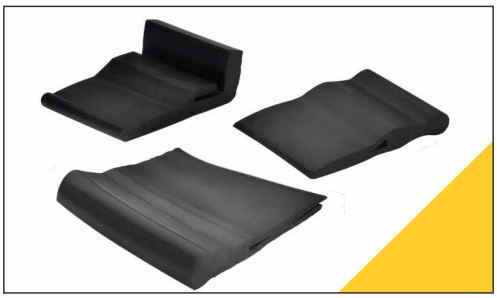
Saga wiper tip for IFRT is a strip of nitrile rubber mixed with other polymers & is used to provide a seal between the rim of the floating roof and the tank shell to reduce vapor leakage. The Saga wiper tip is ozone resistant and can further reduce the evaporation loss very effectively.

Saga wiper tip seal systems are used as secondary seals in internal floating roof tanks (IFRT). These wiper tips are specially designed to prevent product loss and atmospheric contamination from internal floating roof tanks (IFRT). Saga wiper tip seal systems are designed to ensure effective operation in specific tank conditions. Saga manufactures multiple options of IFRT wiper tip seals customized as per your choice to ensure the best fit for your tank.

Team Saga has achieved the best of these properties in our Nitrile /PVC blend compound

Features & benefits

- High tensile strength
- Excellent abrasion resistance while maintaining a lightweight and flexible design.
- Offers vapor tight splicing options that maintain the integrity of the seal around the tank diameter.
- We can make lengths of up to 25 meters to minimise joints in the sealing system
- Wide range available
- Customization options available



Construction Industry

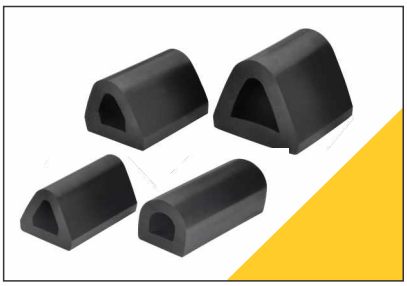
Rubber is highly elastic, durable and is corrosion resistant. It has good weathering property, is water resistant, an electrical and thermal insulator and is able to absorb movement and vibration.

Rubber is commonly used in the construction industry for:

- Sound, vibration and impact absorption (Protectors).
- Pipes and cabling.
- Architectural Profiles for facades, curtain walls, aluminium & uPVC window profiles
- Joints, seals and gaskets.
- Belting.

a. Saga loading dock/parking garage bumpers

Saga designs and manufactures premium quality bumpers in EPDM which are used in loading docks, parking garages, etc. Saga bumpers absorb impact & protect structures from damage during vehicle movement and deliveries. Saga loading dock bumpers are also known as dock fenders and are used in heavy industries where trailers are loaded and unloaded, such as retail businesses, distributors, warehouses, etc.

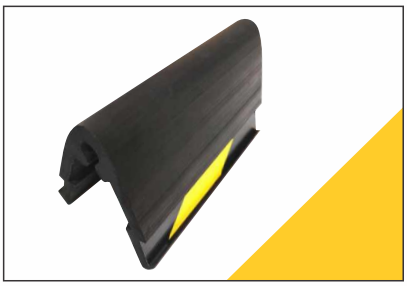


Features & benefits

- Provide dock and trailer protection in loading dock applications.
- Help absorb impact and provide cushioning between the trailer and dock.
- Help protect docks, dock levellers, and shelters from impact damage.
- The D-shape allows the bumpers to compress on contact, reducing impact force between buildings and vehicles.
- Weather and abrasion resistant
- Wide range
- Easy to install
- Customization options available

b. Saga edge protectors

Saga brand wall & edge protectors are signage products to prevent accidents. It also acts as a buffer when accidents happen. Saga wall & edge protectors are manufactured in high quality EPDM material. The design of the product allows it to be easily glued or screwed to the angle of pillars, beams or ramps on surface or underground parking lots, protecting doors and vehicle bodies from bumps or scratches.



These are ideal for

- loading docks
- warehouse interiors
- parking areas
- factory interiors and exteriors.

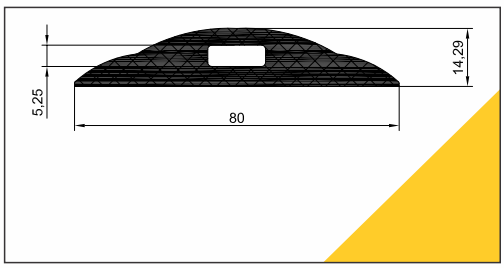
Features & benefits

- High durability
- Easy to install
- Weather and abrasion resistant
- Wide range

Customization options available

c. Saga SBR easy lay cable protectors

Saga cable protectors are easy to lay and provide a quick and simple solution to protect your cables in both permanent as well as temporary applications. Manufactured from a highly durable rubber compound these cable protectors can protect against heavy footfall in busy working environments.



Features & benefits

- Easy wheelchair passage.
- Reduces potential tripping hazards.
- Range of dimensions.
- Excellent protection.
- UV stable for outdoors installation.
- Saga cable protectors have excellent shape memory to hold your cables in place at all times. Supplied in coil form for easy handling.
- We can also provide cable protectors with large or multiple holes, which enable them to protect large power cables.

d. Saga U channel protectors

Saga U channel protectors are highly recommended for thin sheets & fragile material. It provides a tight fit specifically for thin sheets with sharp edges as well as a secure connection effectively absorbing impacts and protects fragile materials. Saga has designed the product in such a way that it can easily clip on and off an object. This allows multiple usage of the same product.

Features & benefits

- Maintains tight grip.
- Wide variety of channels.
- Protects thin sheets & fragile material well.
- Excellent impact absorption
- Offers protection to handler as well as the material.
- Can be used multiple times.
- Wide range

Customization options available

e. Saga weigh bridge rubber profiles

Saga weighbridge rubber profile perfectly sits in the gap around the outside of a weighbridge. It ensures prevention of grit, dirt & stone from falling inside. Prevents mechanical failure, expensive repairs and reduce its operational life. EPDM is able to compress while in use enabling our product to provide excellent sealing capabilities at all times. Despite offering good compression rates, EPDM also features good “shape memory”, which enables the product to return to its original shape.

