



Insist on Excellence
Create Customer Value

Company Profile

DESIGN – PROBLEM SHOTTING – VALIDATION – PRODUCTION

TCS Oil Seal, CHENG MAO PRECISION SEALING CO., LTD. Founded in 2007 in Nantou City, Taiwan. TCS is a leading oil seal supplier/manufacturer with more than 40 years experiences in advanced oil seals, professional with high quality elements and experiences in the areas of oil seals, packing, U-cups, gaskets, rubber parts and o-rings. With certification of IATF 16949 and ISO 9001, TCS is capable of producing sealing products from design, researching, tooling development, testing, and trial mold to finish products independently.

Our professional in-house tooling design, product development and quality control ensure the sealing performance and reduce the cost. In addition to the standard types, please feel free to contact us, we are glad to provide a total sealing solution for you!



TCS serves our clients over 40 countries from OEM, ODM, and aftermarket to non-standard sealing designs and seal manufacturer. We offer variety ranges of high quality sealing products to fulfill different applications.

Certifications

TCS Seals is IATF 16949 / ISO 9001 certified.

Our organizational structure is well-positioned to growth.

We value quality, technical support, and services.

Research Technology

For Production

Automatic CNC Lathes
 Rubber Compound Kneaders
 Rubber Cutters /Rubber Extruders
 Rubber Low Temperature Storage
 Sanding Machines /Bonding Machines
 Rubber Compression Molding Machines
 Injection Molding Machines
 Trimming Machines
 Automatic Spring Loading Machines
 Automatic Greasing Machines
 Automatic Optical Sorting Machines
 Laser Engraving Machines

For Material Research

Moving Die Rheometer
 Tensile Tester
 Specific Gravity Tester
 Carbon Black Dispersion Tester
 Fourier Transform Infrared Spectroscopy
 Rubber Hardness Tester (Shore A)
 Salt Spray Tester
 Moony Viscosity Tester
 Low Temperature TR10 Tester
 Low Temperature Brittleness Tester
 Mechanical Convection Oven
 Rockwell Hardness Tester
 Damping Tester
 Compression Set Tester

For Design and R&D

Steering Seal Tester
 Radial Load Tester

For QC

Automatic Optical Inspection, AOI
 Automatic Image Measuring Instrument
 Micro-Vu
 Electronic Tensile Testing Machine
 Surface Roughness Measuring Instrument



CNC



Materials Laboratory



Steering Seal Tester



Seal Dynamic Tester



Sample Parameter Setup

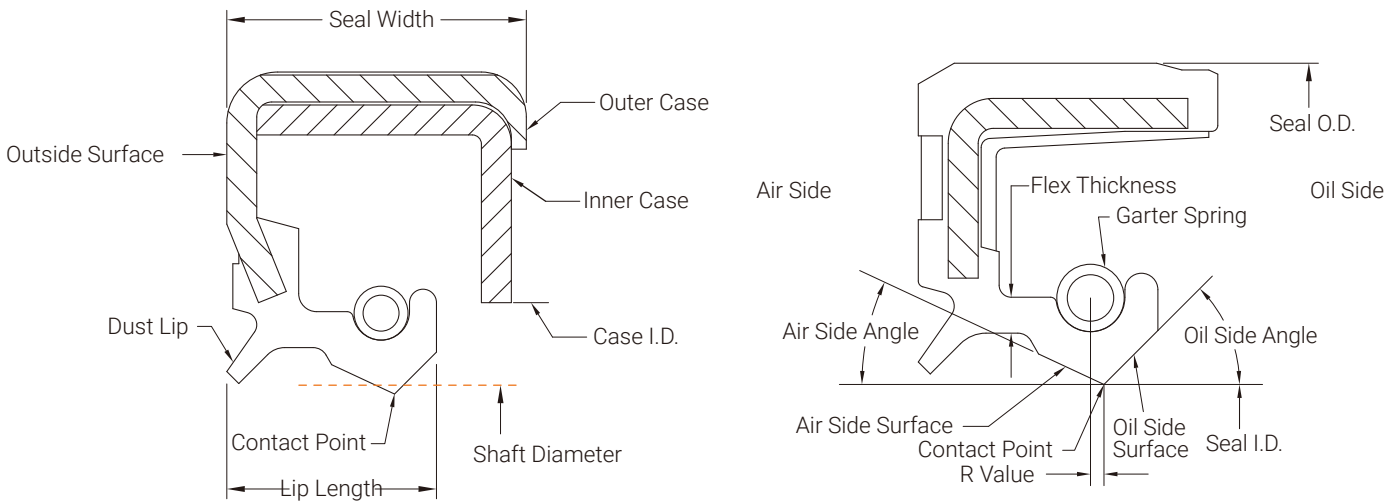


Rheometer



Rubber Hardness Tester

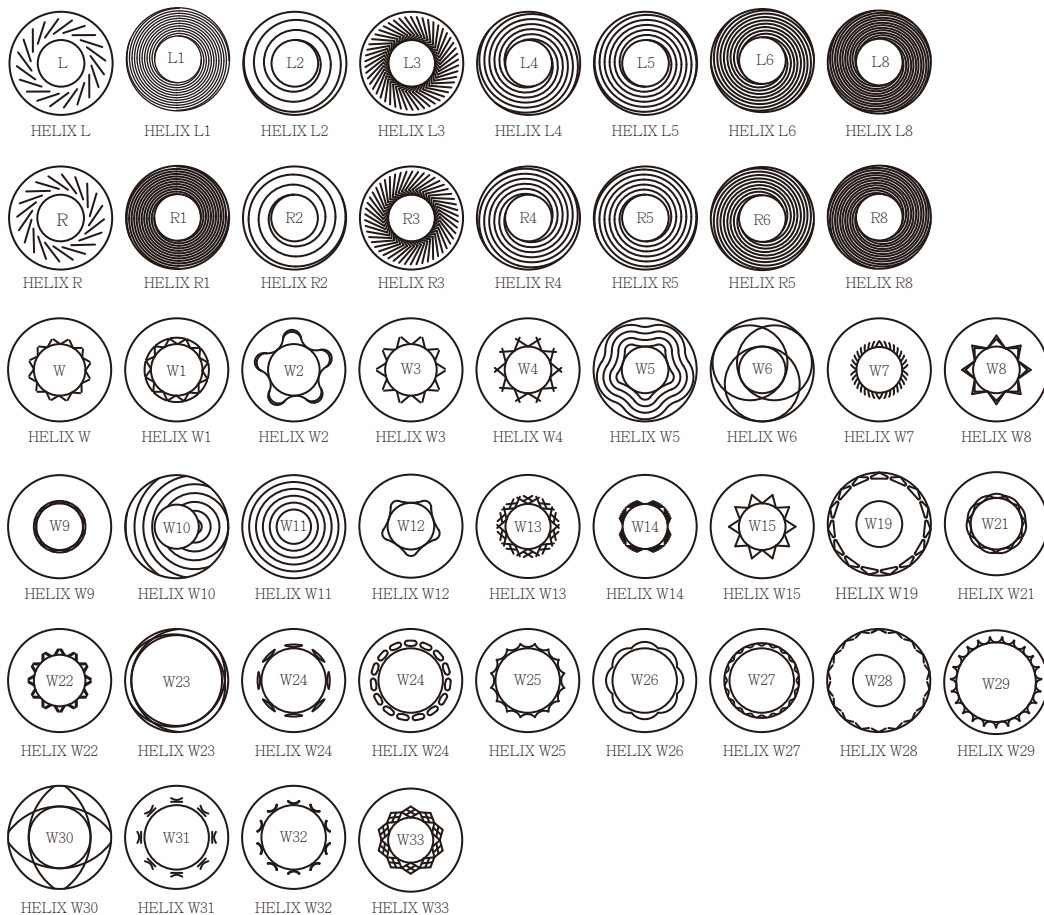
Oil Seal Characteristic



Hydrodynamic Features - Helix Designs

The helix can improve the performance of sealing lip by pushing the medium back into the fluid reservoir.

