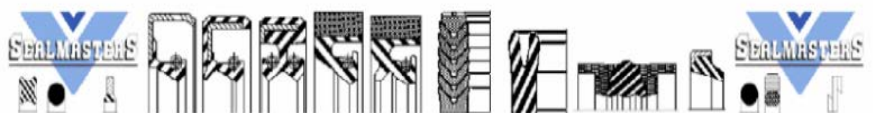
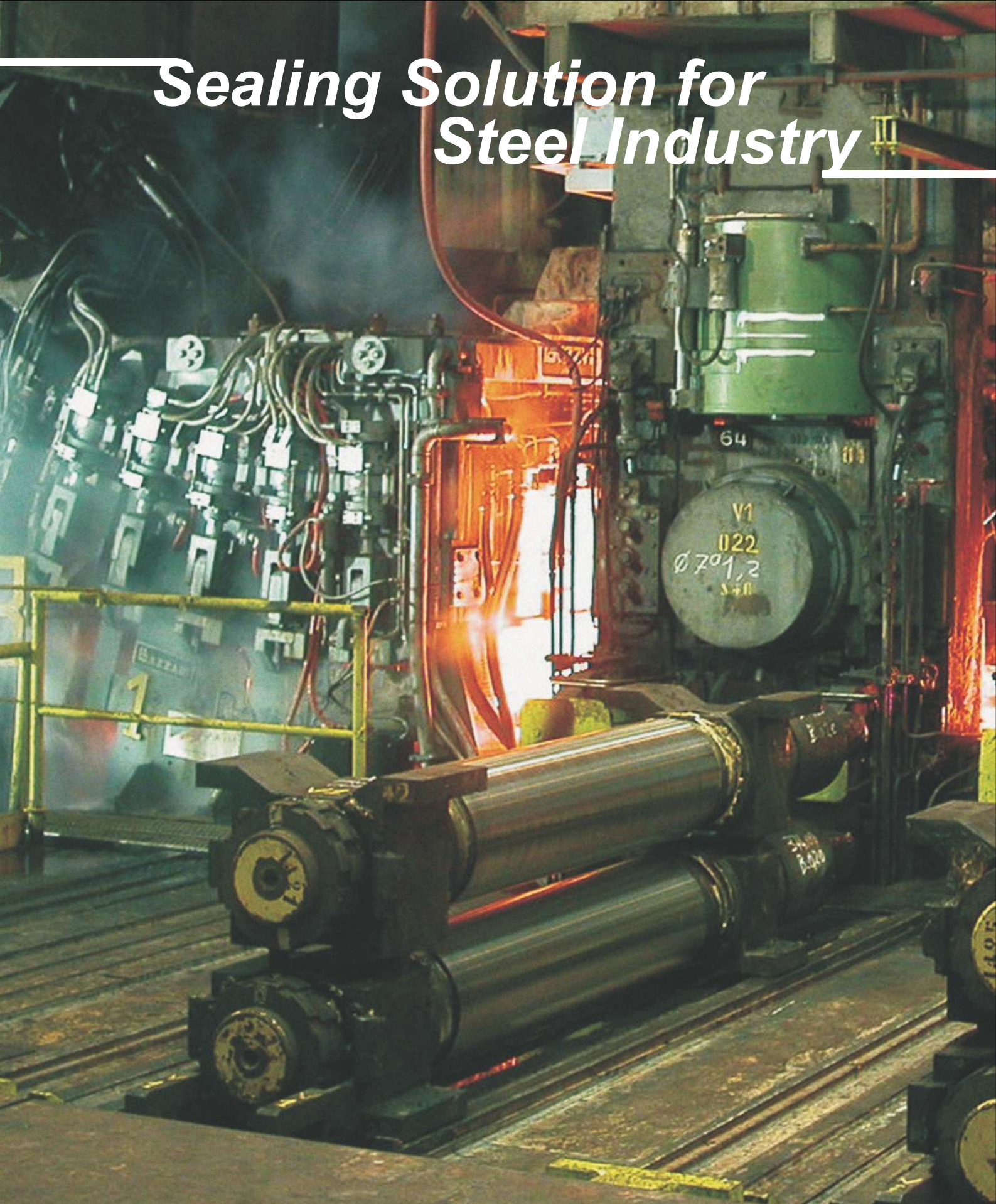
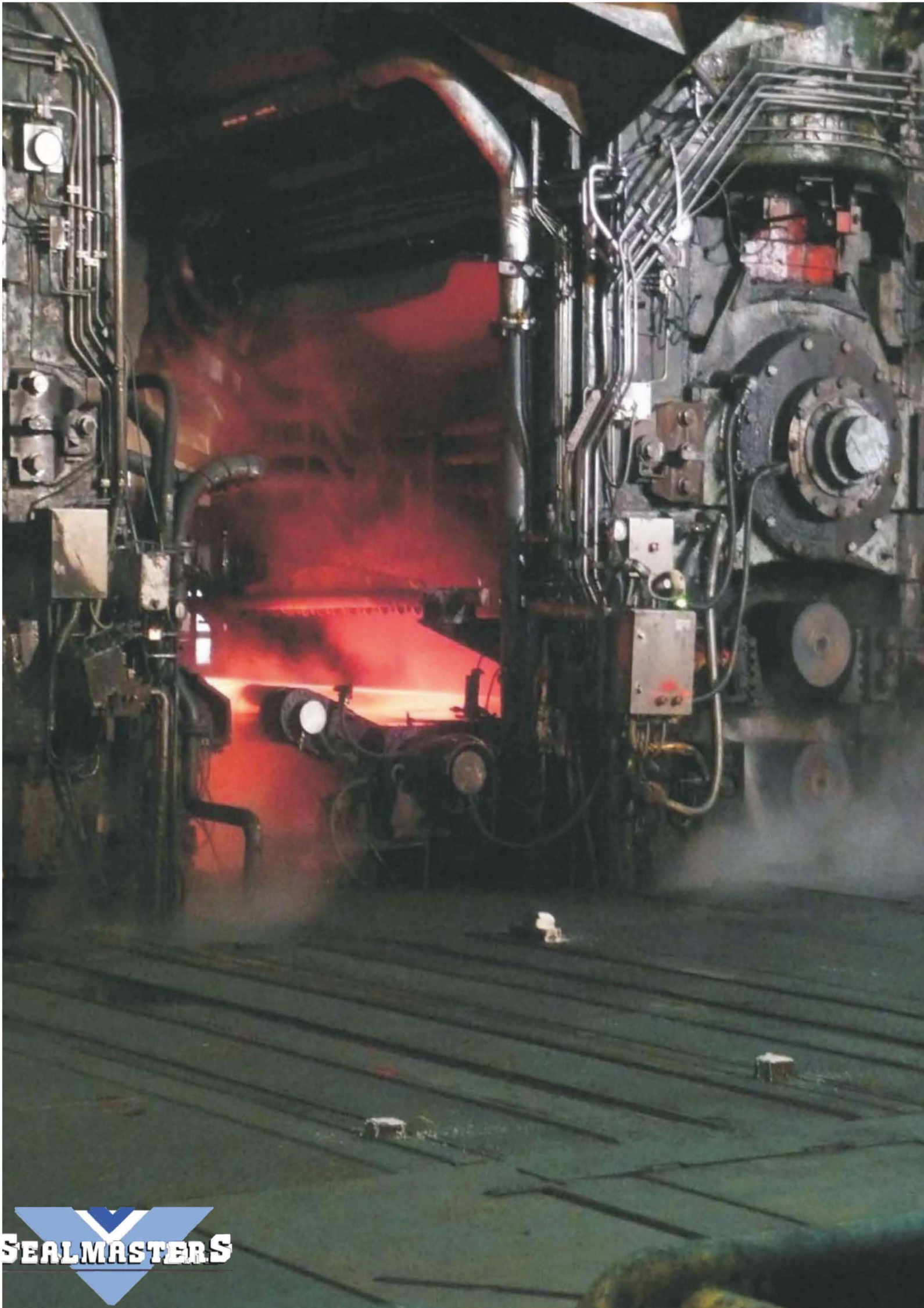


Sealing Solution for Steel Industry





Sealing Solutions for the Steel Industry

Sealmasters have, over many years formed long and enduring partnerships with leading seal manufacturers throughout the world providing standard & customized sealing solutions to clients across industries.