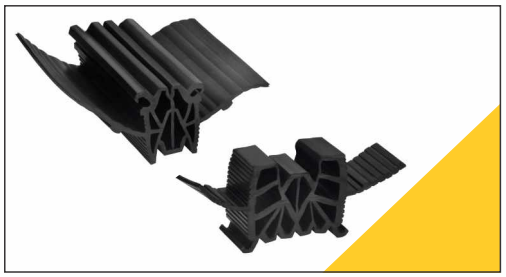
Features & benefits

- High quality materials.
- Highly durable.
- Preserve weighbridge usage.
- UV & ozone resistance.
- Easy to install
- Customization options available
- Smooth finish.
- Prevent dirt & grit build up.
- Good weathering
- Impact and pressure resistance
- Wide range

f. Saga expansion joint profiles

All building materials have a coefficient of expansion. This coefficient is a function of the temperature variation, that is, with an increase in temperature the material dilates and with a decrease in temperature the material contracts. It is therefore necessary to provide an area where these great stresses can be "absorbed" in the expansion joints.

Saga expansion joint is an assembly designed and manufactured to absorb the temperature-induced expansion, contraction and vibration of roads, bridges, etc. It helps keeping different parts together, allowing movement during ground settlement or earthquakes. Saga expansion joint profiles are used on the bridge joints and similar structures to transfer forces from the superstructure to the substructure.



Saga manufactures expansion joint profiles in EPDM and Neoprene which are easy to install and highly durable. These expansion joint profiles are generally installed on floor, sealed with a special glue. Internal cell’s design allows up to 50% multi directional movements while maintaining sufficient lift to absorb all the traffic. These profiles are recommended to be installed minimum 5mm below floor level.

Features & benefits

- Excellent anti-ageing
- Low replacement costs.
- Wide range
- High compression set properties ensure high durability
- A vast range of existing tools gives an edge to end users
- Customization options available

g. Saga architectural profiles for glass facades

Saga manufactures high quality rubber profiles for glass facades, curtain wall and structural glazing in EPDM as well as Silicone which is preferred by leading names in the construction industry. Saga has invested lot of time and energy in developing and adapting various designs to suit increased customer choice and demands. Saga's strict adherence to highest quality parameters, precision focus for dimensions and zero tolerance policy makes us preferred manufacturer for leading companies.

Features & benefits

- Ease of installation
- High strength & durability-Low replacement hassles.
- Ensures holding of glass and aluminium sash
- Works as a shock absorber
- Higher sealing property.
- Helps in sound proofing
- High resistance to humidity and temperature variations, even in the most adverse climatic conditions.
- Superior anti-ageing properties
- Excellent aesthetic appearance
- Reduced expansion/contraction of material.
- Available in different models & sizes
- Customization options available

h. Saga architectural glass profiles for aluminium & uPVC windows and doors

Saga has immense experience in manufacturing high quality EPDM rubber profiles for aluminium & uPVC windows and doors. Saga profiles are preferred by leading names in the construction industry for its consistent quality and vaster design offering. Saga has invested lot of time and energy in developing and adapting various designs to suit increased customer choice and demands. Saga's strict adherence to highest quality parameters, precision focus for dimensions and zero tolerance policy makes us preferred manufacturer for leading companies.

Features & benefits

- Ease of installation
- High strength & durability-Low replacement hassles.
- Ensures holding of glass and aluminium sash
- Works as a shock absorber
- Helps in sound proofing.
- Higher sealing property.
- Superior anti-ageing properties
- High resistance to humidity and temperature variations, even in the most adverse climatic conditions.
- Excellent aesthetic appearance
- Available in different models & sizes
- Customization options available.

I. Saga clamp rubber for pipes and straps for tanks

The Saga EPDM profiles being an integral part of the clamps used in the fixing of natural gas and air conditioner pipes, water distribution pipes, helps reducing vibration and increases insulation. Saga EPDM clamp rubber are suitable for vertical and horizontal assembly as straps in restricting movement in tanks during transportation.

Features & benefits

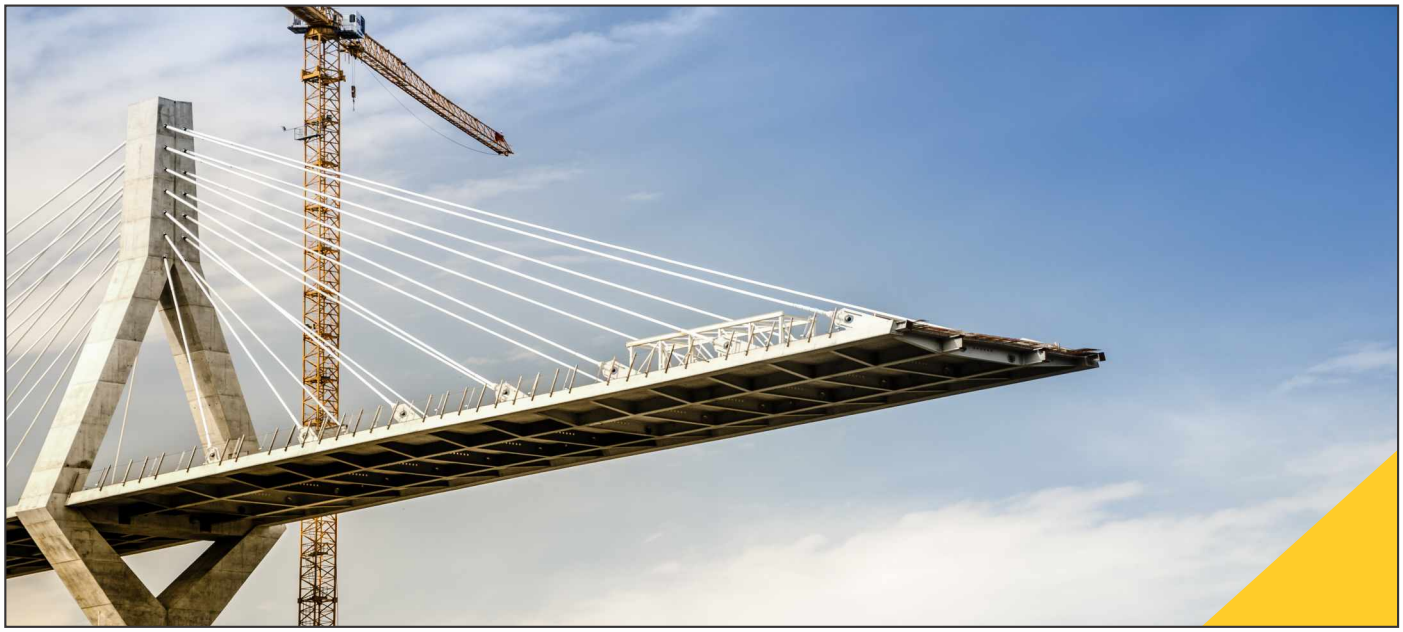
- Ease of installation
- Saga EPDM clamps are cut at the desired sizes, ready for installation
- Vibration absorption
- Corrosion resistance
- Deformation resistance
- Customization options available
- Ozone resistance
- Ageing resistance
- Available in different models & sizes

