

# 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.

Certificate no.: NGS-50127

Date: 12.11.2018

Valid until: 14.04.2020

Manufacturer: Tensar International Ltd

Product: Tensar RE540

Product Type: GGR

Raw material: HDPE

Function: Reinforcement

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: 12.11.2018

## Quality Product Certification Reinforcement

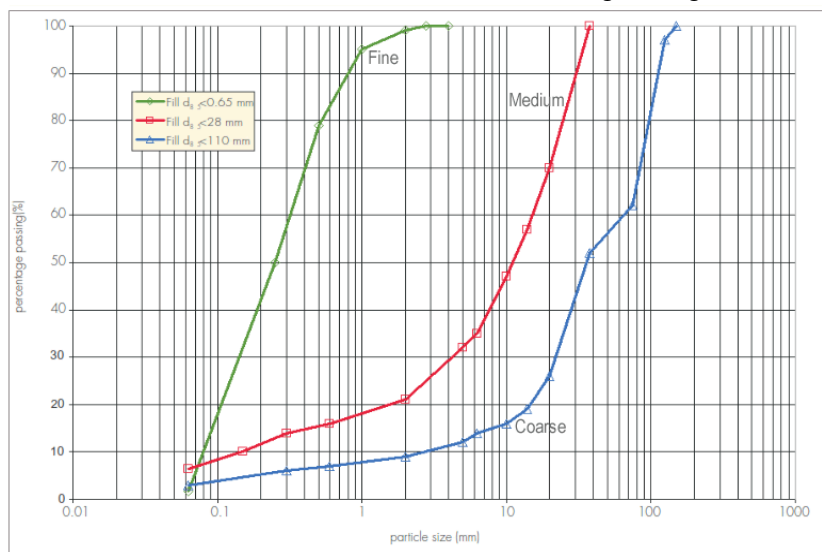
Characteristic		Standard	Unit	Declared value	Max. tolerance	Certification value
Mass per unit area		EN ISO 9864	g/m <sup>2</sup>	455	± 45.5	<b>409.5 – 500.5</b>
<b>Dimension</b>		NorGeoSpec 2012				
Tensile elements		Production width	1.3m	60	± 0	<b>60</b>
		Production width	1.0m	48	± 0	<b>48</b>
Grid apertures	MD	Annex F	mm	218	± 32.7	<b>185.3 – 250.7</b>
	CMD	Annex F	mm			
<b>Mechanical tests</b>						
Nominal tensile strength	MD	EN ISO 10319	kN/m	67.00	- 2.50	<b>64.50</b>
	CMD	EN ISO 10319	kN/m			
Tensile strain at nominal strength	MD	EN ISO 10319	%	9.8	± 2.0	<b>7.8 – 11.8</b>
	CMD	EN ISO 10319	%			
Tensile stiffness at 2% tensile strain	MD	EN ISO 10319	kN/m	940.00	- 188.00	<b>752.00</b>
	CMD	EN ISO 10319	kN/m			
Tensile stiffness at 5% tensile strain	MD	EN ISO 10319	kN/m	750.00	- 150.00	<b>600.00</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			
Dynamic perforation resistance		EN ISO 13433	mm			
<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.						

## Declared values Reinforcement

Declared values						
Reduction factor for creep rupture <sup>1) 2)</sup>	RF <sub>CR</sub>	2.1	Remarks: 120 years, BBA Certificate 13/H201			
Reduction factor for environmental effects	RF <sub>CH</sub>		Remarks:			
Chemical		1.0	Application in natural soils at a pH-value between 3 and 12 and a soil temperature of <25°C - ERA report EDP2729001			
Oxidation		1.0	ERA Report 2014-0725			
Hydrolysis						
Reduction factor for weathering	RF <sub>W</sub>		Remarks:			
Or max. exposure time						
1 month		x				
2 weeks						
1 day						
Reduction factor for installation damage	RF <sub>ID,fine</sub>	1.0	RF <sub>ID,medium</sub>	1.07	RF <sub>ID,coarse</sub>	1.36
Used test method	BBA Certificate 13/H201-Full scale installation test following the method from annex D of BS8006: 1995					

Compaction: Towed Dead Roller [ 72,000kg] – 12 passes. Min. compacted depth above Geogrid 150mm.

Particle size distribution: Particle size distribution of fills used in installation damage testing



<sup>1)</sup> product range

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

n.r. = not required

n/a = not applicable