



materials engineering research  
laboratory

---

# Test Certificate

This document certifies that

thermoplastic material **Z431** from

**TRELLEBORG SEALING SOLUTIONS**

has been tested according to

**ISO 10423:2009**

**Annex F.1.13.5.2 (immersion test).**

**Assessed by: Dr Keyur Somani and Dr Barry Thomson**  
**Date: 20<sup>th</sup> November 2012**

MERL 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.



---

**Materials Engineering Research Laboratory Ltd**

Wilbury Way, Hitchin, Hertfordshire, SG4 0TW, United Kingdom. T: +44 (0) 1462 427850 F: +44 (0) 1462 427851  
enquiries@merl-ltd.co.uk www.merl-ltd.co.uk



MERL Ltd. (Hitchin, England) confirms that the TRELLEBORG SEALING SOLUTIONS thermoplastic material, which is intended to be used for sealing applications, has been tested according to ISO 10423:2009, annex F.1.13.5.2 (immersion testing).

Five replicate tensile specimens of Z431 (PAEK type<sup>1</sup>) were exposed in the hydrocarbon liquid phase to the following conditions for 160 hours.

Temperature	(200 ± 2)°C
Pressure	(1000 ± 100) psig
Gas	FF/HH: 10/80/10 mol% H <sub>2</sub> S/CO <sub>2</sub> /CH <sub>4</sub>
Liquids	5 volume% water (deionised water) 60 volume% NORSOK oil (70/20/10 volume% heptane/cyclohexane/toluene)

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 visibly altered by the exposure conditions.

The acceptance criteria given in section 8.2.2 of the NORSOK M-710 standard<sup>2</sup> were applied. The results are tabulated below.

PROPERTY	ACCEPTABLE CHANGE RANGE	ACTUAL CHANGE (%)
Volume change (swelling)	-1%/+5%	+4
Tensile modulus	±50%	+11
Tensile strength	±50%	-8
Strain at break (nominal)	±50%	-38

**TRELLEBORG SEALING SOLUTIONS material grade Z431 meets the acceptance criteria applied after an immersion test undertaken according to ISO 10423:2009, annex F.1.13.5.2.**

<sup>1</sup> Polyaryletherketone.

<sup>2</sup> NORSOK M-710, "Qualification of Non-Metallic Sealing Materials and Manufacturers", Rev. 2, October 2001.

