

**Engineered Sealing Solutions  
for the Automotive Industry**



## Company profile

Ceetak Ltd is a leading UK designer, developer and supplier of seals and sealing solutions.

Established for over 30 years, and part of the Ceetak Holdings Group, our Head Office is based in Bedford, England.

Our products and systems are used throughout all major industries, from the most technically demanding applications, to high quality, high volume precision requirements.

Ceetak's Application Engineers are able to assist in the design of seals for Automotive applications. Our engineers fully understand the variety of technical challenges when designing and manufacturing components for these critical conditions.



## Strategic Sourcing Partners

Ceetak has been in partnership with Parker Hannifin Seal Group for over 30 years, and is the accredited and recognised UK distributor of their seals.



Our unique partnership allows us to offer extensive product knowledge and applications expertise. Our engineering team has the backing of the Parker global manufacturing network, providing you with the latest developments in seal technology.

Parker's portfolio of materials include a wide range of special elastomers to satisfy the unique sealing requirements of Automotive applications, including materials that are designed for harsh media and temperature extremes.

## Technical support and Quality Assurance

Our facilities are approved to ISO9001:2008 and ISO14001:2004, with our manufacturing facilities approved to ISO9001:2000 and TS16949. We are dedicated to providing a complete design service; from initial concept to final production, using the latest design technology.

Our Application Engineers have an appreciation for "significant feature" and "critical function" elements when designing sealing solutions for integration with customer mating parts within automotive applications.

Our technical facilities can support full material testing programmes to agreed specification parameters, along with finished component endurance testing.

For each project, our experienced Application Engineers provide both in-house and on-site support, and unrivalled expertise when designing the sealing solution to fulfil your application requirements.

## Why choose Ceetak Ltd?

- Broad range of elastomer compounds and materials specifically accredited for Automotive applications
- Extensive product range including; o-rings, custom moulded shapes, 2-shot mouldings, face seals, PTFE seals, metal seals and diaphragms
- Bespoke seal design for specialist applications
- Material development and testing, and component endurance testing support
- Full quality support on production and documentation (IMDS, PPAP Level 3)
- Unrivalled technical input and design support, including project management
- Competitively priced, real value engineering



## Air Admission, Fuel & EGR Management

Applications in fuel systems are considered safety critical with challenging requirements. When specifying components, Ceetak's Application Engineers are able to support customers from the very beginning of each project. Typical demands include:

- Low closure force requirements on mating parts with assembly issues (face seal on air intake, quick release coupling seals, fuel cap face seals)
- Elastomers for broad temperature requirements (for example,  $-50^{\circ}\text{C}$  to  $+250^{\circ}\text{C}$ )
- Material selection for aggressive media/additives (low swell and extraction resistance to crude/heavy oil, ethanol, methanol based fuels, LPG and bio-diesels)
- High static or pulsating pressure applications (fuel applications)
- Optimised sealing arrangements to reduce permeability and vapour loss
- Acidic condensate and high air temperature resistant compounds (for example on EGR and turbo intercoolers)
- Sealing solutions suitable for use in Selective Catalytic Reduction (SCR) exhaust gas aftertreatment systems of diesel-powered vehicles (for example, AdBlue® tank sealing)



## Braking Systems

Repeatable and reliable control of braking function is paramount. Our Engineers have experience on a broad range of applications in environmental, hydraulic and pneumatic circuits to ensure optimum sealing. Typical demands include:

- Controlling running friction and wear on seals to maximise life (high cycle/frequency rate, dynamic seals on ABS/EBS systems)
- Identification of critical seal component features for repeatable assembly and function (for example control of tolerance, surface finish)
- Components that are "system critical" requiring strict process control (for example 100% "zero defect" inspection, high cleanliness specification)
- Stable elastomeric and composite materials to ensure optimised life expectancy against working conditions (for example, defined compression set and stress/strain relaxation)



## Cooling & Lubrication Systems

Increasing temperatures and extended life expectancy are typical on modern cooling and lubrication systems. In addition, to improve efficiency, these circuits are now aided by sophisticated electric pre-heat and/or monitoring features. Our Engineers are able to develop and supply sealing solutions to satisfy these changing parameters. Typical demands include:

