TECHNICAL PRODUCT DATA SHEET

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solidian GRID Q85-CCE-21 (F01R01)

Symmetrical, bidirectional reinforcement grid (type Q) made of media-resistant carbon fiber reinforced polymer (CFRP) for the reinforcement of concrete components

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Material

Fiber material	C (Carbon)					
Impregnation agent	E (Epoxy resin)					
Color	black					
Surface finish	smooth					
Chemical resistance of the reinforcement in relation to the exposure classes in accordance with EN 206-1	XD3	Chlorides, except seawater				
	XS3	Chlorides from seawater				
	XA3	Chemical attack				

Geometry and	structure

metry and structure		Unit	Value	Standard
	longitudinal	[0]	0	
Directions of the fiber strands	transversal	_ []	90	
Maan welve of file or strend width	longitudinal	[]	3,4	
Mean value of liber strand width	transversal	[mm]	4,2	_
Maan weben of filmer strend height	longitudinal	[]	1,8	
Mean value of liber strand height	transversal	[mm]	1,5	_
Nersiael discostor	longitudinal	[]	2,37	
Nominal diameter	transversal	[mm]	2,37	_
	longitudinal	r 21	4,4	100 10 400 1
nominal cross-sectional area per liber strand	transversal	[[[1]][1]]	4,4	
Newsign large easting a second second	longitudinal	[mm mm ² /mm]	210	
nominal cross-sectional area per meter	transversal	— [mm-/m] —	210	
Fileer cross continued cross room fileer strand	longitudinal	[1,81	
Fiber cross-sectional area per liber strand	transversal	[[[1]][1]]	1,81	
	longitudinal	[mm mm ² /mm]	85	
Fiber cross-sectional area per meter	transversal	- [mm-/m]	85	_
Crid ana sia s	longitudinal	[]	21	
Grid spacing	transversal	[mm]	21	
Clear manipulation of the file or strande	longitudinal	[]	17,0	
Clear spacing of the liber strands	transversal	[mm]	18,0	
n_{G} Grid height (average value of the maximum height)		[mm]	2,1	-
Weight per unit area of the non-metallic reinforcement		[g/m²]	512	-
Degree of coverage of the grid		[%]	32,6	-
Minimum permissible radius of curvature		[mm]	350	-
	Weight per unit area of the non-metallic reinforceme Degree of coverage of the grid	Directions of the fiber strandsIongitudinal transversalMean value of fiber strand widthIongitudinal transversalMean value of fiber strand heightIongitudinal transversalMean value of fiber strand heightIongitudinal 	Directions of the fiber strandsIongitudinal transversal[°]Mean value of fiber strand widthIongitudinal transversal[mm]Mean value of fiber strand heightIongitudinal transversal[mm]Mean value of fiber strand heightIongitudinal transversal[mm]Nominal diameterIongitudinal transversal[mm]Nominal cross-sectional area per fiber strandIongitudinal transversal[mm²]Nominal cross-sectional area per meterIongitudinal transversal[mm²/m]Fiber cross-sectional area per fiber strandIongitudinal transversal[mm²/m]Fiber cross-sectional area per meterIongitudinal transversal[mm²/m]Fiber cross-sectional area per meterIongitudinal transversal[mm²/m]Grid spacingIongitudinal transversal[mm]—Clear spacing of the fiber strandsIongitudinal transversal[mm]—Grid height (average value of the maximum height)[mm]—Weight per unit area of the non-metallic reinforcerent[g/m²]—Degree of coverage of the grid[%][%]	$\begin{array}{c c c c } \label{eq:phi} \begin{tabular}{ c c } \label{eq:phi} \end{tabular} \\ \begin{tabular}{ c c c } \label{eq:phi} \end{tabular} \\ \begin{tabular}{ c c c } \label{eq:phi} \end{tabular} \end{tabular} \\ \begin{tabular}{ c c c c } \label{eq:phi} \end{tabular} \end{tabular} \\ \begin{tabular}{ c c c c c } \label{eq:phi} \end{tabular} ta$