Having more than five decades of experience and expertise in serving our industrial clients, Sealmasters can with its wide range of seal profiles and elastomer's be fully capable of serving Iron & Steel Industries worldwide.

Sealmasters is involved in all different stages of Iron & Steel making process.

- High Speed
- High Pressure
- High Temperature
- Operating Reliability
- Economy & Long Life
- Customised Solutions

Sealmasters fully understand the requirements of each operation and our selection of appropriate seals and elastomer's provided long and exception service in operation.

We can offer Standard and Customised seals for Rotating and reciprocating applications, along with high pressure hydraulic seals up to 700 bar we can offer rotary seals with capabilities of speeds as high as 30 mtr/sec for rolling mill applications.

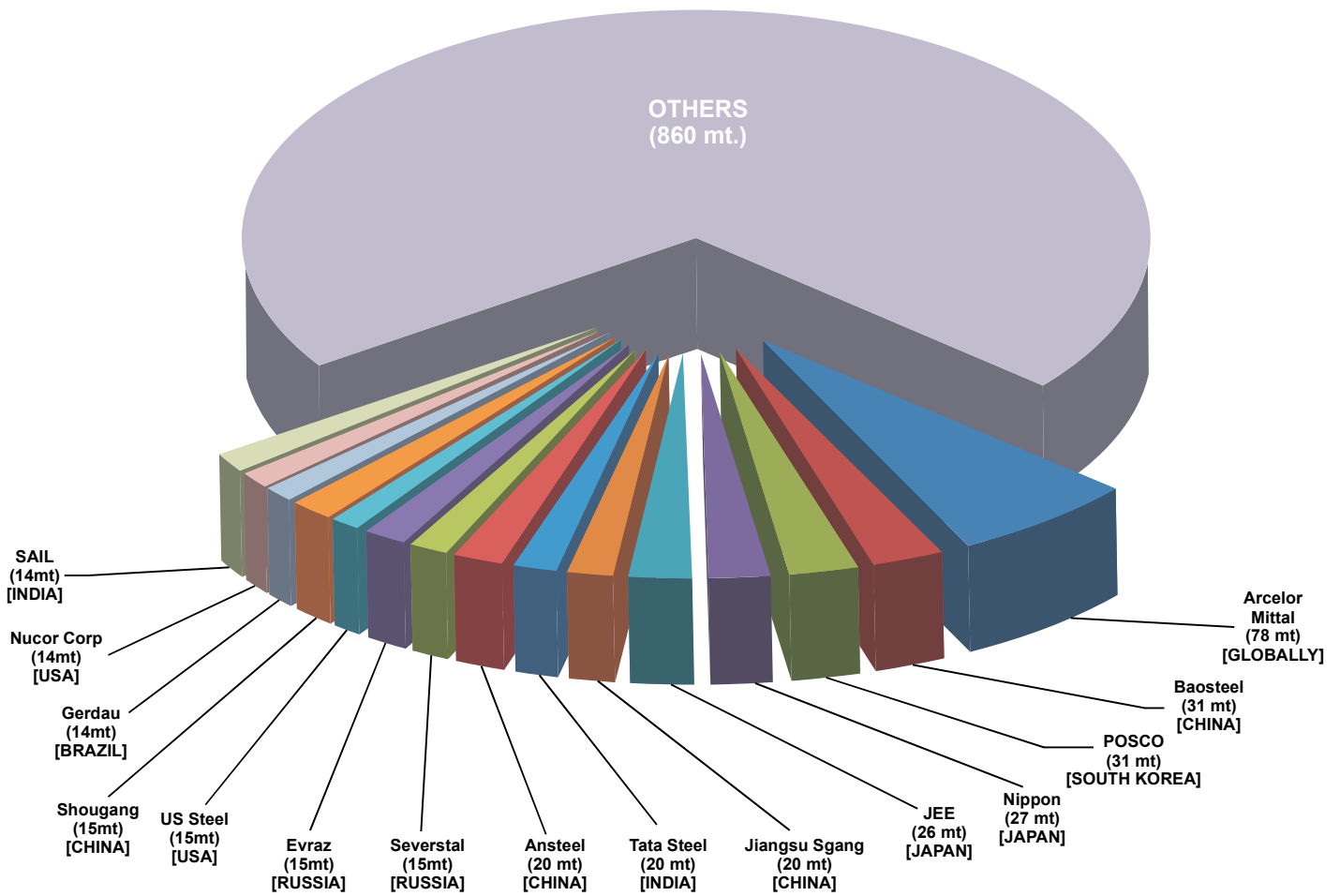
In some applications it is not the seal design that is an issue, but the ease of installation when faced with challenging conditions and environments in these applications, Sealmasters offers split seal solutions which reduces down time.

With our team of competence engineers, we are capable to offer sealing solutions without carrying out major modification in the existing setup. Our team is involved from to the designing, installation and monitoring the performance of the sealing solutions.

Our global presence enables Sealmasters to deliver sealing technology to places where it matters the most. From anywhere in the world we are just a phone call away from delivering the best sealing solutions.







ABOVE IS AN OVERVIEW OF THE TOP COMPANIES PRODUCING STEEL

Sealmasters involvement in Iron & Steel making process

- Material Handling Plant
- Blast Furnance
- Coke Oven
- Continuous Casting
- Hot & Cold Rolling Mill

