

0316-L-20/1

22 October 2020

Test report

Polyurea Rayston / Geomax Spray 200 /
Eurofast® EDS-B-48120 + DVP-EF 7007N5 /
Tauroxx / trapezoidal steel deck



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**Testing institute for
the building envelope**

expertise in façades and roofs



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Details

Principal

Eurofast[®]

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Date of order

21 July 2020

Project number

0316-L-20/1

Author

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Subject

resistance to dynamic wind load

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1 Introduction

By order of Eurofast®, Kiwa BDA Testing B.V. has determined the resistance to dynamic wind load of the following buildup:

- substructure of a **trapezoidal steel deck VD 106R/750**;
- mechanically fastened insulation, **Tauroxx**;
- two layer roof waterproofing system with a top layer of **Polyurea Rayston**, liquid applied roof waterproofing sheet and a mechanically fastened underlayer of **Geomax Spray 200** roof waterproofing sheet in combination with a **Eurofast® EDS-B-48120 + DVP-EF 7007N5** fastening system.

The suppliers and the delivery dates of the products used are mentioned below.

Table 1 – Specifications of the products used

Product	Supplier		Delivery date
	company	person	
Substructure	Kiwa BDA Testing B.V.	-	05-08-2020
Thermal insulation	Kiwa BDA Testing B.V.	-	05-08-2020
Fastening system	Eurofast®	M. de Bruin	06-08-2020
Roof waterproofing sheet (underlayer)	Krypton Chemical S.L.	J. Degraauw	06-08-2020
Roof waterproofing sheet (top layer)	Krypton Chemical S.L.	J. Degraauw	06-08-2020

See annex V for photos and data sheets of the products.

2 Investigation

The investigation into the resistance to dynamical wind forces has been performed on one test specimen according to EN 16002:2018 – Flexible sheets for waterproofing – Determination of the resistance to wind load of mechanically fastened flexible sheets for roof waterproofing.

The testing equipment used to determine the resistance to wind load has been a BDA Wind Uplift Tester.

The last calibration date of the equipment has been 11 March 2019.

The pitch of the test specimen during testing has been set at 0° (horizontally).

The test result of the wind uplift test has been interpreted according to the European Assessment Document EAD 030351-00-0402:2019 – Systems of mechanically fastened flexible roof waterproofing sheets¹, and according to the Dutch national standard NEN 6707:2011 – Bevestiging van dakbedekkingen – Eisen en bepalingmethoden².

The investigation has been performed in week 36 and week 37, 2020.

See annex III for the test schedule.

¹ EAD 030351-00-0402:2019 supersedes ETAG 006:2000/Amended:2012 – Guideline for the European Technical Approval of systems of mechanically fastened flexible roof waterproofing membranes.

² Fixing of roof coverings – Requirements and determination methods.

3 Construction of the test specimen

The construction data for the test specimen are mentioned in the table below.
The various layers are mentioned from the bottom up.
The specifications of the used products are mentioned underneath the table.

Table 2 – Construction data

Layer	Construction		Date
	company	person	
Substructure	Kiwa BDA Testing B.V.	A.R. Hameete	05-08-2020
		W.J.B. Middag	
Thermal insulation	Kiwa BDA Testing B.V.	A.R. Hameete	05-08-2020
		W.J.B. Middag	
Roof waterproofing sheet (underlayer)	Krypton Chemicals S.L.	J. Degraauw	06-08-2020
Fastening system	Eurofast®	M. de Bruin	06-08-2020
Roof waterproofing sheet (top layer)	Krypton Chemicals S.L.	J. Degraauw	06-08-2020

The construction of the test specimen has been supervised by Mr A.R. Hameete of Kiwa BDA Testing B.V. in the presence of Mr E. Balkensteyn of Krypton Chemicals S.L.

The specimen has the effective test dimensions of 3000 mm × 2800 mm and has been built up according to the prescription of the principal from the bottom up.

Substructure

- Trapezoidal steel deck, VD 106R/750, mass 9,81 kg.m⁻², steel quality S320GD; measured overall thickness: 0,75 mm.

Thermal insulation

- Tauroxx, production code: NL01ROE6LINE120180620 21:47:22, insulation boards made of mineral wool (MW), dimensions: 2000 mm × 600 mm, thickness: 100 mm, mechanically fastened with one fastener per board.

Roof waterproofing sheet (underlayer)

- Geomax Spray 200, a polypropylene fleece roof waterproofing sheet, thickness: 2,5 mm, width of the sheet: 1500 mm, production code: not revealed.
- The spacing between the individual fasteners has been set at 0,50 m.
- The spacing between the rows of fasteners has been set at 0,46 m.
- The nominal width of the overlap is 100 mm.

Fastening system roof waterproofing sheet

- Roofing screw: Eurofast® EDS-B-48120, production code: not revealed.
- Metal washer / Plastic tube washer: Eurofast® DVP-EF 7007N5, production code: not revealed.

Roof waterproofing sheet (top layer)

- Polyurea Rayston, a liquid applied polyurea coating, production code: not revealed.
- Consumption: approximately 2530 g.m⁻².



