



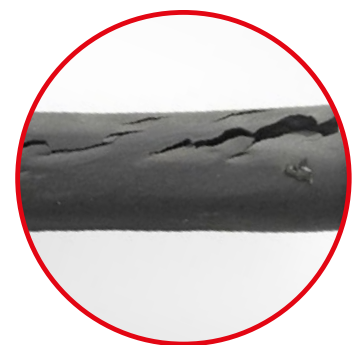
SEAL TECHNOLOGY
PREMIUM-QUALITY SINCE 1867



Explosive Decompression. No problem. High-tech compounds against explosive decompression.

The first-class precision elastomer seals from COG are used for various industrial applications. They must fulfill highest requirements to achieve the best possible sealing result. Many manufactures and operators in the oil and gas industries as well as in the compressor manufacturing business and in compressed air conditioning have leakage problems with elastomer seals, especially when a drop in pressure takes place.

This primarily occurs in sealings which create a barrier against gaseous media if highly pressurized gas falls to a very low pressure level within a very short period of time. The result of this process is often a damage of the sealings. The elastomer material is either torn in various places or blistering on the surface. This phenomenon is called **explosive decompression**.



For the high demands on elastomer seals **against explosive decompression** (AED / Anti Explosive Decompression) **COG** offers with **seven tested** compounds a wide range of AED products which were especially developed for use in this sector. **All compounds** have been tested **successfully** according to the **NORSOK Standard M-710** – the leading international standard for this field of application and renowned for safety for applications where explosive decompression may occur.

Sealing compounds against explosive decompression

Conventional elastomer sealing materials cannot be used in applications with explosive decompression as their resistance against such force is not sufficient. Only high-tech sealing compounds which were especially designed with very good physical properties are applicable in this sector.

Due to a special recipe and performance the FKM compounds from COG are suitable for applications in gas environment and have a long-term sealing effect even when a drop in pressure occurs. Furthermore FKM compounds offer a high chemical and thermal resistance.

Vi 890

The compound Vi 890 has proven its ability in praxis for applications where explosive decompression may occur and is one of the leading products in this product category. The excellent NORSOK rating of "1100" – even two of three tested O-Rings have been rated "0000" makes clear why so many customers trust in the ultimate performance of this compound.

Material	O-Ring	NORSOK rating	OVERALL NORSOK rating	PASS/FAIL
Vi 890	1	0000	1100	Pass
	2	0000		
	3	1100		

Properties of Vi 890:

- Very good resistance to explosive decompression
- Excellent chemical and thermal resistance
- Operating temperature range from -20 °C up to +210 °C
- Good physical properties
- Applicable under high pressure

Datasheet

COG-No.:	Vi 890
Basic elastomere:	Fluorinated rubber (FKM)
Colour:	black
Temperature range:	from -20 °C to +210 °C
License/Certificate:	Certificate according to NORSOK Standard M-710

Typical properties

Properties	Unit	Value	Testing methods
Hardness:	Shore A	90 ± 5	DIN ISO 7619-1
	°IRHD	90 +3/-8	DIN ISO 48
Tensile strength:	MPa	> 17	DIN 53 504
Ultimate elongation:	%	> 130	DIN 53 504
Compression set (24 h/200 °C)	%	< 15	DIN ISO 815

The indicated values do not replace the official data sheet. They are not binding and exclude all liability for damage of any kind.

Vi 895

The FKM compound Vi 895 offers a very good low temperature flexibility down to -45 °C as well as a high resistance to explosive decompression. Vi 895 fulfills some of the most important certifications for this sector: the NORSOK Standard M-710, NACE TM 0297 (explosive decompression) and NACE TM 0187 (sour gas). In addition to that the FKM compound shows an improved resistance to methanol, sour gas, hot water, water vapour and oils. An outstanding FKM compound without any compromises.