Steel Products

- Hot rolled sheets
- Cold rolled sheets
- Flat products
- Galvanized sheets

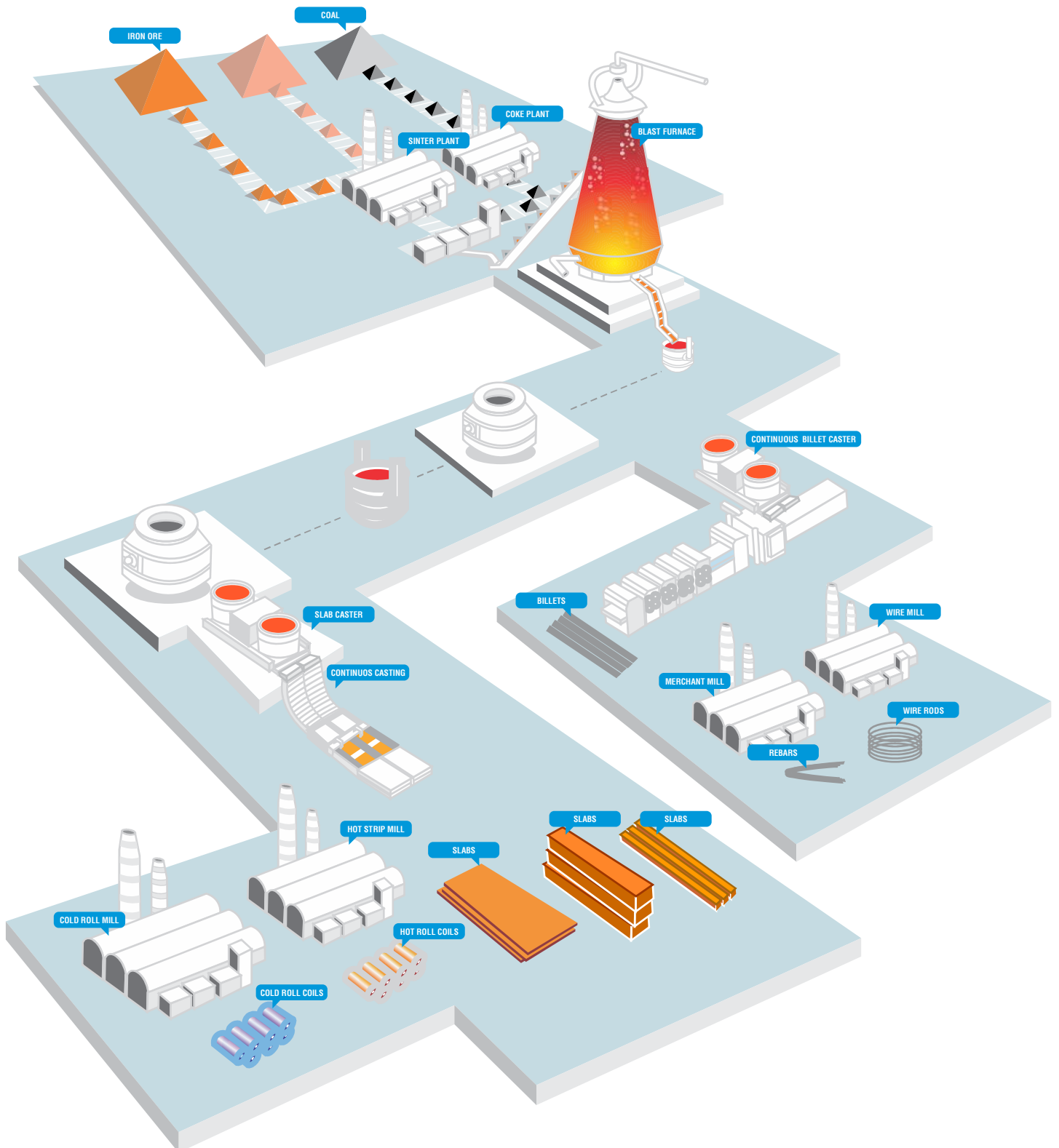
Long Products

- Long rail products
- Rolled wires
- Seamless pipes

Steel Making Process

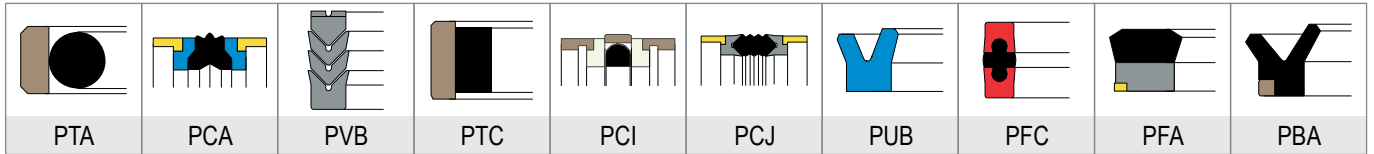


Sealmasters Seals are present at all different stages in steel industry across the globe. Start from iron ore processing till finished coils. Sealmasters have been providing technically advanced seals solutions to meet the needs of applications in these industries. Our involvement starts from application study, designing, material compounding, manufacturing to installation and monitoring performance.

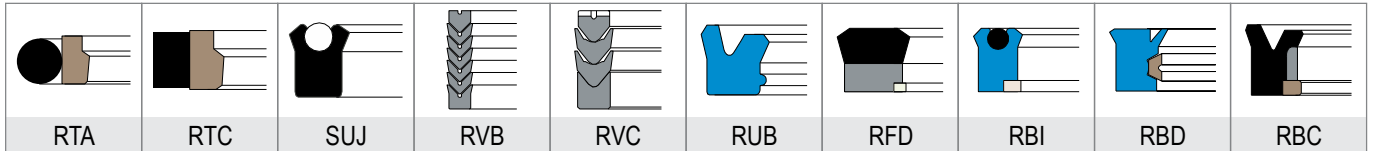


Sealmasters Product Line for Steel Industry -

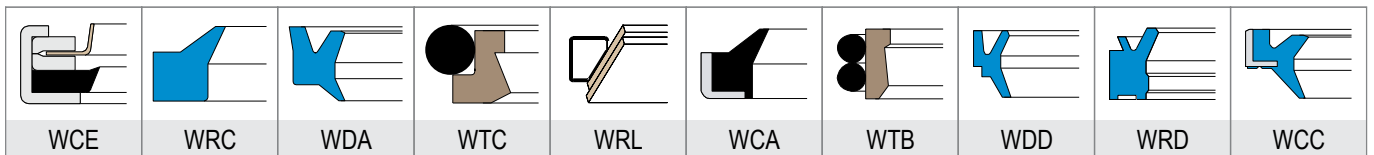
Piston Seal



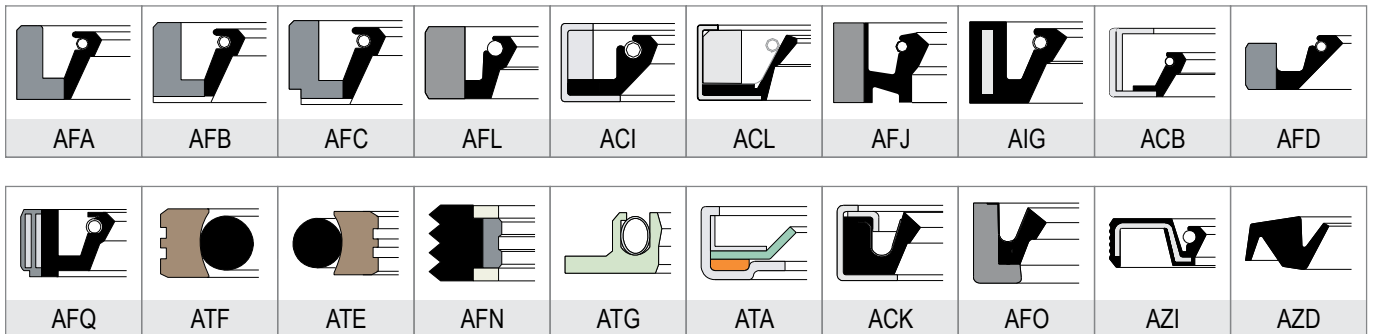
Rod Seals



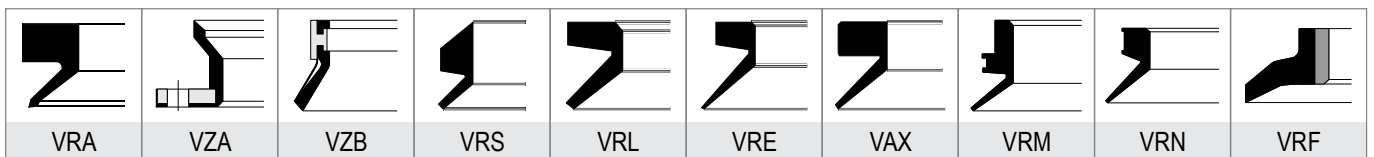
Wiper Seals



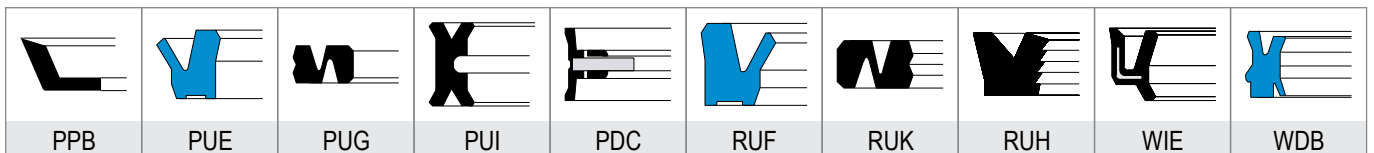
Rotary Shaft Seals



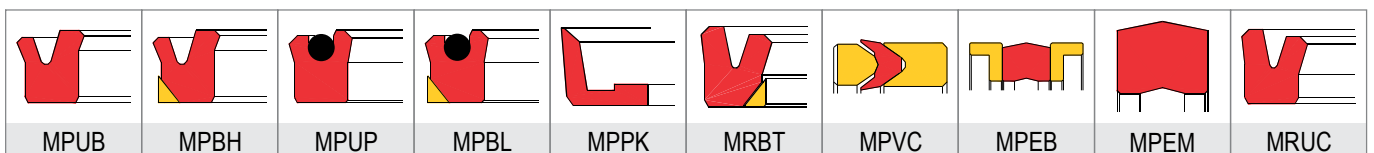
V-Rings



Pneumatic Seals



Jet Express Seals



Blast Furnace



The hottest place in the steel making process is in the blast furnace where the seals are exposed to high temperature. Sealmasters can offer seals that have been developed for some of the most critical equipment used in blast furnace in combination of elastomer and Teflon.