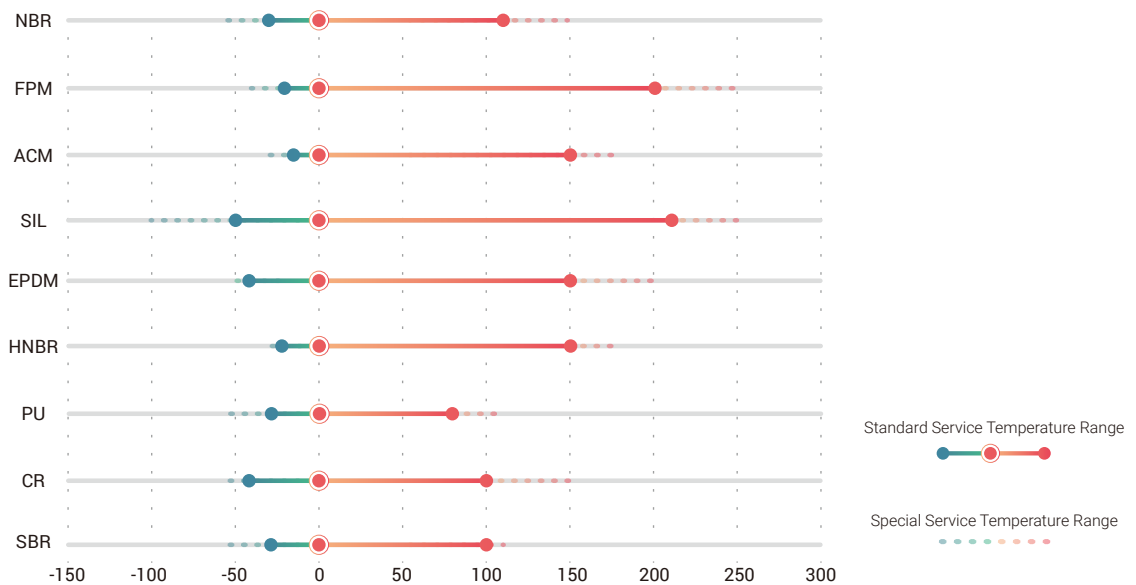
The helix applies to all rotary seals. There are three types available: Bi-directional (W Type), Counter clockwise (R Type) and Clockwise (L Type):



Rubber Specifications

	NBR	FPM	ACM	SIL	EPDM	HNBR	PU	CR	SBR
Tensile Strength	●	●	▼	▼	△	◎	◎	●	△
Elongation	●	▼	▼	◎	●	■	◎	●	△
Rebound Resistance	●	△	△	△	●	■	◎	◎	△
Tear Resistance	●	△	▼	▼	△	●	◎	●	△
Abrasion Resistance	◎	△	△	▼	●	◎	◎	●	●
Impact Strength Resistance	●	△	▼	▼	●	◎	◎	◎	■
Gas Impermeability Resistance	●	●	△	▼	△	■	●	●	■
Ozone Resistance	▼	◎	●	◎	◎	■	●	●	▼
Weathering Resistance	△	◎	●	◎	◎	■	●	●	▼
Flame Resistance	▼	◎	●	◎	◎	■	●	●	△
Heat Resistance	△	◎	●	◎	◎	●	△	●	●
Low Temperature Resistance	△	●	▼	◎	●	■	●	△	■
Oil and Fuel Resistance	●	◎	●	△	▼	●	●	■	▼
Animal and Vegetable Oil Resistance	◎	◎	◎	■	●	●	●	●	▼
Alcohol Resistance	●	●	●	●	■	■	■	◎	●
Alkaline Resistance	●	■	▼	▼	●	■	▼	◎	●
Acid Resistance	●	●	△	△	●	■	▼	●	●
Aliphatic-solvent Resistance									
- Aliphatic	◎	◎	◎	▼	▼	●	●	●	◎
- Aromatic	■	◎	△	▼	▼	■	▼	△	■
Oxygenated-Solvent Resistance	▼	▼	▼	△	◎	▼	▼	▼	▼
Water Resistance	●	●	▼	●	◎	■	△	●	●
Sodium Resistance	■	■	▼	■	■	■	■	●	■

◎ Excellent ● Good ■ Suitable △ Limited ▼ Poor



For Automotive

Zero Defect Policy Automotive Seals

To obtain in highly competitive innovation, technology and economic solutions to automotive industry.

TCS OIL SEAL owing its ISO 9001 and IATF 16949 certifications to build up eco-friendly working environment and manufacturer, which provides our global automotive customer to improve better solution on sealing systems. PPAP, ISIR, IMDS, PSW documents available by on-site lab.

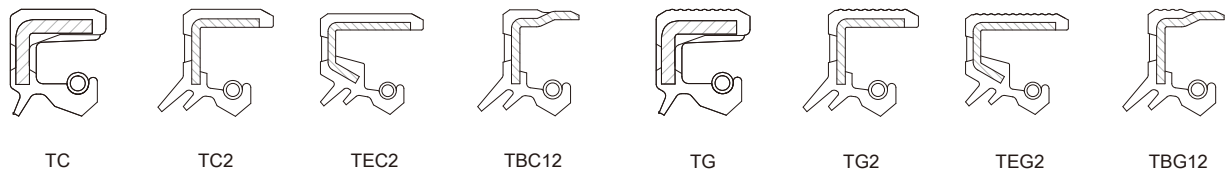


EV Seals

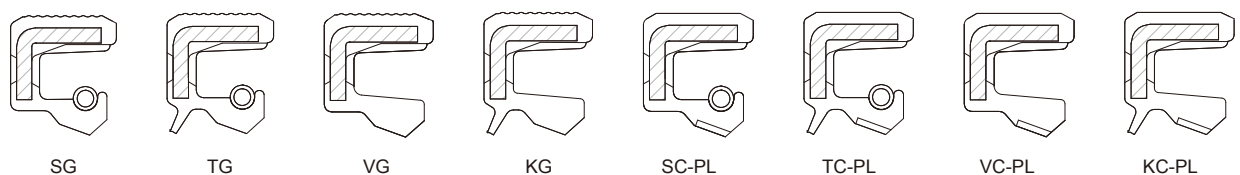
In order to obtain the rapidly changed market for electric vehicles, the function of EV seal requires high improvement than gasoline vehicle seals. Electric vehicle engines run around 15000RPM to 16000RPM, faster than gasoline-powered vehicles.

In the electrical vehicle shaft, the electric motor and gearbox are in the same area. The gearbox is lubricated for high efficiency; however, the motor is kept dry. Therefore, we provide more precision oil seals to meet these requirements.

TCS material lab provides suitable material (ACM, AEM, FKM, PTFE, etc.) as per customer needs; we can also customize the products to achieve sealing effect.



High Speed Rotary Shaft Seals



For Automotive

Power Steering Oil Seals

The "Power Steering Oil Seal" is used in the power steering system of automobiles. Its function is to prevent dust, sand, and water from entering the steering system, keep gears lubricated, and ensure the normal operation of the power steering system.

