

# **Elastomers for petrochemical applications – oil and gas**

# Elastomer for petrochemical applications – oil + gas

Exploring oil and gas and to follow the further processing is putting extreme demands onto the required sealing material.

**MCM-S.P.A.** has been successfully operating in this field for many years and has developed a number of outstanding compounds. Many are equipped with appropriate certificates!

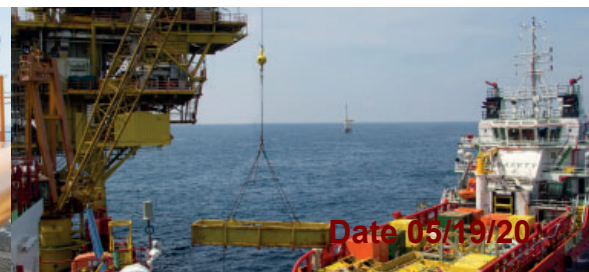
**Ametric**<sup>®</sup> cooperates closely with **MCM-S.P.A** on O-rings. Since customers often need quantities which do not correspond to the necessary production volume and usually require shortest delivery times, **Ametric**<sup>®</sup> has been building up extensive stocks.



In oil drilling plants, depending on the different possible positions, one can find harsh mixtures of hydrocarbons even sulfonated, superheated steam, H<sub>2</sub>S, CO<sub>2</sub>, methane, amine based corrosion inhibitors, temperatures well below 0°C and over 200°C, high pressure.

**To cope with so aggressive and diversified combinations** the following features must be granted **at the same time**:

- chemical resistance
- outstanding physical properties
- elasticity in a wide range of temperatures
- resistance against explosive decompression (AED)



# As a matter of fact the following elastomers are of common use



materials engineering research  
laboratory

## TEST CERTIFICATE

This document certifies that

**“AFL9G” (AFLAS® 90 ED (FEPM))**

compound in O-ring form, supplied by

**MCM S.p.a**  
**VIA CASTELLO 70**  
**24060 ADRARA S. M.**  
**(ITALY)**

passed the requirements of

**NORSOK M710 Rev 2 in respect of rapid gas  
decompression resistance, under the following test  
conditions**

Test gas	90/10 mol% CH <sub>4</sub> /CO <sub>2</sub>
Test temperature	100°C
Test pressure	150 bar (15 MPa)
Decompression rate	20 bar/minute
No. of cycles	10
Tested by	M.V. Lewan
Date	1 <sup>st</sup> July 2010

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### FKM, bisphenolic cured

Maximum thermal rating (short time +250°C), excellent resistance against hydrocarbons also aromatic, good physical properties, limited resistance to steam and H<sub>2</sub>S (max 2000 ppm). Special compounds for explosive decompression (AED).

### FKM, peroxide cured

Excellent thermal rating (+220/230°C, short time +250°C), special grades for low temperatures, good resistance to bases, limited resistance to H<sub>2</sub>S. Special compounds for explosive decompression (AED).

### FEPM, AFLAS®

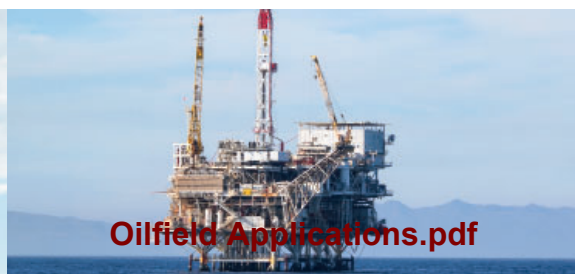
Excellent thermal rating (+230°C), outstanding resistance against bases and H<sub>2</sub>S ( up to 30%), limited resistance to hydrocarbons and aromatic substances, limited low temperature flexibility. Special compounds for explosive decompression (AED).

### FFKM, evolast®

Outstanding thermal rating (+320°C, short time +340°C), outstanding resistance towards aggressive chemicals, acids, organic and inorganic fluids, ketones, esters, solvents, amines, hot water and steam. Special compounds for explosive decompression (AED).

### HNBR

Maximum physical properties, good thermal rating (+160°C, short time +180°C), good steam and H<sub>2</sub>S (max 5000 ppm) resistance, limited resistance to aromatic hydrocarbons. Special compounds for explosive decompression (AED).



