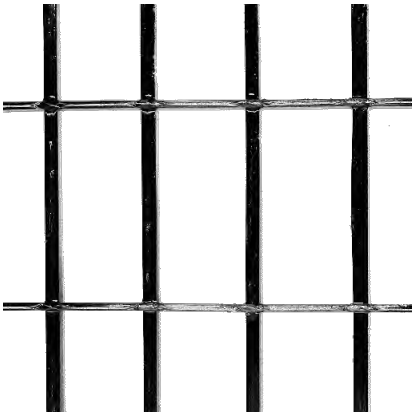
solidian GRID R95/24-CCE-38/76 (F01R01)

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



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

			Unit	Value	Standard
	Directions of the fiber strands	longitudinal	[°]	0	-
		transversal		90	
ϕ_h	Mean value of fiber strand width	longitudinal	[mm]	5,1	-
		transversal		3,8	
ϕ_v	Mean value of fiber strand height	longitudinal	[mm]	3,1	-
		transversal		1,8	
ϕ_{nm}	Nominal diameter	longitudinal	[mm]	3,35	-
		transversal		2,37	
A_{nm}	Nominal cross-sectional area per fiber strand	longitudinal	[mm²]	8,8	ISO 10406-1
		transversal		4,4	
a_{nm}	Nominal cross-sectional area per meter	longitudinal	[mm²/m]	232	-
		transversal		58	
$A_{f,nm}$	Fiber cross-sectional area per fiber strand	longitudinal	[mm²]	3,62	-
		transversal		1,81	
$a_{f,nm}$	Fiber cross-sectional area per meter	longitudinal	[mm²/m]	95	-
		transversal		24	
s	Grid width	longitudinal	[mm]	38	-
		transversal		76	
s_l	Clear distance of the fiber strands	longitudinal	[mm]	33,4	-
		transversal		72,8	
h_G	Grid height (average value of the maximum height)		[mm]	3,3	-
g	Weight per unit area of the non-metallic reinforcement		[g/m²]	350	-
$\kappa_ü$	Degree of coverage of the grid		[%]	17,4	-
r_{min}	Minimum permissible radius of curvature		[mm]	350	-

Material properties

			Unit	Value	Standard
ρ	Bulk density of the fiber composite material		[g/cm³]	1,30	ISO 1183-1
α	Coefficient of thermal expansion	along the fiber	[10^{-6} 1/K]	0,5	-
T_{g0}	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

Mechanical properties

			Unit	Value	Standard
$f_{nm,k}$	Characteristic short-term tensile strength related to the nominal cross-sectional area	longitudinal	[MPa]	1200	ISO 10406-1
		transversal		1250	
E_{nm}	Young's modulus related to the nominal cross-section	longitudinal	[MPa]	97000	ISO 10406-1
		transversal		99000	
$f_{f,nm,m}$	Mean short-time tensile strength related to the fiber cross-sectional area	longitudinal	[MPa]	≥ 3910	ISO 10406-1
		transversal		≥ 4070	
$f_{f,nm,k}$	Characteristic short-term tensile strength related to the fiber cross-sectional area	longitudinal	[MPa]	≥ 2917	ISO 10406-1
		transversal		≥ 3039	
$E_{f,nm,m}$	Mean Young's modulus related to the fiber cross-sectional area	longitudinal	[MPa]	≥ 243000	ISO 10406-1
		transversal		≥ 247000	
$\varepsilon_{nm,uk}$	Characteristic elongation at failure under tensile load of the non-metallic reinforcement	longitudinal	[‰]	≥ 12,4	ISO 10406-1
		transversal		≥ 12,6	
$F_{nm,k}$	Characteristic tensile force transmission of the non-metallic reinforcement per m width	longitudinal	[kN/m]	278	ISO 10406-1
		transversal		72	

Further key values

		Unit	Value	Standard
d_g	Recommended maximum grain size in concrete [2)]	[mm]	8	-

Standard goods variety

		Unit	Value	Tolerance
Single grid	Length	[m]	6,0	± 16 mm
	Width		2,30	± 12 mm
Roll in CARGO System CS [3)]	Length	[m]	≤ 130,0	-
	Width		3,0	± 12 mm
Roll in CARGO System CS-U or CS-S [3)]	Length	[m]	≤ 130,0	-
	Width		2,30	± 12 mm
Roll	Length	[m]	≤ 250,0	-
	Width		3,0	± 12 mm

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 = 16 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.

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 country-specific 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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