



DATA SHEET

MATERIAL REFERENCE – FLUORINOID® FL021

DESCRIPTION      GLASS FILLED MODIFIED PTFE

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

TYPICAL APPLICATIONS

FL021 has been developed to take advantage of the reduced permeability and creep of modified PTFE whilst improving the wear factor without dramatically increasing the coefficient of friction. Used in dynamic seals of high pressure, low molecular weight gaseous media.

TYPICAL PHYSICAL PROPERTIES

SPECIFIC GRAVITY	(BS EN ISO 13000-2)	2.10 - 2.25
TENSILE STRENGTH	(BS EN ISO 13000-2)	Min. 20MPa
ELONGATION CD	(BS EN ISO 13000-2)	Min. 240 %
SHORE D HARDNESS	(BS EN ISO 13000-2)	55-59
MAXIMUM SERVICE TEMPERATURE		260°C

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## TEST CERTIFICATE

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This document certifies that

**FL021 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 FL021 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 FL021 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 FL021 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

FL021 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 changes in mechanical 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 FL021 had been chemically aged by the conditions.

FL021 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