- Inner diameter back-up ring design to enhance the pressure resistance of the oil seal.
- Helix design on lip is designed to return the oil to the oil side, prevent oil leakage, reduce friction and temperature rise.
- Operation methods include rotary and reciprocating, which function to prevent pressure loss and ensure the normal operation of the power steering system.
- Material: NBR/HNBR

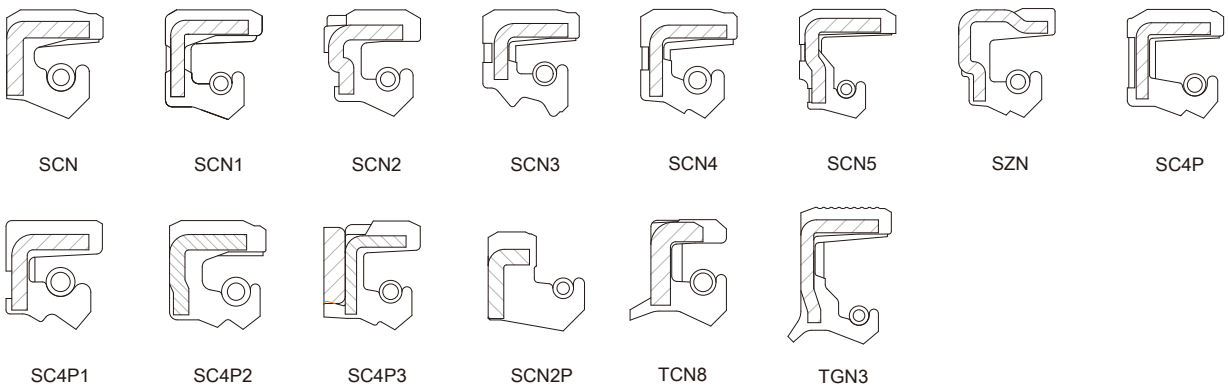


For Automotive

Power Steering Oil Seals

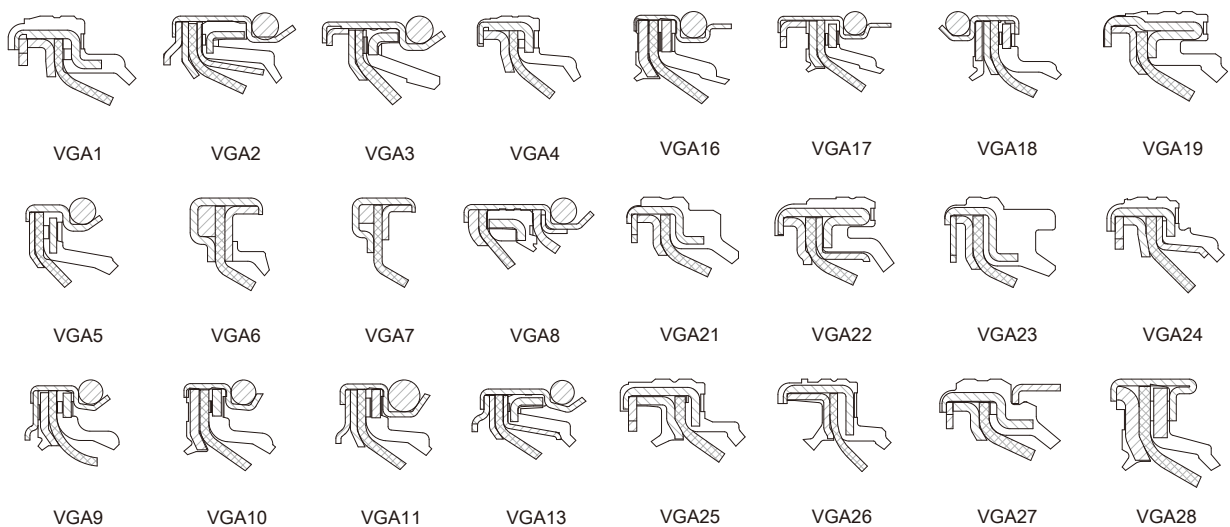
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A/C Compressor Seals

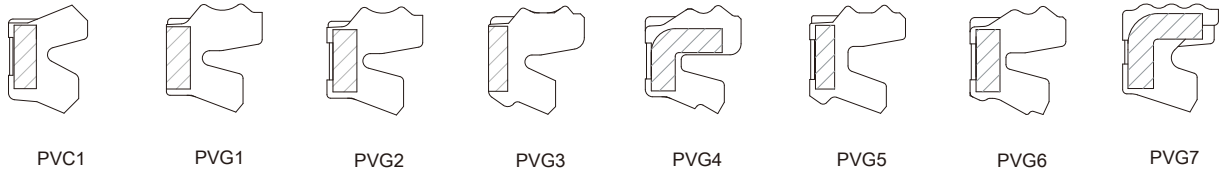
Air-conditioning compressor is an important part in the air conditioning system, automotive air-conditioning compressor seal is adhered by steel, susceptible high-temperature HNBR rubber and high-performance PTFE, which is preventing the leakage of oils and infiltration of dust.



For Automotive

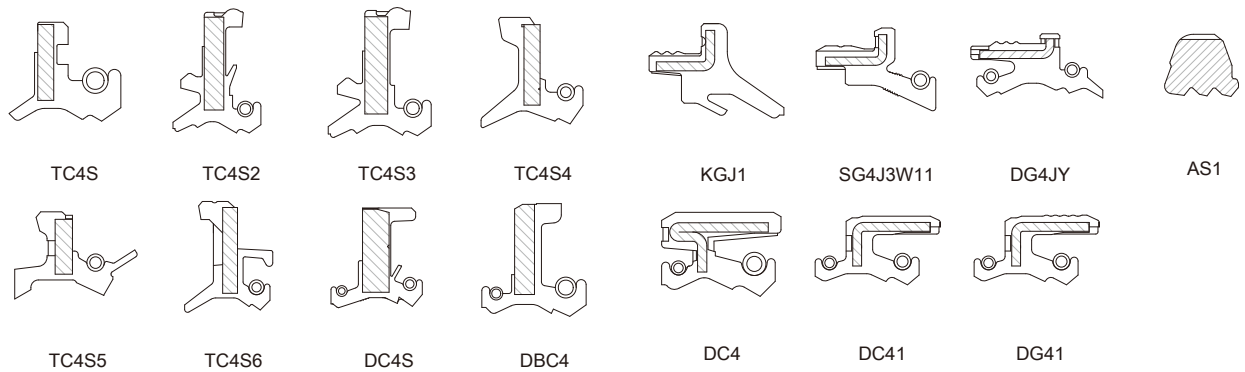
Gas Spring Seals

The Gas Spring Seal (spring oil seal) acts an extremely important role in Gas Spring equipment. A qualified seal is tested by 400 thousand times of operation test and high pressure environment test to achieve the high quality standard.



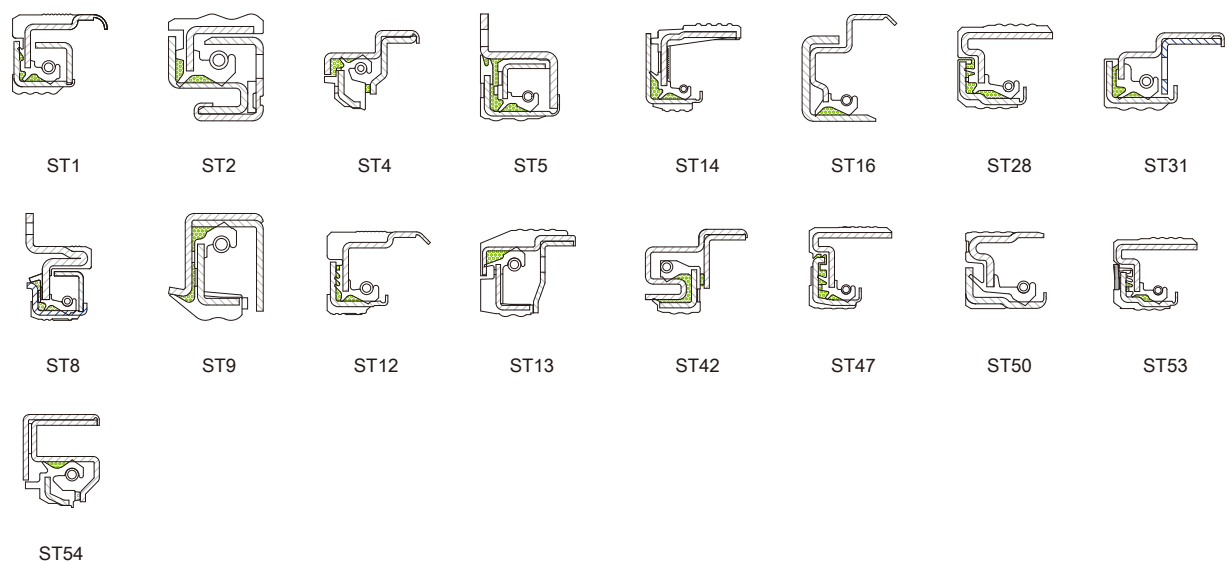
Shock Absorber Oil Seals

Shock Absorber seals are applied between the rod and tube, including motorcycles, cars, trucks and other vehicles. The main function of the reciprocation is preventing gas from leakage and external contaminants from entering successfully.



