



Approved compound

We have extensive experience in UL certified materials and recently had a Silicone Compound tested & approved for UL 157 & UL 50E.



Harkesh Rubber LLP

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O Rings | Seals | Diaphragms | Gaskets

ADVANTAGES

- ▶ Free Engineering Assistance.
- ▶ Extensive Experience in choosing different materials and developing special compounds.
- ▶ Complete in-house testing & validation of every compound.
- ▶ Overnight dispatch of parts.
- ▶ Proven customer base.
- ▶ REACH and ROHS compliant.
- ▶ Achieved critical tolerance as low as $\pm 0.02\text{mm}$.

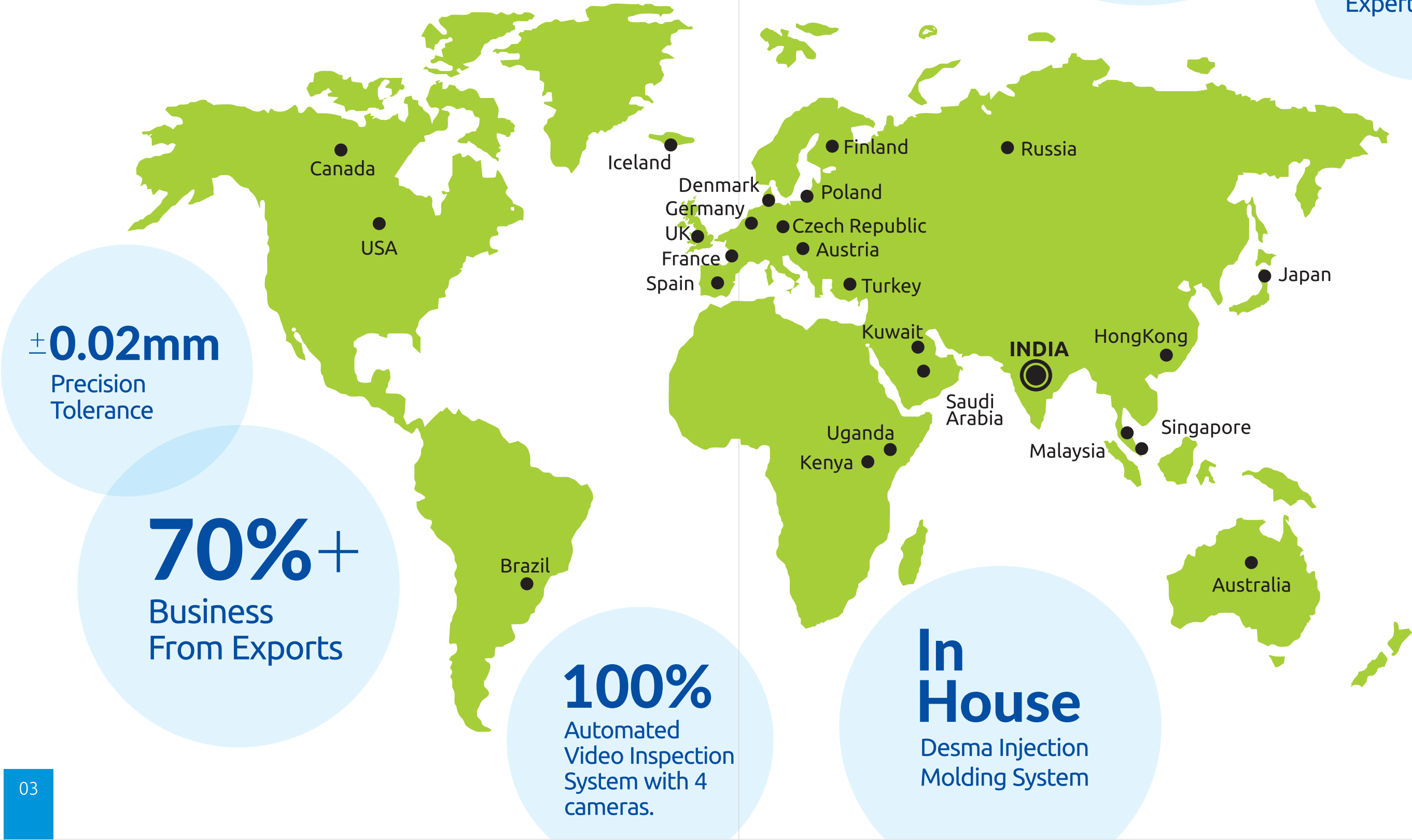


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GLOBAL FOOTPRINTS & INSIGHTS

Supplying to countries world over!



