



materials engineering research  
laboratory

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## TEST CERTIFICATE

This document certifies that

**PEEK compound HiMod<sup>®</sup> 550**

from

**Trelleborg Sealing Solutions**

meets the requirements of

**NORSOK M-710 in respect of sour fluid resistance**

Test fluid: 2% hydrogen sulphide/hydrocarbon oil/water  
Test pressure: 100 bar (10 MPa)  
Passed by : Barry Thomson  
Date: 13<sup>th</sup> March 2012

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MERL verify that specimens of the Trelleborg Sealing Solutions PEEK compound HiMod 550 have been subjected to a series of sour multi-phase fluid exposures at three elevated temperatures.

### Test Conditions

#### Exposure fluid composition and distribution

Volume (%)	Composition
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 PEEK testpieces were placed in the hydrocarbon oil phase for the exposure tests.

Test temperatures and exposure periods used in the Norsok M-710 programme are shown in the table below; test pressure was 100 bar.

#### Exposure test conditions

Temperature (°C)	Sampling intervals (days)
200	7, 12, 27, 48
210	5, 10, 22, 41
220	5, 10, 21, 35

### Summary for HiMod 550

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

<sup>1</sup> <5%

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

PEEK grade HiMod 550 behaves as expected when immersed in a liquid hydrocarbon oil phase with H<sub>2</sub>S present. Swelling is low and the material darkens. The tensile test results do not discriminate sufficiently between the influence of exposure time and temperature, excluding their use in life estimation calculations. The changes in room temperature tensile property levels are within the allowable range after exposure periods at 200-220 °C of up to 7 weeks.

PEEK compound HiMod<sup>®</sup> 550 meets the requirements of the Norsok M-710 standard for sour fluid exposure.