Heavy Duty Wheel Seals

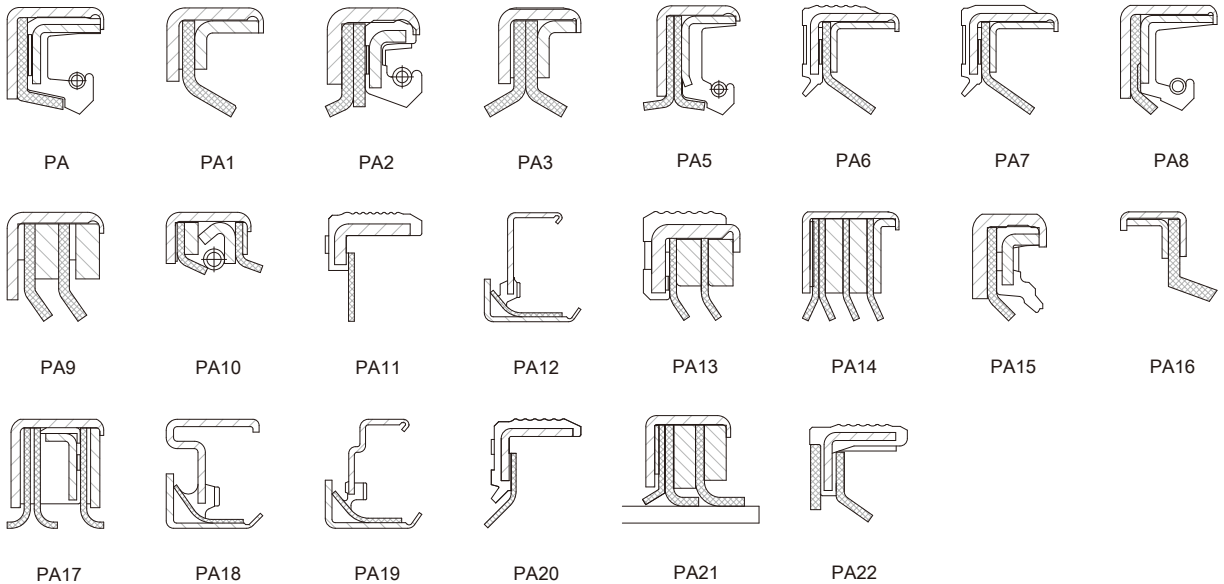
The Heavy Duty Wheel Seals (ST design) are primarily used in heavy-duty vehicles such as trucks and buses. Compared to rotary shaft seals, its special internal lubrication design, and multiple lip designs effectively prevent contamination and grease leakage from the outside. It also prevents the infiltration of mud, water, and sediment, significantly enhancing operational stability and reliability.



For Automotive

PTFE Teflon Seals

TEFLON, which is the chemical, names "polytetrafluoroethylene (PTFE)". It has excellent chemical stability, corrosion resistance, sealing and good oxidation endurance. It can be used in long-term operation at a temperature -180 °C to 250 °C.

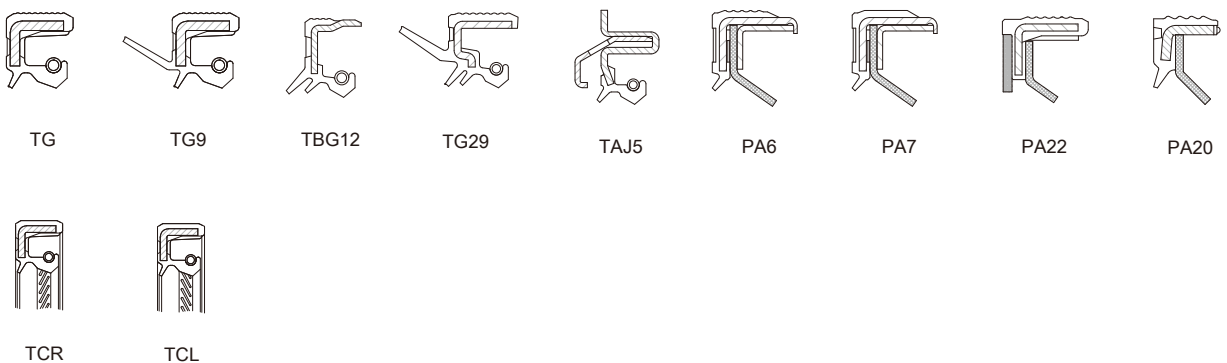


Transmission /Gear Box /Crankshaft and Camshaft Oil Seals

Transmission Oil Seals are designed of dynamic applications; it can reduce the friction efficiently, easy for assembling, have good performance and long life in high temperature application, and suit for high rotational speed environment.

Gearbox Oil Seals are designed of static applications to act as a plug or barrier and reducing the risk of corrosion, it can prevent the dust on air side, higher roughness of the surface finish is allowed, and common applications include sealing in the gearbox as an end cap. The temperature range is depending on the material.

Camshaft and crankshaft oil seal, which is designed as TC type with helix design on the lip, it can increase the sealing performance of the lip seal and produce oil return characteristics to prevent oil from spilling. Helix design is divided into three: two-way, left-handed and right-handed. The lip of Camshaft and crankshaft oil seal is increased L (Helix-Left) and right-handed (Helix-Right), with rotary way to use the seal.



For Automotive

End Cap Seals

"End Caps" are most used in gear units and gear box, the outer diameter is covered with whole rubber to prevent oil spills, dust and dirt. Be used in static way, the whole rubber design in outer diameter to achieve the seal and the effect of dust.



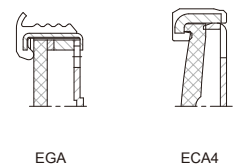
High Pressure Oil Seals

High pressure and combined seal, based on TDN or TDN1 design.



Oil Gauge Seals

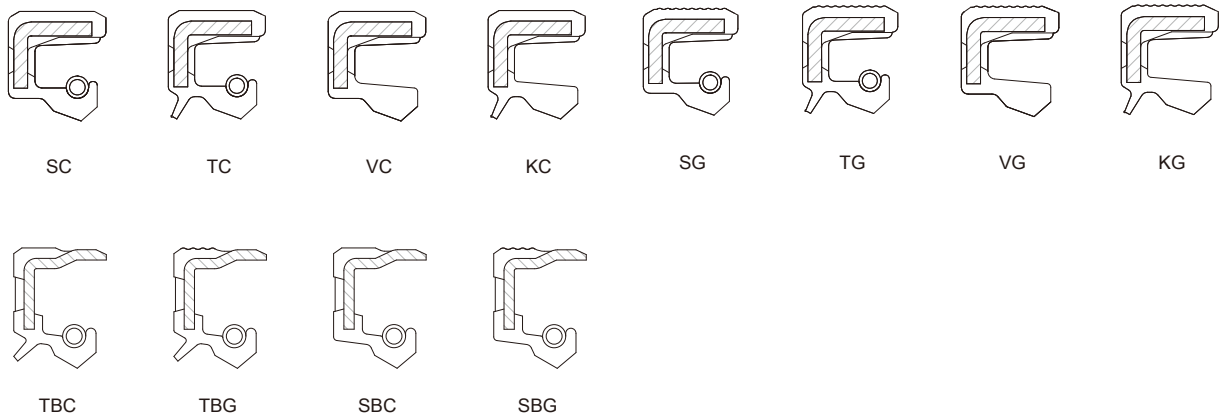
The function of Oil Gauge Seals is similar as EC seals. It is used in static way. The common function is used in air compressor seals to observe the oil pressure.