OUR PROMISE

► On time delivery

► Zero defect

We are a customized rubber molded components specialist. In the last +40 YEARS, we have developed and on time delivered over 50 million+ parts globally across European and USA territories.

Our products are found in Aircraft, Pneumatic, Flow Control, Automation, and Building Technology in over 100 countries.

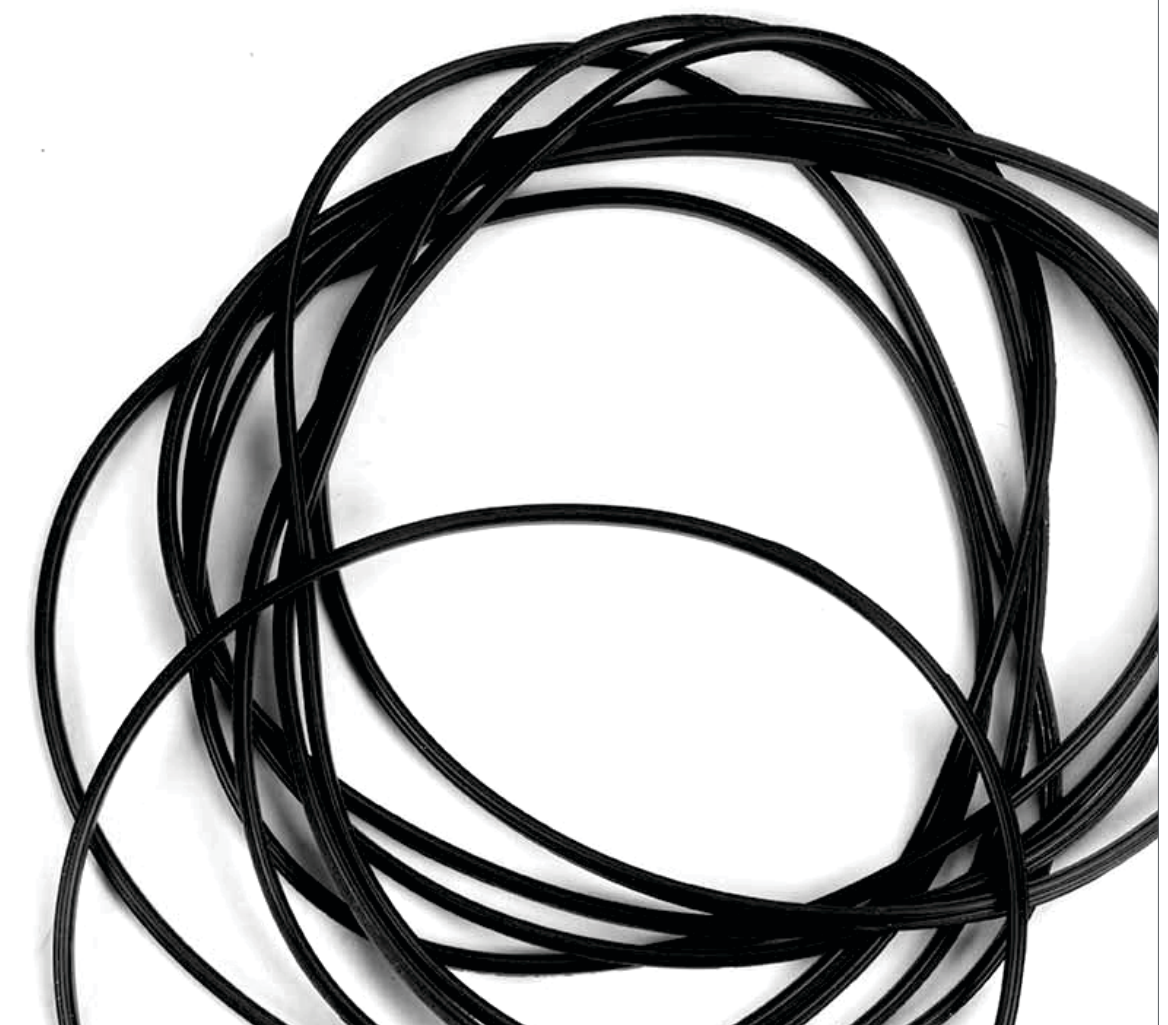
Our prompt, timely deliveries and new product development at a short lead time helped our customer in winning a contract of over 5 million USD.

