



ELASTOMERS & ADVANCED THERMOPLASTIC REFERENCE GUIDE

FREUDENBERG
OIL & GAS TECHNOLOGIES

 **FREUDENBERG**
INNOVATING TOGETHER

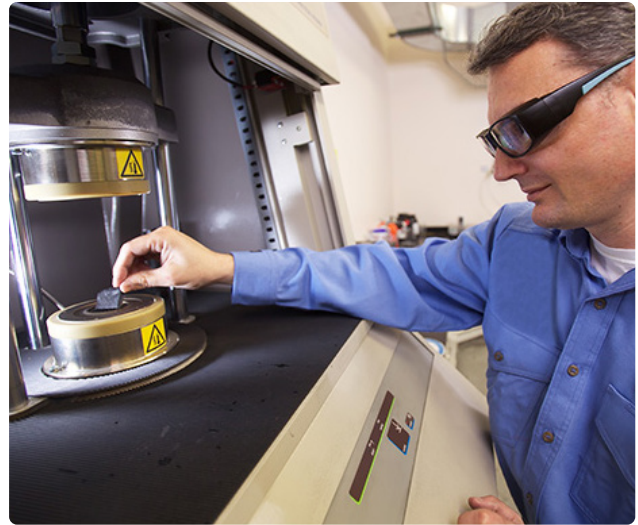
Solutions Development and Testing

Freudenberg Oil & Gas Technologies leverages the more than 80 years of sealing and material innovation of The Freudenberg Group. With focused innovation through our 14,000-sq-ft Material Development & Product Test Facility located in Houston, Texas, Freudenberg Oil & Gas Technologies works to develop and certify new materials and products to meet the greater sealing demands for upstream applications.

The material development and product testing facility has International Standard ISO/IEC 17025:2005 accreditation for testing and calibration laboratories.

Our material development and product testing capabilities include:

- Elastomer Development, Mixing, and Prototyping
- Material Property Testing and Validation
- Sour Gas (H₂S) Testing
- HPHT Testing
- Thermal Cycle/PR 2 Testing
- Product Testing to API and ISO Industry Standards
- Rapid Gas Decompression (RGD) Testing



NATURAL RUBBER

[Request Data Sheet](#)

NBR Elastomers	Features and Benefits	Temperature Range (in air)	Hardness (Shore A)	Tensile Strength (psi/Mpa)	100% Modulus (psi/MPa)	Elongation at Break (%)
70 PEI 01OGT	Natural rubber compound, sulphur cured and carbon black reinforced. Ideal for dynamic or static engineering applications with low hysteresis loss, good low temperature properties, strong bonding to metal parts and high resistance to tear and abrasion.	-51°C to 125°C -60°F to 257°F	70	3500/24.2	50% - 280/1.9 200% - 1350/9.3	450
109 Black	Natural rubber compound using high purity block NR stock polymer and mineral fill reinforced. Used in our FOGT Cement Plug product line.	-51°C to 125°C -60°F to 257°F	65	2022/14.0	465/3.2	478
109 Orange	Natural rubber compound using high purity block NR stock polymer and mineral fill reinforced. Used in our FOGT Cement Plug product line.	-51°C to 125°C -60°F to 257°F	62	2117/14.6	1988/13.7	178

ELASTOMERS

[Request Data Sheet](#)

