



solidian GRID Q47-C-EP-s38-F145 (F01R01)

Symmetrical, bidirectional reinforcement grid (type Q, grid family 1) made of media-resistant carbon fiber composite material for the reinforcement of concrete components with predominantly static loads in accordance with German national technical approval/construction technique permit Z-1.6-308

Material

Fiber material	C (Carbon)		
Impregnation agent	EP (Epoxy resin)		1 1
Color	schwarz		
Surface finish	smooth		
Bending stiffness class	III, stiff	N 8. 6.	B. B.
Validity for concrete strength classes	C30/37 to C70/8	35	
Chemical resistance of the reinforcement in relation to the	XD3	Chlorides, except seawater	
exposure classes in accordance with DIN EN 206-1 in con-	XS3	Chlorides from seawater	
iunction with DIN 1045-2	XA3	Chemical attack	

Geo	Geometry and structure			Value	Tolerance
	Directions of the file or strends	longitudinal	F 0 1	0	± 5°
	Directions of the fiber strands	transversal	- []	90	± 5°
T	Maan value of fiber strend width	longitudinal	_ []	3,5	± 10%
φh	Mean value of fiber strand width	transversal		4,2	± 10%
4	Mean value of fiber strand beight	longitudinal	- [mm]	1,9	± 10%
Ψν	Mean value of fiber strand height	transversal	[[]]]]	1,8	± 10%
4	Nominal diameter	longitudinal	- [mm]	2,37	-
Ψnm		transversal	[[[[[[2,37	-
Δ	m Nominal cross-sectional area per fiber strand	longitudinal	- [mm ²]	4,4	-
Anm		transversal		4,4	-
2	anm Nominal cross-sectional area per meter	longitudinal	- [mm²/m]	116	-
anm		transversal		116	-
A Eiber cross-sectional a	Fiber cross-sectional area per fiber strand	longitudinal	- [mm ²]	1,81	-
/ \t,nm	nm Fiber cross-sectional area per fiber strand	transversal		1,81	-
20.00	Fiber cross-sectional area per meter	longitudinal	- [mm²/m]	47	-
a _{f,nm}		transversal		47	-
c	Grid width	longitudinal	- [mm]	38	± 3 mm
		transversal	[]	38	± 3 mm
C.	Clear distance of the fiber strands	longitudinal	- [mm]	34,2	± 10%
		transversal	[[]]]]	34,9	± 10%
hg	Grid height (average value of the maximum height)		[mm]	2,3	± 10%
g	g Weight per unit area of the non-metallic reinforcement		[g/m²]	309	± 10%
Kü	Degree of coverage of the grid		[%]	18,9	-
r _{min}	Minimum permissible radius of curvature		[mm]	350	-
Mat	erial properties		Unit	Value	Tolerance

IVIA	Material properties		Unit	value	Tolerance
ρ	Bulk density of the fiber composite material		[g/cm ³]	1,30	-
CX	Coefficient of thermal expansion	along the fiber	[10 ⁻⁶ 1/K]	0,5	-
T _{g0}	Glass transition temperature (DMA)		[°C]	≥ 110	-
	Recommended operating temperature range		[°C]	-20 bis +80	-
	Building material class reinforcement grid acc. to D	DIN EN 13501-1	[-]	E, normally flammable	-





Mechanical properties

Mec	Mechanical properties			Value	Tolerance
£	Characteristic short-term tensile strength related	longitudinal		1.250	-
Inm,k	to the nominal cross-sectional area	transversal	[IVIPa]	1.250	-
Г	Young's modulus related to the nominal cross-	longitudinal		99.000	-
⊑nm	section	transversal	[IVIP d]	99.000	-
£	Characteristic short-term tensile strength related	longitudinal		≥ 3.039	-
lf,nm,k	to the fiber cross-sectional area	transversal	[IVIPa]	≥ 3.039	-
	Mean Young's modulus related to the fiber	longitudinal		≥ 247.000	-
⊑f,nm,m	cross-sectional area	transversal	[IVIPa]	≥ 247.000	-
_	Characteristic elongation at failure under tensile	longitudinal	[0/]	≥ 12,6	-
۲nm,uk	load of the non-metallic reinforcement	transversal	[700]	≥ 12,6	-
£	Characteristic short-term bond strength for an-	longitudinal		1,7	-
lbk	choring for ≥ C30/37	transversal	[IVIPa]	1,7	-
_	Characteristic value of the mean bond stress ($k_t=0$)	longitudinal		7,1	-
Lbm,k	for ≥ C30/37	transversal	[IVIPa]	7,1	-
Г	Characteristic tensile force transmission of the	longitudinal		145	-
Fnm,k	non-metallic reinforcement per m width	transversal	[KIN/[11] —	145	-