j. Saga tubes for braiding

Saga EPDM tubes are most suited for braiding applications needed in various industries.

Features & benefits

- Hardness up to 85-90. High hardness and stiffness ensure ID confirmation even after braiding.
- Available in different models & sizes
- Customization possible.



Shipping Industry

Rubber as a material is widely used in shipping and marine industry for its ability to withstand water, saltwater, wind, sunlight, temperature extremes and other environmental conditions. Every part including rubber plays a critical role in boats, ships, yachts, cruises, etc whether on the high seas or in coastal waters, part failure can sink the same. Hence, for marine buyers and ship builders alike, smooth sailing means choosing the right compounds.

Following are the applications where Saga extruded rubber products are used in shipping and marine industry
Seals & Insulation
Trims & bumpers
Fenders for jetty & ports

a. Saga EPDM fenders and bumpers for jetty, ports, boats & ships

At Saga, our in-house experts deploy the state-of-the-art technology to design, manufacture and supply rubber fenders for various types of vessels ranging from cruise ships to personal yachts, cargo ships & ferries. Saga fenders are used at Jetty's & docks, in boats, protection of unloading and storage areas, heavy load vehicles, etc

Features & benefits

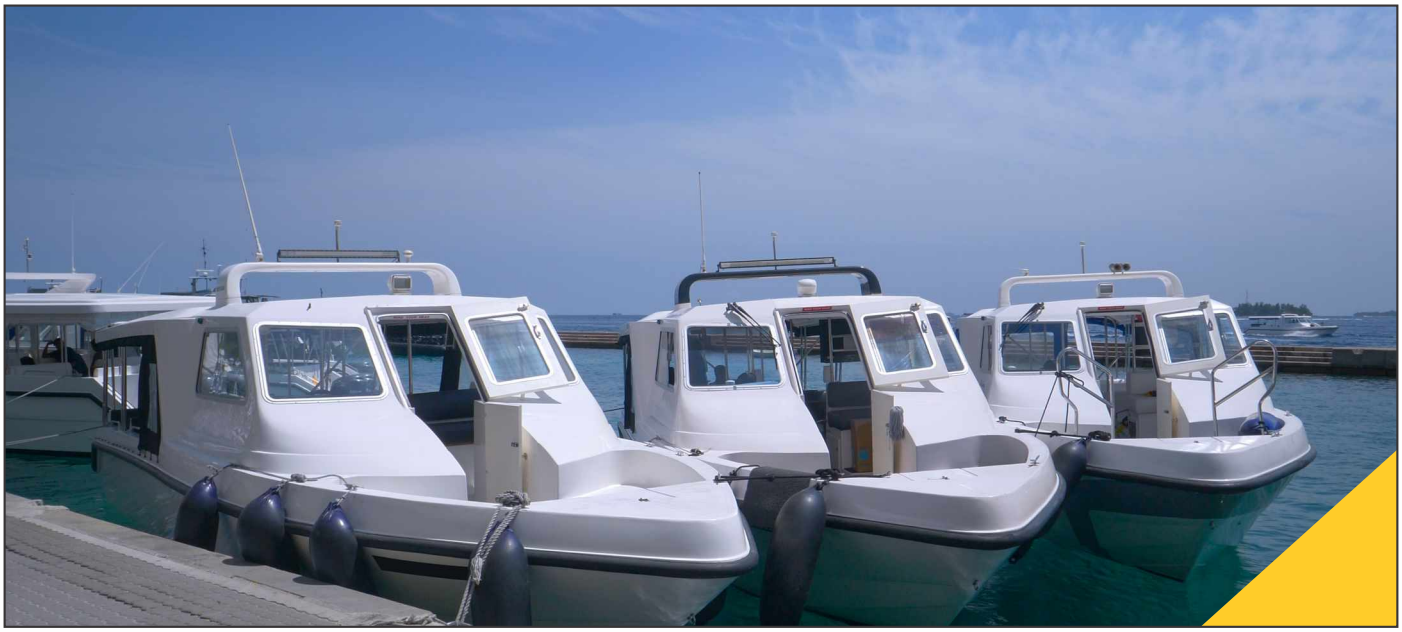
- High resistance to impact and tearing.
- Resistance to adverse climates and high temperatures.
- Resistance to salt water and resistance to corrosion.
- Prevents damage to vessels and birthing structures.
- High durability.
- Easy installation.
- Customization options available
- Cost effective.
- Wide range

b. Saga low hardness cabin seals

Low hardness cabin seals made of EPDM & Silicon in ships, yachts and cruises. Saga low hardness cabin seals are manufactured using high grade EPDM/Silicon ensuring multi axis flexibility for small inside and outside radius corners.