NBR Elastomers	Features and Benefits	Temperature Range (in air)	Hardness (Shore A)	Tensile Strength (psi/Mpa)	100% Modulus (psi/MPa)	Elongation at Break (%)
124OGT-70	Synthetic, sulfur-cured NBR elastomer with medium ACN content. General purpose elastomer with good aging properties and provides good resistance to oil, fuel, weathering and acid.	-20°C to 100°C -4°F to 212°F	73	3181/21.9	730/5.0	408
125OGT-70	Synthetic, sulfur-cured NBR elastomer with medium ACN content. Superior low temperature performance and has good resistance to oil, fuel, water, greases and mineral oils.	-25°C to 100°C -13°F to 212°F	69	2919/20.1	463/3.2	595
160OGT-95	Extrusion-resistant NBR.	-20°C to 125°C -4°F to 257°F	95	2576/17.7	1988/13.7	178
161OGT-80	Synthetic, sulfur-cured NBR elastomer with medium ACN content. General purpose elastomer with good aging properties and provides good resistance to oil, fuel, weathering and acid.	-20°C to 100°C -4°F to 212°F	80	3249/22.4	669/4.6	385
162OGT-80	Synthetic, sulfur-cured NBR elastomer with medium ACN content. General purpose elastomer with good aging properties and provides good resistance to oil, fuel, weathering and acid.	-20°C to 100°C -4°F to 212°F	79	3700/25.5	620/4.3	520
163OGT-80	High-elongation NBR that is good for high-strain applications.	-20°C to 100°C -4°F to 212°F	80	4074/28.1	627/4.3	543
168OGT-80	Synthetic NBR elastomer with low ACN content. Superior low temperature performance. This general purpose elastomer exhibits good aging properties and provides good resistance to oil, fuel, weathering and acid.	-54°C to 121°C -65°F to 250°F	80	2100/14.5	1100/7.6	150
169OGT-90	Synthetic, sulfur-cured NBR elastomer with medium ACN content. General purpose elastomer with good aging properties and provides good resistance to oil, fuel, weathering and acid.	-20°C to 125°C -4°F to 257°F	93	2773/19.1	1835/12.7	228

ELASTOMERS CONTINUED

Request Data Sheet

XNBR Elastomers	Features and Benefits	Temperature Range (in air)	Hardness (Shore A)	Tensile Strength (psi/Mpa)	100% Modulus (psi/MPa)	Elongation at Break (%)
81OGT-85	Cabroxylated nitrile rubber, recognized for its superior performance in a variety of oil and gas applications, particularly stripping and snubbing. Oil and solvent resistant, this compound offers better abrasion resistance, even at elevated temperatures.	-20°C to 100°C -4°F to 212°F	88	4025/27.8	1490/103	287
91OGT-90	Cabroxylated nitrile rubber, recognized for its superior performance in a variety of oil and gas applications, particularly stripping and snubbing. Oil and solvent resistant, this compound offers better abrasion resistance, even at elevated temperatures.	-20°C to 100°C -4°F to 212°F	91	2886/19.9	2878/27	219
912OGT-90	Cabroxylated nitrile rubber, recognized for its superior performance in a variety of oil and gas applications, particularly stripping and snubbing. This compound offers good abrasion resistance even at elevated temperatures, as well as the similar resistance associated with conventional nitrile rubber.	-20°C to 100°C -4°F to 212°F	91	3666/25.3	2700/18.6	184

