

We are the Elastomeric Compounding Specialists FROM FORMULATION TO APPLICATION

CASE STUDY

Specially Developed Oil & Gas Compounds

Rubber compounds formulated and compounded by Clwyd Compounders are used around the world for a variety of oil and gas applications. We have established an excellent reputation of being the specialist compounder for this industry, this is largely based on our ability to formulate and consistently mix the most difficult of compounds.

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Due to the extreme conditions encountered in downhole wells the performance of the rubber is becoming ever more critical with material purity and quality a key requirement for rapid gas decompression (RGD) and sour gas (H₂S) resistant compounds. The mouldability of the compound is another important consideration, with the ability to produce parts that are free of defect and voids, enabling moulders to avoid performance issues and part failure in service. We specialise in providing materials that can withstand high pressures and chemical attack, whist maintaining a viscosity and mouldability that gives our customers confidence in their finished products. We can also customise our formulations to suit your moulding method.

Most easily accessible oil (low hanging fruit) has now been extracted and this places an increasing emphasis on the rubber compounds that are being selected. The exploration for new oil wells is causing a drive to extend the temperature range and improve the chemical compatibility of the base elastomers. A careful balance of compound composition and overall processability is necessary if a material is to achieve certification to international standards such as NORSOK M710, ISO 23936-2, ISO 10423 (API 6A) & NACE TM0297.

The test parameters vary widely across the RGD and sour gas ageing standards, which are currently in use around the world. With regards to RGD test standards significant factors such as test temperature, maximum pressure, decompression rate and gas volume concentrations (typically $CH_4 \otimes CO_2$) must be considered by our rubber technologists. The sour gas hydrogen sulphide (H_2S) can be found in wells at varying concentrations, and this is reflected in the test standards with a possible 2-20% concentration in the gas phase depending on the test standard in question.

ATF drilling muds/fluids contain a proprietary blend of complex chemicals and corrosion inhibitors (amines), this is another key consideration when selecting a compound, as any incompatible elastomer will harden and become brittle, causing a part failure in service.



We offer a range of ED resistant compounds that are suitable for a wide range of extreme temperatures and vary in their chemical resistance.



Our typical compounds include: NBR, EPDM, HNBR, FKM, FKM BR, FEPM (Aflas), FFKM.

We have a range of compounds designed for testing to meet a variety of oil and gas standards.

Compound Type	Description	Temperature Range(°C)	General comments
HNBR	HNBR 85/90 (ED)	-20 to 150	Good workhorse. Optimum mechanicals across operating temperature range
HNBR	HNBR 90/95 (ED)	-20 to 150	Good workhorse. Optimum mechanicals across operating temperature range
HNBR Low-ACN	HNBR 80/85 LT (ED)	-35 to 150	Improved low temperature; inferior resistance to oil etc
FKM Type 2 PO	FKM 90 (ED) (1)	-15 to 200	Good mech, high temp, improved chemical resistance
FKM Type 2 PO	FKM 90 (ED) (2)	-2 to 220	Good mech, high temp, high fluorine for optimum chemical resistance, ok steam
FKM Type 2 PO	FKM 90 (ED) (3)	-3 to 220	Good mech, high temp, high fluorine for optimum chemical resistance, ok steam
FKM Type 2 PO	FKM 90 (ED) (4)	-3 to 220	Good mech, high temp perf, high fluorine for optimum chemical resistance, ok steam
FKM Туре 1	FKM 90 (ED) (5)	-12 to 240	Good mech, high temp performance, oils
FKM Туре 1	FKM 90 (ED) (6)	-14 to 240	Good mech, high temp performance, oils
FKM Type 3 LT	FKM 90 LT (ED)	-30 to 220	Improved low temperature
FKM Type 3 LT	FKM 95 LT (ED)	-30 to 220	Improved low temperature
FKM 90 VLT	FKM 90 VLT (ED)	-40 to 220	Best in class low temperature
FEPM (Aflas®)	FEPM 90 (ED)	0 to 250	Good mech, high temp, amines, H2S, steam
FEPM (Aflas®)	FEPM 95 (ED)	0 to 250	Good mech, high temp, amines, H2S, steam
FKM Type 5 BR	FKM 90 BR (ED)	-7 to 220	Good mech, high temp, amines, H2S, steam
Viton Extreme	Viton-Ext 90 (ED)	-7 to 220	Good mech, high temp, amines, H2S, steam
FFKM	FFKM 90/95 (ED)	-2 to 250	Very broad chemical resistance (including amines, H2S, steam) high temp
FFKM LT	FFKM 90 LT (ED)	-30 to 250	As above, extended temperature range

*General temperature range for the elastomer under normal service conditions estimated using the TR-10 value of the base polymer. Any high pressures likely to be encountered in service should be considered.

These compounds are suitable candidates for testing to RGD and/or sour gas standards. The correct material selection is dependent on factors such as required test standard, chemical resistance and low temperature requirements. Please contact us for more information.

GET IN TOUCH WITH OUR TECHNICAL TEAM TO DISCUSS YOUR REQUIREMENTS FURTHER

For further information please visit our website **www.clwydcompounders.com** or call to speak to a member of our technical team +44 (0) 1978 810551.