## Oilfield Sealing Solutions

Material	Material No.	Hardness Shore A	Colour	Temperature °C from to	Remarks *approvals available
FKM 90 nero	N9000	90	black	-25 +230 (+250)	Copolymer, oil/gas applications
FKM 90 ED	N9001	90	black	-27 +230 (+250)	oil/gas applications, AED *NORSOK M710 (AED) – 5.33, – 10.82 mm *NACE TM0297 (AED) – 5,33 mm *NACE TM0187 (sour gas environment) – 5% + 20% H <sub>2</sub> S *TOTALFINA SP-TCS-142 *SHELL (80°C – 138 bar) *API6A (sour gas environment) – 10% H <sub>2</sub> S *Sour fluid test Arrhenius ISO 23936-2/NORSOK M710-3 *Life prediction & AED test – Arrhenius ISO 23936-2 *Saudi Aramco 06-SAMSS-001
FKM 90 TER	N9002	90	black	-25 +230 (+250)	Terpolymer, oil/gas applications
FKM 90 PLT	N9003	90	black	-40 +225 (+250)	PLT, low temperature
FKM 90 GF	N9004	90	black	-25 +230 (+250)	peroxide cured, oil/gas applications
FKM 90 PLT/ED	N9012	90	black	-41 +220 (+250)	low temperature, AED *NORSOK M710 (AED) – 5.33 mm *NACE TM0297 (AED) – 5,33 mm *TOTALFINA SP-TCS-142 *ITN 84700/A (AED) – 10 mm *NACE TM0187 (sour gas environment) – 5% + 20% H <sub>2</sub> S *API6A (sour gas environment) – 10% H <sub>2</sub> S - [FF/HH] *Sour fluid test Arrhenius ISO 23936-2/NORSOK M710-3 *Life prediction & AED test – Arrhenius ISO 23936-2 *SHELL - MESC SPE 85/301 *Saudi Aramco 06-SAMSS-001
FKM 90 BR ED	N90BR	90	black	-30 +220 (+240)	oil/steam applications, AED *NORSOK M710 (AED) – 5.33 mm *NACE TM0187 (sour gas environment) – 5% + 20% H <sub>2</sub> S *API6A (sour gas environment) – 10% H <sub>2</sub> S - [FF/HH] *Sour fluid test Arrhenius ISO 23936-2/NORSOK M710-3 *Life prediction & AED test – Arrhenius ISO 23936-2 *Saudi Aramco 06-SAMSS-001
FKM 90 HFLT	N9013	90	black	-37 +230 (+250)	low temperature, high chemical resistance
FKM 90 GFLT®ED	N9015	90	black	-40 +230 (+250)	low temperature, high chemical resistance, AED *NORSOK M710 (AED) – 5.33 mm *NACE TM0187 (sour gas environment) – 20% H <sub>2</sub> S *API6A (sour gas environment) – 10% H <sub>2</sub> S *Sour fluid test Arrhenius ISO 23936-2/NORSOK M710-3
FKM 90 GF/ED	N9024	90	black	-25 +230 (+250)	peroxide cured, oil/gas applications, AED *API6A (sour gas environment) – 10% H <sub>2</sub> S - [FF/HH] *NORSOK M710 (AED) – 5.33 mm *Saudi Aramco 06-SAMSS-001
FKM 90 GBL	N9030	90	black	-20 +230 (+250)	peroxide cured, high mechanical performance
FKM 90 LT40/ED	N9034	90	black	-41 +220	low temperature, AED very good performance in Methanol *NORSOK M710 (AED) – 5.33 mm *SHELL - MESC SPE 85/301 *API6A 10% H <sub>2</sub> S FFHH *Saudi Aramco 06-SAMSS-001
FKM 90 LT50/ED	N9035	90	black	-51 +225 (+250)	low temperature, AED *NORSOK M710 (AED) – 5.33 mm *NACE TM0187 (sour gas environment) – 5% H <sub>2</sub> S

