C. OTTO GEHRCKENS
SEAL TECHNOLOGY

COG Resist® – and sealed.

Top-class perfluorelastomers (FFKM)

COG.de/en

For our customers' advantage

COG is your independent manufacturer and leading supplier of precision O-rings and elastomer seals. As an owner-managed family business now in its fifth generation, we draw on more than 150 years' expertise. Because only with in-depth knowledge of the subject can we respond to our customers' complex requirements – and satisfy you with our solutions.

Our dialogue with you forms our central focus. Your wishes and challenges provide our impetus. At the same time, our experience in the development and manufacture of materials forms the basis for being able to offer you proven products in dependable high quality – And at the same time to notch up
innovations that set new standards for your sector.

More than 250 employees are committed to this objective, monitoring the market and tackling relevant topics, in order to be able to rapidly react to new challenges with solutions-based approaches. In addition, delivery capability and flexibility are of highest importance. The manufacture of the smallest series also forms part of our service, in order to realise the perfect product for your requirements.

There's always lots involved. We will assist in your success. And delight you with our unparalleled expertise.

Jan Metzger
Managing Director

Dr. Jan Cord Becker
Managing Director

Please visit our website ***www.cog.de/en*** *for more information or contact our sealing experts directly.*

COG at a glance

- Founded in 1867 in Pinneberg, near Hamburg
- Independent family business employing over 250 staff
- Supplier and independent manufacturer of O-rings and precision seals
- Large O-ring warehouse (over 45,000 items kept in stock for immediate delivery)
- State of the art logistics centre for maximum delivery capability
- Tools available for over 18,000 different O-ring dimensions
- Close cooperation with leading manufacturers of raw materials
- Approvals/certifications for a wide variety of materials, including among others DVGW, NORSOK Standard M-710, ISO 23936-2, BAM, FDA, USP, 3-A Sanitary Standard, BfR, KTW-BWGL (DIN EN 16421), NSF/ANSI and many more
- Our own mixing and compound development facilities
- Our own toolshop
- COG's technology centre for material development
- Quality management to DIN EN ISO 9001
- Environmental management to DIN EN ISO 14001

Sustainability plays an important role at COG:
COG has its carbon footprint balanced externally and offsets the emissions through certified projects in cooperation with PrimaKlima. In return, we are authorised to use the 'PRIMA KLIMA' climate seal.

Content

High-performance materials for maximum resistance

From the petrochemical industry to classic mechanical engineering to the food and medical technology industries – in countless applications in the widest variety of sectors, there is absolutely no alternative to perfluorelastomer (FFKM/FFPM). These materials are extremely resistant – even with changing media. With the COG Resist® FFKM compound, COG offers a wide range of high-tech materials for demanding applications. COG Resist® proves its worth with the greatest degree of chemical resistance of all elastic seal materials, maximum temperature resistance and excellent physical properties.

Ideally suited for complex requirements

Aggressive media, extreme temperatures and high mechanical loads can all present elastomer seals with the greatest challenges during use. For example, in many applications, a single seal is exposed to various different chemicals. If high temperatures of above +200 °C are also present, COG Resist® materials, with their temperature resistance up to +325 °C, offer a perfect solution for users and design engineers. Furthermore, during the cleaning process, the seal can also come into intensive contact with hot water, steam and solvents. In such cases, a universal seal of the very highest quality is absolutely essential. So it's good to know that you can rely on COG's COG Resist® products.

Advantages of COG Resist®

- *Maximum chemical resistance of all elastic sealing materials*
- *High temperature stability up to +325 °C, depending on the grade used*
- *Low compression set*
- *Excellent vacuum performance*
- *Ideal for changing effects*
- *Ring diameter up to 2,000 mm possible*

96
operating hours

FKM

Result: Machine damage, 4 hours' downtime, €10,000 damage

VS.