Properties of Vi 895:

- Very good resistance to explosive decompression
- NORSOK Standard M-710, NACE TM 0297 & NACE TM 0187 tested
- Very good high temperature resistance down to -45 °C
- High chemical resistance
- Low compression set

Datasheet

COG-No.:	Vi 895
Basic elastomere:	Fluorinated rubber (FKM)
Colour:	black
Temperature range:	from -45 °C to +225 °C
License/Certificate:	Tested according to NORSOK Standard M-710, NACE TM 0297, NACE TM 0187, ISO 10423 (API 6A), ISO 23936-2

Typical properties

Properties	Unit	Value	Testing methods
Hardness:	Shore A	90 ± 5	ASTM D 2240
	°IRHD	90 ± 5	ASTM D 1415
Tensile strength:	MPa	> 14	ASTM D 412
Ultimate elongation:	%	> 130	ASTM D 412
Compression set (24 h/200 °C)	%	< 20	ASTM D 395 B

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Vi 896

The FKM compound Vi 896 has been tested successfully to the Norsok Standard M-710 (Norsok Rating 1111). The FKM compound Vi 896 has been designed as a reasonable alternative even for large quantities and can be used in many applications with explosive decompression.

Properties of Vi 896:

- Very good resistance to explosive decompression
- Good chemical and thermal resistance
- Operating temperature range from -20 °C up to +210 °C
- Good physical properties

Datasheet

COG-No.:	Vi 896
Basic elastomere:	Fluorinated rubber (FKM)
Colour:	black
Temperature range:	from -20 °C to +210 °C
License/Certificate:	Certificate according to Norsok Standard M-710

Typical properties

Properties	Unit	Value	Testing methods
Hardness:	Shore A	90 ± 5	DIN ISO 7619-1
	°IRHD	90 +3/-8	DIN ISO 48
Tensile strength:	MPa	> 9	DIN 53 504
Ultimate elongation:	%	> 130	DIN 53 504
Compression set (24 h/200 °C)	%	< 25	DIN ISO 815

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Vi 899

Next to an excellent low temperature flexibility down to -46 °C the FKM compound Vi 899 offers high resistance to explosive decompression. Vi 899 is suitable for the use in API 6A & 6D compliant valves and wellhead equipment. A good chemical resistance and physical properties complete the performance profile of that high-tech compound.

Properties of Vi 899:

- Very good resistance to explosive decompression
- Good chemical and thermal resistance
- Operating temperature range from -46 °C up to +230 °C
- Fulfills the API 6A & 6D standard in the valve and wellhead equipment industry
- Good physical properties

Datasheet

COG-No.:	Vi 899
Basic elastomere:	Fluorinated rubber (FKM)
Colour:	black
Temperature range:	from -46 °C to +230 °C
License/Certificate:	Certificate according to Norsok Standard M-710

Typical properties

Properties	Unit	Value	Testing methods
Hardness:	Shore A	90 ± 5	DIN ISO 7619-1
	°IRHD	90 +3/-8	DIN ISO 48
Tensile strength:	MPa	> 10	DIN 53 504
Ultimate elongation:	%	> 200	DIN 53 504
Compression set (24 h/200 °C)	%	< 20	DIN ISO 815

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HNBR 895

The compound HNBR 895 has an excellent chemical resistance especially to oil and fuel. Beyond that the compound provides a very good resistance to weather and heat. At the same time a high mechanical strength persists. HNBR 895 fulfills the NORSOK Standard M-710 requirements for resistance to explosive decompression. These are ideal conditions for a long-term, leakage free use in the oil and gas industry.

Properties of HNBR 895:

- Very good resistance to explosive decompression
- NORSOK Standard M-710 and NACE TM 0297-97 tested
- High chemical resistance
- High mechanical strength

Datasheet

COG-No.:	HNBR 895
Basic elastomere:	Hydrated acrylnitrile-butadiene rubber (HNBR)
Colour:	black
Temperature range:	from -25 °C to +180 °C
License/Certificate:	Certificate according to NORSOK Standard M-710, NACE TM 0297-97

Typical properties

Properties	Unit	Value	Testing methods
Hardness:	°IRHD	89	ASTM D 1415
Tensile strength:	MPa	32,1	ASTM D 412
Ultimate elongation:	%	264	ASTM D 412
Compression set (24 h/150 °C)	%	< 20	ASTM D 395

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HNBR 899

The HNBR 899 has passed the NORSOK test with the best possible rating of „0000“. This HNBR is a multi-purpose compound which is usable in different industrial applications. Due to the chemical resistance e. g. to mineral oils with additives or oil and grease in combination with a low gas or vapour permeability this compound is an optimal choice for many applications.