For Automotive

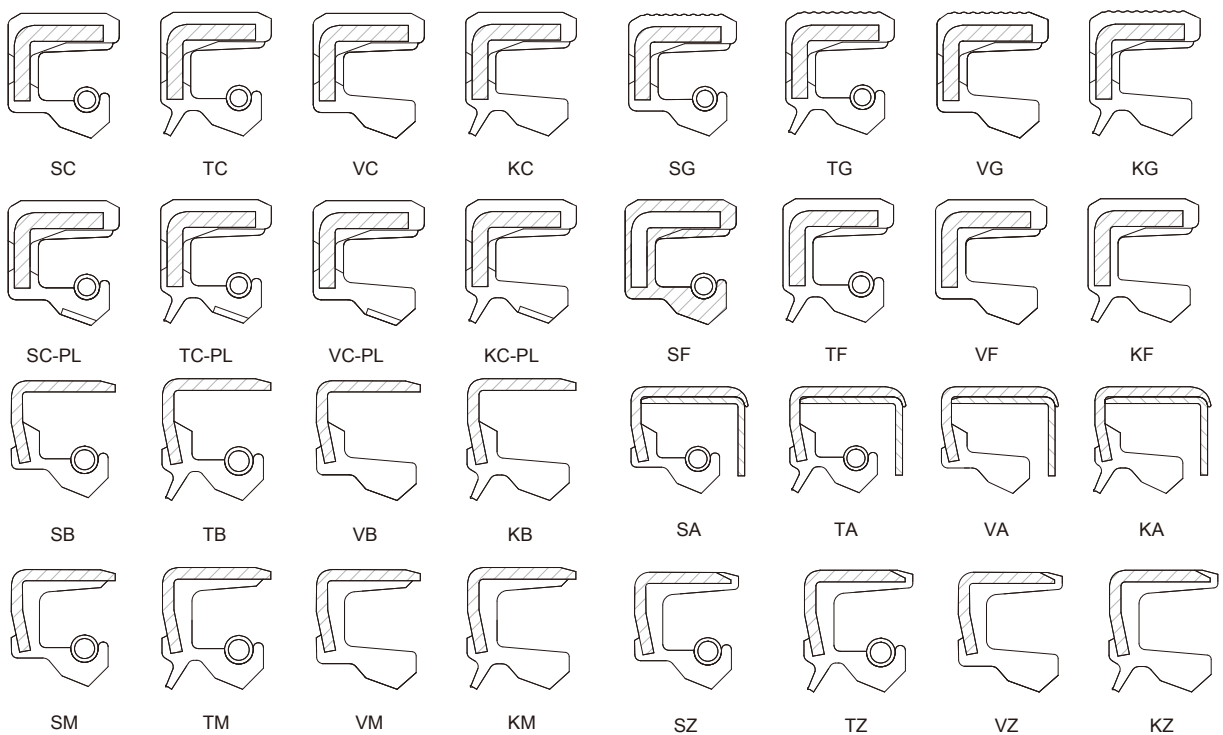
eMobility Motor Seals

Motor Seals are used in motors, with the external rubber whole-covering design to ensure the outer diameter of the sealing effect. A rotary actuator seal can prevent the loss of pressure and ensure the normal operation of the power steering system, to achieve the sealing effect.



Rotary Shaft Seals

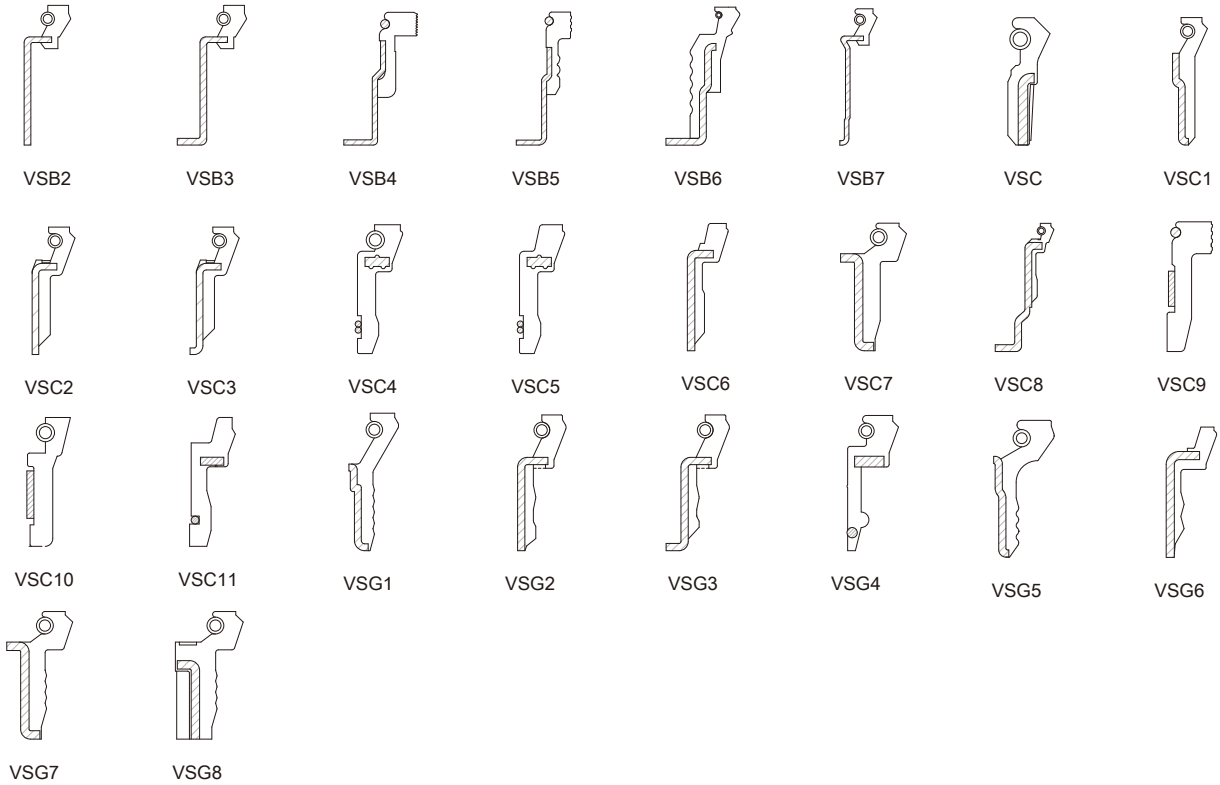
Rotary shaft seals and bearing unit seals are also known as steel seal, which are common seals made with steel in the general type, such as A-type, B-type and C-type. The steels and springs are generally used in carbon steel and carbon springs; however, if used in corrosive or special work environments, it can be made with stainless steel and stainless spring.



For Automotive

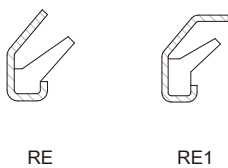
Valve Stem Seals

Valve Stem Seals are used in car engine, which is preventing engine oil enter to exhaust pipe, preventing gasoline mixed with air, and preventing engine oil enter to combustion chamber.



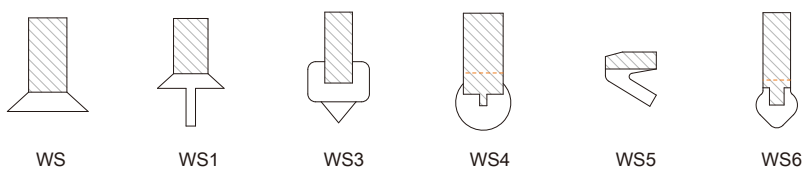
Gamma Seals / Axial Face Seals

Axial Face Seals are a kind of side dust-proof seal, which made with corrosion-resistant metal case and V-ring to achieve the effect of dust.