95% of our business is generated from global OEM's

Important Metrics

Global markets have undergone a dramatic volatility in price & availability of rubber raw materials. However we made certain informed decisions in order to ensure our Top 10 customers had uninterrupted supplies with barely any or no price escalation.

On-Time Delivery Before Covid	94%
On-Time Delivery During Covid	79%
Reduction in Lead Times by over(average)	57%
Bring Down Purchase Costs by over	33%
Customer End Deviations	0.2%



THE COMPANY WE KEEP

And what our esteemed clients say about us



We are working with Harkesh Rubber since 3 years. Our initial development of few seals for one of the important project developed and supplied by them as per the schedule. We found the quality and commitment for overall business is good. The response and technical support for our need is fair and on-time. Overall the services and co-operation found to be satisfactory.



Harkesh Rubber has been instrumental in supporting Rostra Vernatherm with quality rubber components, on time, consistently for more than 5 years. They respond and support our needs in a fair manner without delay. We look forward to many more years of Harkesh Rubber supporting our current and future rubber needs.



We have been working with Harkesh Rubber since last 6 years. During this period their Quality, Delivery and Performance found very good and consistent. During the development of new products especially FKM/FPM gaskets, we had a very good technical support from Harkesh Rubber team.

Wish you all the best for your business growth.



We have been working with you since more than 10 years. During this period quality and performance found is very good. Even when we arranged a supplier meet in 2012, **we awarded Harkesh Rubber as a best supplier of the year** in 'Bought Out Item' category. Whenever we had any new developments their support was perfect. Overall performance was very good and hope the same in future too.



In all honesty I have to say that for us it's really a pleasure to do business with you now already more than 5 years. In the whole time you had never let us down, your delivery performance is nearly perfect, the service which we get is quicker than quick. The product quality has been never a problem and when we had an issue you help us always to solve it. This reliability is we trust in and what makes our decision to work with you also in the future very easy.



MATERIAL PROPERTIES

Properties	NBR	EPDM	CR	VMQ	FKM	HNBR	FVMQ	FFKM
Common Name	Buna-N, Nitrile	Ethylene Propylene	Chloroprene	Silicone	Fluorinated Hydrocarbon	Hydrogenated Nitrile	Fluorosilicone	Per Fluoroelastomer
Trade Name	Oilace, Mincar, Chemigum, Hycar	Nordel, Epcar, Vistalon, Coyaene	Neoprene, Matchless, Mirprene	Thermoflex, Silastic	Viton, Fluorel, Vi-Chem	Therban, Tornac, Zetpol	Fluorosilicone LS	Chemraz
Chemical Definition	Butadiene Acrylonitrile	Ethylene Propylene Diene Co & Terpolymer	Poly-chloroprene	Polydim-ethylsiloxane	Vinylidene Fluoride Hexa-fluoropropylene	Hydogenerated Butadiene Acrylonitrile	Fluororinyl Methyl Siloxane	Per-fluoroelastomer
ASTM D-2000 & SAE J 200	BF BG BK CH	CA BA AA DH	BC BE	FC FE CE	HK	DH	FK	-
Minimum Continous use Temperature (°C)	-40 to -57	-46 to -18	-57 to -34	-117 to -68	-28 to -57	-18 to -40	-67 to -60	-7
Maximum Continous use Temperature (°C)	121 to 150	150 to 200	93 to 121	204 to 260	200 to 260	120 to 160	+232.2	+232.2
Brittle Temperature (°C)	-40 to -65	-67.8	-65	-90 to -117.8	-37 to -51	-	-62 to -87	-
Heat Aging at 100°C	Good	Good-Outstanding	Good-Excellent	Excellent	Excellent	Excellent	Excellent-Outstanding	Excellent
Aging in Oxygen Ozone & Weather	Poor- Fair	Very Good	Good	Excellent	Very Good-Excellent	Good	Excellent	Good-Excellent
FDA Approved Grades Available	Yes	Yes	Yes	Yes	Yes	-	-	-

