



materials engineering research
laboratory

TEST CERTIFICATE

This document certifies that

Xplor V9T20

from

Trelleborg Sealing Solutions

passed the requirements of

**NORSOK M-710 in respect of sour fluid resistance
in operating conditions to 175°C in 2% H₂S**

and

**NORSOK M-710 in respect of rapid gas decompression
resistance in 10% carbon dioxide at 150 bar and 100°C**

Passed by :

S M G Munch (Dipl. Ing., PhD)

Date:

05/03/2009

Sour fluid resistance

MERL has subjected Xplor V9T20, an FKM grade produced by Trelleborg, to a series of sour fluid exposures to the conditions specified by Norsok M-710¹ and detailed below. Tensile properties, hardness and fluid swelling in sour conditions were determined. The results indicate that the saturated material will not undergo a 50% change in tensile strength over the long term² at 175°C.

Test Conditions

Ageing fluid

Volume (%)	Composition
30	2% H ₂ S, 3% CO ₂ , 95% CH ₄
10	Distilled water (conductivity < 5 µS)
60	70% heptane, 20% cyclohexane, 10% toluene

The elastomer samples were placed in the hydrocarbon phase for the exposures.

Test temperatures and exposure periods used in the Norsok programme are shown in the table.

Temperature (°C)	Sampling intervals (days)
210	5, 8, 12, 25
195	4, 8, 12, 24
175	5, 11, 20, 35

Summary

Compound	Type	Hardness	% swell	Change within ±50% ³			NORSOK-acceptable
				50% modulus	Tensile strength	Elongation at break	
Xplor V9T20	FKM	PASS	9-14	PASS	PASS	PASS	YES

¹ Norsok M-710, "Qualification of non-metallic sealing materials and manufacturers", Rev. 2, October 2001.

² Greater than 100 years.

³ Taking reference as oil-soaked material.

Rapid gas decompression

MERL has subjected Xplor V9T20 O-rings manufactured by Trelleborg Sealing Solutions to a multicycle series of rapid gas decompression tests according to Norsok M-710⁴, and detailed below. After 10 cycles, no failure were seen in any of the four test O-rings. The results indicate that Xplor V9T20 elastomer can realistically be considered for use in the same or less severe conditions.

O-ring details

Elastomer	Xplor V9T20
Size	BS 1806 size 312
Section diameter	5.33 mm
Internal diameter	15.24 mm

Test Conditions

Temperature	100°C
Pressure	150 bar
Gas	90/10 CH ₄ /CO ₂
Total cycles	10
Soak period	24 hours (initial exposure period; 72 hrs ± 4 hrs.)
Depressurisation rate	20 - 40 bar per minute (± 10%)
Dwell at ambient pressure	1 hour

Summary

O-ring	NORSOK rating	Overall NORSOK rating	PASS /FAIL
1	3000	3100	PASS
2	1000		
3	3100		
4	1000		

⁴ Norsok M-710, "Qualification of non-metallic sealing materials and manufacturers", Rev. 2, October 2001.