

0034-L-19/1

3 July 2019

Test report

PVC roof waterproofing sheet



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Testing institute for
the building envelope

expertise in façades and roofs



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Date of order

15 March 2019

Project number

0034-L-19/1

Author

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Subject

determination of product characteristics

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1 Introduction

By order of Zavod Logicroof LLC, Kiwa BDA Testing B.V. has determined a number of product characteristics of a **PVC roof waterproofing sheet**.

On 27 May 2019 a sample, consisting of a sheet and two joints, provided by Mr A. Taritsyn of Zavod Logicroof LLC, has been received at Kiwa BDA Testing B.V. for the purpose of testing.

On the sample no data were found regarding product name, manufacturer and/or production date/code.

See annex I for photos of the delivered sample.

The investigation has been performed in the period from week 22 up to and including week 26, 2019.

2 Test methods and results

2.1 Thickness

The investigation into the thickness of the sheet has been performed according to ASTM D751:2011, § 9 – Standard Test Methods for Coated Fabrics – Thickness.

The diameter of the pressure-foot is 9,5 mm. The applied load has been set at 23,5 kPa. The size of the test specimens has been set at 100 mm × 100 mm.

The test, including the conditioning of the test specimens, has been performed at 23 °C and 50% relative humidity.

Table 1 – Thickness

Test specimen	Thickness [mm]
1	1,26
2	1,28
3	1,29
4	1,29
5	1,25
Average	1,27
Standard deviation s ($\sigma_{(n-1)}$)	0,02

2.2 Tensile strength and elongation

The investigation into the tensile strength and elongation has been performed according to ASTM D751:2011, § 11-16 – Standard Test Methods for Coated Fabrics – Breaking Strength – Procedure B – Cut Strip Test Method.

The actual elongation of the test specimens has been measured with an optical extensometer, the constant separation speed has been set at 5 mm.s⁻¹. The width of the test specimens has been set at 50 mm; the number of threads in each test specimen is 14 in longitudinal direction and 14 in transverse direction. The distance between the clamps at the start of the test has been set at 75 mm.

The test, including the conditioning of the test specimens, has been performed at 23 °C and 50% relative humidity.

Table 2 – Tensile strength and elongation at break

Test specimen	Tensile strength [N.(50 mm) ⁻¹]		Elongation [% (L/L)]	
	longitudinal	transverse	longitudinal	transverse
1	1151	1116	33,6	38,2
2	1241	1061	35,0	36,9
3	1242	1063	36,9	36,9
4	1216	1068	35,9	37,4
5	1206	1022	35,5	36,5
Average	1211	1066	35,4	37,2
Standard deviation s ($\sigma_{(n-1)}$)	37	33	1,2	0,7

2.3 Seam strenght of the joints

The investigation into the seam strength of the joints has been performed according to ASTM D751:2011, § 66-71 – Standard Test Methods for Coated Fabrics – Seam Strength.

The constant separation speed has been set at 5 mm.s⁻¹. The clear distance between the grips has been set at 200 mm.

The effective width of the transverse joint (force in longitudinal direction) and of the longitudinal joint (force in transverse direction) has been determined at 45 mm.

The test, including the conditioning of the test specimens, has been performed at 23 °C and 50% relative humidity.

Table 3 – Seam strength of the joint

Test specimen	Seam strength [N.(50 mm) ⁻¹]	
	longitudinal direction	transverse direction
1	1213 ¹⁾	992 ¹⁾
2	1250 ¹⁾	907 ¹⁾
3	1202 ¹⁾	884 ¹⁾
4	1221 ¹⁾	815 ¹⁾
5	1232 ¹⁾	942 ¹⁾
Average	1224	908
Standard deviation s ($\sigma_{(n-1)}$)	18	66

¹⁾ Fracture outside the joint.

See photo 1 and 2 in annex II for the failure mode.

2.4 Dimensional stability

The investigation into the dimensional stability has been performed according to ASTM D1204:2014 – Standard Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated Temperature.

By request of the principal the test conditions have been set at 6 h at 80 °C. Before testing the test specimens have been conditioned for at least 40 h at 23 °C and 50% relative humidity.

Table 4 – Dimensional stability

Test specimen	Linear change [% (L/L)]	
	longitudinal	transverse
1	- 0,10	- 0,09
2	- 0,16	- 0,05
Average	- 0,13	- 0,07

2.5 Water absorption

The investigation into the resistance to ageing on exposure to water has been performed according to ASTM D570:2010 – Standard Test Method for Water Absorption of Plastics.

The dimensions of the test specimens have been set at 76,2 mm × 25,4 mm.

The test specimens have been submitted to 168 h in water of 70 °C.