Note: Charts given above are for guidance purpose only

TRUSTED SUPPLIERS



MATERIAL RESISTANCE

Resistance	NBR	EPDM	CR	VMQ	FKM	HNBR	FVMQ	FFKM
Steam Resistance	Fair-Good	Excellent	Good	Fair-Good	Poor-Good	Fair-Good	Fair-Good	Good-Excellent
Flame Resistance	Poor	Poor	Good-Excellent	Fair-Excellent	Good-Excellent	Poor	Excellent	Excellent
Weather Resistance	Fair-Good	Excellent	Fair-Good	Excellent	Excellent	Good-Excellent	Excellent	Excellent
Ozone Resistance	Fair-Good	Good-Excellent	Good-Excellent	Excellent	Excellent	Good-Excellent	Excellent	Excellent
Water Resistance	Good-Excellent	Excellent	Fair-Good	Excellent	Excellent	Excellent	Excellent	Good-Excellent
Acids Concentrated	Fair-Good	Excellent	Poor	Poor-Fair	Good-Excellent	Fair-Good	Good	Excellent
Alkalies Concentrated	Pood-Good	Excellent	Poor	Poor-Excellent	Poor	Poor-Good	Good	Good
Amines	Poor	Fair-Very Good	Poor-Good	Good	Poor	Good	Poor	Good-Excellent
Brake Fluid, Non Petro Based	Poor	Good-Excellent	Fair	Good-Excellent	Fair	Fair	Excellent	-
Diester Oils	Fair-Good	Poor	Poor	Poor-Fair	Good-Excellent	Good	Good-Excellent	-
Ethers	Poor	Fair	Poor	Poor	Poor	Poor-Fair	Fair	Good
Halogenated Solvents	Poor	Poor	Poor	Good-Excellent	Fair	Poor	Very Good	-
Hydrocarbon Oil, High Aniline	Excellent	Poor	Good	Very good	Excellent	Excellent	Excellent	-
Ketones	Poor	Good-Excellent	Fair	Poor	Good-Excellent	Poor	Poor	Excellent
L.P Gases & Fuel Oils	Excellent	Poor	Good	Fair	Excellent	Excellent	Excellent	-
Petroleum Aromatic	Good	Poor	Good	Poor	Excellent	Good-Excellent	Good	-

Note: Charts given above are for guidance purpose only

Abbreviations:

- NBR- Nitrile Butadiene Rubber
- EPDM- Ethylene Propylene Diene Rubber
- CR- Chloroprene Rubber
- VQM- Silicone Rubber | FKM- Flouroelastomer
- HNBR- Hydrogenated Nitrile Butadiene Rubber
- FVMQ- FluoroSilicone | FFKM- Perfluoroelastomer

Note: Charts given above are for guidance purpose only

PRODUCT RANGE

Rubber Diaphragms (Fabric Reinforced – Convoluted, Rolling, Flat etc.)

Harkesh Rubber Diaphragms are manufactured using specialised technology to achieve unparalleled physical strength. Custom Fabric-Reinforced Elastomeric Diaphragms are supplied to companies world over specialising in Control Valves, Actuators, Pressure Regulators amongst many other Fluid Control Industries.

With compression presses ranging from 50 tons to over 1500 tons, Harkesh offers Rubber Diaphragms upto 800 mm in Diameter. Our Rubber Diaphragms are available in a variety of materials, formulated to meet the most challenging applications.

We have over 80 different reinforcing fabrics which are tested & approved by NABL accredited laboratories to achieve different specifications in physical as well as chemical resistance.

Key Advantages:

- ▶ Life cycle tested regularly for 2 Million Cycles.
- ▶ Low Temperature Material for Cold Markets (upto -60°C).
- ▶ Over 15 years of experience in development, with Control Valve Industry.



Rubber Diaphragms (Crimped, Spherical, Gas Diaphragms, Medical, etc.)

