REPORT

issued by an Accredited Testing Laboratory

Contact person RISE
Anna Bondeson
Chemistry and Materials
+46 10 516 55 30
anna.bondeson@ri.se

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Kiso A/S
Henrik Karnøe Bentzer
Falkevej 9
DK-4600 KÖGE
Danmark

Testing of weatherstrips for P-marking

(3 appendices)

Commission

Testing of weatherstrips according to CR 076 - P-marking of weatherstrips and gaskets.

Test material

Approximately one metre of each weatherstrip type were delivered to RISE AB, in October 2018. The gaskets were designated:

Test notation	Profile designation	Material designation	Colour	Profile type	Material type
1	12G0 0409	KISO 141 Grå Ind.	Grey	E-profile	Cellular EPDM
2	120K 0409	KISO 141 Sort Ind.	Black	E-profile	Cellular EPDM
3	17W0 5509	KISO 141 Hvid Kons.	White	P-profile	Cellular EPDM
4	170K D 1012	KISO 141 Sort Kons.	Black	D-profile	Cellular EPDM

Rubber material with grey or white pigment have the same composition and these pigments are a very small fraction of the material constituents which will give them the same material properties (also the fingerprints will match).

KISO 141 Hvid/Grå Ind. and KISO 141 Hvid Kons. are the same material regarding rubber, plasticizers, fillers, vulcanizing agents, pigment etc, only the blowing agent differs. The same is valid for KISO 141 Sort Ind. and KISO 141 Sort Kons.

The weatherstrips were tested without the reinforced adhesive strip for all tests except for the change in length after heat ageing.

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Test procedure

Tests and requirements for static strips for indoor use in accordance with CR076 – P-marking for weatherstrips and gaskets – 2017/02 category I-Y are listed in table 1 below. The material was preconditioned and tests were carried out at standard laboratory atmosphere 23 °C and 50 %RH.

Table 1: Test methods and requirements

Property	**Reference ISO 3934**	**Test**	**Requirement**
Heat ageing	Table 3 Annex E	14 days at 70 °C	Elongation at break, max. 50 % change Max. 2 % change in length.
Ozone resistance	Table 10	96 hours 20 % elongation Ozone concentration 50 pphm Temperature 40 °C	No cracks
Compression recovery	Annex C	Performed in designated groove profile [a] 55 °C for 21 days	Min. 30 % [b] recovery [c]

[a] *It is the part of the strip which is outside the groove that is being tested with the intended maximum compression.*

[b] *For statically mounted strips, the requirement is a minimum of 30% recovery.*

[c] *The recovery shall be calculated using the measured dimensions according to the alternative formula:*

$$CR = \left(1 - \frac{a-a1}{a-a0}\right) * 100$$

Where a0 is the height of the strip in compression in mm.
Using the manufacturer's rated operating range often gives an error in the result.

Tensile test was tested according to ISO 37 with test piece type 2, testing speed of 500 mm/min and a preload of 2 N.

The change in length was measured on the weatherstrips according to Annex E in ISO 3934.

Ozone resistance was tested according to ISO 1431-1.

Material identification / fingerprint with TGA according to SP-method 1390 and FTIR – reflection absorption with ATR according to SP-method 1468.

Result

The tested gaskets fulfil the requirements for P-marking in CR 076 – "P-marking of weatherstrips and gaskets" category I-X: static strips for indoor use.

Table 2 shows the result and the requirements for the materials and weatherstrips according to ISO 3934. Table 3 shows the initial values for tests were applicable. Individual values are presented in appendix 1.

Table 2: Result and requirements for the materials

Property	**Requirement**	**Results**	
		KISO 141 Grey/White	KISO 141 Black
Heat ageing	Elongation at break, max. 50 % change	**13.2 %**	**9.1 %**
Ozone resistance	No cracks	**Passed**	**Passed**

Table 3: Result and requirements for the profiles

Property	**Requirement**	**Results**			
		12G0 0409	120K 0409	17W0 5509	170K D 1012
Heat ageing	Change in length: Max. 2 %.	**< 1.2 %***	**1.2 %**	**< 1.2 %***	**< 1.2 %***
Compression recovery	Min. 30 % recovery	**51.9 %**	**52.3 %**	**60.1 %**	**71.4 %**

* Length change was measured on strip without adhesive tape with reinforcement and was compared with profile no 2 that was tested both with and without tape and because the result for the length change was less than for profile 2 without tape, the list length change is estimated to be less than 1.2%, while the adhesive tape with reinforcement is the same on these strips.

Material identification / fingerprint with TGA and FTIR see appendix 2.

Uncertainty of measurement for the relevant methods are presented in appendix 3.

RISE Research Institutes of Sweden AB
Chemistry and Materials - Polymer Technology

Performed by

Signed by: Anna Bondeson
Reason: I am the author of this document
Date & Time: 2019-02-26 15:04:53 +01:00

Anna Bondeson

Examined by

Signed by: Lilin Johnsson
Reason: I have reviewed this document
Date & Time: 2019-02-26 14:01:13 +01:00

Elin Johnsson

Appendices

Individual values

Fingerprint

Uncertainty of measurement