REPORT
issued by an Accredited Testing Laboratory

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SWEDAC ACKREDITERING 1002 ISO/IEC 17025

Hakan Plastik Boru ve Profil San. Tic. A.S
Organize San. Böl. Gaziosmanpasa Mh.
Istiklal Cd. No:11
Cerkezköy, Tekirdag
Turkiet

Testing of rubber seals according to EN681

(1 appendix)

Commission

Hardness test according to ISO 48 before and after aging. Ageing 70°C, 168 h according to ISO 188. Compression set according to ISO 815 in three different temperatures. Stress relaxation test according to ISO 3384.

Test object

Rubber seals arrived at SP, Chemistry Material and surfaces, in January 2013. The seals were sliced and cut into appropriate test pieces for the different tests.

Tests performed

Hardness testing according to ISO 48 was performed in a Bareiss digitest (Inv no 403458) with IRHD-Micro. Tests were performed at constant climate, 23 ±2 °C / 50 ±5 % R.H.

Ageing and according to ISO 188 compression set in 70 °C was made in a Elastocon oven inv. no 135.

Compression set was made according to ISO 815-1 method A in 23°C and 70°C and according to ISO 815-2 in -10 °C. Time for tests: 72h.

Relaxation was made according to ISO 3384 method A for 168 hours in 23°C.

Tests were made during 18th to 25th of January 2013.

Result

Hardness change

Test point	Hardness change [IRHD-M]
1	+0,4
2	-1,0
3	+0,5
Mean	**±0**

Table 1: Hardness change after aging in 70°C, 168h

Mr. Razvan MARTIN

Compression set

Temperature [°C]	Compression set [%]
-10	37
23	6
70	24

Table 2: Compression set after72 h for the three different temperatures.

Relaxation

Time [h]	R(t) [%]
24	11
48	13
72	14
168	18

Table 3: Stress Relaxation value after various time in 23°C

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Performed by

Jenny Johansson

Examined by

Thomas Gevert

Appendix

Uncertainty of measurement

Appendix 1

Uncertainty of measurement

ISO 48: Hardness (micro)	± 2,3 IRHD	2)
ISO 815: Compression set	± 13 %	2)
ISO 3384: Stress relaxation	± 2,4 %	2)

The reported uncertainty is an expanded uncertainty (U), based on a standard uncertainty multiplied by a coverage factor, k=2, which provides a level of confidence of approximately 95 %.

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1) The uncertainty of measurement applies for a single measurement value. The spread in results due to variations in sample characteristics is not accounted for in the given uncertainty of measurement.

2) The uncertainty of measurement has been obtained from results from an inter laboratory test.

3) Uncertainty in percent of measurement value.