Diaphragms are sealing components which seal two chambers hermetically, as elastically moveable partitions and whilst doing so, lead to a lifting movement that is perpendicular to the clamping surface.

They do not need any maintenance or lubrication, they are wear-free and have a long service life. Thin-walled diaphragms operate almost frictionless without any breakaway torques.

Diaphragms are used in various technical ranges – the application determines size and design of the diaphragm.

Key Features:

- ▶ EN 549 Tested & Approved compounds for Gas based applications.
- ▶ Skydrol fluid resistant compound for Aerospace.
- ▶ Dimensional tolerance of $\pm 0.02\text{mm}$.

O-Rings & X-Rings

O-rings and X-Rings are the most common sealing elements used across all types of engineering applications.

At Harkesh we understand the importance of this simple product and offer our customers advanced solutions for the same.

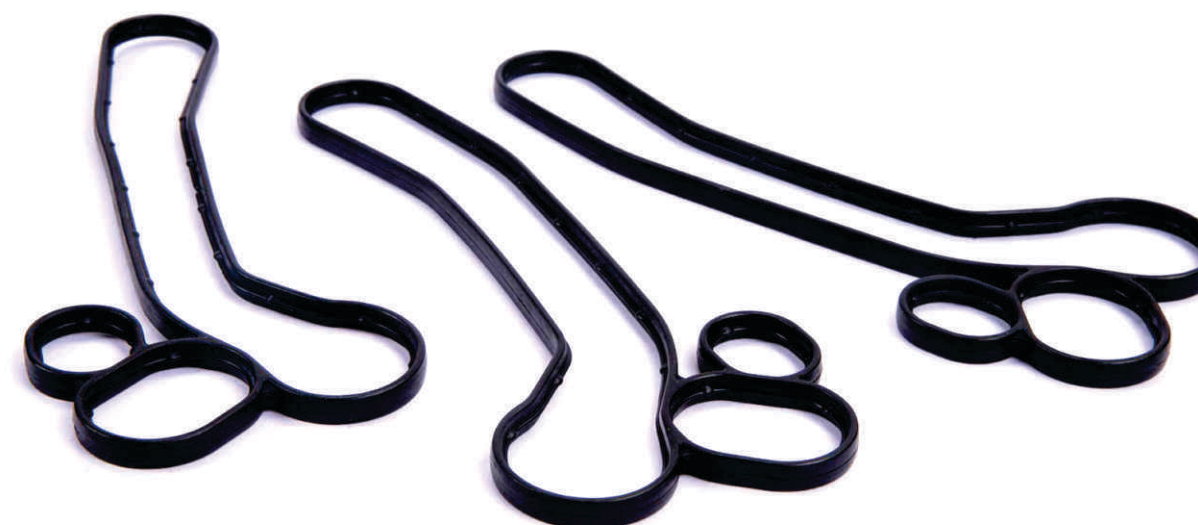
Key Advantages:

- ▶ Cryogenically de-flashed O-rings.
- ▶ 45° parting line O-rings for optimal sealing.
- ▶ X-Rings with cross sections checked on VMS.
- ▶ Currently producing over 5,00,000 orings/day.



