

DATA SHEETMATERIAL REFERENCE – FLUORINOID® FL011

DESCRIPTION PTFE with GLASS and MOLYBDENUM DISULPHIDE

Material approved in accordance with **NORSOK M-710** Annex C, by Element Materials Technology Report No. C3014-1

TYPICAL APPLICATIONS

FL011 has been developed for sealing applications. The glass improves compression and wear properties whilst the MoS2 counters the increase in friction due to the glass.

This grade is particularly suited to dynamic sealing applications.

TYPICAL PHYSICAL PROPERTIES

SPECIFIC GRAVITY	(BS EN ISO 13000-2)	2.22 ó 2.30
TENSILE STRENGTH	(BS EN ISO 13000-2)	Min. 17.2MPa
ELONGATION	(BS EN ISO 13000-2)	Min. 200%
SHORE D HARDNESS	(BS EN ISO 13000-2)	60 - 68
STATIC COEFFICIENT OF FRICTION	at 23°C	0.085
MAXIMUM WORKING TEMPERATURE		260°C

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## TEST CERTIFICATE

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This document certifies that

**FL011 PTFE**  
from  
**FLUOROCARBON**

meets the requirements of

**NORSOK M-710 Rev. 2 in respect of sour fluid resistance**

Test fluid: 2% hydrogen sulphide/hydrocarbon oil/water

Test pressure: 100 bar (10 MPa)

Passed by: Jeanne BABALOLA

Date: 16<sup>th</sup> September 2013

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Element verify that machined tensile specimens of FL011 PTFE supplied by FLUOROCARBON have been exposed in a multi-phase sour fluid at three elevated temperatures.

### **Test Conditions**

#### **Exposure fluid composition and distribution**

<b>Volume (%)</b>	<b>Composition</b>
30	2/3/95 mol% H <sub>2</sub> S/CO <sub>2</sub> /CH <sub>4</sub>
10	Distilled water
60	70% heptane, 20% cyclohexane, 10% toluene

The FL011 PTFE testpieces were placed in the hydrocarbon liquid phase for each exposure test.

Test temperatures and sampling intervals used in the NORSOK M-710<sup>1</sup> programme are shown in the table below; test pressure was 100 bar.

#### **Exposure test conditions**

<b>Temperature (°C)</b>	<b>Intervals (days)</b>
190	5, 10, 20, 50
205	5, 10, 20, 35
220	5, 10, 20, 35

### **Summary for FL011 PTFE**

<b>Swell<sup>1</sup></b>	<b>Tensile modulus<sup>2</sup></b>	<b>Tensile strength<sup>2</sup></b>	<b>Elongation at break<sup>2</sup></b>	<b>NORSOK acceptable</b>
PASS	PASS	PASS	PASS	YES

<sup>1</sup> <5% overall

<sup>2</sup> changes within ±50% range, from as-received level

FL011 PTFE behaved as expected when immersed in a liquid hydrocarbon oil phase with H<sub>2</sub>S gas present: the material absorbed a small quantity of liquid early in the exposure period and this caused moderate reductions in tensile modulus and break property levels. The changes in room temperature tensile property levels are within the allowable range after exposure periods at 190-220°C of up to 7 weeks. All exposed specimens were intact and there was no evidence that FL011 had been chemically aged by the conditions.

FL011 PTFE meets the requirements of the NORSOK M-710 Rev. 2 standard for sour fluid exposure.

<sup>1</sup> NORSOK M-710, "Qualification of non-metallic sealing materials and manufacturers", Rev. 2, October 2001