Features & benefits

- Optimized compression set
- Optimized load deflections
- Excellent resistance to abrasion
- Excellent resistance to water absorption
- Resistance to salt water and resistance to corrosion
- Resistance to adverse climates and high temperatures
- High durability
- Wide range
- Easy installation
- Customization options available



Mining Industry

The mining industry consists of the search for, extraction, beneficiation, and processing of naturally occurring solid minerals from the earth. These mined minerals include coal, metals such as iron, copper, or zinc, and industrial minerals such as potash, limestone, and other crushed rocks. Rubber is used in the wedge wire screens as well as the conveyor belts. In mining, wedge wire screen is mainly used as a filtering screen for petroleum and screen for salt. These wedge wire screens are protected with rubber seal around which increases the durability and provides good protection to the screen. Cleats for conveyor belt are used to convey material through inclines/declines and prevent product rollback, as well as to create separation between the products or materials that are being conveyed.

a. Saga extruded U rubber beading sealing profile for mining- Saga U

type profiles are used to cover sharp surfaces like metal sheets, glass or any other material with edges.

Features & benefits

- Properly covers sharp surfaces that could cause cuts or bumps.
- Excellent weathering properties
- Wide range
- Customization options available.

b. Saga U profiles for wedge wire screens- Saga U-type profiles are used to provide protection to wedge wire screens in mining industry.

Features & benefits

- Protects wedge wire screens.
- Excellent weathering properties
- Wide range
- Customization options available.

c. Saga SBR & NR cleats or skirting for conveyor belts

Conveyor belts are used for transport of goods and face a lot of abrasive loads so cleats also face the same abrasive forces. Cleated belts are used to help move items through inclines/declines as well as provide consistent spacing between products. Saga has mastered the art of manufacturing high quality cleats to prevent mechanical wear & tear of conveyor belts used specially in mining industry. Saga conveyor belt cleats ensure good abrasion resistance. Saga conveyor belt cleats are used in variety of applications in different industries.

Features & benefits

- High Anti abrasive property.
- Prevents mechanical wear & tear of conveyor belts
- Excellent weathering properties
- Wide range
- Customization options available
- Baseless high frequency cleat
  - T-Cleat
  - J- Cleat
  - Beefy cleat.

Team Saga would be happy to extend support in finding the right cleat type and size option to best meet the requirements of your application.

Rail & Road Transportation

Railways form a backbone of any transportation system around the world. Maintaining the railway coaches and keeping them on track is a huge task for Railway Industry.

Team Saga now offers Flame Retardant profiles for window and door seals in railway and metro coaches.

a. Saga doors and windows profile for railways

Saga extruded rubber products are extensively used in windows and doors of railway coaches. Saga windows glass seals and door seals are designed and manufactured to provide an excellent grip to the window panes of AC train bogies. Our windows glass rubber profile provides a perfect seal to the inside glass surrounding the aluminium channel, while the Saga railway coach door rubber profile seals are ideal for AC chamber doors since they help keep the doors tightly shut. This helps maintain the ideal temperatures inside the AC bogies. The Saga extruded rubber profiles are designed and manufactured in various shapes and sizes based on our client's need.

When you choose Saga customized windows glass and door Seals or profiles, you enjoy a host of unique advantages & benefits including:

- Increases energy efficiency
- Prevents allergens from coming inside
- Increased durability
- Wide range
- Prevents damage caused by moisture
- Resistant to different weather conditions
- Highly resistant to varying temperatures
- Customization options available

b. Saga container seals

Saga container rubber seals are used to prevent air, moisture and water from entering into the container and they help in preservation of the stored articles.

The shipping container seals have to ensure perfect sealing from the external environment without compromising on the cushioning required during the operation of the doors. Thus, the factors like sponge levels, relaxed modulus, compression set, ageing properties and other related parameters have to be delicately balanced and stringently monitored to provide optimal product characteristics.

Power Distribution- Thermal, Electrical, Solar

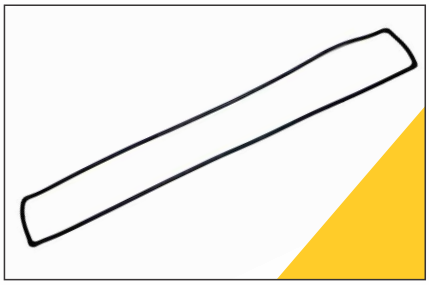
a. Saga gaskets & seals

Saga gaskets & seals Provide excellent sealing properties increasing life of the machines & instruments and reducing maintenance costs. Team Saga provides seals and gaskets in Sponge as well as Solid synthetic rubber materials for electrical panels, light panels/casings, thermal panels & solar panels

Features & benefits

- Tight tolerances
- Resilient
- Wide range available
- Highly durable
- Easy to install.
- Customization options available

b. Saga PHE (Plate Heat exchanger) gaskets & seals



Saga PHE gaskets, seals & tubes manufactured from various materials in solid and sponge provide the insulation effectively. Saga manufactures seals which are highly precise in dimensions to perform well in high pressure conditions.

Features & benefits

- Tight tolerances
- Resilient
- Wide range available
- Highly durable
- Easy to install.
- Customization options available

c. Saga rubber profiles, pads, gaskets & seals for solar panels

Saga rubber profiles, pads, gaskets & seals for solar panels have become an integral part of the Solar industry. Solar panels are those devices which are used to absorb the sun's rays and convert them into electricity or heat. A solar panel is actually a collection of solar (or photovoltaic) cells, which can be used to generate electricity through photovoltaic effect. These cells are arranged in a grid-like pattern on the surface of solar panels.

Features & benefits

- Excellent weathering conditions
- Resilient
- Wide range available
- Highly durable-Low replacement costs
- Easy to install.
- Customization options available

Automotive Industry

One of the most commonly used materials across various industries, rubber possesses many distinct features that make it very purposive, especially in the car manufacturing industry. Given that vehicles are exposed to varying temperatures and different chemicals, it is essential to pick a material that can withstand harsh environments.

Following features of Saga extruded rubber products play useful part in the automotive industry

- High tear strength
- Chemical and grease resistance
- COzone resistance
- Excellent weathering properties
- Abrasion resistance
- Excellent resistance to petroleum and oil

a. Saga bus body profiles

Saga has been a leading player in EPDM bus body profiles and has been a prominent supplier to state transport and premium buses.

Features & benefits

- Excellent weathering properties
- Wide range
- High Durability-Low replacement costs
- Customization options available.

b. Saga windshield finishers

Saga has developed a wide range of profiles in EPDM for car doors, windows, windshields.

