

Static oil compatibility tests with O-Ring compounds for use in FLENDER gear units

This test specification serves as an supplement to the Freudenberg test specification FS PLM 111 0118 „Static oil compatibility tests with Freudenberg O-Ring – compounds for the release to be used in FLENDER-gear units (Tabellen T7300)“, Revision 01.

Test Documentation

1. General information

The test is to be performed according to the underlying test procedure (see above) and may only differ where it is explicitly stated in this document.

2. Test parameters

Table 1 gives information about the test temperatures for different elastomer materials and lubricants.

Table 1 Test temperatures

Elastomer-compound	Temperature / °C				
	Mineral oil (API 1 & 2)	Mineral oil (API 3)	PAO - Oil (API 4)	PAG Oil (API 5)	Synth. Ester (API 5)
NBR (nitrile butadiene rubber)	80	80	80	80	80
HNBR (hydrogenated nitrile butadiene rubber)	100	110	110	120	100
AEM (ethylene acrylic rubber)	100	110	110	120	100
FKM (fluorocarbon)	100	110	110	120	100

2.3 Evaluation of test results

The limits for the different evaluations are given in Table 2:

Table 2: Evaluation of changes in functional values of O-Ring compounds (median values)

Change in hardness Shore A in hardness degrees	Change in volume in %	Change in tensile strength in %	Change in elongation at break in %	Points
-10 ≤ x ≤ 10	-10 ≤ x ≤ 10	-25 ≤ x ≤ 10	-25 ≤ x ≤ 10	2
-15 ≤ x < -10 oder 10 < x ≤ 15	-15 ≤ x < -10 oder 10 < x ≤ 15	-50 ≤ x < -25 oder 10 < x ≤ 50	-50 ≤ x < -25 oder 10 < x ≤ 50	1 **)
x < -15 oder x > 15	x < -15 oder x > 15	< -50	< -50	0

***) only if the deviation to bold written limits exceeds one of the four test criteria limits. If more than one test criteria is exceeded: zero points.

unrestricted

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Link: <https://www.flender.com/de/testdescriptionslubricants>

3. Test report

The test report has to contain not only the measured material parameters but also some information about the test conditions. The following information are mandatory for a report:

1. General information
 - a. Date
 - b. Order number
 - c. Test number (PP-Nr.)
 - d. Customer
2. Test information
 - a. Test-rig operator
 - b. Immersion test temperature
 - c. Duration of immersion test
 - d. Starting date of immersion test
 - e. Compound
 - f. Compound batch number
 - g. Test laboratory
 - h. Identificatin number of measurement equipment (Microscope, hardness tester,...)
 - i. Abnormalities in the test
3. Information about tested medium
 - a. Sample name
 - b. Batch
 - c. Type of oil (PAO, PG, MIN, ...)
 - d. API class
 - e. Nominal viscosity grade
 - f. Volume
4. Tested material properties
 - a. Hardness before/after test
 - b. Tensile strength before/after test
 - c. Elongation at break before/after test
 - d. Change in volume
 - e. Evaluation of test results in points

Contact

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