The fixation at the perimeter has been realized using wooden planks, with dimensions of 120 mm × 18 mm, whereby the roof waterproofing sheet has been welded around the planks (see annex IV). The mutual spacing between the fasteners at the perimeter fixation has been set at 0,25 m.

By request of the principal after the buildup and before testing the test specimen has been stored in the laboratory for a period of at least seven days.

A photo report of the construction of the test specimen has been given in annex I.

4 Results

At the 100% step of the cycle of $\Delta W_{\max 100\%} = 1300$ N (theoretical load) per fastener the test specimen has collapsed by pulling several fasteners out of the substructure.

See also the photos in annex II.

According to EN 16002:2018 and NEN 6707:2011 the test result is the peak load of the cycle preceding the cycle of failure.
Therefore the test result is 1200 N (theoretical load) per fastener.

According to EAD 030351-00-0402:2019 the admissible (design) load for the wind uplift resistance is 800 N per fastener (see paragraph 5.1: Design load according to EAD 030351-00-0402).

According to NEN 6707:2011 the admissible (design) load for the wind uplift resistance is 800 N per fastener (see paragraph 5.2: Design load according to NEN 6707).

5 Determination admissible (design) load

5.1 Design load according to EAD 030351-00-0402

The test result of the wind uplift test has been interpreted according to the European directive European Assessment Document EAD 030351-00-0402:2019 – Systems of mechanically fastened flexible roof waterproofing sheets.

The admissible (design) load for the wind uplift resistance has been specified in the next formula:

$$W_{adm} = \frac{W_{test} \cdot C_a \cdot C_d}{\gamma_m}$$

Wherein:

- W_{adm} = admissible (design) load for the wind uplift resistance [N per fastener];
- W_{test} = test result [N per fastener];
- C_a = geometric correction factor;
- C_d = statistical correction factor;
- γ_m = material/safety factor.

The result and the correction/safety factors are given below.

Table 3 – Result and the correction/safety factors

System	W_{test}	C_a	C_d	γ_m	W_{adm}
See paragraph 3 for the buildup of the test specimen	1200	1,0	1,0	1,5	800

5.2 Design load according to NEN 6707

The test result of the wind uplift test has been interpreted according to NEN 6707:2011 – Bevestiging van dakbedekkingen – Eisen en bepalingmethoden¹.

The admissible (design) load for the wind uplift resistance (X_d) has been specified in the next formula:

$$X_d = \frac{X_k \times K_{mod}}{\gamma_M} \quad X_k = W_{test} \times C_a \times C_d \quad \gamma_M = \gamma_m \times \gamma_{Rd}$$

Wherein:

- X_d = admissible (design) load for the wind uplift resistance [N per fastener];
- X_k = the characteristic value for the strength per m² of roof surface against blow off [N per fastener];
- K_{mod} = modification factor;
- γ_m = the partial factor for material property;
- γ_{Rd} = the partial factor associated with the uncertainty of the resistance model;
- γ_M = the partial factor for material property, also accounting for model uncertainties and dimensional variations.
- W_{test} = test result [N per fastener];
- C_a = geometric correction factor;
- C_d = statistical correction factor.

The result and the correction/safety factors are given below.

Table 4 – Result and the correction/safety factors

System	W_{test}	C_a	C_d	X_k	K_{mod}	γ_m	γ_{Rd}	X_d
See paragraph 3 for the buildup of the test specimen	1200	1,0	1,0	1200	1,0	1,5	1,0	800

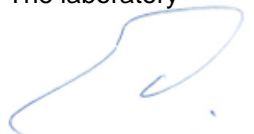
Remarks:

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, 22 October 2020
The laboratory



A.R. Hameete
operational manager

Kiwa BDA Testing B.V.



C.W. van der Meijden MSc
technical director

¹ Fixing of roof coverings – Requirements and determination methods.

I Photo report of the construction

Photo 1

The trapezoidal steel deck has been fixed on wooden beams and the insulation has been fixed on the trapezoidal steel deck.



Photo 2

The roof waterproofing sheet (underlayer) has been fastened.



Photo 3

The fastening system has been placed.



Photo 4
Detail of the fastening system.



Photo 5
The coating is applied.



Photo 6
The coating has been applied and the test specimen is ready for testing.



II Photo report failure mode

Photo 1
Failure mode.