Features & benefits

- Excellent weathering properties
- Wide range
- High Durability-Low replacement costs
- Customization options available.

c. Saga EPDM tire flaps

Saga manufactures and exports premium quality EPDM tire flaps suitable for buses.

Features & benefits

- Excellent weathering properties
- Wide range
- Tensile - 60 kg/cm2
- Ozone testing - Passes test (no cracks)
- High Durability-Low replacement costs
- Customization options available.
- Elongation - 300 % minimum

d. Saga EPDM glass run seals

Saga glass run seals are suited for variety of light vehicles, heavy cargo, buses & trains. They are made from premium grade EPDM to ensure high weathering and increased ozone resistance.

Features & benefits

- Resistance to climatic changes.
- Ozone resistant
- Prevention of dust & water seepages.
- High durability-Low replacement costs
- Customization options available.
- High weathering properties
- Helps maintaining internal temperature.
- Good anti-ageing properties
- Wide range

e. Saga tubes for wiper water distribution & radiator

Saga radiator tubes and wiper water tubes are exposed to under hood temperatures and atmospheric conditions. Saga tubes are made in high quality material with special attention to withstand both these conditions.

Features & benefits

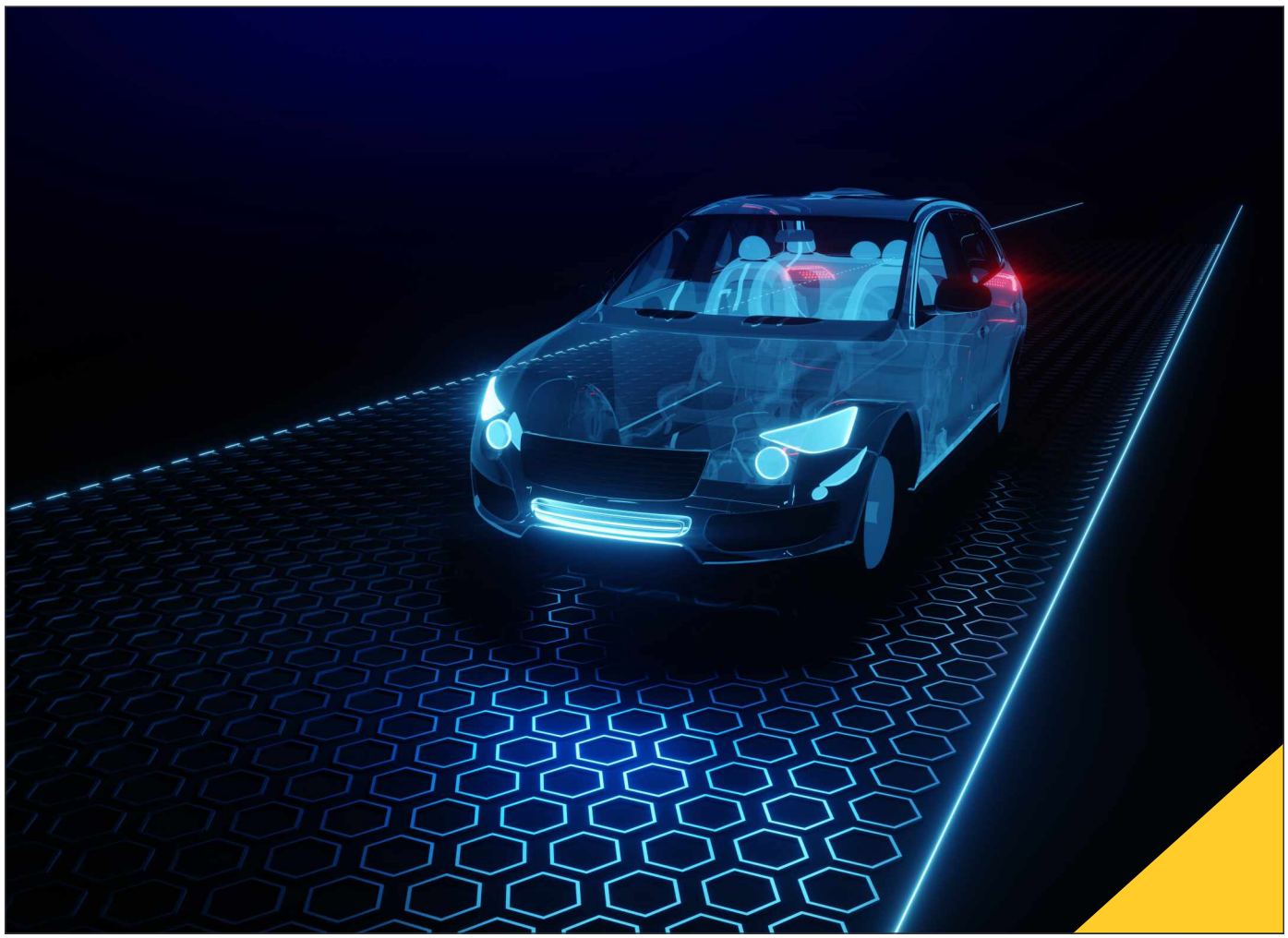
- High weathering properties
- High durability-Low replacement costs
- Customization options available.
- Good anti-ageing properties
- Wide range

f. Saga Capping rubber beadings for automotives

Saga manufactures high quality capping rubber beading that prevents water, dust getting into the boot, lockers and doors.