## Oilfield Sealing Solutions

Material	Material No.	Hardness Shore A	Colour	Temperature °C		Remarks *approvals available
				from	to	
FKM 90 LT60/ED	N9036	90	black	-61	+225 (+250)	ultra low temperature, AED *NORSOK M710 (AED) – 5.33 mm *NACE TM0187 (sour gas environment) – 5%, 20% H <sub>2</sub> S *API6A (sour gas environment) – 10% H <sub>2</sub> S - [FF/HH] *Sour fluid test Arrhenius ISO 23936-2/NORSOK M710-3
FKM 98 nero	N9800	98	black	-25	+230 (+250)	Copolymer, oil/gas applications
FKM 98 ED	N9801	98	black	-27	+230 (+250)	oil/gas applications, AED *BS EN ISO 23936-2
FKM 98 TER	N9802	98	black	-25	+230 (+250)	Terpolymer, oil/gas applications
FKM 98 PLT	N9803	98	black	-40	+225 (+250)	PLT, low temperature
FKM 98 GF	N9804	98	black	-25	+230 (+250)	peroxide cured, oil/gas applications
FKM 98 PLT/ED	N9812	98	black	-40	+225 (+250)	PLT, low temperature, AED
FKM 98 HFLT	N9813	98	black	-37	+230 (+250)	low temperature, high chemical resistance
FKM 98 GFLT®ED	N9815	98	black	-37	+230 (+250)	low temperature, high chemical resistance, AED
FKM 98 GF/ED	N9824	98	black	-25	+230 (+250)	peroxide cured, oil/gas applications, AED
FKM 98 GBL	N9830	98	black	-20	+230 (+250)	peroxide cured, high mechanical performance
FKM 98 LT50/ED	N9835	98	black	-50	+225 (+250)	low temperature, AED
FKM 98 LT60/ED	N9836	98	black	-61	+225 (+250)	ultra low temperature, AED
AFLAS® 90 ED	AFL9G	90	black	-20	+200 (+230)	oil/steam, AED, *NORSOK M710 (AED) – 5.33 mm *NACE TM0187 (sour gas environment) – 20% H <sub>2</sub> S *API6A (sour gas environment) – 10% H <sub>2</sub> S - [FF/HH]
HNBR 90 NERO	HN90N	90	black	-25	+160 (+180)	oil/gas applications
HNBR 90 ED	HN90G	90	black	-35	+160 (+180)	oil/gas applications, AED *ED Total Fina-Shell, *NORSOK M710 (AED) – 5.33 mm *NORSOK M710 (sour fluid resistance) 2% H <sub>2</sub> S *EN 14141-2003 (natural gas transportation pipeline) *NACE TM0187 (sour gas environment) – 5%, 20% H <sub>2</sub> S *API6A (sour gas environment) – 10% H <sub>2</sub> S *Sour fluid test Arrhenius ISO 23936-2/NORSOK M710-3 *Saudi Aramco 06-SAMSS-001
HNBR 90 ED-L	HN90L	90	black	-55	+160 (+180)	oil/gas applications, low temperature, AED *NORSOK M710 (AED) – 5.33 mm *NACE TM0187 (sour gas environment) – 5% H <sub>2</sub> S *SHELL, *MESC SPE 85/301 *API6A (sour gas environment) – 10% H <sub>2</sub> S - [FF/HH]
HNBR 98 NERO	HN98N	98	black	-25	+160 (+180)	oil/gas applications
HNBR 98 ED	HN98G	98	black	-35	+160 (+180)	oil/gas applications, AED
HNBR 98 ED-L	HN98L	98	black	-55	+160 (+180)	oil/gas applications, low temperature, AED
evolast® N9ED	PN9ED	90	black	-15	+260 (+280)	oil/gas applications, AED *NORSOK M710 (AED) – 5.33 mm *NACE TM0187 (sour gas environment) – 5% - 20% H <sub>2</sub> S *Sour fluid test Arrhenius ISO 23936-2/NORSOK M710-3 *API6A (sour gas environment) – 10% H <sub>2</sub> S - [FF/HH]
evolast® N9EX	PN9EX	90	black	-15	+320 (+340)	high temperature, AED *NORSOK M710 (rapid gas decompression)
evolast® N9LT	PN9LT	90	black	-46	+250 (+270)	low temperature, AED *NORSOK M710 (rapid gas decompression)