Medium: Heavy oil
Temperature: +150 °C

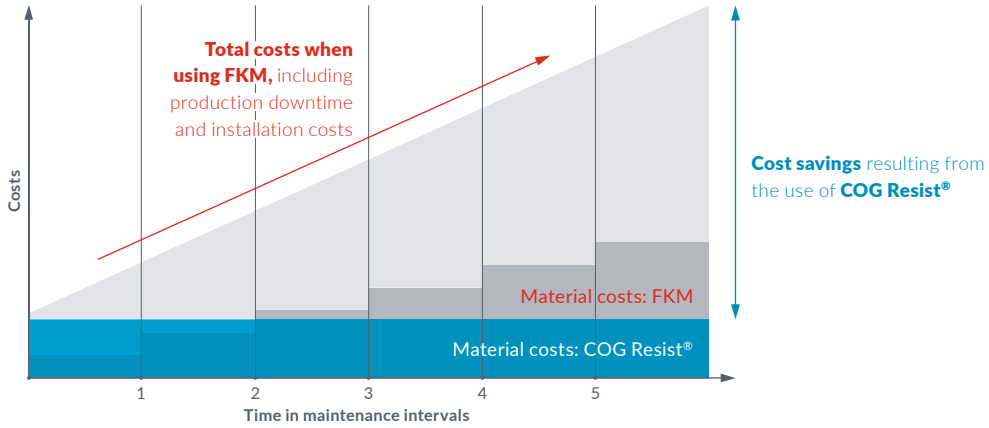
Over
4.000
operateing hours

COG Resist®

Conclusion: Seal still maintained

A one-off investment with long-term cost savings

The COG Resist® compound's initially higher material costs balance themselves out in use, thanks to the material's extreme durability and high levels of resistance. Less suitable types of elastomer seals need to be replaced after just a short time in use, resulting in not only material and installation costs, but also expensive production downtime. An optimally adapted COG Resist® seal, on the other hand, extends the maintenance interval and therefore plays an important role in keeping costs down.



Highclass all-rounder: COG Resist®

This material group is based on perfluorelastomers (FFKM/FFPM). These premium compounds have been designed for high-performance applications, special applications and also for very long periods of use where there is often no alternative material available: COG Resist® is extremely resistant, even with changing media. This is especially important in applications where a single seal is exposed to various different chemicals. In such applications, the extreme operating temperatures, which range from extremely cold to extraordinarily hot, often place the greatest demands on the seals used.

COG Resist® RS 75 AL

This all-rounder material for the widest variety of applications impresses with its outstanding temperature resistance combined with excellent resistance to chemicals and acids and superb mechanical properties. This high-performance elastomer is also resistant to vapour and hot amines, and is ideal for use in vacuum applications.

- Heat resistant to +325 °C
- Outstanding chemical resistance
- Good mechanical properties
- Highly resistant to vapour
- High thermal expansion coefficient
- Excellent behaviour in vacuums

COG Resist® RS 80 AL

This high performance FFKM material demonstrates excellent resistance to acids, amines and media containing chlorine and solvents. It is heat resistant up to +260 °C and has excellent mechanical properties. What's more, its range of applications is correspondingly broad: whether in pressure tanks or diesel engines, couplings or valves – COG Resist® RS 80 AL demonstrates the necessary resistances.

- Heat resistant to +260 °C
- Excellent chemical resistance
- Outstanding mechanical properties
- High coefficient of thermal expansion
- Can be used universally in the chemical industry and also in refineries

ASTM D 1418 ISO 1629	COG material	Hardness	Colour	Operating temperature	Special properties
FFKM	COG Resist® RS 75 AL	76 Shore A	black	from -15 °C to +325 °C	outstanding chemical resistance, heat resistant to +325 °C
	COG Resist® RS 80 AL	79 Shore A	black	from -15 °C to +260 °C	excellent chemical resistance, good mechanical properties
	COG Resist® RS 92 AED	92 Shore A	black	from -15 °C to +260 °C	NORSOK M-710 (Annex B), NACE TM0297
	COG Resist® RS 175 AL	75 Shore A	black	from -15 °C to +230 °C	excellent chemical resistance

COG Resist® RS 92 AED

The COG Resist® RS 92 AED material is high tech: it was especially developed and tested for use in environments where explosive decompression can occur. Wherever seal materials are exposed to high pressure and aggressive media, COG Resist® RS 92 AED provides the security you need. Because the compound combines extraordinary chemical resistance with excellent thermal resistance. These high-end properties, along with its low compression set, make it the number one choice for deep sea-valves, pumps and compressor construction. In short, a material that satisfies the very highest demands.

- Excellent resistance to explosive decompression
- Tested to NORSOK standard M-710 (Annex B) and NACE TM 0297
- Operating temperature range from -15 °C to +260 °C
- Excellent chemical and thermal resistance
- Extraordinary resistance to methanol, hot water, vapour and oils
- High chemical resistance
- Very good compression set

COG Resist® RS 175 AL

As an attractively priced starter FFKM, COG Resist® RS 175 AL is suitable for series production of medium and large batch sizes. With excellent chemical resistance combined with extraordinary mechanical properties and excellent performance in vacuums, COG Resist® RS 175 AL proves its worth as a versatile high-performance material. This FFKM compound is universally used in the widest range of industrial systems, including in valves, pumps, valve fittings, diesel motors and pressure tanks, among other items.