HNBR Elastomers	Features and Benefits	Temperature Range (in air)	Hardness (Shore A)	Tensile Strength (psi/Mpa)	100% Modulus (psi/MPa)	Elongation at Break (%)
Gazguard 702OGT	Synthetic, peroxide-cured, hydrogenated, medium acrylonitrile, HNBR elastomer. This high-performance grade has been compounded to offer superior Rapid Gas Decompression (RGD) resistance and is ideal for high-pressure gas applications. Excellent abrasion resistance.	-25°C to 160°C -13°F to 320°F	90	5511/38.0	1885/13.0	226
Gazguard 728OGT	Low acrylonitrile, peroxide-cured HNBR elastomer designed to offer superior low-temperature sealing performance combined with excellent resistance to RGD.	-33°C to 150°C -27°F to 302°F	90	3480/24.0	1740/12.0	230
591OGT-70	Synthetic, sulfur-cured, hydrogenated, medium acrylonitrile HNBR elastomer. This high-performance grade has been compounded to offer good chemical resistance combined with superior mechanical properties. Good for high-elongation applications like packer elements.	-25°C to 150°C -13°F to 302°F	69	4858/33.5	457/3.1	496
591OGT-80	Synthetic, sulfur cured, hydrogenated, medium acrylonitrile HNBR elastomer. This high performance grade has been compounded to offer good chemical resistance combined with superior mechanical properties. Good for high elongation applications like packer elements	-25°C to 150°C -13°F to 302°F	80	3800/26.2	1400/9.7	315
591OGT-90	Synthetic, sulfur-cured, hydrogenated, medium acrylonitrile HNBR elastomer. This high-performance grade has been compounded to offer good chemical resistance combined with superior mechanical properties. Good for high-elongation applications like packer elements.	-25°C to 150°C -13°F to 302°F	90	4108/28.3	2314/16.0	267
731OGT-80	Medium acrylonitrile, peroxide-cured HNBR elastomer. Resistance to conventional oils and fuels. This HNBR compound has enhanced mechanical properties and abrasion resistance, excellent resistance to oxygen and ozone weathering, and higher temperature capabilities.	-25°C to 150°C -13°F to 302°F	82	4500/31.0	2050/14.1	210
741OGT-90	Medium acrylonitrile, peroxide-cured HNBR elastomer. This high performance grade has been compounded to offer excellent resistance to extrusion, RGD and sealing performance at low temperatures.	-25°C to 150°C -13°F to 302°F	93	4600/31.7	3600/24.8	130
754OGT-80	Synthetic, peroxide-cured, hydrogenated, medium acrylonitrile, HNBR elastomer. This high-performance grade has been compounded to offer good chemical resistance combined with superior mechanical properties.	-25°C to 150°C -13°F to 302°F	81	4710/32.5	1150/7.9	250
775OGT-85	Synthetic peroxide/sulfur-cured, hydrogenated medium ACN content HNBR elastomer. Resistance to conventional oils and fuels. This HNBR compound has enhanced mechanical properties and abrasion resistance, excellent resistance to oxygen and ozone weathering, and higher temperature capabilities.	-15°C to 150°C 5°F to 302°F	83	5766/39.8	1266/8.7	372
776OGT-90	Synthetic, peroxide-cured, hydrogenated, high ACN content HNBR elastomer. This material has been compounded for improved performance in dynamic applications and excellent extrusion resistance at high temperatures.	-15°C to 160°C 5°F to 320°F	94	4633/32.0	4682/32.3	109

ELASTOMERS CONTINUED

Request Data Sheet

FKM Elastomers	Features and Benefits	Temperature Range (in air)	Hardness (Shore A)	Tensile Strength (psi/Mpa)	100% Modulus (psi/MPa)	Elongation at Break (%)
Gazguard 026OGT	Peroxide-cured, FKM terpolymer, carbon black reinforced. This high-performance grade has been compounded to offer excellent resistance to RGD, a wide range of aliphatic and aromatic hydrocarbons and solvents. Good compression resistance, high elongation and optimized performance in high-pressure gas applications.	-13°C to 200°C 9°F to 392°F	92	2645/18.2	1450/10.0	207
Gazguard 029OGT	Low-temperature, peroxide-cured, FKM terpolymer. This high-performance grade has been compounded to offer excellent resistance to RGD and superior sealing performance at low temperatures.	-30°C to 200°C -22°F to 392°F	88	2900/20.0	1740/12.0	163
Gazguard 030OGT	Low-temperature, peroxide cured, FKM tetrapolymer. This high-performance grade has been compounded to offer excellent resistance to RGD and superior sealing performance at low temperatures.	-30°C to 200°C -22°F to 392°F	92	3300/22.7	2600/18.0	130
037OGT-90 (BRE)	Peroxide-cured fluoroelastomer with excellent resistance to aggressive oils, amine-containing fluids, bases, steam and sour gas. Superior extrusion resistance.	-9°C to 210°C 16°F to 410°F	91	3100/21.4	2370/16.3	130
2174OGT-70	Bisphenol-cured fluoroelastomer with excellent resistance to a wide range of aliphatic and aromatic hydrocarbons and solvents, ketones, esters, strong acids and bases.	-12°C to 250°C 10°F to 392°F	71	1850/12.8	700/4.8	270
2174OGT-80	Bisphenol-cured fluoroelastomer with excellent resistance to a wide range of aliphatic and aromatic hydrocarbons and solvents. This compound offers high-elongation and low-compression set values, coupled with good extrusion resistance.	-12°C to 200°C 10°F to 392°F	79	1668/11.5	718/5.0	282
2174OGT-90	Bisphenol-cured fluoroelastomer with excellent resistance to a wide range of aliphatic and aromatic hydrocarbons and solvents. This compound offers high-elongation and low-compression set values, coupled with good extrusion resistance and optimized performance in high-pressure gas applications.	-12°C to 200°C 10°F to 392°F	90	2350/16.2	1750/12.1	150