Bonded Seals

Bonded Seals, also known as washers seal and washer gasket. It is used as industrial oil seals, which is used in static way, with the rubber material in inner diameter to achieve the sealing effect.



For Agricultural, Constructional and Mining

Provide Durable Seals for Heavy Duty Agriculture Equipment

In order to solve extreme working environment on agriculture machinery, TCS Oil Seal specialize on heavy duty seal design, test and manufacture.

Combi Seals are used in construction, excavating machines, etc.

TCS has designed a variety of types to suit high contamination working environment, and can meet the needs of clients with high pollution or hostile environment.

Customize Design for Constructional and Mining Seals

Majority of construction and mining seals are customized design. Filling out TCS design sheet helps engineer provides research and development solutions to solve critical temperature, media and working requirement.

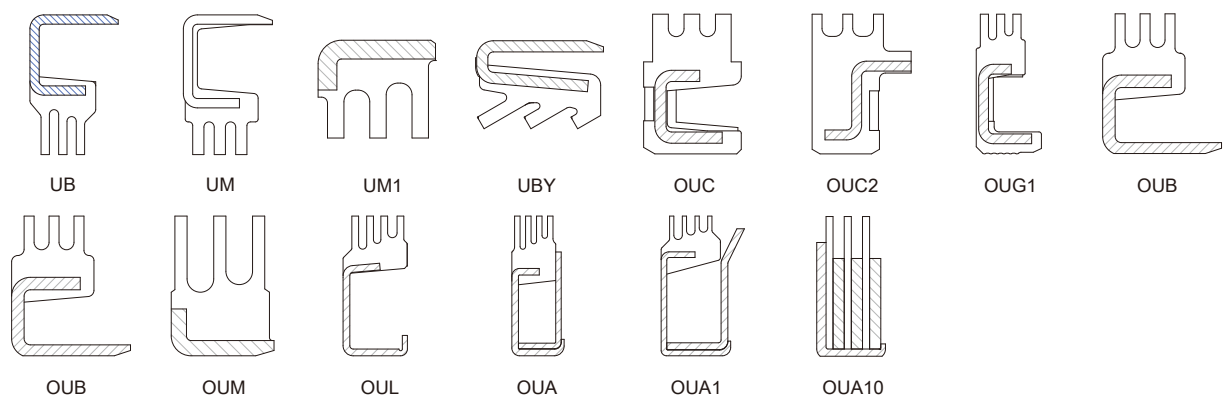
All customize designed seals are rigorously and regularly validate by testing lab annually.

Critical design for high temperature durable, thicker steel wall and longer working life will be considered.



Agricultural Seals

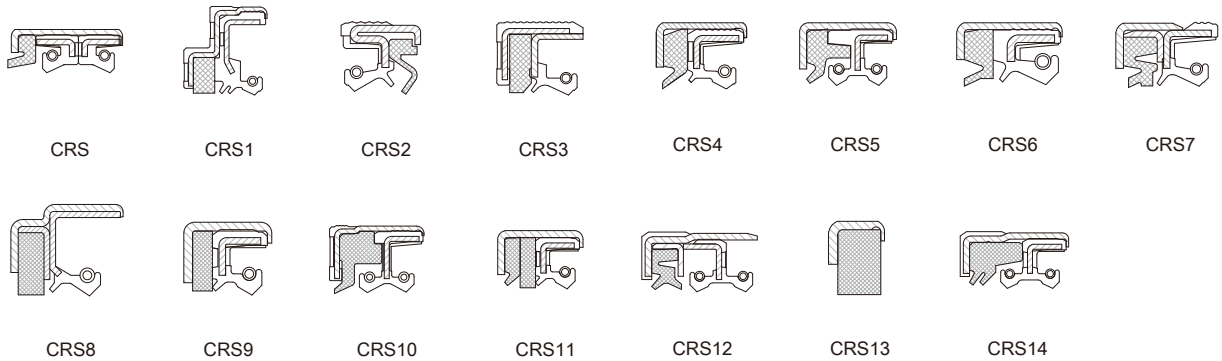
The special triple lip oil seals design are specifically effective for use in heavily contaminated environments and is commonly applied in agricultural machinery and equipment.



For Agricultural, Constructional and Mining

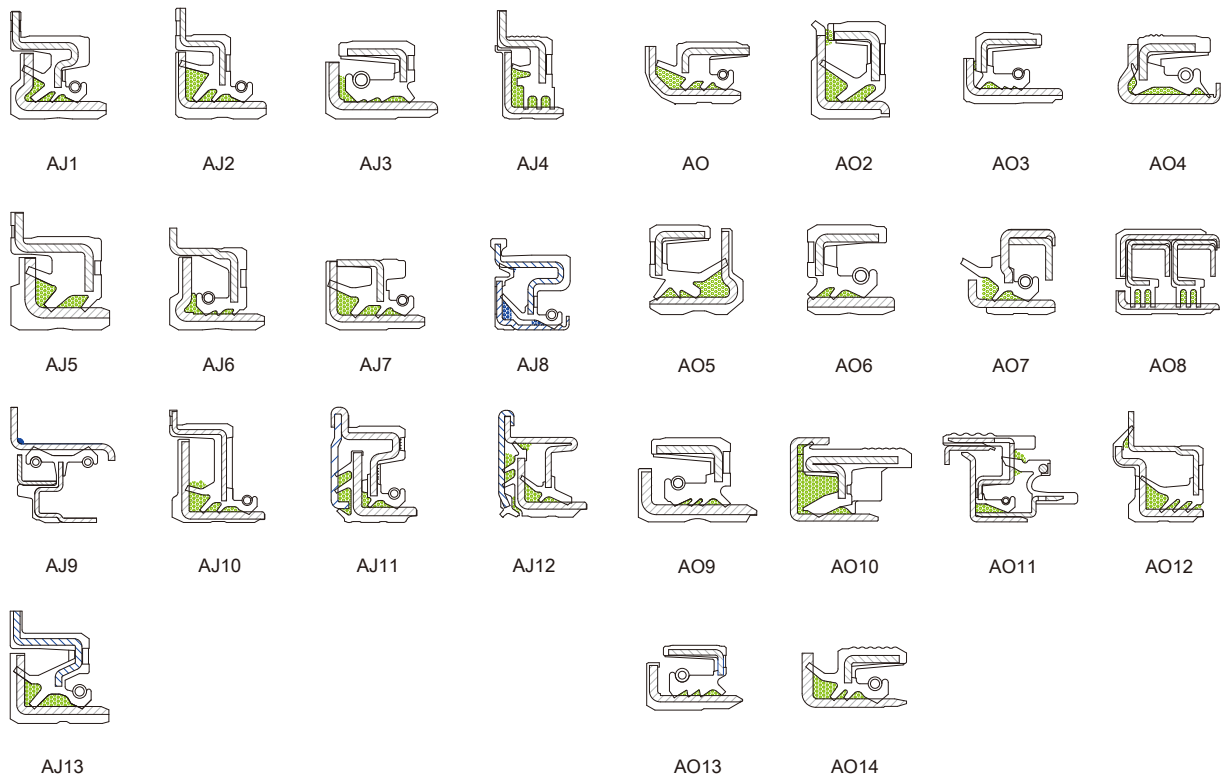
Combi Seals

Combi Oil Seals is designed to overcome highly contamination environment with certain lubricated function. TCS provided design with felt, high density form and polyurethane ring Combi seal for critical working environment in construction.



Heavy Duty Wheel Seals /Agricultural Seals

The special designs AJ, AO, and AP are tailored for highly contaminated agricultural machinery equipment. The TCS design is customized to provide tailored services and recommendations for different machinery equipment and application environments.



For Agricultural, Constructional and Mining

Heavy Duty Wheel Seals /Agricultural Seals

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For Industrial

Long Performance Life for Motor Sealing Elements

Pump, Motor & Gear Boxes seals are designed in higher speed, pressure, temperature resistance, and media resistance and operation reliability.