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erial properties		Unit	Value	Standard	
Bulk density of the fiber composite material		[g/cm ³]	1,30	ISO 1183-1	
Coefficient of thermal expansion	along the fiber	[10 ⁻⁶ 1/K]	0,5	-	
Glass transition temperature (DMA)		[°C]	≥ 110	DIN 65583	
Recommended operating temperature range		[°C]	-20 to +80	-	
Building material class components ¹⁾		[-]	A2, non-combustible	DIN 4102-1	
Building material class reinforcement grid		[-]	E, normally flammable	EN 13501-1	
hanical properties		Unit	Value	Standard	
Characteristic short-term tensile strength related to	longitudinal	- [MPa]	1250	ISO 10406-1	
the nominal cross-sectional area	transversal		1250		
Young's modulus related to the nominal cross-	longitudinal	0.45.1	99000		
section	transversal	[MPa]	99000	ISO 10406-1	
Mean short-time tensile strength related to the	longitudinal	[MPa]	≥ 4070	ISO 10406-1	
fiber cross-sectional area	transversal		≥ 4070		
Characteristic short-term tensile strength	longitudinal	- [MPa]	≥ 3039	ISO 10406-1	
related to the fiber cross-sectional area	transversal		≥ 3039		
Mean Young's modulus related to the fiber	longitudinal	[MPa]	≥ 247000	ISO 10406-1	
cross-sectional area	transversal		≥ 247000		
Characteristic elongation at failure under tensile	longitudinal	- [‰]	≥ 12,6	ISO 10406-1	
load of the non-metallic reinforcement	transversal		≥ 12,6		
Characteristic tensile force transmission of the non-	longitudinal		262	ISO 10406-1	
metallic reinforcement per m width	transversal	- [kN/m]	262		
Further key values			Value	Standard	
Recommended maximum grain size in concrete ²⁾		[mm]	5	-	
dard goods variety		Unit	Value	Tolerance	
Single grid Length Width		· [m]		± 16 mm	
				± 12 mm	
	Length		≤ 130,0	_	
Roll in CARGO System CS ³⁾		[m]	· · · · · · · · · · · · · · · · · · ·	± 12 mm	
	Length		≤ 130,0	-	
CARGO System CS-U or CS-S ³⁾		[m]	2,30	± 12 mm	
CARGO System CS-U or CS-S ³⁾	Width Length	[m] [m]	2,30 ≤ 250,0	± 12 mm	
	Bulk density of the fiber composite material Coefficient of thermal expansion Glass transition temperature (DMA) Recommended operating temperature range Building material class components ¹) Building material class reinforcement grid hanical properties Characteristic short-term tensile strength related to the nominal cross-sectional area Young's modulus related to the nominal cross- section Mean short-time tensile strength related to the fiber cross-sectional area Characteristic short-term tensile strength related to the fiber cross-sectional area Mean Young's modulus related to the fiber cross-sectional area Characteristic short-term tensile strength related to the fiber cross-sectional area Mean Young's modulus related to the fiber cross-sectional area Characteristic elongation at failure under tensile load of the non-metallic reinforcement Characteristic tensile force transmission of the non- metallic reinforcement per m width her key values Recommended maximum grain size in concrete ² dard goods variety grid	Bulk density of the fiber composite material along the fiber Coefficient of thermal expansion along the fiber Glass transition temperature (DMA) Recommended operating temperature range Building material class components ¹⁾ Building material class reinforcement grid hanical properties Iongitudinal the nominal cross-sectional area transversal Young's modulus related to the nominal cross-sectional area Iongitudinal fiber cross-sectional area transversal Mean short-time tensile strength related to the fiber cross-sectional area Iongitudinal related to the fiber cross-sectional area transversal Mean Young's modulus related to the fiber cross-sectional area Iongitudinal related to the fiber cross-sectional area transversal Mean Young's modulus related to the fiber cross-sectional area Iongitudinal cross-sectional area transversal Mean Young's modulus related to the fiber cross-sectional area Iongitudinal transversal Iongitudinal cross-sectional area transversal Characteristic leongation at failure under tensile