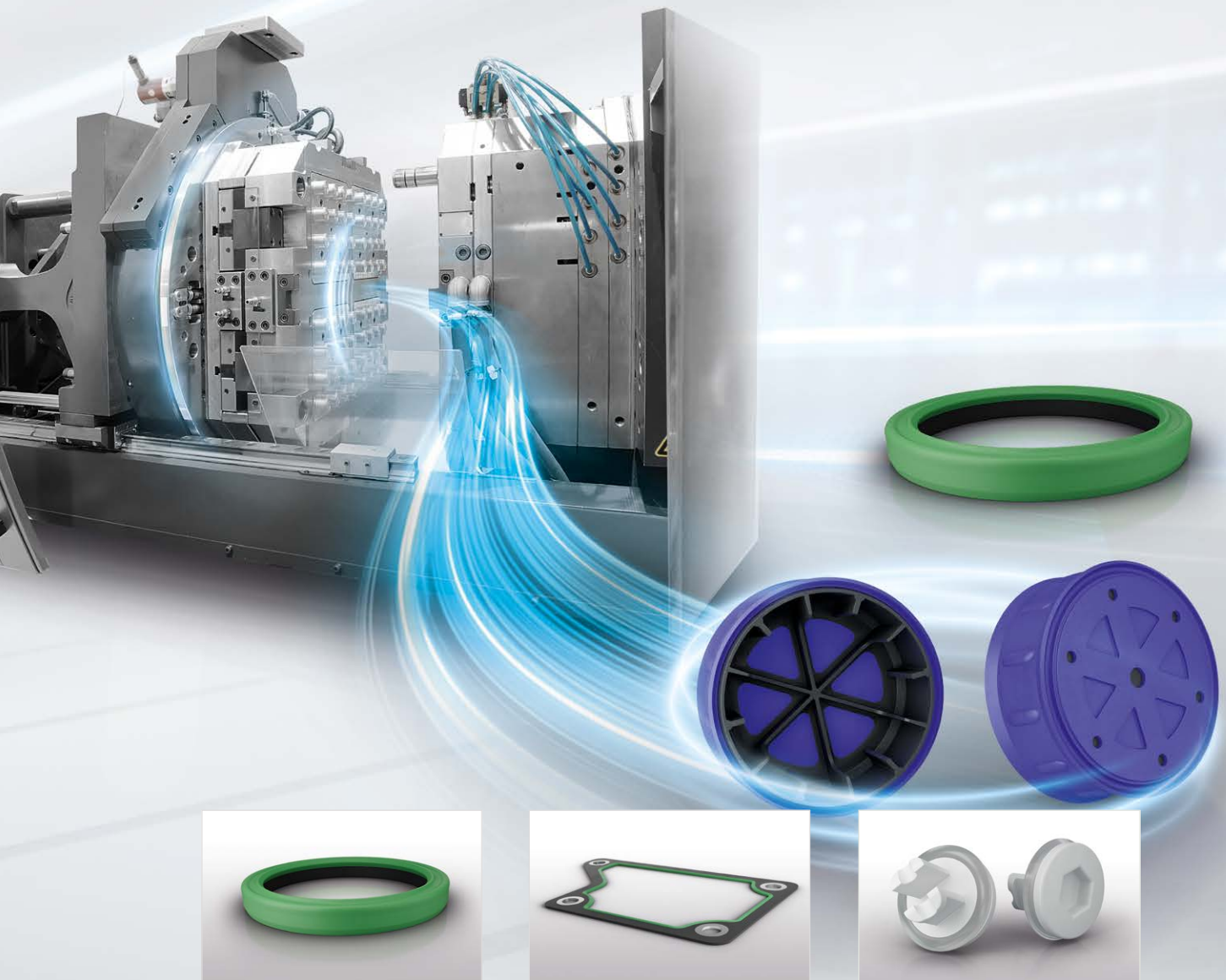


# Multicomponent Technology

ENGINEERED ONE-PIECE SOLUTIONS  
FOR INTEGRATED FUNCTIONALITY



# Multicomponent Technology

**Custom molded high-specification polymers to improve performance and consolidate multiple functions into one engineered part.**

Changing times call for new innovative solutions. With increasing demands on seals in many industries, multicomponent technology provides the perfect solution when a single component no longer fits the bill.

Our multicomponent technology strongly bonds a range of polymers, chosen to meet your specific requirements. Unique seal geometries, combining multiple features or seals, can be customized to your application. This can improve performance, facilitate assembly and reduce part handling. The seals produced are leak-free and need less space and assembly effort, making them a cost-effective sealing solution.