Gasket

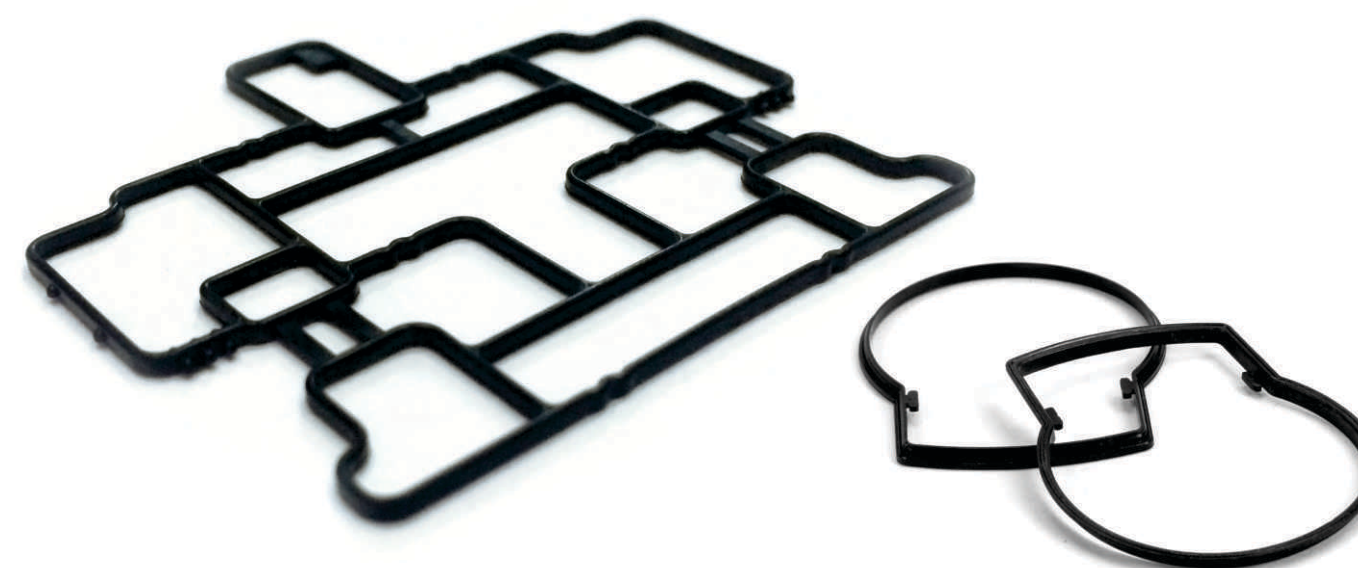
We manufacture PHE Gaskets, Heat Exchanger Gaskets for various OEM's. We have many gaskets in-stock for various models. We also have Viton Gaskets for moulds and other applications. These gaskets are used in media like, Steam, Ammonia, Sulphuric Acid etc.



Customized Seals

Customized Seals are developed Completely as per the Clients application. In any development we are involved from a very early stage bringing our Rubber experience to the Client for a better product with Practical manufacturing design.

We have reverse engineered many seals with highly Complex designs and material specifications for our clients, examples include some Aerospace applications.



Seals (Oil Seal, Wiper Seal, Butterfly Seal)

Seals are always critical to the function of the assembly and the manufacturer’s products. They are used for fluid control and made out of synthetic rubber or Polyurethane to ensure resistance of high pressure, temperature and volatile media.

Our seals are Compliant with FDA Regulations. Used in both static and dynamic applications.

- Key Advantages:**
- ▶ Vast range of sizes available.
 - ▶ Tested and approved compounds for various applications.
 - ▶ REACH, ROHS and FDA approved.



Wire Seals

Rubber Wire Seals are essential in many electro – mechanical applications for cable, solar, aerospace & automation industries.

Wire Seals also have extensive use in two-wheeler and four-wheeler vehicles primarily for fuel injection systems and various types of sensors.

They provide excellent insulation properties. In addition, our wire seals also offer exceptional high temperature resistance along with the ability to repel water as well as withstand various hydraulic fluids. This makes them versatile for a wide range of applications.

- Key Advantages:**
- ▶ High Precision with core dimensions of >0.50 mm.
 - ▶ Extensive experience in developing Wire Seals (Over 500 sizes).
 - ▶ Capacity to produce large volumes with high precision.
 - ▶ Tested for use in various Automotive/Aerospace Hydraulic Fluids.



(Magnified at 8x on a Profile Projector)

Suction Cups

Our 3-dimensional Suction cups can secure work pieces of all types. They are extensively efficient for packaging and logistics. Materials which can be lifted include but are not limited to Boxes, Metal work pieces, Glass etc.

These suction cups are characterized by a robust body and a soft sealing lip that molds to the shape of the packaging. The suction cups in the packaging industry are either made of Silicone or Polyurethane, meeting FDA guidelines. This means these suction cups can be used for handling primary as well as secondary packaging.

The versatility of the rubber allows flexibility of range of materials reducing setup costs and increasing throughput.



Bellows

Bellows are essential to protect cylinders, rods, shafts and moving components. By having the proper protection, you could potentially reduce equipment breakdowns, longer periodic service requirements, reduced machine down times, improved manufacturing and therefore an overall increase in productivity and profit.