Aflas Elastomers	Features and Benefits	Temperature Range (in air)	Hardness (Shore A)	Tensile Strength (psi/Mpa)	100% Modulus (psi/MPa)	Elongation at Break (%)
430OGT-80	Tetrafluoroethylen-propylene (TFE/P) (FEPM) peroxide-cured compound that has excellent resistance to H ₂ S, hot water, steam and amines.	-20°C to 200°C -4°F to 392°F	83	3033/20.9	1689/11.6	180
455OGT-90	Tetrafluoroethylen-propylene (TFE/P) (FEPM) peroxide-cured compound that has excellent resistance to H ₂ S, hot water, steam and amines.	-20°C to 221°C -4°F to 430°F	90	3200/22.1	2900/20	120

FKM Elastomers	Features and Benefits	Temperature Range (in air)	Hardness (Shore A)	Tensile Strength (psi/Mpa)	100% Modulus (psi/MPa)	Elongation at Break (%)
130OGT	Perfluoroelastomer compound with wide operational temperature and broad chemical resistance. In addition, the compound has very good RGD resistance.	-6°C to 250°C 21°F to 482°F	90	3439/23.7	3482/24.0	91
131OGT	Perfluoroelastomer compound with very good steam resistance and chemical resistance to acids, caustics, sour gas and hydrocarbons.	-15°C to 320°C 5°F to 608°F	90	2930/20.2	2930	100

Polyurethane	Features and Benefits	Temperature Range (in air)	Hardness (Shore A)	Tensile Strength (psi/Mpa)	100% Modulus (psi/MPa)	Elongation at Break (%)
PU 030OGT	Displays good mechanical properties, dynamic properties, cold flexibility and processing capabilities. This material also shows good resistance to oils and hydrolysis.	-30°C to 105°C -22°F to 221°F	92	8050/55.5	1905/13.1	339