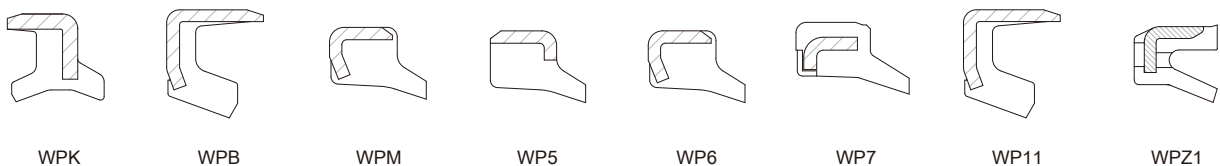
TCS Oil Seal design motor seal by choosing suitable elastomers, steel case and set up dynamic test rigs to optimize working life and design verifications.

To serve wide range of low demand customers, TCS built up online stock system to show up to date stock information of over 20,000 part numbers. Please refer to below link to check ready to ship seals.



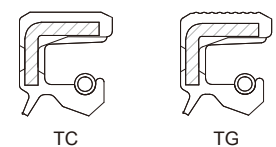
Hydraulic Oil Seals

Hydraulic Seals can be divided in to Wiper Seals and U-Packing Seals, which are used in air and hydraulic system, designing by appropriate materials according to the kinds of the different environment to prevent contaminants such as dirt, dust and moisture from entering the cylinder as they retract back into the system. The main materials are polyurethane (PU) and rubber. It also can be designed with O-RING or X-RING on the lip, which can enhance the pressure resistance.



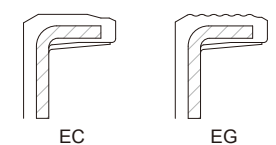
Alternator Seals

Alternator Oil Seals are used in vehicle generators, with the external rubber whole-covering design to ensure the outer diameter of the sealing effect. A rotary actuator seal can prevent the loss of pressure and ensure the normal operation of the power steering system, to achieve the sealing effect.



End Cap Seals

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For Industrial

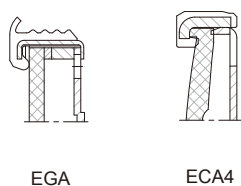
High Pressure Seals

High pressure and combined seal, based on TDN or TDN1 design.



Oil Gauge Seals

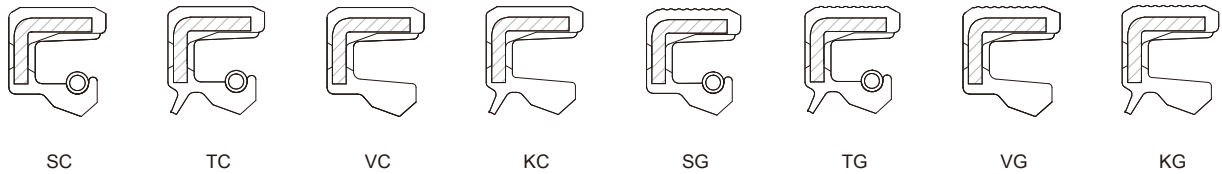
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For Industrial

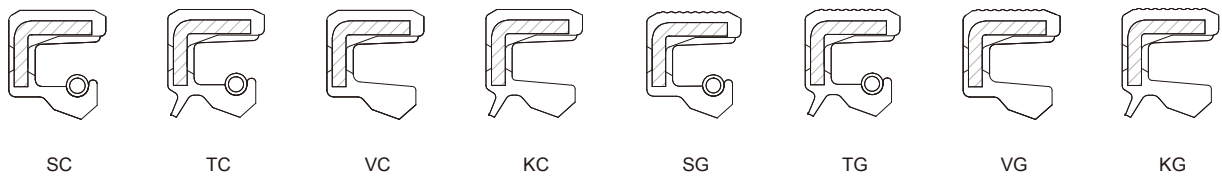
Reducer Seals

Reducer Seals are used in reducers, with the external rubber whole-covering design to ensure the outer diameter of the sealing effect. A rotary actuator seal can prevent the loss of pressure and ensure the normal operation of the power steering system, to achieve the sealing effect.



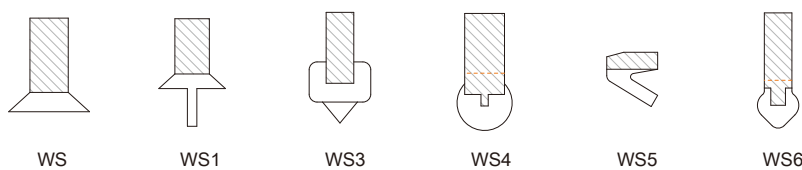
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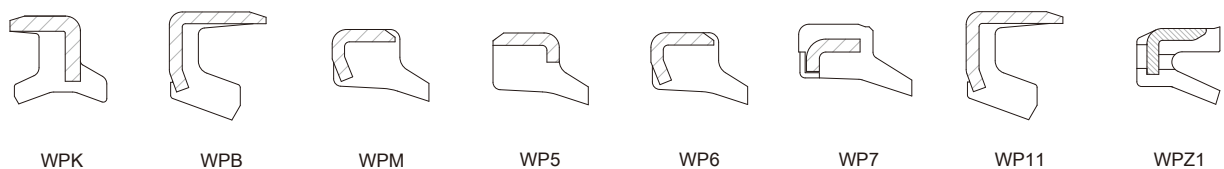
Bonded Seals

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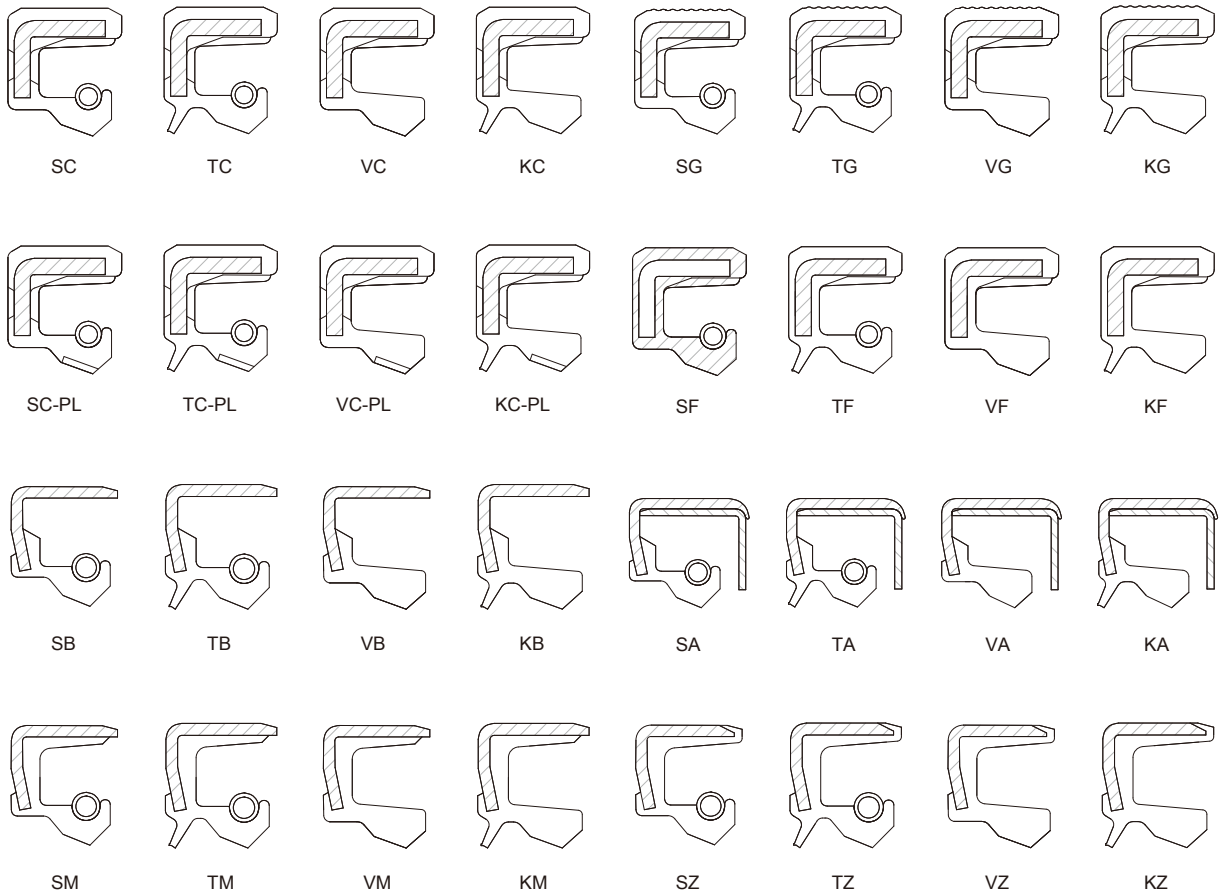
Pneumatic Tool Seals