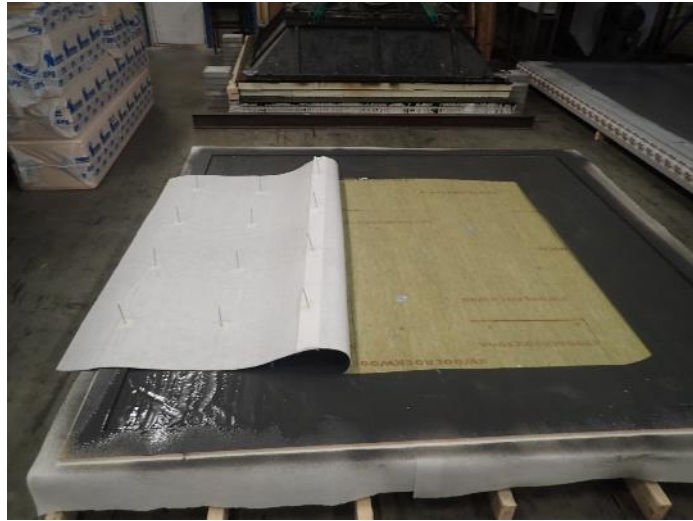



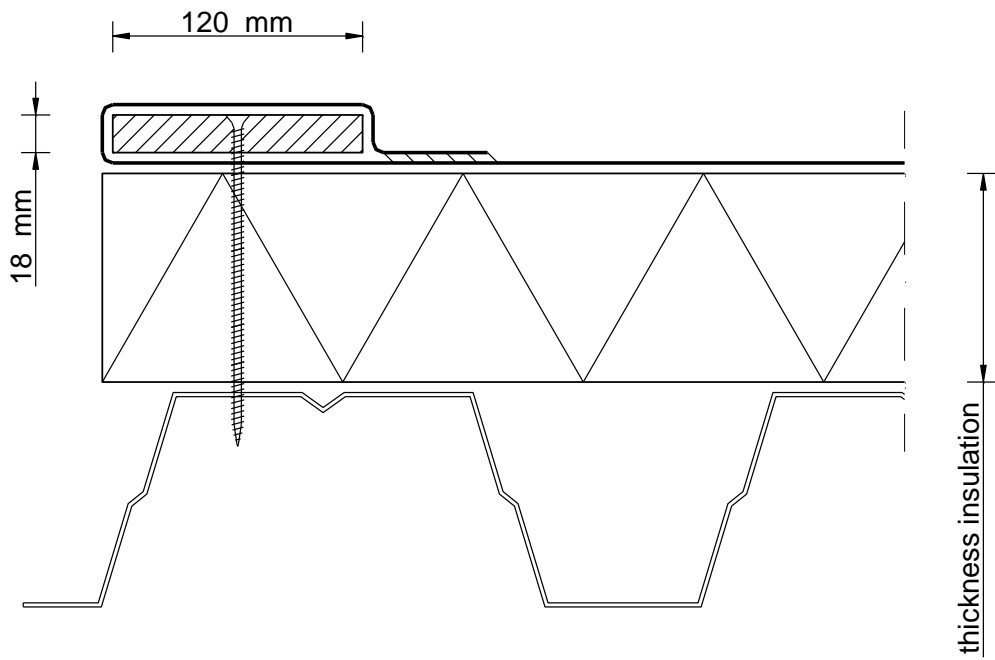
Photo 2
Detail of the failure mode.



III Test schedule

WIND TEST		Order number: 0316-L-20/1								
Start of test: 4-9-2020	Setting outlet	50								
End of test: 8-9-2020	cap [m x m]: 3,00 x 2,80	50								
Operator(s): A.R. Hameete / W.J.B. Middag / J.C. Delgado	5,00 x 2,80	150								
System: double layer mechanically fixed roof waterproofing sheet										
Dimensions test area				longer side	shorter side (m)	a/b = 1,09				
				3,00 m	x 2,80 m	m/b = 6,09				
Distance between rows (a):	0,50 m	α	β		Ca					
			≤ 3	--						
Distance between fasteners (b):	0,46 m	2	4		0,85					
			≥ 5		0,90					
Number of fasteners per m ² :	4,35	3	≤ 2		--					
			3		0,90					
			4		0,95					
			≥ 5		1,00					
Number of spaces between the rows (α)	6	> 3	≤ 2		--					
Number of spaces between te fasteners (β)	6		> 3		1,00					
percentage peak pressure										
number of gusts										
		40	60	80	90	100	90	80	60	40
		500	200	5	2	1	2	5	200	500
temperature [°C]	peak force [N/fastener]	suction pressure								
		[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]
21,7	300	0,52	0,78	1,04	1,17	1,30	1,17	1,04	0,78	0,52
22,2	300	0,52	0,78	1,04	1,17	1,30	1,17	1,04	0,78	0,52
22,2	300	0,52	0,78	1,04	1,17	1,30	1,17	1,04	0,78	0,52
21,9	300	0,52	0,78	1,04	1,17	1,30	1,17	1,04	0,78	0,52
21,0	400	0,70	1,04	1,39	1,57	1,74	1,57	1,39	1,04	0,70
21,0	500	0,87	1,30	1,74	1,96	2,17	1,96	1,74	1,30	0,87
22,7	600	1,04	1,57	2,09	2,35	2,61	2,35	2,09	1,57	1,04
25,0	700	1,22	1,83	2,43	2,74	3,04	2,74	2,43	1,83	1,22
25,5	800	1,39	2,09	2,78	3,13	3,48	3,13	2,78	2,09	1,39
25,4	900	1,57	2,35	3,13	3,52	3,91	3,52	3,13	2,35	1,57
20,8	1000	1,74	2,61	3,48	3,91	4,35	3,91	3,48	2,61	1,74
21,6	1100	1,91	2,87	3,83	4,30	4,78	4,30	3,83	2,87	1,91
21,9	1200	2,09	3,13	4,17	4,70	5,22	4,70	4,17	3,13	2,09
22,4	1300	2,26	3,39	4,52	5,09	5,65	5,09	4,52	3,39	2,26
	1400	2,43	3,65	4,87	5,48	6,09	5,48	4,87	3,65	2,43
	1500	2,61	3,91	5,22	5,87	6,52	5,87	5,22	3,91	2,61
	1600	2,78	4,17	5,57	6,26	6,96	6,26	5,57	4,17	2,78
	1700	2,96	4,43	5,91	6,65	7,39	6,65	5,91	4,43	2,96
	1800	3,13	4,70	6,26	7,04	7,83	7,04	6,26	4,70	3,13
	1900	3,30	4,96	6,61	7,43	8,26	7,43	6,61	4,96	3,30
	2000	3,48	5,22	6,96	7,83	8,70	7,83	6,96	5,22	3,48
	2100	3,65	5,48	7,30	8,22	9,13	8,22	7,30	5,48	3,65
	2200	3,83	5,74	7,65	8,61	9,57	8,61	7,65	5,74	3,83
	2300	4,00	6,00	8,00	9,00	10,00	9,00	8,00	6,00	4,00
	2400	4,17	6,26	8,35	9,39	10,43	9,39	8,35	6,26	4,17
	2500	4,35	6,52	8,70	9,78	10,87	9,78	8,70	6,52	4,35
	2600	4,52	6,78	9,04	10,17	11,30	10,17	9,04	6,78	4,52
	2700	4,70	7,04	9,39	10,57	11,74	10,57	9,39	7,04	4,70