- Superior material grades with low compression set and swell, in high performance additive "enhanced" coolants (for example proprietary brands of ethylene glycol, from  $-50^{\circ}\text{C}$  to  $+140^{\circ}\text{C}$ )
- Stable material grades for a broad range of mineral oil and synthetic oils up to  $200^{\circ}\text{C}$  (oxidised oil resistance, heat age and condensate resistance)
- Low friction elastomers and composite seals for thermostat controls, valves and pressure relief valves (reduced "stiction", pressure extrusion)
- Compounds compatible for new generation, eco-friendly air conditioning gases and compressor oils (examples include  $\text{CO}_2$  and PAG/PAO/POE oils, resistant from  $-55^{\circ}\text{C}$  to  $200^{\circ}\text{C}$ )



## Transmission & Steering

Designers of commercial and passenger transmissions and steering systems are challenged to improve weight and size, efficiency, multifunction and environmental targets (e.g. hybrid systems). Our Application Engineers can assist in meeting these requirements with a range of sealing systems. Typical demands include:

- Composite sealing elements designed to combine with mating parts to reduce size, cost and improve assembly with improved integrated function
- Complex 1 piece gaskets for valve controls
- PTFE seals for low noise and friction, at high speed or high pressure requirements (for example; steering and valve rings)
- Broad range of elastomeric material grades for new generation environmental fluids
- Dampening elements for noise vibration and harshness reduction (N.V.H.)



## Chassis & Suspension

Components used in and around chassis and suspension assemblies need to be designed with optimised strength. High frequency cycling, vibration and wear influence the integrity of the seals and life expectancy. Our products typically meet the following demands:

- Abrasion and loading resistant high strength materials such as TPE's, TPU's and engineered plastics (used on bearings, mounts and buffer elements)
- Aggressive dirt and corrosion resistance, with high IP rating specifications (for example, wipers or rubber boots for static and dynamic function)
- High shock pressure and cycle rate requirements (bearings, rod and piston seals) for oil/gas dampers
- Precision components for high performance in broad temperatures (for example; stability control valves)
- Weathering and ozone resistant materials for chassis fixings (bulkhead grommets, door closure components)



## Electronics

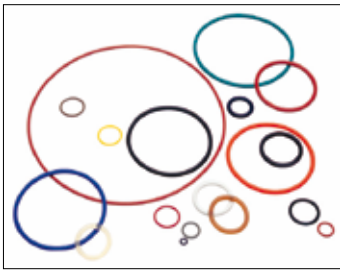
Electronic circuitry is utilised throughout the modern vehicle to monitor and control key areas for information management and safety systems. Ceetak has designed, developed and manufactured a range of precision elastomeric components for this type of application. Typical demands include:

- IP rated low closure force mouldings and o-rings for under bonnet positioning sensors, connectors, sockets and wiring harnesses
- Varied compounds for transmission and steering fluids, oils and fuel and air switches and sensors (-60°C to +250°C)
- Conductive elastomers for EMI/RFI shielding and screening with environmental function (for example, radar, navigation, ECU packaging)
- Composite elements for fixing wiring looms onto the chassis to eliminate chaffing and vibration





## Automotive Product Overview



### O-Rings

O-Rings are available in all AS568 inch sizes and a wide range of metric sizes (DIN 3771, ISO 3601 and JIS B2401) as well as custom sizes. Ceetak O-Rings can be moulded in a wide range of elastomer compounds, from basic neoprene to perfluorinated materials.



### Custom Moulded or Machined Shapes

Custom moulded or machined seals are available in virtually any range of shapes and cross sections. Ceetak designs and manufactures engineered elastomeric shapes, both homogenous and inserted, for sealing systems and isolation applications.



### Miniature Elastomer Seals

Ceetak is able to create high quality and consistent precision-elastomeric components for critical applications and constrained feature and packaging demands.



### Diaphragms

Custom designed elastomer and elastomer/fabric reinforced diaphragms are used for zero leakage and fine control of devices where friction and hysteresis are an issue. Ceetak Engineers will design the perfect diaphragm for optimum sealing performance.



### 2-Shot mouldings

Ceetak offers a range of innovative 2-shot (or multi-shot) custom components. These parts allow integration of several functional aspects to give cost, ease of assembly and product reliability advantages. Material combinations are designed to meet application demands.



### Standard and Custom Face Seals

Ceetak offers an array of standard and custom face seals for static (and some) dynamic applications. Manufactured to meet the demands of irregular groove dimensions and wide tolerancing on mating parts, they are available in a range of materials for critical vibration and sealing requirements.