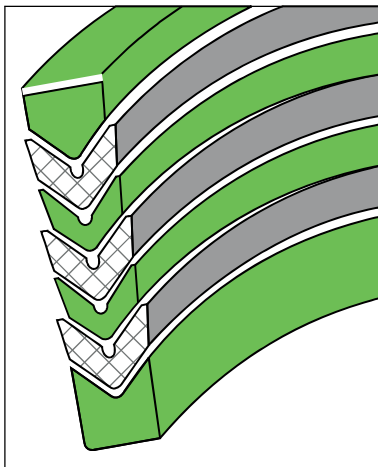
Tap Hole Drilling

The Tap Hole drilling used for tapping the furnace hearth for casting or draining iron and slag down is exposed to extremely high temperature. Thus, replacement of standard sealing system by a special designed seal kit made of teflon & elastomer achieved extension of lifetime of the seal in working condition.



Mudgun Ramming Cylinder

With the combination of Teflon & High Temperature resistance material, seals are developed for robust and reliable working conditions for such high end applications.



V-Packing Set consists of two support rings and two centre rings in Teflon & 3 centre rings in FKM fabric.

Working Conditions	
Pressure	400 Bar
Temperature	-40° C to +250° C
Speed	1 mtr/sec



Coke Oven

SEALMASTERS

Coke
Oven



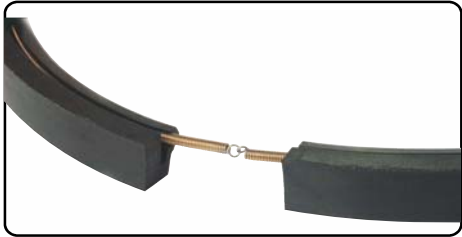
In coke oven applications the most critical concern is reliability, Sealmasters with our partners have developed sealing profiles in combinations of elastomer and Teflon which achieved a tremendous extension of the lifetime of the seal.



Converter

Dismantling equipment and replacing seals is time consuming and therefore expensive. Sealmasters offers its split seal range for such applications which reduces down time and production loss.

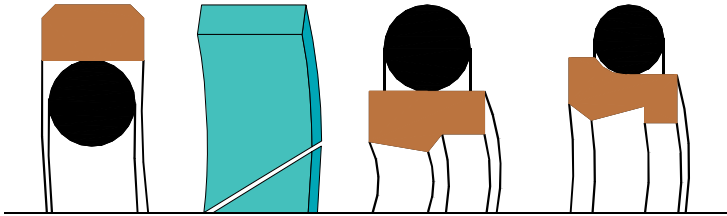
Sealmasters have developed Split Seals which enables to reduce down times for replacing the seals with its range of profiles with combination of rubber fabric material.



Continuous Casting

Continuous Casting Plant is operating 7 days a week. Thus required reliability of seals. Shutdown of this process leads to high production losses.

Sealmaster offers high end Rubber & Thermoplastic Material in combination of seal profile which given optimum life of the seals in working condition.

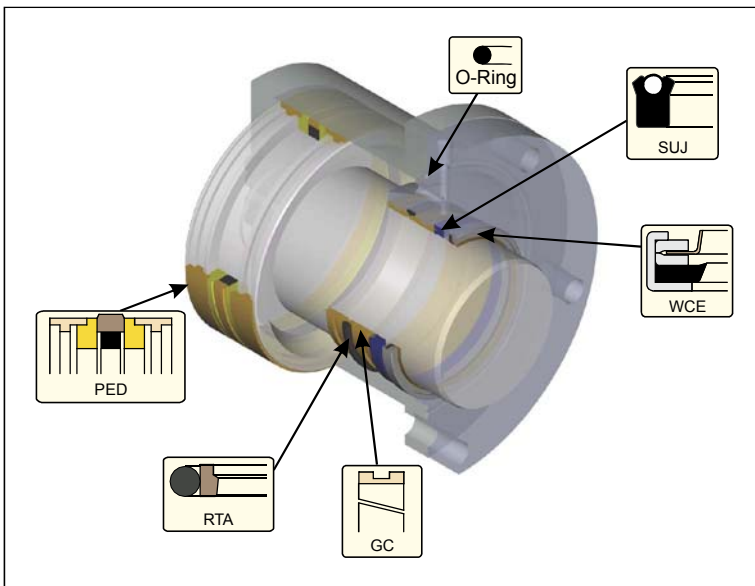


Sealing system for Guide Segment Hydraulic Cylinders in CCP



Working Conditions	
Pressure	400 Bar
Temperature	-40° C to + 250° C
Speed	10 mtr/sec

Hot & Cold Rolling Mill



Sealmasters Sealing System for Work Roll Bending Cylinder / Back-up Roll Balancing Cylinder

Working Parameters	
Pressure	Upto 300 Bar
Temperature	-30° C to +100° C (Viton matl. upto +220° C)
Speed	1 mtr/sec
Size Range	Upto 7"

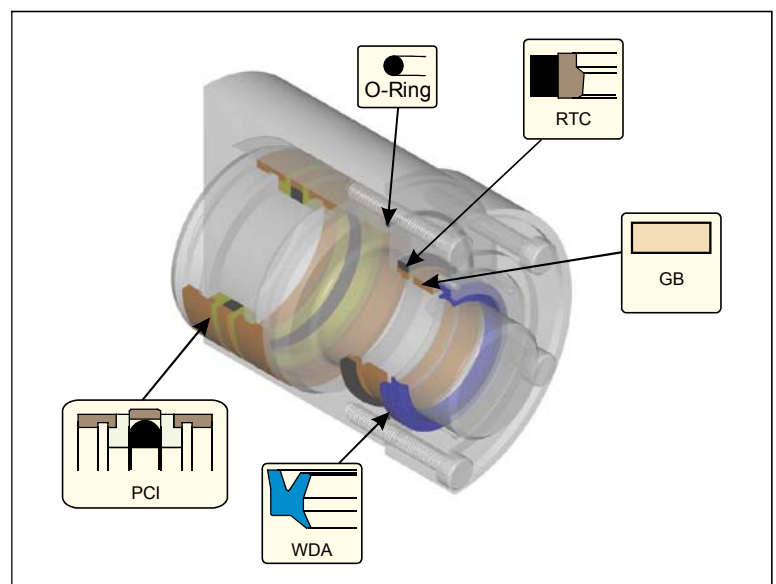
Sealmasters Sealing System for Hydraulic Automatic Gauge Control (HAGC) Cylinders

Scope of Developments -

- In house modifications for existing grooves
- Long Term effective solutions
- Standard Size
- Cost Saving