Trelleborg Sealing Solutions engineers are positioned globally and are experts in designing and customizing multicomponent solutions to meet any application requirements. They are backed by our specialized Multicomponent Development Center, which offers full testing, qualification and analysis services to ensure confidence in design and performance.

Our world-class manufacturing facilities create fully bonded components in a variety of material combinations. Production processes are fully automated, ensuring high-volume product consistency, wherever you are in the world.




**Combine multiple functions**



**Easier assembly**



**Customized engineered solutions**



**Reduce component footprint**

## KEY BENEFITS OF MULTICOMPONENT SOLUTIONS:

- Customized to application requirements
- Leak-free and corrosion resistant
- Easier installation and assembly
- Integrate multiple functions in a single part
- High volume output with maximum quality and consistency
- Simplified logistics by reducing handling and article management
- Reduce weight and footprint
- New design opportunities, such as more compact forms and multiple sealing positions
- Reduced Total Cost of Ownership (TCO)



## MANUFACTURING EXCELLENCE

Trelleborg Sealing Solutions adopts a 'quality mindset' throughout all of its processes. We have invested in the latest technologies to ensure quality and consistency at high volumes on complex precision parts.

- Develop components at the highest levels of complexity and accuracy
- Swiss precision tooling, process and automation technology
- State-of-the-art and unique manufacturing set-up, including cleanrooms
- Bonding without pre-treatment
- Highly reliable and repeatable processes at high volumes
- Integrated visual and functional quality checks
- Lean and flashless production
- Range of production methodologies including liquid injection molding

## APPLICATIONS

The benefits of multicomponent solutions can be applied to a wide variety of applications in diverse industries, including:

- Automotive
- Healthcare & Medical
- Food, Beverage & Water
- Sanitary
- Robotics



## GLOBALLY POSITIONED TO MEET YOUR NEEDS

Trelleborg Sealing Solutions uses its global network of manufacturing, design and logistics centers to support your business, wherever you are. We operate in your language and understand your local market. As your business expands, we can follow you - providing the same quality of product and level of service, anywhere in the world.

## FIND OUT HOW WE CAN HELP YOU

Contact our engineering teams now to discuss how multicomponent solutions can improve performance in your application.



Find the easiest way for you to contact your local Trelleborg Sealing Solutions Customer Solution Center at [trelleborg.com/en/seals/csc](https://trelleborg.com/en/seals/csc)

# Quality by Design

## World-class engineering, research and development to create custom solutions.

Multicomponent technology allows many new design opportunities, enabling complex geometries and unique profiles to combine sealing features, housings and installation guides within the component itself.

Trelleborg Sealing Solutions engineers will work with you from the design stage to develop new customized products that function in innovative ways.

Key to a successful solution is a good working partnership. With over 60 years of experience in sealing technology and a global network of specialists, Trelleborg Sealing Solutions is perfectly positioned to quickly bring new and effective products to market.

### Broad technical possibilities:

- Multiple integrated functions
- Metal and composite inserts
- Improved tolerances
- Undercuts

Quicker and easier installation



Ready-to-use, no extra steps



Stronger, leak-free products

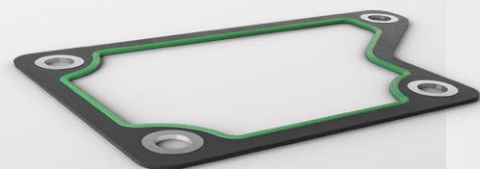
# Application Examples

## 3K INTEGRATED GASKET

**Materials:** Plastic and LSR — **Application area:** Electronic Controller

This product was developed hand-in-hand with our customer to seal a safety-critical device and provide several functions within a single component. Metal inserts provide the strength needed for tightening a housing at the torque required, while an LSR sealing lip effectively seals the external environment from the media in the housing. A custom plastic connector joins these two components reducing assembly to a single step. The end result is a highly effective 3K solution capable of being produced with consistently high quality.

**Advantages:** Three functions in one — Reduced weight — Easy assembly



## MULTIFUNCTION REINFORCED SEAL

**Material:** Plastic and NBR — **Application area:** Automotive

A custom design was developed to replace three different seals with a single component, while also integrating the functions of the piston, seals, bearing, and damping. Sealing performance was also increased with a modified lip design after application analysis.