Iongitudinal transversal Iongitudinal transversal	Bulk density of the fiber composite material [g/cm³] Coefficient of thermal expansion along the fiber [10-6 1/K] Glass transition temperature (DMA) [°C] Recommended operating temperature range [°C] Building material class components ¹ [-] Building material class reinforcement grid [-] hanical properties Unit Characteristic short-term tensile strength related to the nominal cross-sectional area longitudinal transversal Young's modulus related to the nominal cross-sectional area longitudinal transversal Mean short-time tensile strength related to the fiber cross-sectional area longitudinal transversal Mean short-time tensile strength related to the fiber cross-sectional area [MPa] Characteristic short-term tensile strength longitudinal transversal ImPa] [MPa] Rean Young's modulus related to the fiber cross-sectional area [MPa] Characteristic elongation at failure under tensile longitudinal transversal ImPa] [MPa] Characteristic tensile force transmission of the non-metallic reinforcement per m width longitudinal transversal Impa] [MN] Mear Moung's modulus relate in concrete ²) [mm] </td <td>Bulk density of the fiber composite material$[g/cm^3]$1.30Coefficient of thermal expansionalong the fiber$[10^{-6} 1/K]$0,5Glass transition temperature (DMA)$[^{\circ}C]$$\geq$ 110Recommended operating temperature range$[^{\circ}C]$$\geq$ 110Building material class components 10$[^{-1}]$A2, non-combustibleBuilding material class reinforcement grid$[^{-1}]$$E$, normally flammablehanical propertiesUnitValueCharacteristic short-term tensile strength related to the nominal cross-sectional area$[MPa]$$1250$Young's modulus related to the nominal cross- section$[ongitudinal]$ transversal$[MPa]$$99000$Mean short-time tensile strength related to the fiber cross-sectional area$[ongitudinal]$ transversal$[MPa]$$\geq 3039$Mean Young's modulus related to the fiber cross-sectional area$[ongitudinal]$ transversal$\geq 247000$$\geq 247000$Characteristic short-term tensile strength related to the fiber cross-sectional area$[ongitudinal]$ transversal$\geq 247000$$\geq 12,6$Characteristic clongation at failure under tensile load of the non-metallic reinforcement$[ongitudinal]$ transversal$\geq 12,6$Characteristic tensile force transmission of the non- metallic reinforcement per m width$[mm]$$\geq 12,6$Characteristic tensile force transmission of the non- metallic reinforcement per m width$[mm]$$\geq 12,6$Characteristic tensile force transmission of the non- metallic reinforcement per m width$[mm]$<t< td=""></t<></td>	Bulk density of the fiber composite material $[g/cm^3]$ 1.30Coefficient of thermal expansionalong the fiber $[10^{-6} 1/K]$ 0,5Glass transition temperature (DMA) $[^{\circ}C]$ \geq 110Recommended operating temperature range $[^{\circ}C]$ \geq 110Building material class components 10 $[^{-1}]$ A2, non-combustibleBuilding material class reinforcement grid $[^{-1}]$ E , normally flammablehanical propertiesUnitValueCharacteristic short-term tensile strength related to the nominal cross-sectional area $[MPa]$ 1250 Young's modulus related to the nominal cross- section $[ongitudinal]$ transversal $[MPa]$ 99000 Mean short-time tensile strength related to the fiber cross-sectional area $[ongitudinal]$ transversal $[MPa]$ ≥ 3039 Mean Young's modulus related to the fiber cross-sectional area $[ongitudinal]$ transversal ≥ 247000 ≥ 247000 Characteristic short-term tensile strength related to the fiber cross-sectional area $[ongitudinal]$ transversal ≥ 247000 $\geq 12,6$ Characteristic clongation at failure under tensile load of the non-metallic reinforcement $[ongitudinal]$ transversal $\geq 12,6$ Characteristic tensile force transmission of the non- metallic reinforcement per m width $[mm]$ $\geq 12,6$ Characteristic tensile force transmission of the non- metallic reinforcement per m width $[mm]$ $\geq 12,6$ Characteristic tensile force transmission of the non- metallic reinforcement per m width $[mm]$ <t< td=""></t<>	