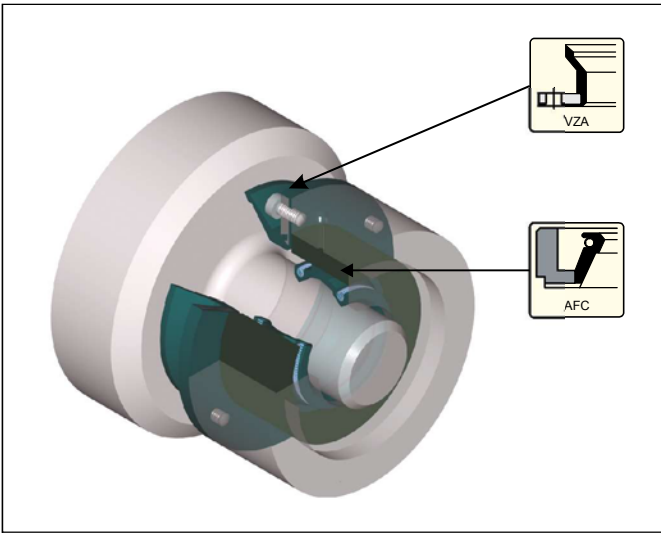
Features -

- High Load Bearing Rings
- Very Low Friction. No Stick-Slip
- Proven Design
- Heavy Duty Seal Profile Construction
- Long Service Life.
- Easy Installation



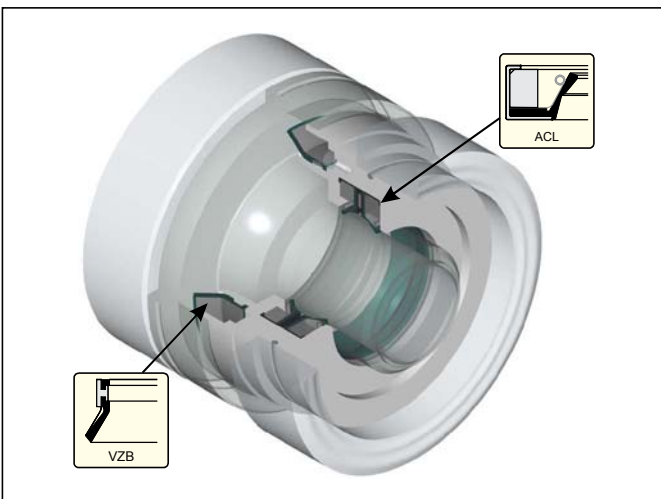
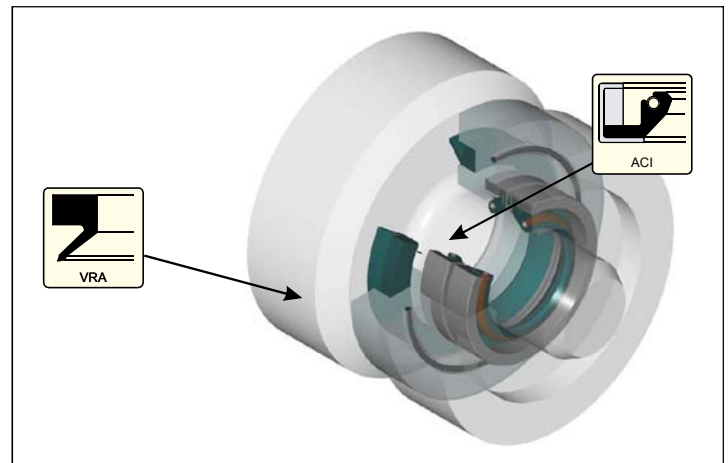
Working Parameters	
Pressure	Upto 500 Bar
Temperature	-30° C to +100° C (Viton matl. upto +220° C)
Speed	1 mtr/sec
Size Range	20" to 60"

Sealmasters Sealing System for Roll Shop Work Rolls and Back-up Rolls



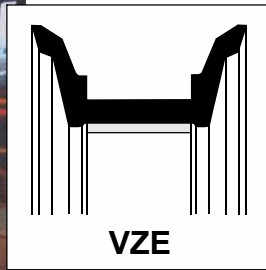
Working Parameters			
	NBR	HNBR	FKM
Temperature	-30° C to +100° C	-30° C to +140° C	-40° C to +220° C
Speed	10 m/s	15 m/s	20 m/s
Size Range	1" to 40"		

Working Parameters			
	NBR	HNBR	FKM
Temperature	-30° C to +100° C	-30° C to +140° C	-40° C to +220° C
Speed	20 m/s	25 m/s	30 m/s
Size Range	5" to 60"		



Working Parameters			
	NBR	HNBR	FKM
Temperature	-30° C to +100° C	-30° C to +140° C	-40° C to +220° C
Speed	30 m/s	32 m/s	35 m/s
Size Range	10" to 60"		

(Given Speed Values may vary depending upon actual working parameters)



FRONT VALVE SEALS

This seals are developed in WRM for module. Specially design sealing element with steel band offers high wear resistance and excellent performance.

- Speed - 2 mtr/sec
- Size Range - 4", 6" and 8"

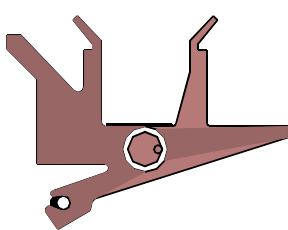
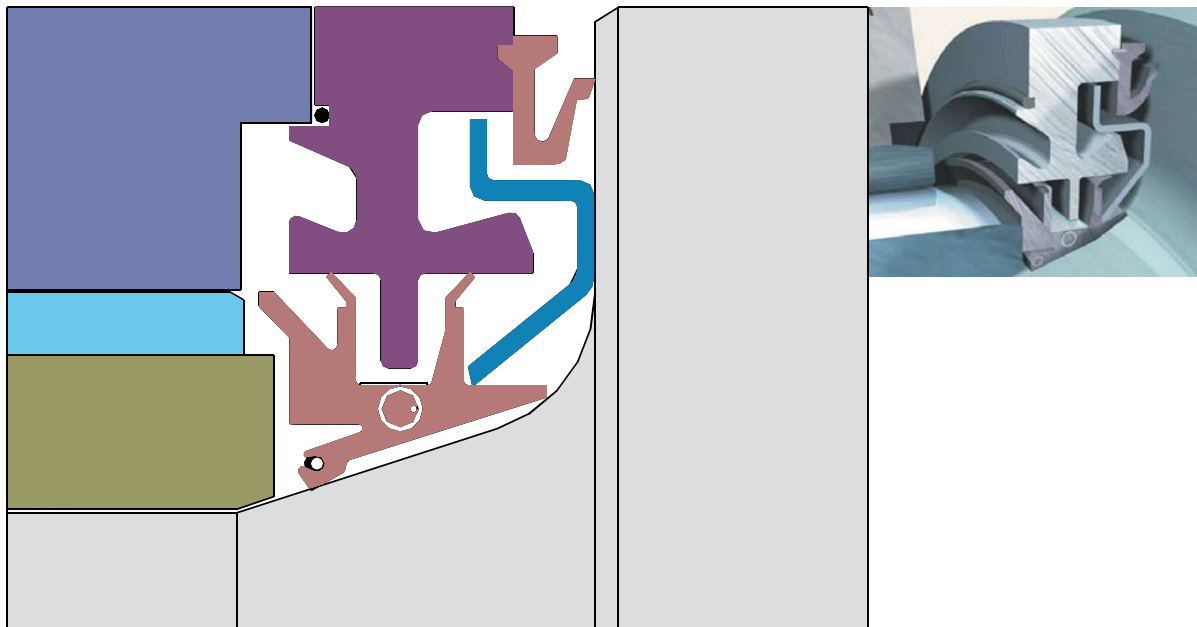
NECK SEALS

Sealmasters supply a developed Neck Seals for domestic and international steel industries.

This neck seal series is available in both ANA & ANB style to meet customers requirement.

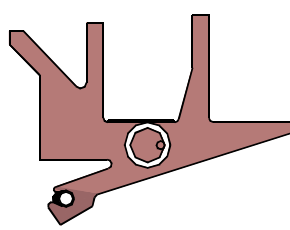
With the special material compound and stringent manufacturing process this neck seal had proven good performances and optimum service life.