**Advantages:** Fewer assembly steps — Integrated functionality — Improved performance



## CUSTOM MULTICOMPONENT SEAL

**Material:** Plastic and FKM — **Application area:** e-Mobility

Formerly a plastic-to-plastic seal used within a shaft, the material integrity of this product needed to be improved due to more aggressive media and system pressures. Trelleborg Sealing Solutions provided a material combination, customized to the application, that could meet the demanding requirements.

**Advantages:** One-piece solution — Easy assembly — Improved material integrity



## 2K LSR PUMP HOUSING

**Material:** Plastic and LSR — **Application area:** Medical Device

Automated two component LSR cleanroom production is essential to this micro-scale component. The customer's desire for a smaller medical device made conventional sealing impossible, requiring a one-piece solution to be developed. The sealing element is layered with an extremely low friction, medical-grade silicone to ensure no stuttering during operation and medical compliance.

**Advantages:** Micro-sized — Stick-slip free and low friction — Cleanroom production



# Testing and Development Services

**Supporting you with a global network of engineering and materials expertise and a dedicated Multicomponent Development Center.**

## MULTICOMPONENT DEVELOPMENT CENTER

To better support the development of new and custom components, Trelleborg Sealing Solutions has a dedicated Multicomponent Development Center with testing and processes set-up specifically for multicomponent solutions.

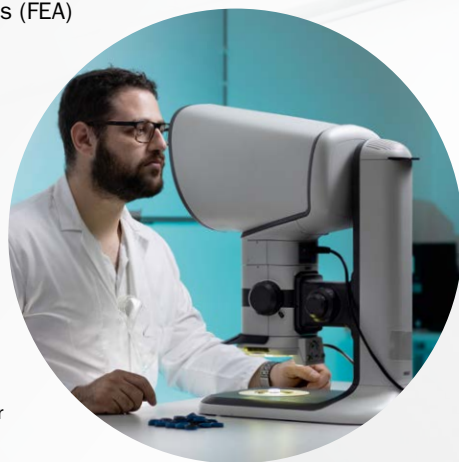
### Specific testing capabilities include:

- Bonding strength testing of a wide range of polymer combinations including elastomers, thermoplastics and thermoplastic elastomers
- Process parameter optimization for specific material combinations
- Development of micro multicomponent products

In addition, the development center offers customers a dedicated resource for producing prototypes, which is a key aspect of the product design and manufacturing feasibility phase.

The Multicomponent Development Center works hand in hand with the full global R&D network to coordinate other activities such as:

- Material performance testing, evaluation and validation
- Automation, camera inspection and other in-line testing capabilities
- Finite Element Analysis (FEA)
- Moldflow analysis



Dedicated Multicomponent Development Center on-hand for testing and engineering support

Trelleborg Sealing Solutions offers a full suite of testing, quality and validation services to prove the performance of our products:

- In-house laboratories: testing of material combinations and key performance metrics
- Quick prototyping and sampling services using additive manufacturing
- Camera inspection
- Functionality checks into fully-automated manufacturing process
- Different material combinations
- Process parameter window
- Prototype samples in quasi production conditions
- Full FEA service and material evaluation



Full service suite including prototyping, sampling and camera inspection

# Advanced Materials

**Trelleborg Sealing Solutions is the market-leading provider of combined plastic and elastomer solutions. The state-of-the-art technology, expertise and toolmaking required is provided by very few companies on the market.**

We offer one of the most complete material portfolios on the market that is engineered for the most demanding conditions. We have developed a range of techniques and processes to achieve strong bonds between these and with other compounds and metal, ensuring there are no leak paths.

#### **Unique multicomponent material combinations:**

- Plastic to Thermosetting Elastomer (Rubber)
- Plastic to Liquid Silicone Rubber
- Plastic to Thermoplastic Elastomer

The type of materials chosen depends greatly on the application. Our engineers work with you to analyze many factors, such as media encountered, temperature range and mating surfaces, to fully understand the sealing issues and develop the best solution.



Vast range of polymers for multicomponent solutions, including thermoplastic elastomer

Trelleborg is a world leader in engineered polymer solutions that seal, damp and protect critical applications in demanding environments. Its innovative solutions accelerate performance for customers in a sustainable way.

Trelleborg Sealing Solutions is a leading developer, manufacturer and supplier of precision seals, bearings and custom-molded polymer components. It focuses on meeting the most demanding needs of aerospace, automotive and general industrial customers with innovative solutions.

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If you'd like to talk to Trelleborg Sealing Solutions, find your local contact at: [www.trelleborg.com/seals/worldwide](http://www.trelleborg.com/seals/worldwide)