Single grid up to 3,0 m wide on request. The maximum length of the grid as a roll depends on the product type and the type of transport. Please enquire before ordering. Please specify the required length of the grid as a roll when ordering.

Transport and storage

Non-metallic reinforcements from solidian GmbH must not be damaged during transportation, storage, processing and installation and must not be exposed to temperatures higher than 80°C. They must be stored dry, protected from the weather and without touching the ground. They must be protected from UV radiation and moisture until concreting and be free from bond-reducing impurities (e.g. grease, soil, loose concrete residues).

¹⁾ Building material class for components from a component thickness of 30 mm with a minimum concrete cover of 14 mm or for components with a component thickness of 30 mm and a single layer of centrally arranged reinforcement grid.

 $^{2)}~~d_g$ = 8 mm possible depending on the manufacturing process.

³⁾ The CARGO System CS is a stacking and transport rack for our reinforcement grids. In the CS-U version with additional unwinding device. In the CS-S version with additional unwinding device and cutting device.

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Measurement

Specified values were determined on the product itself. Deviating properties may occur in the structural component or during processing. We recommend checking the values by suitable structural component tests with the concrete formulation used in each case.

Tests

As part of our in-house production control, two test units with 6 tensile tests each per reinforcement direction are carried out for each production order for quality assurance purposes, from which the characteristic short-term tensile strength is determined. All other measured values are determined as part of a comprehensive product qualification and are not subject to continuous control.

The described tensile tests per production order are included in the sales price. If you need an extended production control for your construction project, please contact us. We will be happy to provide you with a non-binding quotation for additional production-related tests.

Country-specific regulations

For the use of the product, the respective national regulations at the place of use apply, in Germany for example the building regulations of the federal states, and the technical provisions based on these regulations.

The design is generally carried out in accordance with the applicable standards for reinforced concrete components, whereby adjustments must be made for fiber composite reinforcements if applicable standards, guidelines (e.g. guideline for Germany "Concrete components with non-metallic reinforcement" of the German Committee for Reinforced Concrete (DAfStb) and the co-applicable standards cited in the guideline) etc. do not exist for reinforcements made of fiber reinforced polymer materials. Accordingly, the respective national standards and regulations must be taken into account in the design.

Processing information

All work must only be carried out by trained personnel.

Damaged fiber bundles (resin spalling, brittle areas, etc.) must not be installed, as the specified load-bearing capacity cannot be guaranteed. The specified values of the product only apply when used as intended.

For further information, please refer to the current Technical Information for our solidian reinforcement products.

Ecology and health protection

REGULATION (EC) NO. 1907/2006 - REACH.

This product is an article as defined in Article 3 of Regulation (EC) No 1907/2006 (REACH). It does not contain substances that are released from the article during normal use. A safety data sheet according to Article 31 of the same regulation is not required to place this product on the market, to transport it or to use it. For safe use, follow the instructions from this data sheet. To our current knowledge, this product does not contain any SVHC (Substances of Very High Concern) according to Annex XIV of the REACH Regulation or substances published on the Candidate List by the European Chemicals Agency at concentrations above 0,1% (w/w).

Industrial safety and health

The currently valid legal regulations on occupational health and safety must be observed during all transportation activities. Protective measures, such as wearing cut-resistant gloves, safety goggles and a dust mask, must be observed when working with cutting equipment. The specific handling of fiber reinforced polymers should be based on the respective national technical regulations.

Legal information

The above information is based on our knowledge and experience under normal circumstances, provided that the product has been transported, stored and used or processed properly and in accordance with the information in this product data sheet and the Technical Information for our solidian reinforcement products. The work results that can be achieved with our products depend in particular on their use and processing. The suitability of the product for the specific application must be checked in advance on your own responsibility.

Since non-metallic reinforcements are not yet regulated by building authorities in most countries, planners, specialist planners, building authorities, structural engineers, experts, etc. must be consulted for load-bearing components and countryspecific regulations must be observed.

We reserve the right to make changes to the product specifications. Third-party property rights must be observed. In all other respects, our respective terms and conditions of sale and delivery apply. The latest technical product data sheet at the time of purchase of our products shall apply.

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