IV Fixation



V Photos and data sheets of the products

Roof waterproofing sheet (top layer)

POLYUREA RAYSTON

RAYSTON
products

Pure polyurea membrane for waterproofing in spray applications.

DESCRIPTION

Polyurea Rayston is a 2-component polyurea system for elastic membrane application with crack-bridging capability. It is an extra fast-curing system that can only be applied by hot mechanical spraying equipment. Polyurea Rayston can be combined with different geotextiles to obtain on site applied, seamless liners.



APPLICATIONS

Waterproofing of concrete structures. Waterproofing of foundations, specially those designed as barriers to Radon gas. Roof waterproofing. Sewage and wastewater treatment structures. On-site applied liners, totally seamless, for secondary containment applications, ponds, landfills, tunnels, canals, dam repairing. Protective coating for metallic structures. Polyurea Rayston can be completed with an aliphatic polyurethane topcoat to ensure UV protection.



PROPERTIES

- Crack-bridging capability. Highly elastic membrane.
- Very fast curing, using two-component spraying equipment.
- It can be pigmented.



CERTIFICATIONS

CE marking EN 1504-2: 0370-CPR-2247, • ETA (ETAG005): European Technical Assessment document N° 16/0148



BBA certificate (roofing) number 18/5582

Radon diffusion coefficient according to ISO 11665-13

Aplus (Independent laboratory):

- Drinking water certification (Migration test). 928/09/8505
- Contact with alcoholic beverages. Simulation C as per regulation EU 10/2011 (EN 1186): pass. Certificate 928/11/4106 M1
- Low-temperature foldability: 11/2855-1313
- Mechanical properties: 11/2855-1314
- Dynamic and Static indentation test according to EOTA. 11/2855-1315
- Contact with fuel products (UNE 48307:2011) Exp 13/6620-457
- External fire resistance EN 13501-5:2005+A1 :2010
- DOP: 16 -750

AITEX (Independent laboratory):

- Mechanical properties EN ISO 527-1/3.
- Static indentation/CBR UNE-EN-ISO 12236:2007.
- Tear, according to UNE-EN ISO 34-1:2011



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43890 - l'Hospitalet de l'Infant - Spain
Tel: +34 977 822 245 - Fax: +34 977 823 977
www.kryptonchemical.com - rayston@kryptonchemical.com

External fire behaviour	NPA Roof (F)
Fire class	NPA (F)
Use life	W3
Climatic zone	S (Severe)
Use load	P4
Roof slope	S1 to S4
Minimum surface temperature	TL3
Maximum surface temperature	TH4
Hazardous components	Not declared

Water Regulations Advisory Scheme LTD. (WRAS) Material Approval (United Kingdom), contact with water intended for human consumption). Approval number 1709541

TECHNICAL DATA

INFORMATION ON THE PRODUCT BEFORE APPLICATION

	Component A	Component B
Chemical description	Polyamine	Aromaticisocyanatep repolymer
Physical state	Liquid	Liquid
Packaging	Metal container	Metal container
Note: Pigment is delivered in a third container. See Pigment Spray data sheet for specific details.	185 kg 23.1 kg	211 kg 26.3 kg
Non-volatile content (%)	100%	100%
Flash point	>100°C	>100°C
Colour	Yellow (without pigment)	Yellow

Density	Temp (°C)	Density (g/cm3)	Temp (°C)	Density (g/cm3)
	20	1.02	20	1.12
60	1.02	60	1.10	

Viscosity	Approximate values	
	Temp (°C)	Temp (°C)
Brookfield	20	2000
	30	1000
	50	400
	70	150

A/B mixing ratio A=1, B=1.17 by weight
A=1, B=1 by volume

Density and viscosity of the AB mixture Fast polymerization (see pot life data)

Colour Dark yellow, but component A is pigmented by addition of pigment paste (Pigment Spray) delivered with each kit of Polyurea Rayston.