Table 5 – Ageing on exposure to water

Test specimen	Mass [g]		Increase [% (m/m)]
	initial	after absorption	
1	3,0045	3,1691	5,48
2	3,0162	3,1806	5,45
3	3,0412	3,2084	5,50
Mean	-	-	5,48

Remarks:

The results are only related to the investigated samples, products and/or systems. Kiwa BDA Testing B.V. is not liable for interpretations or conclusions that are made in consequence of the results obtained.

The uncertainty of measurement can be retrieved at Kiwa BDA Testing B.V.

If sampling was not performed by Kiwa BDA Testing B.V., no judgement can be given with regard to the origin and representativeness of the samples.

Gorinchem, 3 July 2019
The laboratory



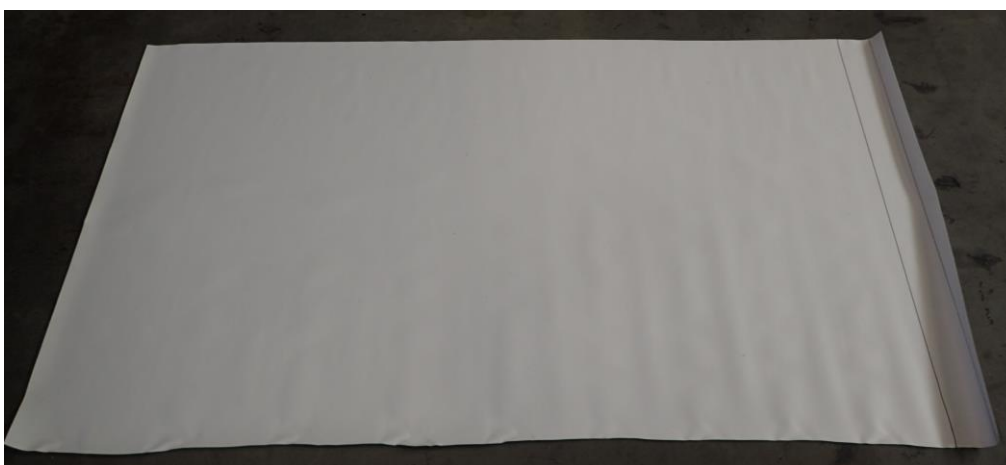
K. van Zee
manager

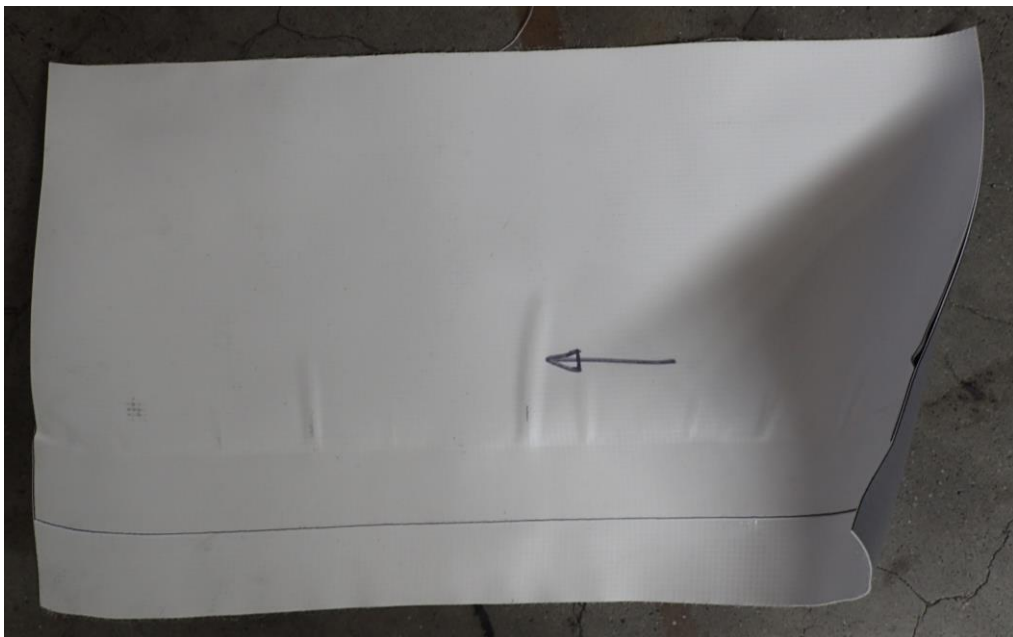
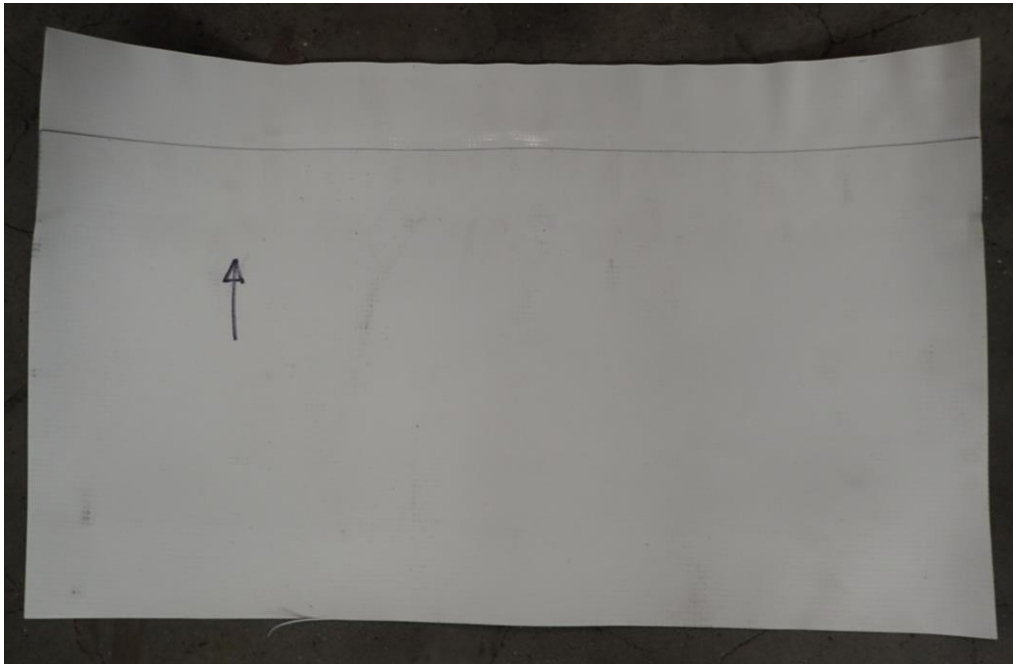
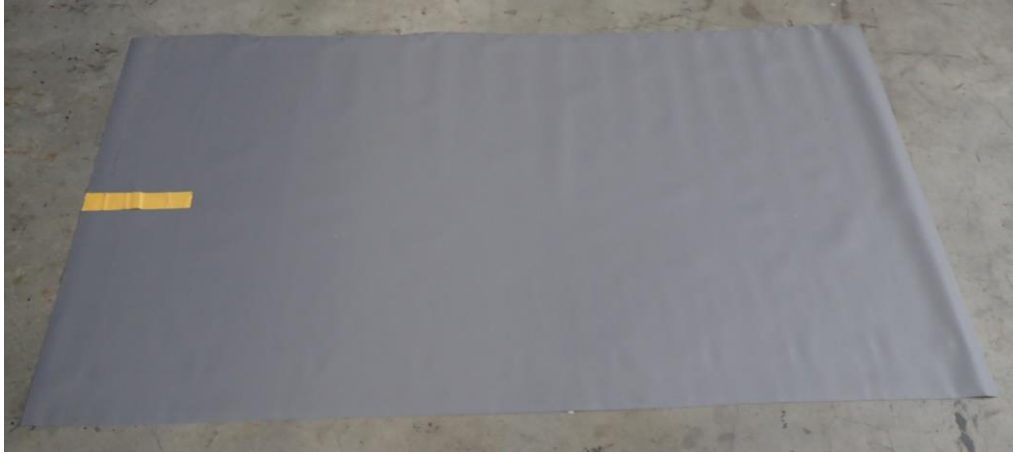
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C.W. van der Meijden MSc
technical director

I Photos of the delivered sample





II Preparation of the joints and failure mode

Photo 1
Failure mode seam strength,
longitudinal direction, initial.

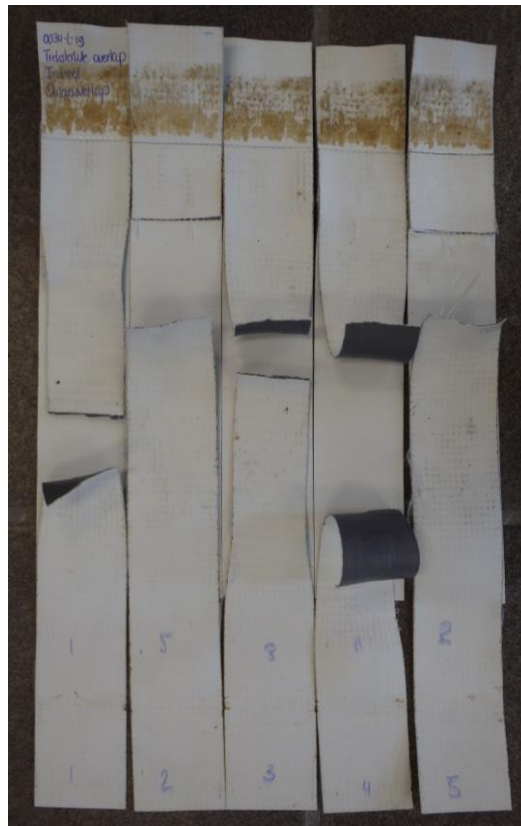


Photo 2
Failure mode seam strength,
transverse direction, initial.