Features & benefits

- Ensures high sealing performance under high temperature.
- Ozone and waterproof performance.
- High durability-Low replacement costs
- Customization options available.
- Good elastic and anti-ageing property.
- Wide range



Selection of Materials

The following table will give you an idea about the various types of popular rubber available to make industrial products with their properties:

Properties	NR	EPDM	SBR	NBR	CR	SILICONE	VITON
Hardness, A	30-95	30-85	40-95	40-95	30-90	40-80	50-95
Heat Resistance: Max Cont. Deg. C	75	130	85	100	95	205	205
Max. Intermittent Deg. C	105	150	115	130	125	300	300
Low Temp Resistance	-60	-50	-55	-20	-35	-60	-20
Oxidation Resistance	Fair	Excellent	Fair	Good	Very Good	Excellent	Out-standing
Ozone and Weathering	Poor	Out-standing	Fair	Fair	Very Good	Out-standing	Out-standing
Oil Resistance	Poor	Fair	Poor	Excellent	Good	Excellent	Excellent
Solvent:							
- Alcohol	Good	Good	Good	Good	Good	Good	Good
- Acetone	Fair	Good	Fair	Poor	Fair	Fair	Poor
- Benzene	Poor	Poor	Poor	Poor	Poor	Poor	Good
Chemical:							
- Acids	Good	Good	Good	Good	Good	Fair	Excellent
- Bases	Good	Good	Good	Fair	Fair	Fair	Good
Physical Strength	Excellent	Good	Good	Good	Good	Poor	Good
Compression Set	Good	Good	Good	Good	Good	Good	Good
Tear and Abrasion	Excellent	Good	Good	Good	Good	Poor	Good
Resilience	Excellent	Very Good	Good	Good	Very Good	Fair	Poor
Gases Permeability	Poor	Fairly Low	Fairly Low	Good	Very Good	Good	Very Low
Electrical Strength	Excellent	Excellent	Excellent	Poor	Good	Excellent	Good
Flame Resistance	Poor	Poor	Poor	Poor	Self Extinguishing	Good	Self Extinguishing
Water Resistance	Very Good	Excellent	Fair	Good	Good	Good	Good

(Note: These are generic and final application/product would depend upon the compounding & manufacturing process used)

EPDM (Ethylene Propylene Diene Methylene)

EPM (Ethylene Propylene Methylene) was introduced in 1951 by Professor Karl Ziegler of Germany and further developed by an Italian professor of Polymer Chemistry known as Giulio Natta. In 1963, Karl Ziegler and Giulio Natta were awarded the Nobel Prize for Chemistry for their work on controlled polymerisation, which greatly enhanced the progress of plastics and their applications. EPM was the chemical complex of Ethylene, Propylene, Methylene. It is also known as EPR to the chemists as commercial product. It also includes EPDM which is classified as E=Ethylene, P=Propylene, D=Diene, M=Methylene-. EPDM

EPDM is an M-Class rubber under ASTM standard D-1418; the M class comprises elastomers having a saturated chain of the polyethylene type (the M deriving from the more correct term polymethylene). EPDM is made from ethylene, propylene, and a diene comonomer that enables crosslinking via sulphur vulcanization.

Properties of EPDM

Outstanding resistance to heat, ozone, steam, and weather. It is an electrical insulator.

Excellent resistance to water (fresh and sea), oxidation, ultra violet, ozone and weathering coupled with good temperature resistance.

Good resistance to acids, water-based chemicals and vegetable-based hydrocarbons.

Compatible with polar substances, e.g., fireproof hydraulic fluids, ketones, hot and cold water, and alkalis.

Incompatible with most hydrocarbons, such as mineral oils, di-ester based lubricants, kerosene, aromatic compounds, gasoline, and halogenated solvents.

Uses and applications of EPDM

EPDM was first used in USA in 1962 and due to its ability to withstand so many different weather conditions and thermal & mechanical influences, EPDM has been adapted by many industries for many applications from electrical insulation to fenders and from doors and windows profiles to pipe seals. Some of the applications listed are as follows:

Industry	Application
Civil Engineering	Loading dock/parking garage bumpers, edge protectors, cable protectors, expansion joint profiles, etc
Infrastructure	Pads for ROBs, Weigh bridge rubber profiles, etc
Architecture	Architectural Profiles for Glass facades, Glass profiles for windows and doors, Clamp Rubber, tubes for braiding in sanitaryware accessories, etc
Automotive	Door & window seals, radiator tubes, windshield finishers, tire flaps, etc
Shipping & Maritime	Fenders, bumpers, Low hardness cabin seals, etc
Water distribution (Potable & Sewage)	Pipe Sealing rings and gaskets for concrete, GRP, clay pipes, flanges, pads, etc
Power Industry (Thermal, Electrical, Hydro, Solar)	Solar panel profiles, strips & seals, PSA applied EPDM pieces for riveting, insulation tubes, cabin & panel seals, gaskets, etc
Mining	Cleats for conveyor belts, U & V type riddle profile, etc
Transportation	bus body profiles, railway pads, fire retardant profiles for doors & windows

SBR (Styrene Butadiene)

Styrene-butadiene rubber or SBR as it is also known, is a general-purpose synthetic rubber that is manufactured from a copolymer of styrene and butadiene. Perhaps the most widely used synthetic rubber in production today, SBR is predominantly used in the manufacture of car tyres and is widely employed as an abrasion-resistant alternative to natural rubber. Styrene-Butadiene rubber is the only material that fills a special need in modern technology. This is because it exhibits long-range elasticity which makes it ideal for numerous applications ranging from gaskets to conveyor belts to tires and many more. Learn about the complete range of applications which SBR offers.

Like many polymer materials, SBR was conceived during the World Wars to address the shortfall of natural rubber. The original breakthrough was made by German chemists at I.G. Farbenindustrie AG in 1929. Their copolymerisation of butadiene using sodium (Na) as the catalyst gave rise to the catch-all name, “Buna”.

SBR is widely used in production of tires, particularly car and lightweight vehicle tires. Benefits offered by SBR such as low rolling resistance, high traction during braking, low abrasion etc. makes it an ideal material for tire applications.

Advantages and disadvantages of styrene-butadiene rubber

SBR rubber is frequently employed as a direct replacement for natural rubber. It offers a number of advantages, including excellent abrasion resistance, crack endurance and ageing characteristics. Styrene-butadiene also delivers good compression set resistance and water resistance.

The main disadvantages of SBR are its poor strength without reinforcement (using fillers like carbon black), low resilience, low tear strength and inferior low-temperature properties compared to natural rubber.

Nitrile (NBR) Nitrile Butadine Rubber

Nitrile rubber, like styrene-butadiene rubber and other synthetic elastomers (elastic polymers), was a product of research that took place during and between the two world wars. A group of acrylonitrile-butadiene copolymers, given the name Buna N, was patented in 1934 by German chemists Erich Konrad and Eduard Tschunkur, working for IG Farben. Buna N was produced in the United States during World War II as GR-N (Government Rubber-Nitrile), and subsequently the group of acrylonitrile-butadiene elastomers became known as nitrile rubber.