Coef	Coefficients		Value	Tolerance
α _{Tt}	Coefficient for considering influences from short-term particularly	[-]	1,0 bei -20°C ≤ T ≤ 70°C	_
	nigh temperature stress on the tensile strength '		0,95 bei /0°C < 1 ≤ 80°C	
0-	Coefficient for considering influences from short-term particularly	[_]	1,0 bei -20°C ≤ T ≤ 70°C	_
α _{Tb}	high temperature stress on the bond behavior ¹⁾	[_]	0,95 bei 70°C < T ≤ 80°C	
α _{nmt}	Coefficient for considering durability influences and long-term	[]	0.02	
	stresses on the tensile strength	[-]	0,65	-
~	Coefficient for considering durability influences and long-term	[]	0.02	
Unmb	stresses on the bond strength	[-]	0,05	-

Cha	Characteristic values for anchoring and lapping		Unit	Value	Tolerance
	Applicable reinforcement stress for the anchorage	longitudinal		885	-
	proof	transversal	[IVIPa]	885	-
	Minimum an electrica los eth	longitudinal	[42	-
lb,min	I _{b,min} Minimum anchoring length	transversal	[mm]	42	-
		longitudinal		63	-
I _{0,min} Minimum iap length	Minimum iap length	transversal		63	-
	Minimum lap length for transferring $f_{nm,k}$ in lap	longitudinal	[700	-
	ioint ²⁾	transversal	. [[[]]]	700	-

Furt	her key values		Unit	Value	Tolerance
Cmin,b	Minimum concrete cover from bond requ	iirement ³⁾	[mm]	14	-
h _{min}	Minimum component thickness ³⁾		[mm]	≥ 30	-
n	Proof of robustness for predominantly sta (number of tested cycles)	tic loading	[-]	≥ 200.000	-
Stan	ndard goods variety		Unit	Value	Tolerance
Single grid		Length	— [m] —	6,0	± 16 mm
		Width		2,30	± 12 mm
Roll in CARGO System CS ⁴⁾		Length	[]	≤ 130,0	-
		Width	[m]	3,0	± 12 mm
		Lenath		≤ 130,0	_
D - 11 ' -			E 1		

Length ≤ 250,0 Roll [m] 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

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 im-purities (e.g. grease, soil, loose concrete residues).

All values given in accordance with or based on DAfStb guideline "Concrete components with nonmetallic reinforcement", Part 4.

- ¹⁾ To use $\alpha_{Tt} = 1$ and $\alpha_{Tb} = 1$: proof required that the temperature loading does not exceed 70°C.
- ²⁾ For smaller lap lengths, the transferable tensile stresses can be taken from the approval document Table 2, line 10.
- ³⁾ A component thickness of 30 mm is permissible for components with a single layer of centrally arranged reinforcement grid.
- ⁴⁾ 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.

Schematic illustration





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Confirmation of conformity



As part of the confirmation of the conformity of our construction product in accordance with section 2.3 of the German national technical approval/construction technique permit Z-1.6-308 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-1.6-308 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-1.6-308 verifies the usability respectively applicability of the subject of regulation in terms of the German state building regulations.

The design is always carried out in accordance with the currently valid German guideline "Concrete components with non-metallic reinforcement" of the German Committee for Reinforced Concrete (DAfStb) and the applicable standards cited in the guideline.

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 sub-stances 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, the Technical Information for our solidian reinforcement products and the German national technical approval/ construction technique permit Z-1.6-308. 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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solidian GRID Q71-C-EP-s51-F207 (F01R01)

Symmetrical, bidirectional reinforcement grid (type Q, grid family 2) made of media-resistant carbon fiber composite material for the reinforcement of concrete components with predominantly static loads in accordance with German national technical approval/construction technique permit Z-1.6-308

Material

Fiber material	C (Carbon)	
Impregnation agent	EP (Epoxy resin)	
Color	schwarz	
Surface finish	smooth	
Bending stiffness class	III, stiff	
Validity for concrete strength classes	C30/37 to C70/8	35
Chemical resistance of the reinforcement in relation to the	XD3	Chlorides, except seawater
exposure classes in accordance with DIN EN 206-1 in con-	XS3	Chlorides from seawater
junction with DIN 1045-2	XA3	Chemical attack

