

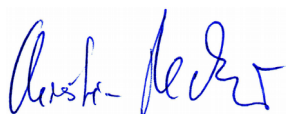
# NorGeoSpec 2012 Product Certificate

## Quality Product Certification Reinforcement

This product has been found to be fit for use in accordance with NorGeoSpec 2012 System for the above given function.

<b>Certificate no.:</b>	NGS-50174
<b>Date:</b>	09.05.2019
<b>Valid until:</b>	08.05.2021
<b>Manufacturer:</b>	HUESKER Synthetic GmbH
<b>Product:</b>	Stabilenka® 400/50
<b>Product Type:</b>	GTX-K
<b>Raw material:</b>	PET
<b>Function:</b>	Reinforcement (Main function), Separation and Filtration (Additional functions)

Issued by



Christian Recker, SINTEF project manager

Approved by



Arnstein Watn, Head of the Technical committee



The products are regularly audited and tested to verify that the characteristics fulfil the NorGeoSpec 2012 Rev.: 01/14.12.2016 requirements. Approved by the NorGeoSpec Technical committee: 09.05.20179

## Quality Product Certification Reinforcement

Characteristic		Standard	Unit	Declared value	Max. tolerance	Certification value
Mass per unit		EN ISO 9864	g/m <sup>2</sup>	750	± 75	<b>675 – 825</b>
<b>Dimension</b>		NorGeoSpec 2012				
Tensile elements	MD	Annex	Production width <sup>1</sup>			
	CMD	Annex F	Elements/m			
Grid apertures	MD	Annex F	mm			
	CMD	Annex F	mm			
<b>Mechanical tests</b>						
Nominal tensile strength	MD	EN ISO 10319	kN/m	400.00	- 0.00	<b>400.00</b>
	CMD	EN ISO 10319	kN/m			
Tensile strain at nominal strength	MD	EN ISO 10319	%	8.3	± 1.7	<b>6.6 – 10</b>
	CMD	EN ISO 10319	%			
Tensile stiffness at 2% tensile strain	MD	EN ISO 10319	kN/m	4000	- 0	<b>4000</b>
	CMD	EN ISO 10319	kN/m			
Tensile stiffness at 5% tensile strain	MD	EN ISO 10319	kN/m	4000	- 0	<b>4000</b>
	CMD	EN ISO 10319	kN/m			
Tensile stiffness at 10% tensile strain	MD	EN ISO 10319	kN/m			
	CMD	EN ISO 10319	kN/m			
Static puncture test		EN ISO 12236	KN	12.000	- 1.00	<b>11.000</b>
Dynamic perforation resistance		EN ISO 13433	mm	9	+ 2.0	<b>11</b>
<b>Hydraulic tests</b>						
Permeability normal to the plane without load		EN ISO 11058	m/s	0.030	- 0.010	<b>0.020</b>
Characteristic opening size		EN ISO 12956	µm	210	± 60	<b>150 – 270</b>
<b>Durability (Declared value)</b>						
Service life			years	<input type="checkbox"/> 25	<input type="checkbox"/> 50	<input type="checkbox"/> 100

Information about reduction factors are given on page 3 of this certificate.

<sup>1</sup> Production width= 5m

## Declared values

### Reinforcement

Declared values						
Reduction factor for creep rupture <sup>1) 2)</sup>	RF <sub>CR</sub>	1.52	BAA assessment, Certificate 13/4979, Product sheet 1; for 120 years and application temperature of 20 °C			
Reduction factor for environmental effects	RF <sub>CH</sub>					
Chemical			Application in natural soils with 4 < pH < 9 and soil temperature < 25 °C			
Oxidation		n. r.				
Hydrolysis		1.03	BBA assessment, Certificate 13/4979, Product sheet 1, 120 years, 4 < pH < 9 and soil temperature of 20 °C			
Reduction factor for weathering	RF <sub>W</sub>					
Or max. exposure time						
1 month						
2 weeks						
1 day		x				
Reduction factor for installation damage	RF <sub>ID,fine</sub>	1.07	RF <sub>ID,medium</sub>	1.11	RF <sub>ID,coarse</sub>	1.23
Used test method	Test report EMPA No. 201666-E25					
Compaction	Ride-on steel-wheeled roller (9500 kg) + vibratory capability M <sub>E1</sub> -value ground level 90 MN/m <sup>2</sup> ; 1st layer 12 cm - geosynthetic - 2nd layer 23 cm					
Particle size	RF <sub>ID,fine</sub> = sand with D <sub>90</sub> ≤ 2,6 mm RF <sub>ID,medium</sub> = rounded gravel D <sub>90</sub> ≤ 32 mm RF <sub>ID,coarse</sub> = crushed stone D <sub>90</sub> ≤ 19 mm					

<sup>1)</sup> product range<sup>2)</sup> not required if used as base course layers

n.r. = not required

n/a = not applicable