Curing performance Gel time mixture A+B (20 g)
4 s at 25°C
3 s at 60°C
Tack free time
30 s at 70°C

Storage Keep between 10°C and 30°C.

Use before 12 months after manufacturing date.



Latest update: 08/05/2020

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POLYUREA RAYSTON



Pure polyurea membrane for waterproofing in spray applications.

INFORMATION ON THE FINAL PRODUCT

Final state	Elastomeric solid membrane																																																												
Colour	Available Pigment Spray pastes are blue RAL 5015, gray RAL 7011. Tile red, Beige RAL 1001. Other pastes are available under request.																																																												
Gloss (60°)	80-85%																																																												
Hardness (shore)	87A 35D																																																												
Mechanical properties	<table border="1"> <thead> <tr> <th>Elongation (%)</th> <th>Tensile strength (MPa)</th> </tr> </thead> <tbody> <tr> <td>50</td> <td>9.8</td> </tr> <tr> <td>100</td> <td>11</td> </tr> <tr> <td>200</td> <td>13</td> </tr> <tr> <td>300</td> <td>15.5</td> </tr> <tr> <td>324</td> <td>16.2</td> </tr> </tbody> </table> <p>Maximum elongation: 324% Tensile strength: 16,2 MPa (UNE EN ISO 527-1/3)</p>	Elongation (%)	Tensile strength (MPa)	50	9.8	100	11	200	13	300	15.5	324	16.2																																																
Elongation (%)	Tensile strength (MPa)																																																												
50	9.8																																																												
100	11																																																												
200	13																																																												
300	15.5																																																												
324	16.2																																																												
Tear strength	69 N/mm (ISO 34-1, method B)																																																												
UV resistance	Polyurea Rayston is an aromatic isocyanate based product. A colour change is to be expected under sunlight. This change does not affect its mechanical properties. An additional UV protection can be provided with an Impertrans/Colodur topcoat.																																																												
Abrasion resistance	10 mg (Taber, 1000 c. CS-10, 1kg)																																																												
Water permeability	0,9 g/m2 * d Class II as per EN1504-2																																																												
Liquid water permeability	0,002 kg/m2 h0,5 EN 1062-3:2008																																																												
Thermal resistance	Stable up to 200°C (8-hour test). According to low temperature tests, (UNE_EN 495-2001), the membrane can be folded at -45°C without cracking or breaks.																																																												
Fire resistance	B roof t1 (External fire exposure test). External fire exposure test (according to EN 13501-5:2005+A1 :2010)																																																												
Indentation	Polyurea Rayston gives, at 2-mm thickness, a resistance to indentation equivalent to a p4 level (approx 25 kJ/cm2) at TH4 (90°C) as directed by EOTA guide ETAG 005. The combined liner of Polyurea Rayston +selected geotextiles gives a static indentation resistance higher than 4000 kN (UNE-EN ISO 12236:2007) Immersion test. (0=not recommended, 5=best)																																																												
Chemical resistance	<table border="1"> <thead> <tr> <th>Chemical</th> <th>Conditions</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Water</td> <td>15d, 80°C</td> <td>5</td> </tr> <tr> <td>Salt water (saturation)</td> <td>15d, 80°C</td> <td>5</td> </tr> <tr> <td>Xylene</td> <td>7d, 80°C</td> <td>2</td> </tr> <tr> <td>Ethyl acetate</td> <td>7d, 80°C</td> <td>1</td> </tr> <tr> <td>Isopropyl alcohol</td> <td>7d, 80°C</td> <td>0</td> </tr> <tr> <td>Sodium hydroxide (50%)</td> <td>7d, 80°C</td> <td>5</td> </tr> <tr> <td>Hydrogen peroxide (33%)</td> <td>7d, 25°C</td> <td>4</td> </tr> <tr> <td>Sulphuric acid (10%)</td> <td>7d, 80°C</td> <td>5</td> </tr> <tr> <td>Sulphuric acid (30%)</td> <td>30d, 80°C</td> <td>4</td> </tr> <tr> <td>Phosphoric acid (54%)</td> <td>7d, 80°C</td> <td>4</td> </tr> <tr> <td>Bleach</td> <td>7d, 80°C</td> <td>4</td> </tr> <tr> <td>Ammonia (3%)</td> <td>7d, 80°C</td> <td>5</td> </tr> <tr> <td>Diesel</td> <td>16d, 80°C</td> <td>5</td> </tr> <tr> <td>Hydrochloric acid 12M (37%)</td> <td>7d, 80°C</td> <td>0</td> </tr> <tr> <td>Hydrochloric acid 6M (18%)</td> <td>7d, 80°C</td> <td>1</td> </tr> <tr> <td>Hydrochloric acid 3M (9%)</td> <td>7d, 80°C</td> <td>4</td> </tr> <tr> <td>Hydrochloric acid 0.75M (2%)</td> <td>7d, 80°C</td> <td>5</td> </tr> <tr> <td>Sodium hypochlorite 1%</td> <td>7d, 80°C</td> <td>3</td> </tr> <tr> <td>Engine oil</td> <td>21d, 80°C</td> <td>5</td> </tr> </tbody> </table>	Chemical	Conditions	Result	Water	15d, 80°C	5	Salt water (saturation)	15d, 80°C	5	Xylene	7d, 80°C	2	Ethyl acetate	7d, 80°C	1	Isopropyl alcohol	7d, 80°C	0	Sodium hydroxide (50%)	7d, 80°C	5	Hydrogen peroxide (33%)	7d, 25°C	4	Sulphuric acid (10%)	7d, 80°C	5	Sulphuric acid (30%)	30d, 80°C	4	Phosphoric acid (54%)	7d, 80°C	4	Bleach	7d, 80°C	4	Ammonia (3%)	7d, 80°C	5	Diesel	16d, 80°C	5	Hydrochloric acid 12M (37%)	7d, 80°C	0	Hydrochloric acid 6M (18%)	7d, 80°C	1	Hydrochloric acid 3M (9%)	7d, 80°C	4	Hydrochloric acid 0.75M (2%)	7d, 80°C	5	Sodium hypochlorite 1%	7d, 80°C	3	Engine oil	21d, 80°C	5
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Crude petroleum	21d, 23°C	5
Sulfamic acid 85%	7d, 80°C	4
Oleic acid	7d, 80°C	0
Glycerine	7d, 80°C	5
Ethanol/water 20/80 w/w	7d, 80°C	4