THERMOPLASTICS

Request Data Sheet

Material Code	Material Description	Features and Benefits	Temperature Range (°F) (in air)	Hardness (Shore D)	Tensile Strength (PSI)	Elongation (%)
1000	PTFE, virgin	Low modulus for good sealability; superior chemical resistance	-400°F to 500°F -240°C to 260°C	57	4350	330
1100	PTFE, w/ carbon	Reduces creep, increases hardness, improves wear	-300°F to 550°F -184°C to 288°C	61	4000	300
1110	PTFE, w/ graphite	Increases wear resistance and decreases abrasiveness in dynamic applications	-350°F to 500°F -213°C to 260°C	60	3100	200
1125	PTFE, w/ carbon + graphite	Increases wear resistance, reduces creep, improves thermal stability	-300°F to 550°F -184°C to 288°C	62	2300	150
1220	PTFE, w/ glass	Increases compressive strength, reduces creep, improves wear	-300°F to 550°F -184°C to 288°C	61	2900	250
1300	PTFE, w/ MDS	Increases surface hardness, improves wear, reduces creep	-350°F to 500°F	59	3900	250
1420	PTFE, w/ glass + MDS	Improves high pressure / temperature performance, improves wear	-300°F to 550°F -184°C to 288°C	60	3700	255
1540	PTFE, w/ bronze	Improves extrusion resistance, increases wear resistance	-350°F to 550°F -213°C to 288°C	63	3300	250
1725	PTFE, w/ PPS + carbon fiber	Increases properties needed for high PV applications	-300°F to 550°F -184°C to 288°C	62	2400	200
1732	PTFE, w/ PPS + glass fiber + MDS	Improves mechanical properties for high-stress applications	-300°F to 550°F -184°C to 288°C	63	1950	145
1742	PTFE, w/ PPS + graphite + MDS filled	Improves mechanical and wear properties for dynamic applications	-300°F to 550°F -184°C to 288°C	65	1425	125
2000	mPTFE, virgin	Chemically modified PTFE for increased mechanical properties, lower permeability, higher density, better thermal stability over standard PTFE	-350°F to 500°F -213°C to 260°C	60	5500	530
2120	mPTFE, w/ carbon	Increases modulus, improves thermal stability	-300°F to 550°F -184°C to 288°C	65	2400	150
2205	mPTFE, w/ glass	Reduces creep, increases hardness, improves wear	-300°F to 550°F -184°C to 288°C	60	4500	400
2300	mPTFE, w/ MDS	Increases surface hardness, improves wear, reduces creep	-350°F to 500°F -213°C to 260°C	62	4400	420
4000	PEEK, virgin	High strength / modulus, thermally stable, good chemical resistance	-75°F to 500°F -60°C to 260°C	87	14300	70
4130	PEEK, w/ carbon fiber	Improves tensile and compressive strength, improves thermal stability	-75°F to 500°F -60°C to 260°C	95	32700	1.3
4230	PEEK, w/ glass	Increases modulus, improves thermal stability	-75°F to 500°F -60°C to 260°C	90	26900	2.8
4235	PEEK, w/ glass (low-stress)	Reduces hoop stress	-75°F to 500°F -60°C to 260°C	91	22900	2.7
4330	PEEK, w/ carbon + graphite + PTFE	Increases modulus, reduces friction	-75°F to 500°F -60°C to 260°C	88	20300	2.2
4410	PEEK, w/ PTFE	Reduces friction	-75°F to 500°F -60°C to 260°C	85	12000	15
5000	PEKK, virgin	Increased glass-transition temperature for higher temperature service	-50°F to 550°F -46°C to 288°C	87	15000	5
5130	PEKK, w/ carbon	Improves tensile and compressive strength, improves thermal stability	-50°F to 550°F -46°C to 288°C	95	15500	2
5230	PEKK, w/ glass	Increases modulus, improves thermal stability	-50°F to 550°F -46°C to 288°C	90	27200	2.4
TR-540	PPS, w/ carbon + graphite	Heavy duty bearing grade; high PV	-50°F to 425°F -46°C to 219°C	85	6000	0.7
TR-560	PPS, w/ carbon + PTFE + graphite	Heavy duty bearing grade; high PV; lubricated	-50°F to 425°F -46°C to 219°C	80	11200	3.0
TR-611	PPS, w/ glass + friction modifier	Utility grade w/ friction modifier	-50°F to 425°F -46°C to 219°C	88	7800	1.0
TR-633	PPS, w/ glass + graphite + friction modifier	High strength / modulus	-50°F to 425°F -46°C to 219°C	89	7500	0.97
TR-888	PPS, w/ PTFE + carbon fiber + glass	High temperature sealing material	-100°F to 500°F -74°C to 260°C	72	1500	1.3

MATERIAL SPECIFICATIONS

API-6A Certified Materials

Proprietary materials qualified to API-6A-FF/HH material classification

Freudenberg Oil & Gas Technologies is a leader in elastomer and advanced thermoplastic material technology, offering FF/HH materials qualified to API-6A 21st ed. F.1.13.5.2 and ISO 10423 F.1.11 standards.

All FF/HH qualified materials are exposed to a chemically aggressive environment for more than 160 hours at the maximum specified temperature rating for the temperature classification being tested or the required maximum temperature of the seal application.

A specific example of certified performance of our FF/HH compounds is the Gazguard® 728 compound, which has been certified to material class FF/HH per ISO 10423:2009 and ANSI/API Specification 6A 21st Ed. within gas mixtures of:

- 10% H₂S / 10% CH₄ / 80% CO₂
- Jet Fuel A, #2 Diesel
- 70/20/10 mix of heptane/cyclohexane/toluene

In addition, S Seals and FS Seals composed of Gazguard® 728 have achieved 10,000 psi PR2 Certification to ISO 10423 F.1.11 in various sizes and temperature ranges.

Benefits:

- Excellent resistance to chemical attack from oils and fuels
- Enhanced mechanical properties and abrasion resistance
- Excellent resistance to oxygen and ozone weathering, and explosive decompression damage

CERTIFIED FOGT ELASTOMERS

[Request Data Sheet](#)