NBR is an oil-resistant synthetic rubber produced from a copolymer of acrylonitrile and butadiene. The main applications of NBR are in fuel hoses, gaskets, rollers, and other products in which oil resistance is required.

Acrylonitrile and butadiene are emulsified in water in production of NBR and then polymerized (their single-unit molecules linked into large, multiple-unit molecules) through the action of free-radical initiators. The amount of acrylonitrile present in the final copolymer varies from 15 to 50 percent. With increasing acrylonitrile content, NBR shows higher strength, greater resistance to swelling by hydrocarbon oils, and lower permeability to gases. At the same time, however, the rubber becomes less flexible at lower temperatures, owing to the higher glass transition temperature of polyacrylonitrile (i.e., the temperature below which the molecules are locked into a rigid, glassy state).

Most common applications

- Nitrile rubber is mostly used where high oil resistance is required
- Automotive seals & gaskets or other items subject to contact with hot oils.
- The rolls for spreading ink in printing
- Hoses for oil products.
- Textiles-application of NBR to woven and nonwoven fabrics improves the finish and waterproofing properties.

CR (Chloroprene) – Neoprene

The first systematic step to establish a synthetic rubber industry had been taken during 19th Century when the basic chemistry of synthetic rubber had been worked out and developed by Fr Julius Arthur Nieuwland, a professor of chemistry at the University of Notre Dame, USA in 1860.

Neoprene was invented by DuPont scientists on April 17, 1930. DuPont first marketed the compound in 1931 under the trade name DuPrene, but its commercial possibilities were limited by the original manufacturing process, which left the product with a foul odor. A new process was developed, which eliminated the odor-causing by products and halved production costs, and the company began selling the material to manufacturers of finished end-products. To prevent shoddy manufacturers from harming the product's reputation, the trademark DuPrene was restricted to apply only to the material sold by DuPont. Since the company itself did not manufacture any DuPrene-containing end products, the trademark was dropped in 1937 and replaced with a generic name, neoprene, in an attempt "to signify that the material is an ingredient, not a finished consumer product"

A multi-purpose material suitable for applications involving weathering, sea water, mineral oils, greases, dilute acids and alkalis but is not recommended for fuel immersion. It also exhibits good flame retardant properties dependent on polymer content.

Neoprene resists degradation more than natural or synthetic rubber. This relative inertness makes it well suited for demanding applications such as gaskets, hoses, and corrosion-resistant coatings. It can be used as a base for adhesives, noise isolation in power transformer installations, and as padding in external metal cases to protect the contents while allowing a snug fit. It resists burning better than exclusively hydrocarbon-based rubbers, resulting in its appearance in weather stripping for fire doors and in combat related attire such as gloves and face masks. Because of its tolerance of extreme conditions, neoprene is used to line landfills. Neoprene's burn point is around 260 °C (500 °F).

In its native state, neoprene is a very pliable rubber-like material with insulating properties similar to rubber or other solid plastics.

Properties of Neoprene

Abrasion, ozone and flame retardant.

Most common applications

- Industrial
- Glass & glazing
- Transport
- Food & Beverage
- Electronics and telecommunications

Not suitable for

- Ketones
- Ester
- UV
- Heat

CSM (Hypalon®)

CHLOROSULPHONATED POLYETHYLENE

More commonly known as Hypalon. This is a special purpose rubber formed by substituting chlorine and sulphonylchloride groups into polyethylene. General properties include moderate mechanical properties; excellent resistance to ozone, oxidation, weathering, and oxidizing chemicals. Its upper temperature limit is ca. + 150 °C. Hypalon® or Chlorosulfonated Polyethylene Rubber is made by DuPont-Dow. It is an elastomer and is a thermoset material. There are many grade variations of this specialty elastomer. A typical grade is 29 % chlorine content and 1.4 % sulphur content. Its neat product form is white, odourless chips. A distinguishing feature is that it is readily soluble in common solvents. Hypalon is known for its resistance to chemicals, temperature extremes, and ultraviolet light.

SI (Silicon)

Silicon (Si), a non-metallic chemical element in the carbon family (Group 14 [IVa] of the periodic table). Silicon makes up 27.7 percent of Earth's crust; it is the second most abundant element in the crust, being surpassed only by oxygen.

Silicone

Silicon is a natural chemical element while Silicone is a man-made product. Technically correct term for the various silicone rubbers is polysiloxanes or polydimethylsiloxanes.

The first silicone elastomers were developed in the search for better insulating materials for electric motors and generators.

The silicones differ from most industrial polymers in that the chains of linked atoms that make up the backbones of their molecules do not contain carbon, the characteristic element of organic compounds. This lack of carbon in the polymer backbones makes polysiloxanes into unusual “inorganic” polymers—though in most members of the class two organic groups, usually vinyl (CH2), methyl (CH3), or phenyl (C6H5), are attached to each silicon atom.

Silicone rubber offers good resistance to extreme temperatures, being able to operate normally from −100 to 300 °C (−150 to 570 °F). Silicone rubber has low tensile strength, poor wear and tear wear properties. Some properties such as elongation, creep, cyclic flexing, tear strength, compression set, dielectric strength (at high voltage), thermal conductivity, fire resistance and in some cases tensile strength can be—at extreme temperatures—far superior to organic rubbers in general, although a few of these properties are still lower than for some specialty materials. Silicone rubber is a material of choice in industry when retention of initial shape and mechanical strength are desired under heavy thermal stress or sub-zero temperatures.

Vulcanised Silicone rubber is prepared in two principal forms: (1) as room-temperature-vulcanizing (RTV) elastomers, which are low-molecular-weight liquids that are cast or molded into desired shapes and then interlinked at room temperature, and (2) high-temperature-vulcanizing (HTV) elastomers, which are higher-molecular-weight gums that are mixed and processed like other elastomers.

Applications

- O-rings
- gaskets
- heat-resistant seals
- electrical insulators
- caulks
- flexible moulds
- surgical implants (Property of chemical inertness).