Adhesion strength

Surface	Adhesion strength (MPa)
Concrete (with epoxy primer)	4.0
Plywood (with epoxy primer)	1.6 (cohesive wood failure)
Steel (PU primer)	5.3
High density PU foam (150kg/m3)	>1.5 foam failure
Fibrous cement (with Impermax LY as a primer)	2.5 (cement failure)

Radon diffusion coefficient
2,6 x 10⁻¹¹ m2/s (ISO 11665-13)

SUPPORT REQUIREMENTS

In order to achieve a good penetration and bonding, support must be:

1. Flat and leveled
2. Compact and cohesive (pull off test must show a minimum resistance of 1.4 N/mm2).
3. Even and regular surface
4. Free from cracks and fissures. If any, they must be previously repaired.
5. Clean and dry, free of dust, loose particles, oils, organic residues or laitance

Support temperature must be between 10°C and 40°C. Support moisture must be less than 4%. Higher humidities do not prevent correct polymerization but may make adhesion increasingly difficult to substrates.

Metal substrates must be clean and free of rust, oils, greases or other loose material.

TEMPERATURE AND HUMIDITY CONDITIONS

Air temperature should be between 10°C and 40°C. Relative air humidity should be less than 85%. Higher humidities do not prevent correct polymerization but may make adhesion increasingly difficult to substrates because of condensation on surfaces.

SUPPORT PREPARATION

Concrete substrates must be prepared mechanically using high pressure sand or abrasion, in order to remove the surface and obtain an open pore. Substrates must be primed and levelled until a regular surface is obtained. Sharp irregularities are eliminated using an abrading disc machine. Eliminate all dust and loose particles from the substrate by brushing or vacuum cleaning. If underlying moisture is suspected, it is recommended to apply 2 coats of epoxy (Rayston Epoxy primer). First one as such and the second one with quartz sand spreaded over.
Metal substrates should be cleaned and primed with Primer PU prior to application.

MIXING

Both the component A side and the component B side should be preconditioned between 25 °C - 30°C before loading. Stir and homogenise separately both components using suitable mixing equipment before being loaded into the machine. Add the required Pigment Spray to the A-component and stir before loading. Recirculate both components while heating up to the required application temperatures.

APPLICATION AND RECOMMENDED QUANTITIES

Polyurea Rayston must be applied using 2-component hot spraying equipment.

Recommended temperatures are:

- Component A: 68°C
- Component B: 70°C
- Hose: 67°C

Pressure must be adjusted to 140 bar.

During spraying, check coating thickness to ensure curing evolution is correct. Polyurea Rayston is applied at 1,5-2,0 kg/m2, obtaining a 1,5-2 mm thickness. Please contact Krypton Chemical for specific application details.



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Latest update: 08/05/2020

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POLYUREA RAYSTON



Pure polyurea membrane for waterproofing in spray applications.