Properties of HNBR 899:

- Outstanding resistance to explosive decompression
- NORSOK Standard M-710 tested
- High chemical resistance
- High mechanical strength
- High resistance to additive mineral oil
- Low gas and vapour permeability
- Good mechanical properties
- Good oil and grease resistance
- Applicable under high pressure

Datasheet

COG-No.:	HNBR 899
Basic elastomere:	Hydrated acrylnitrile-butadiene rubber (HNBR)
Colour:	black
Temperature range:	from -17 °C to +150 °C
License/Certificate:	Certificate according to NORSOK Standard M-710

Typical properties

Properties	Unit	Value	Testing methods
Hardness:	Shore A	90 ± 5	DIN ISO 7619-1
	°IRHD	90 +3/-8	DIN ISO 48
Tensile strength:	MPa	> 20	DIN 53 504
Ultimate elongation:	%	> 210	DIN 53 504
Compression set (24 h/100 °C)	%	< 20	DIN ISO 815

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FFKM compounds

FFKM rubbers are currently the elastomers that are most resistant to chemicals. They combine the elastic properties of rubber with the outstanding chemical resistance of PTFE. As a high-performance elastomer, COG Resist® possesses outstanding resistance to temperature and chemicals whilst its material behaviour is very well balanced. With FFKM COG Resist® RS 92 AED, COG offers a top-class compound.



COG Resist® RS 92 AED

The high-tech sealing compound COG Resist® RS 92 AED offers the exceptional chemical compatibility of an FFKM, combined with an excellent thermal resistance. The compound for highest requirements has been developed and tested to explosive decompression. Ideal preconditions for a use in all situations where the sealing material comes into contact with high pressure as well as with aggressive media, e. g. in subsea valves, pumps and compressors. A low compression set and an improved leak prevention complete the performance profile of this high-tech compound.

Properties of COG Resist® RS 92 AED:

- Very good resistance to explosive decompression
- NORSOK Standard M-710 and NACE TM 0297 tested
- Temperature range from -15 °C up to +260 °C
- Very good chemical and thermal resistance
- Excellent resistance to methanol, hot water, vapour and oils
- Low compression set

Datasheet

COG-No.:	COG Resist® RS 92 AED
Basic elastomere:	Perfluoro rubber (FFKM)
Colour:	black
Temperature range:	from -15 °C to +260 °C
License/Certificate:	Certificate according to NORSOK Standard M-710, NACE TM 0297

Typical properties

Properties	Unit	Value	Testing methods
Hardness:	Shore A	92 ± 5	ASTM D 2240
	°IRHD	92 ± 5	ASTM D 1415
Tensile strength:	MPa	>20	ASTM D 412
Ultimate elongation:	%	>120	ASTM D 412
Compression set (24 h/200 °C)	%	<15	ASTM D 395

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NORSOK:

The NORSOK Standard M-710 was developed by the Norwegian oil and gas industry and is a test method for the resistance of sealing material to explosive decompression.

The greatest resistance to extreme pressure changes.

The phenomenon explosive decompression exists in various industrial applications and concerns different components. Due to that, all elements used must be resistant to explosive decompression. A typical field of application is the natural gas production. Elastomer seals can be used in machine parts like in pig traps, gate valves, ball cocks and other regulating valves. Using the special compounds from COG, damages from explosive decompression and costly leakages have already been avoided. Additionally the compounds have been tried and tested successfully in high pressure compressor constructions and in endurance tests carried out in oil production.

All seven compounds ensure a long-time sealing performance even if an extremely sudden change in pressure takes place. Next to a high chemical and thermal resistance the compounds offer a hardness which counteract a possible gap extrusion and avoid explosive decompression.

Sealing compounds which are used in such areas must withstand the common interaction that can occur in a production process. Often a challenging task which only a few sealing compounds can fulfill. Manufacturing expertise, an experienced consultancy and external, independent tests offer ideal conditions for a safe and satisfying sealing result.

The needs of our customers define how we act in all areas. This means we develop new ideas and products quickly, and in a market- and goal-oriented manner – for the benefit of our customers. Please refer to www.cog.de or contact us directly for more information. Let's discuss your needs!

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