Material	Hydrocarbon Liquid Phase	Temperature	Duration
85 HNBR 6100OGT	Water, #2 Diesel	250°F/121°C	336 hours (14 days)
80 HNBR 731OGT	70/20/10 mix of heptane/cyclohexane/toluene	350°F/177°C	168 hours (7 days)
90 HNBR 741OGT	70/20/10 mix of heptane/cyclohexane/toluene	350°F/177°C	168 hours (7 days)
HNBR 775OGT	Water, #2 Diesel	350°F/177°C	336 hours (14 days)
Gazguard HNBR 702	Water, #2 Diesel	250°F/121°C	168 hours (7 days)
90 Gazguard LT 728OGT	Jet Fuel, Water	250°F/121°C	160 hours
90 Gazguard LT 728OGT	Water, #2 Diesel	250°F/121°C	168 hours (7 days)
90 Gazguard LT 728OGT	70/20/10 mix of heptane/cyclohexane/toluene	350°F/177°C	168 hours (7 days)
90 FKM 03OGT	70/20/10 mix of heptane/cyclohexane/toluene	350°F/177°C	336 hours (14 days)

Note: FOGT has adopted acceptance criterion from ISO 2396-2

Change in properties:

Hardness: +10/-20 units **Volume:** +25%/-5% **Tensile:** +/-50% (tensile modulus, tensile strength, strain at break)

Visual: No dissolution, cracking, blistering or physical deformation permitted

CERTIFIED FOGT ADVANCED THERMOPLASTICS

[Request Data Sheet](#)

Material	Hydrocarbon Liquid Phase	Temperature	Duration
PEEK 4000	70/20/10 mix of heptane/cyclohexane/toluene	350°F (177°C)	336 hours (14 days)
PTFE 2000	70/20/10 mix of heptane/cyclohexane/toluene	350°F (177°C)	336 hours (14 days)
PTFE 1125	70/20/10 mix of heptane/cyclohexane/toluene	350°F (177°C)	336 hours (14 days)
PTFE 1742	70/20/10 mix of heptane/cyclohexane/toluene	350°F (177°C)	336 hours (14 days)

Note: FOGT has adopted acceptance criterion from NORSOK M710 / ISO 23926-1 for thermoplastic seals and gaskets

Change in properties:

Volume: +5%/-1% **Tensile:** +/-50% (tensile modulus, tensile strength, strain at break)

Visual: No dissolution, cracking, blistering or physical deformation permitted

API-6A MATERIAL CLASSES

[Request Data Sheet](#)

Material Class	Hydrocarbon Liquid Phase	Gas Phase
AA/BB	b	5% vol. fraction CO ₂ /95% vol.fraction CH ₄
CC	b	80% vol. fraction CO ₂ /95% vol.fraction CH ₄
DD/EE	b	10% vol. fraction H ₂ S/5% vol. fraction CO ₂ /85% vol.fraction CH ₄
FF/HH	b	10% vol. fraction H ₂ S/80% vol. fraction CO ₂ /10% vol.fraction CH ₄

Note:

- (a) Water shall be added to the liquid phase
- (b) Hydrocarbon liquid phase selected at the manufacturer’s discretion may include, but is not limited to, jet fuel, kerosene, etc.

API-6A TEMPERATURE RATINGS

[Request Data Sheet](#)

Temperature Classification	Operating Range (°C)		Operating Range (°F)	
	Min	Max	Min	Max
K	-60	82	-75	180
L	-46	82	-50	180
N	-46	60	-50	140
P	-29	82	-20	180
S	-18	60	0	140
T	-18	82	0	180
U	-18	121	0	250
V	2	121	35	250
X*	-18	176	0	350
Y*	-18	343	0	650

*Removed from API-6A / ISO 10423 in 2013

Gazguard Elastomers

High performance elastomers engineered for demanding applications

Gazguard® compounds are designed to have exceptional physical and chemical durability, making them ideal for extreme operating environments. All are certified according to the stringent requirements of Norsok M-710 RGD, Norsok M-710 sour gas and ISO 10423 (API 6A) chemical aging immersion and fixture testing.

Our Gazguard® 775 material has been designed for use within Blow Out Preventer (BOP) seals and bonded seals are certified under API 16A 4th edition testing for temperatures up to 350°F and has passed the requirements of Norsok M-710 RGD and Norsok M-710 sour gas testing up to 10% H₂S. Certifications are available for download.