Pneumatic Tool Seals are M-type seal, which are similar to B-type seal. The inner is made with whole rubber to protect the metal from corrosion by liquid. It is commonly used in rotary way to achieve sealing effect.



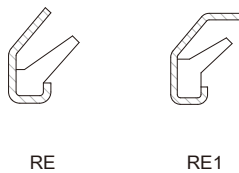
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Gamma Seals / Axial Face Seals

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For Pneumatic and Hydraulic

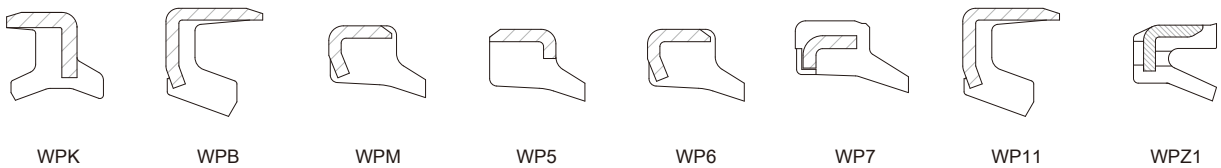
Fluid Sealing Products for the Hydraulic Industry

With over 35 years on providing hydraulic sealing solutions, TCS OIL SEAL only use reliable sources on steel, rubber, polyurethane and spring to manufacture high performance seals. Our engineer team offer complete solutions on Hydraulic and Pneumatic applications. From requirement of friction, speed, pressure and other critical working environments.



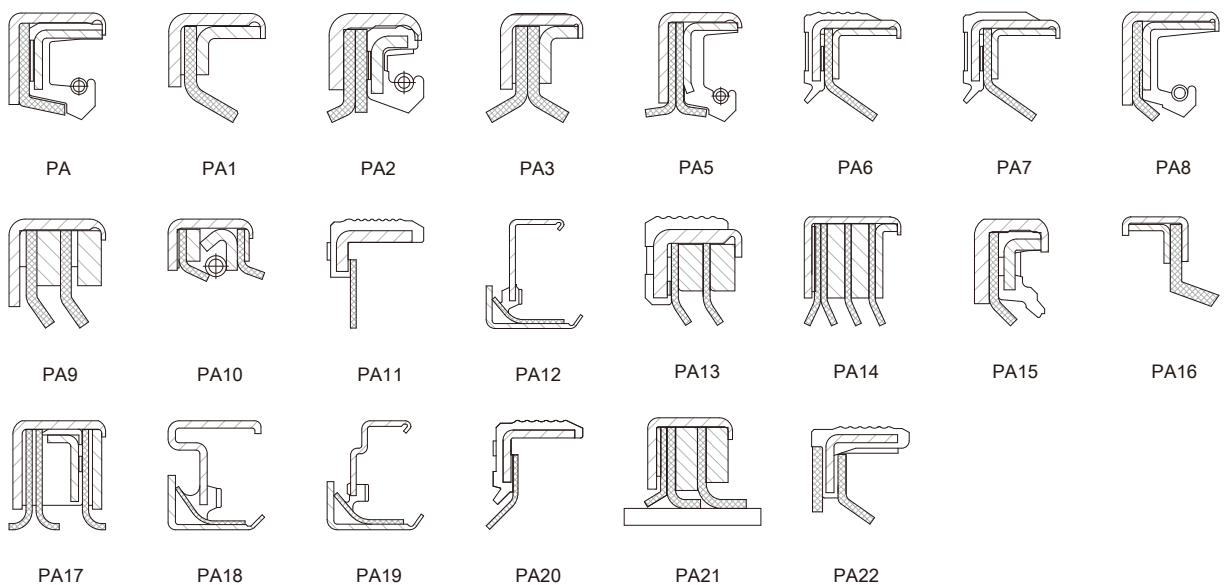
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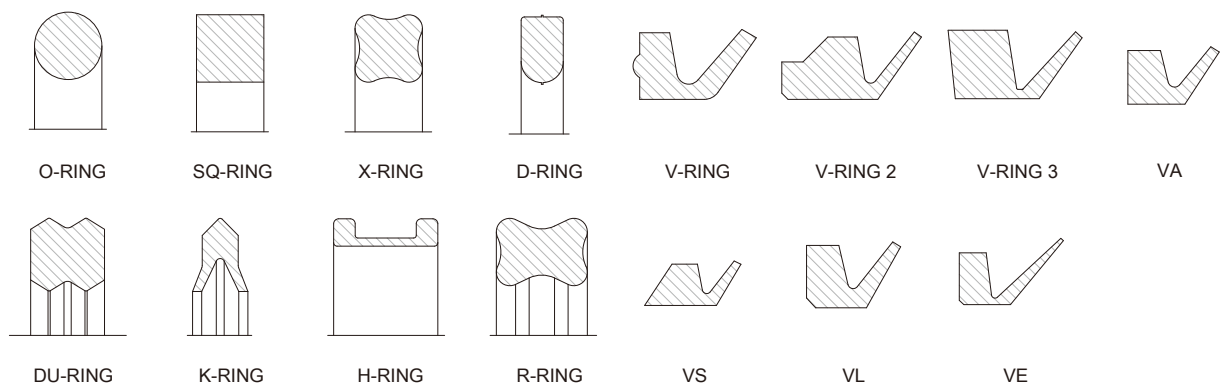
Rubber Parts

Standard Rubber O Rings to Shaped Rubber Parts, all available

Wide selections of fluorine rubber, silicone rubber, ethylene-propylene rubber, chloroprene rubber, nitrile rubber, and many other types of synthetic rubber o rings are mixed to suit the purpose of use.



Rubber Parts are designed in full rubber materials. It can be divided into the following types: O-RING, V-RING, S-RING, X-RING, SQ-RING, H-RING, K-RING, D-RING and BOOT. The most common type is O-RING, which is a kind of circular mechanical gasket with flexibility, it compresses between two or more components of the assembly process, create a seal interface. Boot is the product which designed to protect the parts of the device products and with dust-proof function.



O-Ring Kits

O-Ring Kit is a combination package which contains a variety of O-rings with different sizes.

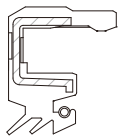


For Consumer Electronics

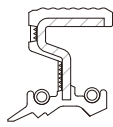
Energy Efficiency Appliances Sealing Solutions

Providing appliances seals OEM dish washer, garbage disposal, and laundry machines. TCS provides experience on solving durability, installation and replace issues. As well as increase user safety.

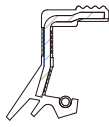
Creating a friendly living environment by using TCS oil seal, we provides FDA, UL qualified material and producing process on appliances sealing products.



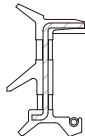
TUCWA2



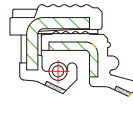
DGWA1



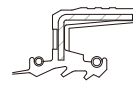
TG2WA1



TC15



SGA1-PL



DG5



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