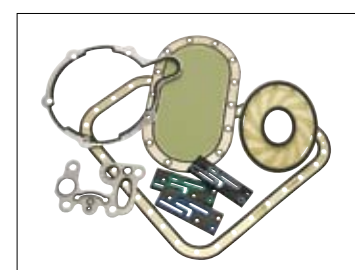
### PTFE FlexiSeals® & Co-Axial Seals

Our full line of spring-energised PTFE lip seals are used in rod, piston, face and rotary sealing applications. FlexiSeals® are typically used in areas where elastomeric seals cannot meet the frictional, temperature or chemical resistance requirements of the application.



### Rotary Seals

Rotary seals (or valve stem seals) can be supplied in a variety of compounds and seal geometry configurations. Ceetak Engineers will recommend the most suitable sealing solution for customer applications.



### Composite Seals (chemical bond or over-moulding)

Ceetak's composite seals are rubber-to-metal or rubber-to-plastic custom engineered sealing solutions. These seals allow for the integration of multiple components with unique sealing geometries, which provide ease of assembly and reliable service, resulting in a lower overall cost.

## Material Certifications

Ceetak continually develops new materials according to Automotive customer specifications in conjunction with our manufacturing and material development centres around the world. An overview of the type of materials and approvals available in each one are shown in the table below, for more information, contact our specialist Application Engineers:

Media	Temp. Range (°C)	Material
Air (Hot)	-50°C to +250°C	Silicone (VMQ)
	-30°C to +200°C	Fluorocarbon (FKM)
Exhaust Gas	Up to 320°C	Perfluoroelastomer (FFKM), Polytetrafluoroethylene (PTFE)
	Up to 700°C	Resilient Metal
Motor Oil (Mineral & Synthetic)	-40°C to +150°C	Hydrogenated Nitrile (HNBR), Polyacrylate (ACM), Ethylene Acrylate (AEM)
	-30°C to +200°C	Fluorocarbon (FKM)
Diesel Fuel (EN590)	-30°C to +100°C	Nitrile (NBR)
	-40°C to +130°C	Hydrogenated Nitrile (HNBR)
Bio-Diesel/RME, Crude/Heavy Oil, Natural Gas	-40°C to +150°C	Fluorocarbon (FKM - grade dependant)
Petroleum blend/ flex fuels	-40°C to +200°C	Fluorocarbon (FKM - grade dependant)
	-70°C to +170°C	Fluorosilicone (FMVQ)
Water & antifreeze/ corrosion inhibitor	-40°C to +150°C	Ethylene Propylene Diene Monomer (EPDM)
Transmission/ Steering Fluids	-40°C to +150°C	Hydrogenated Nitrile (HNBR)
	-40°C to +165°C	Polyacrylate (ACM)
	-30°C to +200°C	Fluorocarbon (FKM)
Motor Oil/Hot Air+ Acidic Condensate	-40°C to +135°C	Epichlorohydrin (ECO)
	-30°C to +200°C	Fluorocarbon (FKM)
Brake Fluids DOT4, DOT5.1	-40°C to +150°C	Ethylene Propylene Diene Monomer (EPDM)
Air Brake (compressed air)	-40°C to +100°C	Nitrile (NBR)
	-40°C to +150°C	Hydrogenated Nitrile (HNBR)
	-30°C to +200°C	Fluorocarbon (FKM)
	-60°C to +210°C	Silicone (VMQ)
Weathering/Ozone Resistance	-40°C to +100°C	Polychloroplene (CR)
	-40°C to +150°C	Ethylene Propylene Diene Monomer (EPDM)
	-30°C to +210°C	Silicone (VMQ)
Air Conditioning Refrigerants (R744, R134a, PAG, PAO, POE oils)	-40°C to +150°C	Ethylene Propylene (EPDM)
	-40°C to +150°C	Hydrogenated Nitrile (HNBR)
	-30°C to +200°C	Fluorocarbon (FKM)
Abrasion/Tear Resistance	-30°C to +100°C	Carboxylated Nitrile (XNBR)
	-40°C to +120°C	TPU/TPE
Broad Temperature/ Media & Low Friction	-260°C to +320°C	Polytetrafluoroethylene (PTFE) with fillers



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