CURING TIME

Polyurea Rayston cures to touch after a few minutes after application. Approximate hardness values are provided here as reference only (1 mm, polypropylene support, 25°C 50% RH)

time	Hardness shore A
5 min	28
10min	40
20 min	55
1 hr	70
24 hrs	80
4 days	88

RECOATING

It is recommended to obtain the right thickness with a single application. Where an epoxy primer has been previously applied, spray Polyurea Rayston Fast only after the primer is fully cured.

RETURN TO SERVICE

Under most conditions (25°C, 50% rh), the membrane is rain-resistant after 10 minutes.

TOOL CLEANING

In order to keep equipment in good conditions (spraying gun, gaskets), it is recommended not to use solvents. A cleaning fluid like Rayston Fluid can be used instead. Component B must be thoroughly removed and replaced with this fluid.

FAQ

Problem	Question	Answer	Solution
Does not cure or remains sticky	Ratio AB correct?	Different pressure	Check and correct pumping equipment Apply an Epoxy-type primer before Polyurea
Bubbles or open holes in the membrane	Porous substrate?	No primer	Open holes are frequent with fast-curing polyurea Use 1 kg/m ² minimum
Not enough hiding power	Horizontal?	Too few No pigment	Mix and homogenize pigment in component A before spraying
Gray colour darkens upon exposure to sun	Exposed?	Components react with UV light.	Apply an aliphatic topcoat afterwards (eg Impertrans, Colodur)

CLEANING AND MAINTENANCE

A maintenance work must be carried out regularly on the treated roofs according to the intended use. This work includes the following tasks:

- Leaf removal
- Grass, dirt, moss and other vegetation removal
- Keeping storm water system in good working order.
- Ensure gratings are in place, in order to prevent gutter obstructions.
- Check proper condition of several structures (flashing, seams, retaining walls...)
- Verification of possible damages due to improper use.

If aesthetic appearance of the roof is an important issue, it is essential to regularly clean the surface with water (some mild detergent may be added), according to the use. It may be necessary to reapply decorative layers (Impertrans, Colodur) if they are worn out due to traffic, weather, corrosion, etc.

For stain removal, a surface treatment with Rayston solvent or isopropyl alcohol may be attempted. Strong acids are totally inadequate. Some solvents

may damage the membrane. If this happens, the affected area has to be cut and repaired with a new Polyurea Rayston application.

SAFETY

Component B of Polyurea Rayston contains isocyanates and Component A contains corrosive polyamines that can cause burns. Always follow the safety instructions in the Material Safety Data Sheet. As a general rule, a good ventilation, protective clothing and respiratory protection is needed (combined organic vapor filters+particles A2P). This product must be used only for the applications here described. This product is intended for industrial and professional use. It is not suitable for DIY-type applications.

ENVIRONMENTAL PRECAUTIONS

Empty containers must be handled with the same precautions as if they were full. Treat empty containers as hazardous waste, and transfer them to an authorized waste manager. If the containers still have some material left, do not mix with other product with no knowledge of potential dangerous reactions. Component A and B may be mixed on a 1/1 ratio in order to get an inert material, but never do it in volumes larger than 5 litres in order to prevent a dangerous heat evolution.

OTHER INFORMATION

The information contained in this DATA SHEET, as well as our advice, both written as verbal or provided through testing, are based on our experience, and they do not constitute any product guarantee for the installer, who must consider them as simple information.

We recommend to study deeply all information provided before proceeding to the use or application of any of our products, and strongly advise to conduct tests "on-site" in order to determine their convenience for a specific project. Our recommendations do not exempt of the obligation of installers to deeply study the right application method for these systems before use, as well as to conduct as many preliminary tests as possible should any doubt arise. The application, use and processing of our products are beyond our control, and therefore under the exclusive responsibility of the installer. In consequence, the installer will be the only responsible of any damage derived from the partial or total in-observation of our indications, and in general, of the inappropriate use or application of these materials.

This data sheet supersedes previous versions.



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Latest update: 08/05/2020
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Roof waterproofing sheet (underlayer)

GEOMAX SPRAY 200



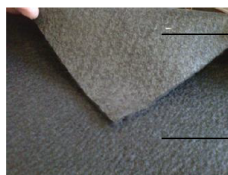
Tejido de soporte para aplicaciones de poliurea rayston

DESCRIPCIÓN



Geomax Spray 200 es un tejido no tejido de fibras de polipropileno punzonado por una cara y calandrado térmicamente por la otra. Este tejido exhibe una alta resistencia mecánica y ha sido diseñado como soporte para aplicaciones de Poliurea Rayston, formando un composite impermeabilizante de alta resistencia. En color negro turmalita para facilitar el control de la aplicación del producto proyectado. Disponible en versiones adhesiva y no adhesiva.

