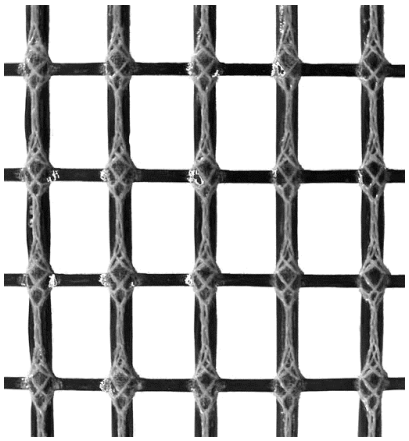
TECHNICAL PRODUCT DATA SHEET

solidian·kelteks

solidian GRID R142/28-CCY-13/16-CARBOrefit

CARBOrefit® Type 3 Standard version



Asymmetrical, bidirectional reinforcement grid (type R) made of media-resistant carbon fiber composite material for the structural strengthening of steel reinforced structures with carbon reinforced concrete in accordance with German national technical approval/construction technique permit Z-31.10-182

Material

Fiber material	C (Carbon)
Impregnation agent	Y (Acrylate)
Color	black

Geometry and structure

			Unit	Value	Tolerance	Standard
Directions of the fiber strands		longitudinal	[°]	0	± 5°	-
		transversal		90	± 5°	
$A_{f,nm}$	Fiber cross-sectional area per fiber strand	longitudinal	[mm²]	1,81	-	-
		transversal		0,45	-	
A_{nm}	Nominal cross-sectional area per fiber strand	longitudinal	[mm²]	3,6	-	-
		transversal		-	-	
a	Grid width	longitudinal	[mm]	12,7	-	-
		transversal		16	-	
$a_{f,nm}$	Fiber cross-sectional area per meter	longitudinal	[mm²/m]	142	-	-
		transversal		28	-	

Material properties

		Unit	Value	Tolerance	Standard
Weight per unit area of the non-metallic reinforcement		[g/m²]	447	-	-
Bulk density of the fiber composite material		[g/cm³]	1,4	-	-
Glass transition temperature T_g (DSC)	longitudinal	[°C]	≥ 100	-	-

Mechanical properties

			Unit	Value[1)]	Set value[1)]	Standard
$f_{f,m}$	Mean tensile strength of the impregnated fiber strand	longitudinal	[N/mm²]	3.600	≥ 2.700	Z-31.10.182
		transversal		-	-	-
$E_{f,m}$	Mean modulus of elasticity of the impregnated fiber strand	longitudinal	[N/mm²]	≥ 230.000	≥ 170.000	Z-31.10.182
		transversal		-	-	-
$f_{f,nm,k}$	Characteristic tensile strength of the impregnated fiber strand in the concrete	longitudinal	[N/mm²]	2.430	≥ 2.250	Z-31.10.182
		transversal		-	-	-
$\varepsilon_{f,nm,uk}$	Characteristic elongation at break of the impregnated fiber strand in the concrete	longitudinal	[%]	≥ 1,25	≥ 1,1	Z-31.10.182
		transversal		-	-	-
$E_{f,nm,i}$	Single value of the modulus of elasticity of the impregnated fiber strand in the carbon concrete	longitudinal	[N/mm²]	fulfilled	≥ 170.000 ≤ 260.000	Z-31.10.182
		transversal		-	-	-
$T_{nm,k}$	Characteristic value of the bond strength of a fiber strand in the longitudinal direction	fiber direction	[N/mm]	14,5	≥ 10,0	Z-31.10.182

Standard goods variety

		Unit	Value	Tolerance
Single mesh	Length	[m]	6,0	± 16 mm
	Width		2,30	± 12 mm
Roll (optional in CARGO System CS, CS-U bzw. CS-S [2)])	Length	[m]	≤ 115,0	± 80 cm
	Width		2,30	± 12 mm
Roll	Length	[m]	≤ 232,5	± 150 cm
	Width		2,30	± 12 mm

Mesh width up to 3,0 m on request. The maximum length of the mesh as a roll depends on the product type and the type of transport. Please enquire before ordering. Please specify the required length of the mesh as a roll when ordering. For quality assurance purposes, we reserve the right to cut ordered lengths into sections. As a result, an ordered roll length may consist of several sections stapled together on a single roll. This is done solely to ensure a defect-free product and is unavoidable due to production requirements. We therefore cannot guarantee delivery in a single continuous length.

Transport and storage

Nonmetallic 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)] Please refer to the German national technical approval / construction technique permit Z-31.10-182, Table 4 for the calculated values of the carbon grid CARBOrefit®-Type 3 as input data for the design. The determination of the design tensile strength and the design bond strength of the carbon grid is carried out using reduction factors according to above mentioned approval/permit Z-31.10-182, Table 4. It should be noted that in the context of approval/permit Z-31.10-182, Section 3.2, only the fiber strands of the carbon grid in the warp direction (lengthwise) may be used for the design of the reinforcing layer.

[2)] The CARGO System CS is a stacking and transport rack for our reinforcing mesh. The CS-U model features an additional unrolling mechanism. The CS-S model features an additional unrolling and cutting mechanism.