Every size of neck seal can be supplied along with its corresponding watergard seal or the single neck seal and watergard seal.



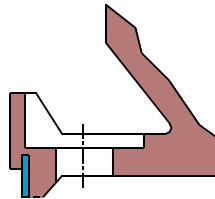
TYPE:- ANB

Developed Sizes -
12", 16", 21",
44", 46", 48", 50"



TYPE:- ANA

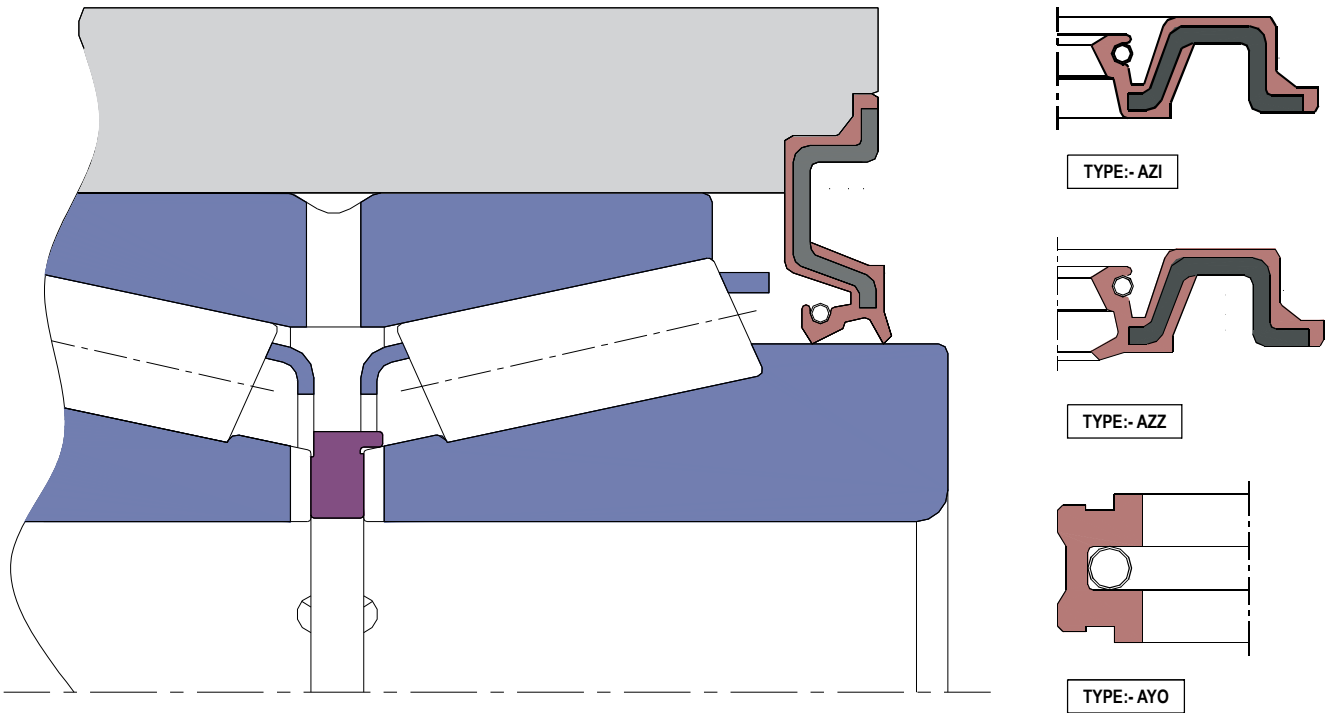
Developed Sizes -
10", 14", 16", 18",
24", 48", 50", 54"



TYPE:- WATERGARD

Taper Roller Bearing Seals -

Sealmasters supply a developed inner & outer seal for Taper Roller Bearings used in work roll and intermediate roll chocks. AZI & AZZ seals are constructed with a metal insert with rubber covered outer diameter. Spring loaded single and dual lip made out of FKM or HNBR elastomer.



* Assembly shown is just for an example purpose, it may vary to the actual bearing assembly.

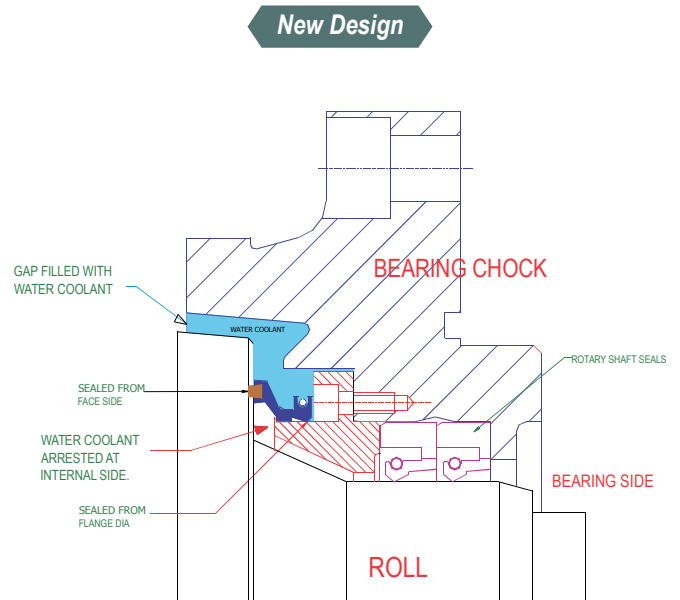
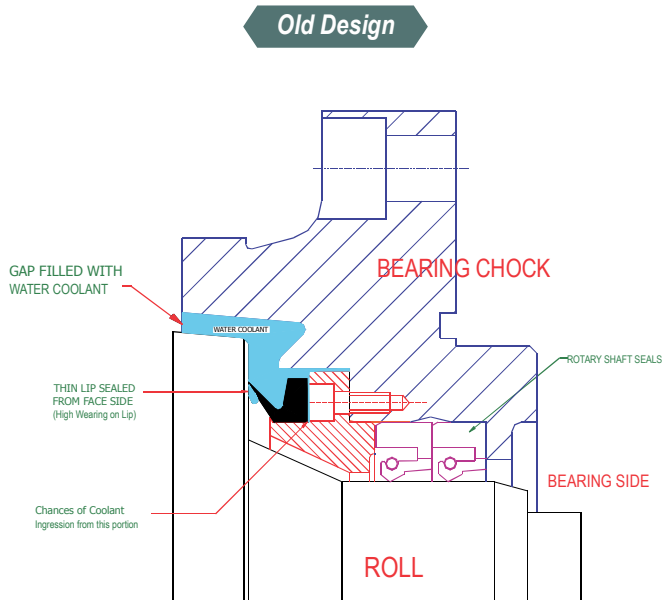
Special seals for different application in steel making process -

Sealmasters continually supply specially developed seals in various applications in different stages of steel making process. Seals for valves, actuators, accumulators, rolling mills, furnace equipments are supplied in different elastomer materials. The size range of these seals are covered upto 2 mtr. in diameter. You can place your trust in Sealmasters for these kinds of special requirements.