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Superficie calandrada

Superficie no calandrada

DATOS TÉCNICOS

INFORMACIÓN SOBRE EL PRODUCTO ANTES DE LA APLICACIÓN

Composición	Fibra de polipropileno
Espesor mm	2.5
Resistencia a la tracción kN	
Longitudinal / transversal	11.2/14.4
Elongación máxima%	
Longitudinal / transversal	67/80
Resistencia a la indentación kN	2.39
Normas estándares	UNE EN-ISO 10319:2008, 12236:2007, 13433:2007

Temperatura de uso	-15°C a 80°C
Presentación	Versión adhesiva: rollos de 1,50 m x 30 m Versión no adhesiva: rollos de 1,50 m x 60 m
Almacenaje	Mantener protegido de los rayos del sol y de la humedad 24 meses a partir de la fecha de fabricación

INSTRUCCIONES GENERALES

Desenrollar el producto sobre la superficie y cortar usando instrumentos adecuados. Aplicar Poliurea Rayston de acuerdo con las instrucciones de su ficha técnica.

RECOMENDACIONES DE USO

Solapar al menos 10 cm rollos contiguos de Geomax Spray. Para una mayor productividad, se recomienda solapar el tejido, formando paños grandes, y posteriormente proyectar la poliurea Rayston de forma continua en una superficie grande.

MEDIO AMBIENTE

Geomax Spray 200 es residuo inerte. Gestionar de acuerdo con la legislación local.

INFORMACIÓN COMPLEMENTARIA

La información contenida en esta FICHA TÉCNICA, así como nuestros consejos, tanto escritos como proporcionados verbalmente o mediante ensayos, se dan de buena fe en base a nuestra experiencia y a los resultados obtenidos mediante ensayos realizados por laboratorios independientes, y sin que sirvan por ello como garantía para el aplicador, quien deberá tomarlos como referencias meramente orientativas y con valor estrictamente informativo. Recomendamos estudiar en profundidad esta información antes de proceder al uso y aplicación de cualquiera de dichos productos, si bien es especialmente conveniente que realicen pruebas "in situ", para determinar la idoneidad de un tratamiento en el lugar, con la finalidad y en las condiciones concretas que se den en cada caso.

Nuestras recomendaciones no eximen de la obligación que el aplicador tiene de conocer en profundidad, el método correcto de aplicación de estos sistemas antes de proceder a su uso, así como de realizar cuantas pruebas previas resulten oportunas si se duda de la idoneidad de éstos para cualquier obra, instalación o reparación, atendiendo a las circunstancias concretas en las que se vaya a utilizar el producto.

La aplicación, uso y procesamiento de nuestros productos están fuera de nuestro control y, por lo tanto, bajo la responsabilidad exclusiva del instalador. En consecuencia, el aplicador será el responsable único y exclusivo de los daños y perjuicios que se deriven de la inobservancia total o parcial del manual de uso e instalación y, en general, del uso o la aplicación inapropiados de estos productos.

Esta ficha técnica anula las versiones anteriores.



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Última revisión: 07/05/2020
Página: 1/1



Fastening system

EUROFAST®

T +31 (0)493 315 885 • www.eurofast.nl • info@eurofast.nl

PAKLIJST

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4202 MS Gorinchem
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Verzendnr. : V-VERZ44867
Datum : 3-8-2020
Orderkiantr. : 250024
Verkoper : Taco van Rooij

Ordernr. : VOR039687
Referentie : KIWA - BDA MET KRYPTON CHEMICAL

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Nr.	Omschrijving	Deze levering
DVP-EF7007N5	DVP-EF7007N5 drukverdeelplaat aluz	500 Stuks
EDS-B-48120	EDS-B-48120 dakschroef parker bpunt	500 Stuks
		Tot. gewicht 19,00

VAT No. NL803341593B01 Rabobank Utrecht Account No. 1525.71.396 IBAN NL57RABO0152571396 BIC RABONL2U

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Quotations, transactions and deliveries are carried out in accordance with the Conditions of Delivery filed with the Chamber of Commerce in Eindhoven, no. 17086651, Netherlands. Mentioned on www.eurofast.nl



Thermal insulation

TAUROXX

DAKPLAAT
DACHPLATTE
PANNEAU DE TOITURE
ROOFBOARD

03-0749

ROCKWOOL B.V.
Industrieweg 15, 6045JG Roermond Nederland

R declared λ declared

250 m²K/W 0.040 W/mK

HTTP://DOP.ROCKWOOL.COM
ID: RWDOPBML-330-003-02
22487
THB
RTF: A1 EUROCLASS
EN13162: 2013+A1 2015
MW-EN 13162-T4-DS(70,90)-
CS(10)50-TR15-PL(5)500-WS
MU1
BC1-511-0003-0085-R268

DIKTE DICKE	EPAISSEUR THICKNESS	LENGTE LANGE	LONGUEUR LENGTH	BREEDTE BREITE	LARGEUR WIDTH	INHOUD INHALT	CONTENU CONTENTS
100	MM	200	CM	60	CM	28.8	M2

CTG-704

2983

01000022487 100029240952

22487

29240952
NL07ROE6LINE120180620
214722

8 711698 730811

Substructure

Trapezoidal steel deck, VD 106R/750 (dimensions in mm)