Moulded Bellows and similar Parts can be moulded very cost effectively in a Range of Rubber Polymers such as Neoprene, Nitrile, FKM, Silicone.

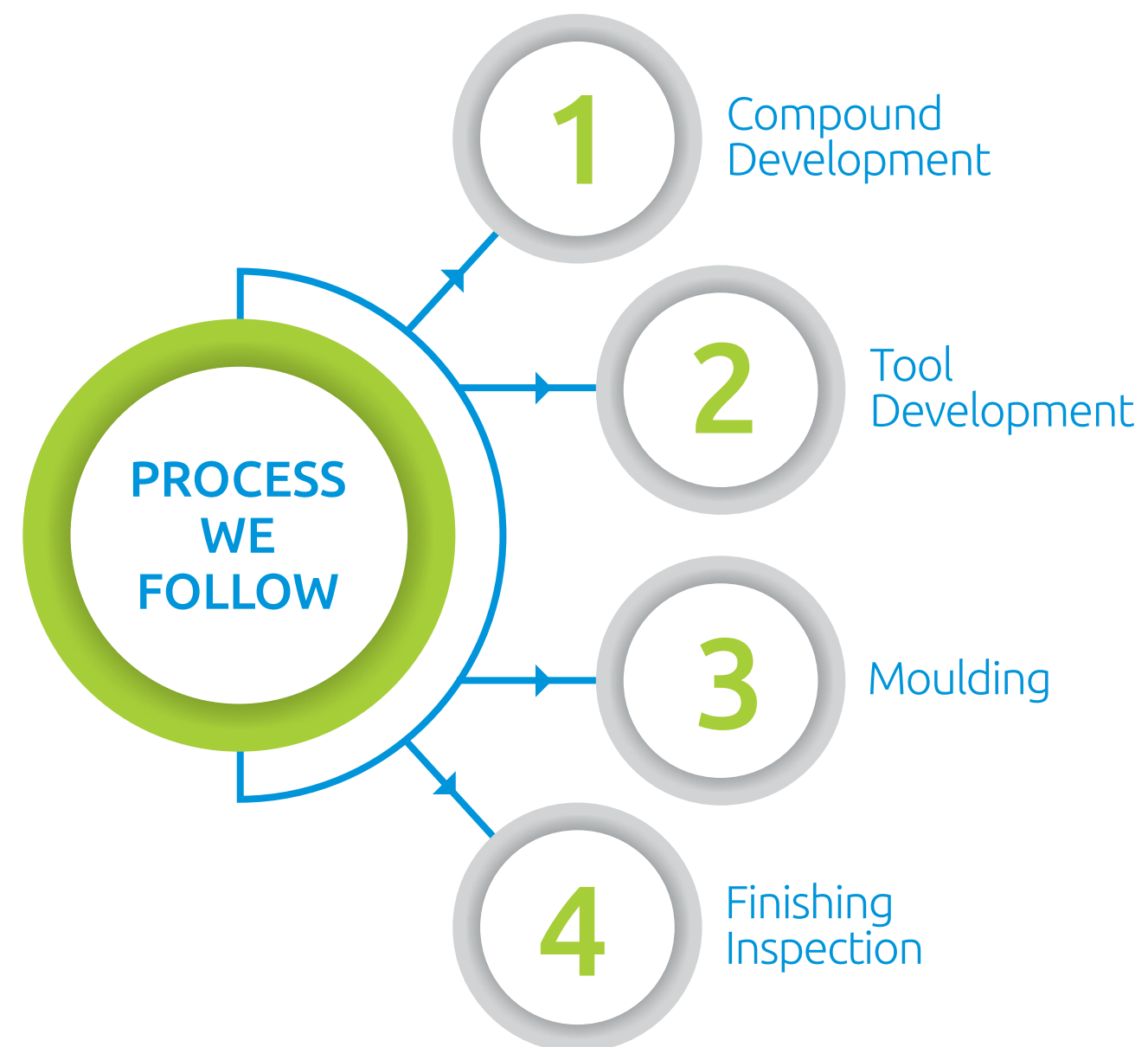


MANUFACTURING

At all stages, beginning from Mould to Temperature control to Timer and so on, utmost care is taken to ensure consistent product quality without any deviation at the time of production.

