

## TEST REPORT

This document certifies that

**FC005C [Carbon/Graphite filled PTFE]**

from

**FCS Fluoro Carbon Seals Private Limited**

has been tested according to the requirements of

**ISO 10423 Appendix F.1.13.5.2/API 6A (Appendix F) in respect of  
sour fluid (FF/HH) resistance**

Test fluid: 10% Hydrogen sulphide/hydrocarbon oil/water

Test pressure: 1,000 psi

Passed by: Dr Michael Lewan

Date: 8<sup>th</sup> July 2020

Element Hitchin has been assessed to BS EN ISO 9001 by the British Standards Institution (BSI) and is a registered firm under the BSI Quality Assurance scheme for the provision of professional and technical services



### Element Materials Technology

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Element Hitchin verify that tensile specimens of FC005C (Carbon/Graphite filled PTFE) by FCS Fluoro Carbon Seals Private Limited have been tested according to ISO 10423:2009, annex F.1.13.5.2 (immersion).

**Test Conditions**

Five replicate tensile dumbbells of FC005C (Carbon/Graphite filled PTFE) were exposed in the hydrocarbon liquid phase to the following conditions for 160 hours. The test was run between 16<sup>th</sup> and 24<sup>th</sup> June 2020.

Temperature	180 ± 2 °C
Pressure	1000 psi (69 bar)
Gas phase (35%)	10/80/10 mol% H <sub>2</sub> S/CO <sub>2</sub> /CH <sub>4</sub>
Liquid phases (65%)	60% vessel volume 70/20/10 heptane/cyclohexane/toluene 5% vessel volume water

Changes in physical and mechanical property levels were measured at room temperature, with non-exposed material serving as the point of reference. The material was not altered by the exposure conditions.

The acceptance criteria given in section 8.2.2 of the NORSOK M-710 standard<sup>1</sup> were applied. The results are tabulated below.

PROPERTY	ACCEPTABLE CHANGE RANGE	ACTUAL CHANGE AFTER IMMERSION
Volume change (swelling)	-1%/+5%	+2.0%
Young's Modulus	±50%	+13%
Maximum Stress	±50%	-12%
Elongation at Break	±50%	+37%

**FCS Fluoro Carbon Seals Private Limited thermoplastic grade FC005C meets the acceptance criteria applied after an immersion test undertaken according to ISO 10423:2009, annex F.1.13.5.2.**

Element report reference number C5195-1 issued dated on 8<sup>th</sup> July 2020 covers all work undertaken.

<sup>1</sup> NORSOK M-710, "Qualification of Non-Metallic Sealing Materials and Manufacturers", Edition 3, September 2014.

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