- Excellent chemical resistance
- Outstanding mechanical properties
- Operating temperature range from -15 °C to +230 °C
- High thermal expansion coefficient
- Excellent behaviour in vacuums
- Suitable for medium and large batch sizes

Dependable in the most sensitive applications

This material group is based on perfluorelastomers (FFKM). These premium compounds have been designed for high-performance applications, special applications and also for very long periods of use, where there is often no alternative material available: COG Resist® is extremely resistant, even with changing media.

Premium compounds for high-performance applications

In many applications, a single seal may be exposed to various different chemicals. During the cleaning process, this seal then also comes into intensive contact with hot water vapour and solvents. In such cases, a universal sealing material of the very highest quality is absolutely essential. So it's good to know that you can rely on COG Resist® products.

Ask us!

For a competent consultation you are welcome to contact our application technology department and harness our know-how.

Email: applicationtechnology@cog.de

The best properties in one material

The molecular structure of perfluorelastomers is similar to that of polytetrafluoroethylenes (PTFE) and represents outstanding thermal stability and chemical resistance. But at the same time, perfluoroelastomers also demonstrate the elasticity (resilience) and sealing properties of an elastomer. The combination of these properties makes COG Resist® a flexible – and in especially demanding applications indispensable – all-rounder.

ASTM D 1418 ISO 1629	COG material	Hardness	Colour	Operating temperature	Special properties
FFKM	**COG Resist® RS 75 HS**	75 Shore A	white	from -15 °C to +260 °C	FDA 21. CFR 177.2600, FDA 21. CFR 177.2400, USP Class VI to +121 °C, Chapter 87 and 88, 3-A Sanitary Standard

HygienicSeal

COG Resist® for food and pharma

COG's FFKM compounds offer top performance and fulfil the highest demands made by the food and pharmaceutical sectors. These also include excellent resistance to the active ingredients in pharmaceutics (AIPs) and the renunciation of animal ingredients (ADI free). These materials can of course also be used in CIP and SIP processes, and can be used in dry, aqueous and also fatty media.

With FDA 21. CFR 177.2600, USP Class VI +121 °C and 3-A Sanitary Standard, industry pros are able to meet all their important demands. And over the long term, their extremely high resistance brings financial benefits thanks to a long service life and lower maintenance expenditure.

Certifications and approvals

Suitable for maximum loads in explosive decompression in systems used in the petrochemical industry, totally harmless when coming into contact with drinking water or guaranteed free of any animal matter in pharmaceutical production – the demands made of elastomer seals vary considerably depending on the different applications. In these sectors, uniform national and international standards apply, providing design engineers and users with the safety and peace of mind they need.



Overview of standards

In many applications, the materials used are subject to different standards. This also applies to the elastomer seals. The relevant certification for materials used in these fields of application is absolutely essential.

Oil and gas industry		
Approval/Test certificate/Directive	**Application/Country**	**Criteria/Standards**
NACE standards	For applications where strong pressure drops occur (explosive decompression), safety standard in the USA	NACE TM0297 In acid gas environments: NACE TM0187
NORSOK M-710 standard	Norwegian test procedure for materials' resistance to explosive decompression	NORSOK M-170 (Annex A or/and Annex B)

Food, medicine and pharmaceutical industries		
Approval/Test certificate/Directive	**Application/Country**	**Criteria/Standards**
FDA regulation number 177.2600 (Food and Drug Administration)	Materials used in the food and pharmaceutical sectors Country of origin: USA	Among others "White List" (List of formula ingredients) in accordance with 21. CFR Part 177.2600
USP test certificate (United States Pharmacopeia, USA)	Applications in the medical and pharmaceutical sectors Country of origin: USA	Various specifications: USP Class I to VI, Chapter 88, USP Chapter 87
3-A Sanitary (3-A Sanitary Standard Inc.)	Materials used in hygienic systems in the dairy and food industry Country of origin: USA	3-A Sanitary Standards and Criteria, Class I to IV

COG Resist® materials at a glance

Here you can find a compact overview of all compounds in our COG Resist® range, showing their most important properties. What's more, we also offer you a wide range of high-performance materials of all classes, in order to perfectly tailor your seal components to your specific requirements. You can find detailed information and data sheets for all materials at any time, in our comprehensive product area at www.cog.de/en.

ASTM D 1418 ISO 1629	COG material	Hardness	Colour	Operating temperature	Special properties
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We are pleased to assist!

When selecting the right material, there are many aspects to consider. You are therefore welcome to contact our application technology department and harness our know-how!

Email: applicationtechnology@cog.de

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