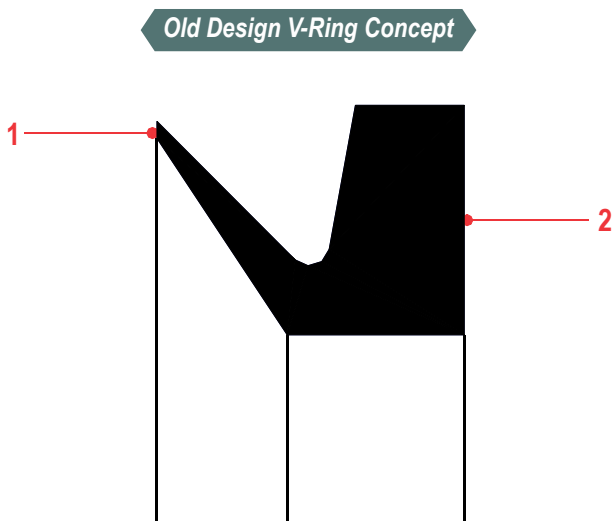
Location : Pellet Plant Description : Sealing ring for discharger air sealing of HBFS 120/10 Size : $\varnothing 1500.00$ mm	Location : Rolling Mill Description : Oil seal for model Y for R2 work roll chock assembly Size : $\varnothing 900.00$ mm	Location : Coke Oven Description : Piston seal for stove accumulator Size : $\varnothing 350.00$ mm	Location : Blast furnace Description : Seal for lower seal valve Size : $\varnothing 1000.00$ mm	Location : Blast Furnace Description : Bleeder Valve Seals Size : $\varnothing 800.00$ mm

Development of Topguard: -

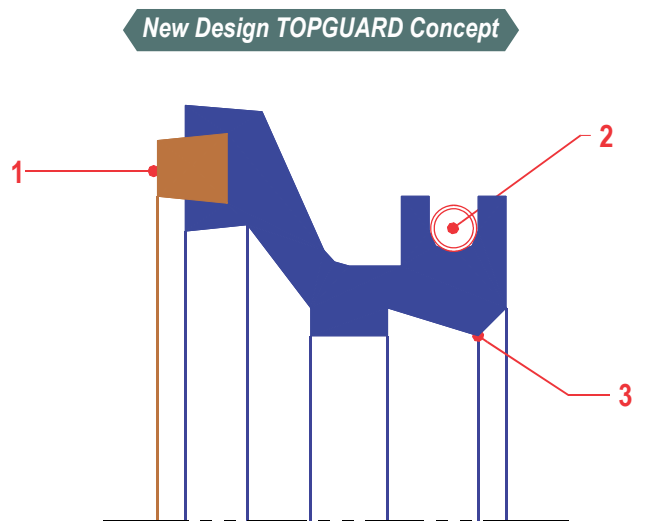
Sealmasters offer customised sealing solution in steel mill according to the requirement and encountering the problems by giving best sealing solution without doing major modification in existing assembly. Below shown design is one of an example of such development.



Sealmasters proposed assembly with new developed TOPGUARD coolant seal

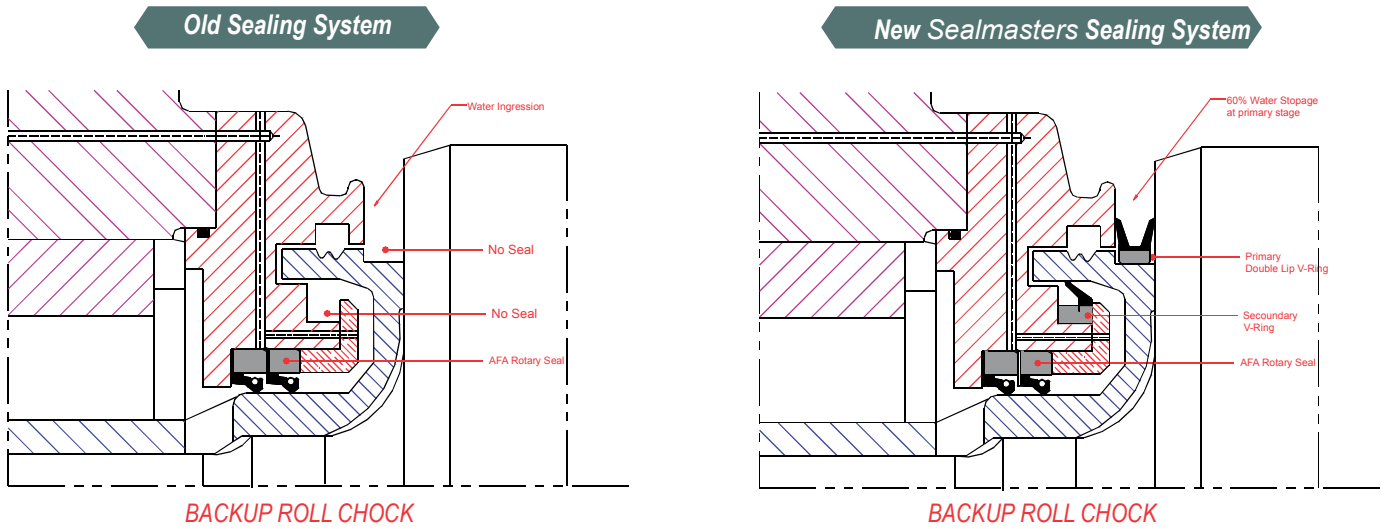


1. Thin Lip surface in contact with roll face
2. Flat body contact with uneven surface of flange



1. Bronze filled PTFE insert Lip for good wear resistance
2. Spring to hold the Lip tight on flange
3. Sealing lip profile to seal coolant from opposite side

Development of Sealing Solutions for Backup Roll: -

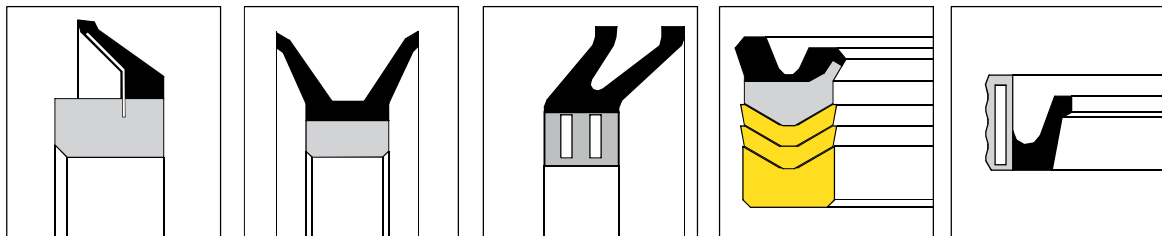


Above is an example of development in one of the steel mill done by Sealmasters which had proven the performance and drastically reduced the ingression of coolant into the bearing and had increased the life & performance of an expensive bearing.

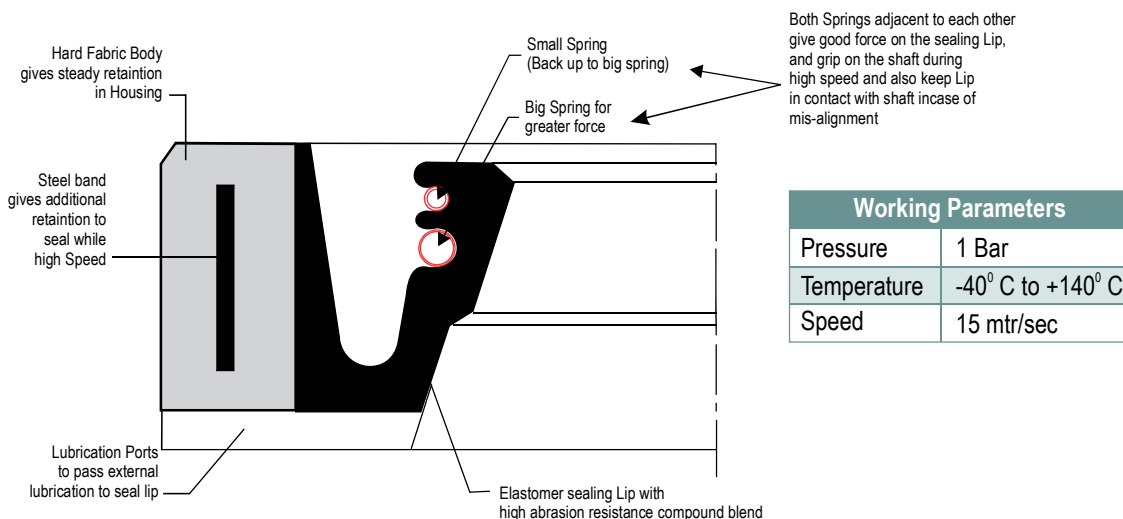
Development of Customised Profile: -

Highlights :-

Sealmasters has developed sealing solutions for Hydraulic and Rolling Mills for Steel Industry by offering customized sealing concepts to overcome the existing problems by developing new sealing profiles with suitable material according to the working parameters. The below given seals profiles are some of the examples developed.



