FLUOROCARBON

Issue 1

DATA SHEET

NORSOK DATA SHEET

MATERIAL REFERENCE – **FLUORINOID® FL013**

DESCRIPTION GLASS, CARBON AND GRAPHITE FILLED PTFE

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

TYPICAL APPLICATIONS

FL 013 has been developed for use in dynamic sealing applications. It combines glass and carbon to improve compression and wear properties. The carbon and graphite interact to maintain a low coefficient of friction over just a glass filled material. The carbon and graphite gives improved thermal conductivity so this is particularly suited to higher speed applications

TYPICAL PHYSICAL PROPERTIES

SPECIFIC GRAVITY	(BS EN ISO 13000-2)	2.14 – 2.18
TENSILE STRENGTH	(BS EN ISO 13000-2)	min. 18MPa
ELONGATION	(BS EN ISO 13000-2)	min 175%
SHORE D HARDNESS	(BS EN ISO 13000-2)	63 – 67
MAXIMUM OPERATING TEMPERATURE		260°C

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TEST CERTIFICATE

This document certifies that

FL013 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: 16th September 2013

Element verify that machined tensile specimens of FL013 PTFE supplied by FLUOROCARBON have been exposed in a multi-phase sour fluid at three elevated temperatures.

Test Conditions

Exposure fluid composition and distribution

Volume (%)	Composition
30	2/3/95 mol% $H_2S/CO_2/CH_4$
10	Distilled water
60	70% heptane, 20% cyclohexane, 10% toluene

The FL013 PTFE testpieces were placed in the hydrocarbon liquid phase for each exposure test.

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

Exposure test conditions

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

Summary for FL013 PTFE

Swell[1]	Tensile modulus[2]	Tensile strength[2]	Elongation at break[2]	NORSOK acceptable
PASS	PASS	PASS	PASS	YES

[1] <5% overall
[2] changes within ±50% range, from as-received level

FL013 PTFE behaved as expected when immersed in a liquid hydrocarbon oil phase with H_2S 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 FL013 had been chemically aged by the conditions.

FL013 PTFE meets the requirements of the NORSOK M-710 Rev. 2 standard for sour fluid exposure.

[1] NORSOK M-710, “Qualification of non-metallic sealing materials and manufacturers”, Rev. 2, October 2001