Benefits:

- Excellent resistance to chemical attack from oils and fuels
- Enhanced mechanical properties and abrasion resistance
- Excellent resistance to oxygen and ozone weathering, and explosive decompression damage
- HNBR, FKM and FFKM-based polymers available

AVAILABLE GAZGUARD MATERIALS

[Request Data Sheet](#)

FOGT Compound	Material Type	RGD Resistant (NORSOK M-710 / ISO 23936-2)	H ₂ S Resistant (NORSOK M-710 / ISO 23936-2)	Hardness (Shore A)	API-6A Material Classification	Recommended Operating Limits	
						Low Temp (°F)	High Temp (°F)
Gazguard 026OGT	FKM	✓	✓	92	Not Tested	9	392
Gazguard 029OGT	FKM	✓	✓	88	Not Tested	-22	392
Gazguard 702OGT	HNBR	✓	✓	90	DD/EE	-13	320
Gazguard 728OGT	HNBR	✓	✓	90	FF/HH	-27	302
Gazguard 775OGT	HNBR	✓	✓	83	FF/HH	5	302

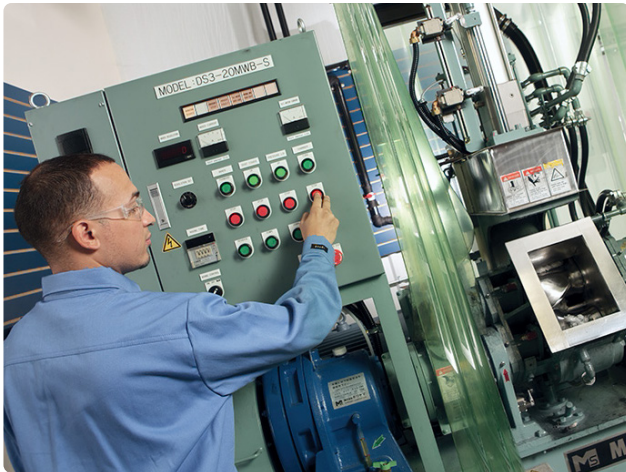
Can't find the material you need?

[Contact Us](#)

Our team works with you to ensure the proper selection for needed applications, with engineering resources available to design custom solutions for your needs.

Elastomer Mixing Lab

Our capabilities include a mixing lab to cultivate new material recipes. Freudenberg Oil and Gas Technologies' elastomer research group is focused on developing new formulations targeted for solving the most stringent challenges encountered by materials used in the oil and gas industry — from extreme temperature and pressure conditions to exposure to harsh drilling and completion fluids.



The mixing lab is used for compounding new material recipes for component seals, BOPs, packers and other non-metallic based oilfield parts. Freudenberg Oil and Gas Technologies has a full range of elastomers, from commercial NBR, HNBR, NR, and EPDM base polymers to high-performance FKM and FFKM grades, including GAZGUARD® — our patented RGD-resistant compounds.

Purpose

- Develop new elastomer material recipes

Product Example

- O-Rings, Spring Seals & T-Seals

Equipment

- 3L Mixer / Mill / Heaters for the mill and mixer / Hydraulic press / Rubber cutter / Oven / Rheometer / DSC

Physical Properties Lab

The Material Properties Test Lab performs physical testing for elastomers and physical products like O-Rings, Spring Seals and T-Seals. This facility is equipped to conduct a wide variety of tests on the mechanical properties of Elastomers and Plastics — Tensile Testing, Flexural Strength and Modulus, Compression Stress Relaxation Testing as well as conduct immersion testing with combustible and flammable fluids.



Equipment

Tensile Tester / Manual clicker press / Densimeter / Microscope / Hardness tester Shore A, D and IRHD / Heating oven / Compression stress relaxation fixtures

Types of Tests Performed

ISO 48 / ISO 37 / ISO 527 / ISO 34-1 / ISO 1817 / ISO 11357-1+2 / ISO 188 / ISO 815 / ISO 1183 / ASTM D 429 / ASTM D 412 / ASTM D 638 / ASTM D 395 / ASTM D 790 / ASTM D 2240 / ASTM 3767 / ASTM D 2000

Example Tests Performed

- Mechanical Properties (room and elevated temperatures)
- Hardness
- Compression set
- Immersion testing (in flammable and combustible fluids)

Thermal Cycling Lab

Our Thermal Test Lab is dedicated to product function testing and PR2 testing for a variety of sealing solutions such as Spring Seals, T-Seals and FS Seals. This facility utilizes an environmental chamber, a gas booster and an accumulator vessel.