FKM (Flouroelastomers and Viton®)

FKM is a family of fluorocarbon-based fluoroelastomer materials defined by the ASTM International standard D1418, while it is called FPM by ISO 1629 (both first ed. 1995 and ed. 2013). It is commonly called fluorine rubber or fluoro-rubber. All FKMs contain vinylidene fluoride as a monomer. Originally developed by DuPont (under the brand name Viton, now owned by Chemours), FKMs are today also produced by many companies, including: Daikin (Dai-El), 3M (Dyneon), Solvay S.A. (Tecnoflon), HaloPolymer (Elaftor), Gujarat Fluorochemicals (Fluonox), Zrunek (ZruElast), and several Chinese manufacturers including VSK Industrial. Fluoroelastomers are more expensive than neoprene or nitrile rubber elastomers. They provide additional heat and chemical resistance. FKMs can be divided into different classes on the basis of either their chemical composition, their fluorine content, or their cross-linking mechanism.

Fluorocarbon elastomers have grown to major importance in the sealing industry. Due to its wide range of chemical

compatibility, temperature range, low compression set, and excellent aging characteristics, fluorocarbon rubber is the most significant single elastomer developed in recent history. Fluorocarbon elastomers are highly fluorinated carbon-based polymers used in applications to resist harsh chemical and ozone attack.

The working temperature range is considered to be -26 °C to +205 °/230 °C (-15 °F to +400 °/440 °F).

For short working periods it will take even higher temperatures.

With increasing fluorine content, resistance to chemical attack is improved while low temperature characteristics are diminished. There are, however, specialty grade fluorocarbons that can provide high fluorine content with low temperature properties.

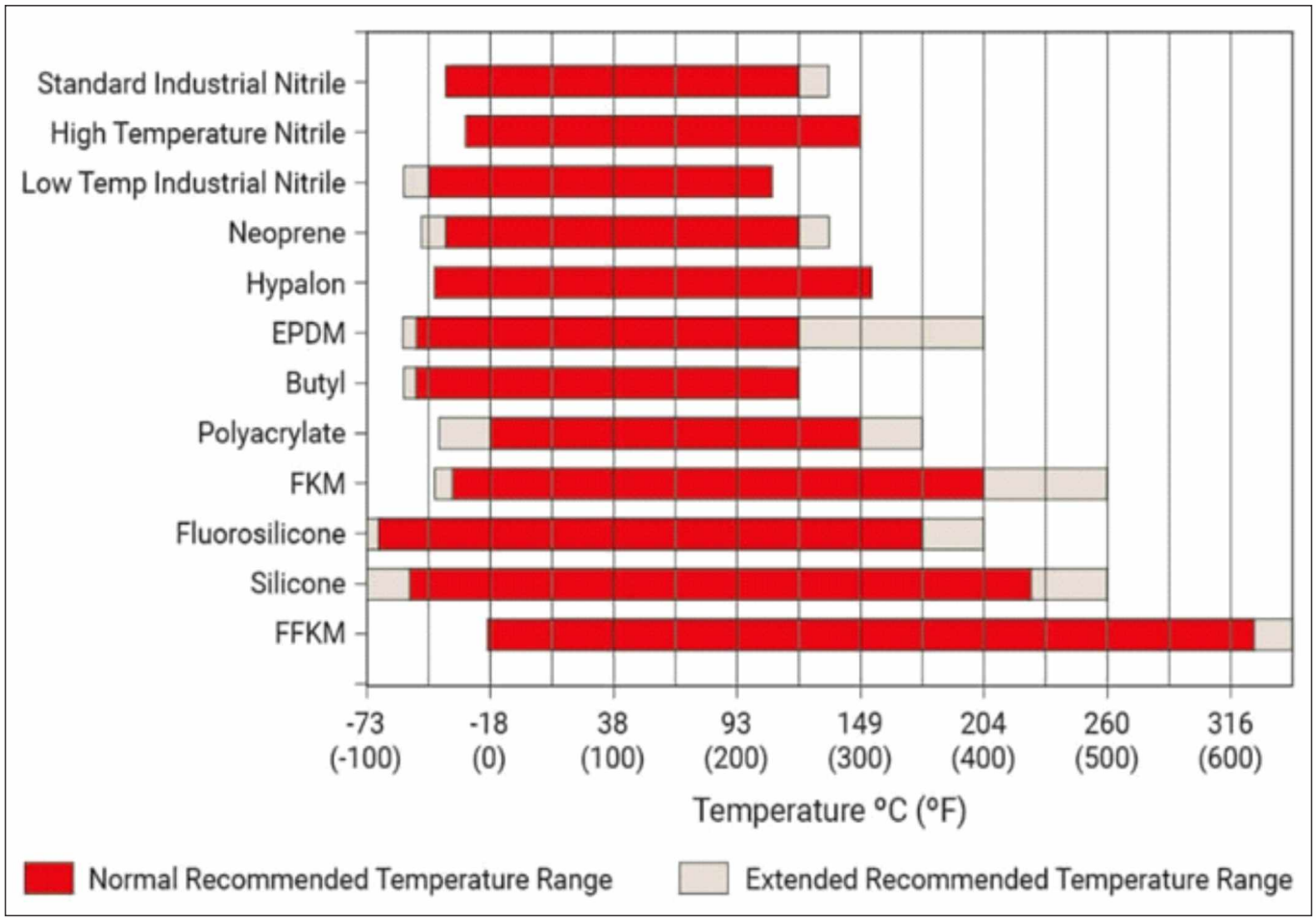
Applications of FKM (FPM, Viton®, Fluorel®)

In Aircrafts, automobiles & other mechanical devices requiring maximum resistance to elevated temperatures and to many fluids.

FKM resist mineral oils and greases, aliphatic, aromatic and also special chlorinated hydrocarbons, petrol, diesel fuels, silicone oils and greases.

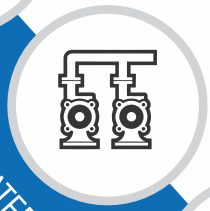
Suitable for high vacuum applications.

Many fluorocarbon compounds have a higher-than-normal mold shrinkage rate, molds for fluorocarbon products are often different from moulds for Nitrile.



MINING

SHIPPING



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