Confirmation of conformity

As part of the confirmation of the conformity of our construction product in accordance with section 2.1.1 of the German national technical approval/construction technique permit Z-31.10-182 and for quality assurance, we carry out our own production controls in accordance with section 2.3.2, which are externally monitored by MFPA Leipzig, Germany. The costs for the tests that are required and carried out as part of the approval/permit Z-31.10-182 via the test and monitoring plan are covered in our offer prices for approved grids. If you require additional tests during production, please contact us. We will be happy to provide you with a non-binding quotation.

Country-specific regulations

The use of the product is subject to the respective national regulations at the place of use, in Germany for example the building regulations of the federal states, and the technical provisions based on these regulations. The approval/permit Z-31.10-182 verifies the usability respectively applicability of the subject of regulation in terms of the German state building regulations.
The dimensioning for the CARBOrefit® process is always carried out in accordance with the national technical approval / construction technique approval Z-31.10-182 and the other applicable standards cited in the document.

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 sub-stances published on the Candidate List by the European Chemicals Agency at concentrations above 0,1% (w/w).

Processing information

According to Z-31.10-182, Section 3.4.1, the reinforcement work with the present reinforcement grid may only be carried out by companies that have proven their suitability. The suitability of the executing company must be proven by a certificate of suitability according to the "Principles for the proof of suitability for the execution of works for the reinforcement of concrete components with carbon reinforced concrete according to the valid construction technique permits" to a testing laboratory recognized by the building authorities for this purpose. 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.

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, the Technical Information for our solidian reinforcement products and the German national technical approval/ construction technique permit Z-31.10-182. 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. The country-specific regulations for the use and application of this product 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 applies.

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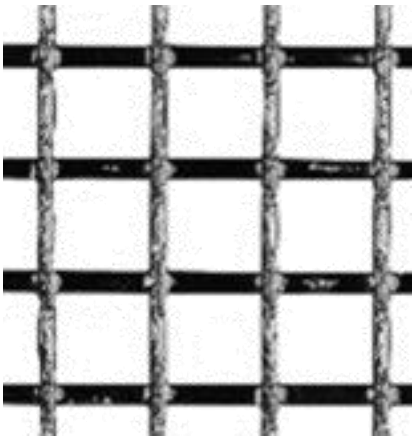
TECHNICAL PRODUCT DATA SHEET

solidian·kelteks

solidian GRID Q85-CCY-21-CARBOrefit

CARBOrefit® Type 3 Special version

Symmetrical, bidirectional reinforcement grid (type Q) made of media-resistant carbon fiber composite material for the structural strengthening of steel reinforced structures with carbon reinforced concrete in accordance with German national technical approval/construction technique permit Z-31.10-182



Material

Fiber material	C (Carbon)
Impregnation agent	Y (Acrylate)
Color	black

Geometry and structure

			Unit	Value	Tolerance	Standard
Directions of the fiber strands		longitudinal	[°]	0	± 5°	-
		transversal		90	± 5°	
$A_{f,nm}$	Fiber cross-sectional area per fiber strand	longitudinal	[mm²]	1,81	-	-
		transversal		1,81	-	
A_{nm}	Nominal cross-sectional area per fiber strand	longitudinal	[mm²]	3,4	-	-
		transversal		3,3	-	
a	Grid width	longitudinal	[mm]	21	-	-
		transversal		21	-	
$a_{f,nm}$	Fiber cross-sectional area per meter	longitudinal	[mm²/m]	85	-	-
		transversal		85	-	

Material properties

		Unit	Value	Tolerance	Standard
Weight per unit area of the non-metallic reinforcement		[g/m²]	421	-	-
Bulk density of the fiber composite material		[g/cm³]	1,3	-	-
Glass transition temperature T_g (DSC)	longitudinal	[°C]	≥ 100	-	-

Mechanical properties

			Unit	Value[1)]	Set value[1)]	Standard
$f_{f,m}$	Mean tensile strength of the impregnated fiber strand	longitudinal	[N/mm²]	3.800	≥ 2.700	Z-31.10.182
		transversal		- [2)]	≥ 2.700	Z-31.10.182
$E_{f,m}$	Mean modulus of elasticity of the impregnated fiber strand	longitudinal	[N/mm²]	≥ 230.000	≥ 170.000	Z-31.10.182
		transversal		- [2)]	≥ 170.000	Z-31.10.182
$f_{f,nm,k}$	Characteristic tensile strength of the impregnated fiber strand in the concrete	longitudinal	[N/mm²]	2.670	≥ 2.250	Z-31.10.182
		transversal		- [2)]	≥ 2.250	Z-31.10.182
$\varepsilon_{f,nm,uk}$	Characteristic elongation at break of the impregnated fiber strand in the concrete	longitudinal	[%]	≥ 1,1	≥ 1,1	Z-31.10.182
		transversal		- [2)]	≥ 1,1	Z-31.10.182
$E_{f,nm,i}$	Single value of the modulus of elasticity of the impregnated fiber strand in the carbon concrete	longitudinal	[N/mm²]	fulfilled	≥ 170.000 ≤ 260.000	Z-31.10.182
		transversal		- [2)]	≥ 170.000 ≤ 260.000	Z-31.10.182
$T_{nm,k}$	Characteristic value of the bond strength of a fiber strand in the longitudinal direction	longitudinal	[N/mm]	14,1	≥ 10,0	Z-31.10.182
		transversal		- [2)]	≥ 10,0	Z-31.10.182

Standard goods variety

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