Equipment

- Thermal chamber
- Gas booster + accumulator vessel

Typical Tests Performed

ISO 10423 pressure temperature cycling test / API 6A F 1.11 / Customer-specified tests

Temperature Range

- Typical temperature cycle:
-20°F to 350°F (-29°C to 177°C)

Pressure Range

- Standard test: atmospheric pressure to 15,000 psi (103 MPa)
- Customer specific test: with new vessel design can get up to 20,000 psi (138 MPa)

Gases / Fluids

- Standard gases: 100% N₂
- Other gas combinations to be evaluated upon request

HPHT Test Lab

Our HPHT (High Pressure High Temperature) Test Lab uses Rapid Gas Decompression (RGD) Testing to assess material and function of products such as O-Rings, Spring Seals and T-Seals. The lab includes insulated, self-contained test vessels with band heaters between vessel and insulation.



Equipment

Insulated self-contained test vessels, with band heaters between vessel and insulation

Typical Tests Performed

Norsok M-710 RGD / ISO 23936 / NACE TM 0187 / Shell DODEP / Total GS-PVV-142 / Customer-specified tests

Temperature Range

- 72°F (22°C) to 430°F (222°C)

Pressure Range

- Standard test: atmospheric pressure to 15,000 psi (103 MPa)
- Customer specific test: new vessel design can get up to 20,000 psi (138 MPa)

Gases / Fluids

- Standard gases: 5% CO₂, 95% CH₄ / 10% CO₂, 90% CH₄ / 100% N₂ and 100% CO₂
- Other concentrations or gas combinations to be evaluated upon request

Product Test Area

Our Product Test Area was designed to perform function testing for products such as BOPs and ram packers. The facility is capable of running API 16A testing, as well as customer-specific tests. Typical tests cover water, control fluids, drilling muds and glycol. Other fluids will be evaluated upon request.



Typical Tests Performed

- API 16A
- Customer-specified tests

Pressure Range

Up to 15,000 psi (103 MPa)

Gases / Fluids

- No gases
- Fluid test: water, control fluids, drilling muds, glycol
- Other fluids to be evaluated upon request

Sour Gas Test Lab

Our Sour Gas Lab tests a broad spectrum of gases and fluids, as well as customer-specific combinations as requested. Material and function tests include atmospheric pressure to 2,000 psi and immersion testing to 15,000 psi, as well as Norsok M-710 sour gas testing.



Equipment

- 3 test vessels with stands and insulation in the lab hood
- Wet scrubber for air purification

Typical Tests Performed

Norsok M-710 sour gas / ISO 23936 / ISO 10423 immersion test / API 6A F 1.13 / ISO 10423 fixture test /API 6A F 1.13 / Customer-specified tests

Temperature range

Room temperature to 430°F (220°C)

Pressure Range

- Standard test: atmospheric pressure to 2,000 psi (13 MPa)
- Customer-specific test immersion testing to 15,000 psi (103 MPa)

Gases / Fluids

- Standard gases: 2% H₂S, 3% CO₂, 95% CH₄ / 10% H₂S, 5% CO₂, 85% CH₄ / 100% N₂
- Other concentrations or gas combinations to be evaluated upon request



UNITED STATES

UNITED KINGDOM

UNITED ARAB EMIRATES

CANADA

MALAYSIA

NORWAY

SINGAPORE

Contact Us

Freudenberg Oil and Gas Technologies

Headquarters
10035 Brookriver Drive, Suite 400
Houston Texas 77040
Phone: +1 281 233 1400

To contact our Sales Team, please reach out to us at www.fogt.com/contact-us



FOGT MATERIAL DEVELOPMENT & TESTING

Learn more about our capabilities here:

www.fogt.com/material-development-product-testing

The information contained herein is believed to be reliable, but no representation, guarantees or warranties of any kind are made to its accuracy or suitability for any purpose. The information presented herein is based on laboratory testing and does not necessarily indicate end product performance. Full scale testing and end product performance are the responsibility of the user.

© 2022 Oil & Gas Technologies. All rights reserved. V003-4-2022