The Moulds are precision machined using the latest CNC machines, with the correct grades of tool steels, appropriate for different rubber materials. The choice of the moulding process depends on the part shape, complexity and the number of parts to be produced.

Our Presses range from 50 tons to 1500 tons. This makes it possible for us to mould any size of rubber component.



Infrastructure Highlights

- ▶ Multiple DESMA Horizontal & Vertical Injection Moulding Machines ranging from 100 tons to 400 tons.
- ▶ Multiple Tungyu Vacuum Compression Presses ranging from 100 Tons to 250 Tons.
- ▶ Cryogenic De-Flashing from Nissanki, Japan.
- ▶ In-House Laboratory with over 16 different Testing Equipments.
- ▶ A dedicated & motivated workforce of over 110 people.
- ▶ Production units spreads over 35000 Square Feet in total.
- ▶ Fully Automated Inspection Machine with 4 Cameras for Checking dimensional accuracy for EVERY Oring.



QUALITY CONTROL

Stringent Quality Control measures are undertaken to ensure 100% product approval. We understand the importance of a critical sealing and therefore ensure measures to keep quality consistent. We are ISO Certified and are regularly assessed, quality approved by a wide range of industry bodies and individual customers, including multinational corporations, utilities and government organisations.

Key Measures:

- ▶ Rheometric Test for every batch traceability.
- ▶ VMS for magnifying parts at over 64x to ensure strict dimensional approvals.
- ▶ Tracking Compounds for upto 7 years.
- ▶ Cryogenic De-Flashing of parts for smooth finish.
- ▶ REACH and ROHS Compliant, FDA approved compounds.
- ▶ 100% fully Automated Dimensional Inspection System which Inspects 7200 parts per hour



SOLAR
ENERGY



FLUID
HANDLING



POWER
GENERATION

INDUSTRIES

We have application experience and material certifications to design and manufacture rubber products for many different industries including:



AEROSPACE



CHEMICAL
AND
PROCESS
INDUSTRY



AUTOMATION
INDUSTRY



PAINT
INDUSTRY

CASE STUDIES



PROBLEM STATEMENT

Chemical Resistance & Performance



ANALYSIS BY HARKESH RUBBER

Customer's rubber vendor was acquired by a competitor who stopped supplying parts overnight. The customer did not have Formulations of the compound as they were developed years ago. A key Military account was at the risk of being lost.

Lead Time

Due to the inefficient delivery of the current Diaphragm supplier, the customer was losing on many orders with short lead times. Also, it caused discrepancies in regular production.

Sub Zero Application

Customer was losing business in Sub Zero Countries due to non availability of Rubber Parts working in Low Temperature Applications.

Timely delivery of FFKM

Due to scarcity and supply chain issues of FFKM material, client existing vendor was unable to supply gaskets on time. As a result customer production got delayed, and was on verge of losing his existing orders.



SOLUTION BY HARKESH RUBBER

Harkesh formulated a new compound by reverse engineering and studying previous test reports from the customer. The formulated compound was developed for approval within 3 weeks specifically for use in Aviation Turbine Fuel with a working cycle of over 10,000 hours at high temperatures.



END RESULT

Increased working cycle by 18% while reducing cost by 23%. The parts were developed for critical applications and passed after undergoing thorough tests.

Developed prototypes within 2 weeks and maintained inventory for the customer during contingencies, if any. Ensured end to end delivery in less than two weeks.

Reduced lead time by over 40% while reducing cost by 31%. Also managed to increase the customer's output of Valves by 17% due to on time delivery of supplies.

Formulated NBR & CR Compounds with high tensile & good compression set to work in Low Temperature Applications. Tested & Approved the compound by an NABL accredited laboratory for credibility.

The customer increased his revenue by 60% due to uncompromised performance of their Valves in Sub Zero Climates and capturing new markets. We also managed to increase the working cycle by 2X.

We maintained a good relationship with global vendors, Preordering and keeping stock of forecasted quantities from clients to fulfil requirements.

We successfully supplied production of gaskets to client during pandemic and extreme market volatility situation