Force - 2K10 type Rotary Seal for Backup Roll Chock. (Hot Rolling & Cold Rolling Mill)



Elastomers

Materials (Commonly known as)	Material Description	Temp. Range
Nitrile	Acrylonitrile Butadiene Rubber (NBR)	-40° C to +100° C
Viton®	Fluro Rubber (FKM)	-40° C to +220° C
Silicon	Silicon Rubber (VMQ)	-70° C to +200° C
EPDM	Ethylene Propylene Diene Rubber	-40° C to +120° C
Neoprene®	Chlorobutadiene Rubber (CR)	-20° C to +100° C
VAMAC®	Polyacrylic Rubber (ACM)	-10° C to +125° C

Acrylonitrile Butadiene Rubber (NBR)

Hardness	Material Code
NBR 70°/75° Shore 'A'	NT4/b
NBR 80°/85° Shore 'A'	NT5/b
NBR 90°/95° Shore 'A'	NT6/b

Commonly known as **NITRILE** or **BUNA-N**.

Nitrile rubber is the sealing material most frequently used in Hydraulic & Pneumatic systems because of its excellent resistance to mineral oil based fluids, greases, water & hydrocarbon fuels. It has good physical characteristics such as abrasion resistance and good compression set.

NBR is not suitable to Aromatic hydrocarbons, chlorinated hydrocarbons, automotive brakes fluids, and some fire resistant hydraulic fluids.

Hydrogenated Acrylonitrile Butadiene Rubber (HNBR)

Hardness	Max Spare Code
HNBR 70°/75° Shore 'A'	NT42/a
HNBR 80°/85° Shore 'A'	NT42/b
HNBR 90°/95° Shore 'A'	NT34

HNBR has good heat resistance, oil resistance & resistance to number of aggressive chemicals. The material exhibits high mechanical strength and improved abrasion resistance. It also has superior resistance to weathering, ozone and hot air and very good resistance to technical oils, even in the presence of hydrogen sulphide and amines.

Polyurethane (PUX)

Hardness	Max Spare Code
92°	PUX

PUX material is a special grade polyurethane capable to withstand temperature upto +110°C, compared to normal grade PU material. Besides temperature resistance it exhibits good wear & tear properties, abrasion resistance, extrusion strength and good flexibility.

Thermoplastics & Thermosets

Materials (Commonly known as)	Material Description	Temp. Range
PU	Polyurethane	-30° C to +100° C
Teflon®	Polytetrafluorethylene (PTFE)	-200° C to +260° C
PTFE Compounds (Bronze / Glass / Carbon / Graphite)		-200° C to +260° C
TPE	Polyester Elastomer	-50° C to +110° C
PF	Phenolic Resin Bonded Fabric	-20° C to +120° C
Delrin®	Polyacetal (POM)	-40° C to +140° C
G.F. PA66	Glass Filled Polyamide (Nylon)	-20° C to +220° C
PEEK	Polyetherether Ketone	upto +315° C

Fluro Rubber (FPM)

Hardness	Material Code
FPM 70°/75° Shore 'A'	VT2/b
FPM 80°/85° Shore 'A'	VT3/b
FPM 90°/95° Shore 'A'	VT4/b

FPM Rubber is commonly known by DU PONT trade name **VITON**. The main characteristics of FPM are that it is resistant to high temperature & their chemical stability. Also displays minimal weight loss in high vacuum & also, its permeability to gases is low.

VITON is compatible to fire resistant Hydraulic fluids, hot oils, greases, hydrocarbon, chlorinated hydrocarbons & most organic acids, even at high concentrations and with / against a number of organic compounds. It has excellent resistance to hot water and to steam.

FPM, however is not resistant to methanol, keytones, esters and ethers.

HNBR with PTFE Filler

Hardness	Max Spare Code
HNBR 80°/85° Shore 'A'	NT34/b

This specially developed compound is very good for low friction and low abrasion resistance. Mostly this material are used for seals subjected to dry run.

Polyamide (Nylon)

Hardness	Max Spare Code
M 95°	NY-X

NY-X grade polyamide have capability to withstand temperature upto +290°C compare to other grade polyamide. It has good slide and wear characteristics. The materials are continually resistant to solvents, grease, fuels, oils and acids. Strong acids, alkalis and hot water attack polyamide.

STEEL MILL



- » HAGC Cylinder
- » Bending & Balance cylinder
- » Work Roll & Backup Roll chock

OIL & GAS



- » Extreme Pressure
- » Robust working conditions
- » Long service life

POWER PLANT



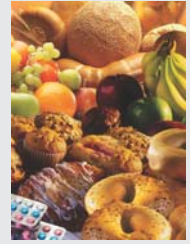
- » Turbines
- » Boilers
- » Coal Pulveriser
- » Roller Journal Assy

PULP & PAPER



- Pneumatic Valves
- Pneumatic Actuators
- Hydraulic Cylinders
- Pneumatic Cylinders
- Calendar Roll Seals

FOOD & PHARMA



- » Food Compliant Material
- » Aggressive Fluids – CIP & SIP Process
- » High Temperature Solutions in Bakery products

TYRE INDUSTRY



- » Tyre Curing Presses
- » Bladder Machine

EARTH MOVING INDUSTRY



- » Steering Cylinder
- » Boom Lifting Cylinder
- » Bucket Cylinder
- » Telescopic Cylinder
- » Axial Grease Seals

PRESS FORMING INDUSTRY



- » Heavy Duty Presses
- » Hydraulic Presses
- » Mechanical Stamping
- » Presses
- » Forming Presses

ALUMINIUM INDUSTRY



- » Crust Breaker Cylinder
- » Point Feeder cylinder
- » Tapping Breaker cylinder
- » Vacuum seals
- » Pneumatic Breaker

CHEMICAL & FERTILIZER



- » Sealing of a coolant compressor with multiple mechanical seals
- » PTFE gaskets and tapes
- » Metal expansion joints

SUGAR INDUSTRY



- » There are numerous rotating equipment which require sealing in sugar industry.

AUTOMOBILE INDUSTRY



- » Transmission Gear Box
- » Axels
- » Shock Absorbers

VALVE INDUSTRY



- » Petroleum Line Valves
- » Gas Line Valves
- » Valve Seat
- » Butterfly Valve Seat

WIND MILL



- » Gear Box
- » Pitch Cylinder
- » Pulse Encoder Seals
- » Main Bearing Rotary Seals

HYD. & PNEU. CYLINDERS



- » All types of Piston single and double acting seals for pressure range start from 0 to 2500 bar.

ENGG. & FABRICATION



- » Various types seals and customised solutions are available in this segment. From machine tools to maintenance & overhauling work.

HYDRO POWER



- Keplan Turbine Blades
- Wicket Gates
- Servomotors & Navlock Cylinders

CEMENT



- » All types of Piston single and double acting seals for pressure range start from 0 to 2500 bar.

TEXTILE INDUSTRY



- » Motors
- » Spinning

PUMP MOTOR & GEAR BOX



- » High Speed
- » High Pressure
- » Temperature resistance
- » Media resistance
- » Operating reliability



Steel Mills of The World



Arcelor Mittal (Germany)



Thyssen Krupp Steel (Germany)



Tata Steel



JSW Steel



Steel Authority of India (SAIL)



Essar Steel



Bhushan Steel



Uttam Steel