Geometry and structure Unit Value Tolerance longitudinal ± 5° Directions of the fiber strands [°] transversal 90 ± 5° 5.0 ± 10% longitudinal **φ**h Mean value of fiber strand width [mm] 5,8 ± 10% transversal longitudinal 2,7 ± 10% Mean value of fiber strand height ϕ_{\vee} [mm] ± 10% transversal 2,6 longitudinal 3,35 Nominal diameter **φ**nm [mm] 3,35 transversal 8,8 longitudinal Anm Nominal cross-sectional area per fiber strand [mm²]8,8 transversal longitudinal 173 [mm²/m] Nominal cross-sectional area per meter anm 173 transversal longitudinal 3,62 Fiber cross-sectional area per fiber strand $[mm^2]$ $A_{f,nm}$ 3,62 transversal longitudinal 71 Fiber cross-sectional area per meter $[mm^2/m]$ a_{f,nm} transversal 71 51 longitudinal ± 3 mm Grid width S [mm] 51 transversal ± 3 mm longitudinal 45,4 ± 10% Clear distance of the fiber strands S [mm] transversal 46,2 ± 10% hg Grid height (average value of the maximum height) 3,5 ± 10% [mm] Weight per unit area of the non-metallic reinforcement 454 $[g/m^2]$ ± 10% g Degree of coverage of the grid [%] 20,1 Κü Minimum permissible radius of curvature [mm] r_{min} **Material properties** Unit Value Tolerance

ρ	Bulk density of the fiber composite material		[g/cm ³]	1,30	-
C(Coefficient of thermal expansion	along the fiber	[10 ⁻⁶ 1/K]	0,5	-
T _{g0}	Glass transition temperature (DMA)		[°C]	≥ 110	-
	Recommended operating temperature range		[°C]	-20 bis +80	-
	Building material class reinforcement grid acc. to DIN	V EN 13501-1	[-]	E, normally flammable	-





Mechanical properties

Mec	Mechanical properties			Value	Tolerance
£	Characteristic short-term tensile strength related	longitudinal		1.200	-
Inm,k	to the nominal cross-sectional area	transversal	[IVIPa]	1.200	-
Г	Young's modulus related to the nominal cross-	longitudinal		97.000	-
⊑nm	section	transversal	[IVIPa]	97.000	-
£	Characteristic short-term tensile strength related	longitudinal		≥ 2.917	-
lf,nm,k	to the fiber cross-sectional area	transversal	[IVIPa]	≥ 2.917	-
	Mean Young's modulus related to the fiber	longitudinal		≥ 243.000	-
⊑f,nm,m	cross-sectional area	transversal	[IVIPa]	≥ 243.000	-
	Characteristic elongation at failure under tensile	longitudinal	[0/]]	≥ 12,4	-
۲nm,uk	load of the non-metallic reinforcement	transversal	[700]	≥ 12,4	-
£	Characteristic short-term bond strength for an-	longitudinal		2,9	-
lbk	choring for \geq C30/37	transversal	[IVIPa]	2,9	-
_	Characteristic value of the mean bond stress ($k_t=0$)	longitudinal		5,9	-
Lbm,k	for ≥ C30/37	transversal	[IVIPa]	5,9	-
Г	Characteristic tensile force transmission of the	longitudinal		207	-
Fnm,k	non-metallic reinforcement per m width	transversal	[KIN/[1]] -	207	-

Coe	fficients	Unit	Value	Tolerance
α _{Tt}	Coefficient for considering influences from short-term particularly high temperature stress on the tensile strength ¹⁾	[-]	1,0 bei -20°C ≤ T ≤ 70°C 0 90 bei 70°C < T < 80°C	-
α _{Tb}	Coefficient for considering influences from short-term particularly high temperature stress on the bond behavior ¹⁾	[-]	1,0 bei -20°C ≤ T ≤ 70°C 0,90 bei 70°C < T ≤ 80°C	_
α _{nmt}	Coefficient for considering durability influences and long-term stresses on the tensile strength	[-]	0,83	-
α _{nmb}	Coefficient for considering durability influences and long-term stresses on the bond strength	[-]	0,83	-

Cha	Characteristic values for anchoring and lapping			Value	Tolerance
	Applicable reinforcement stress for the anchorage	longitudinal		1.020	-
	proof	transversal		1.020	-
	Minimum anchoring langth	longitudinal	[]	76	-
lb,min IVIININ	Minimum anchoring length	transversal	[mm]	76	-
	Minimum lon lon oth	longitudinal	[20.00]	117	-
I0,min	_{nin} Minimum lap lengtn transversal	[[[]]]	117	-	
	Minimum lap length for transferring f _{nm,k} in lap	longitudinal	[]	500	-
	ioint ²⁾	transversal	[[[]]]	500	-

Furt	her key values		Unit	Value	Tolerance
Cmin,b	Minimum concrete cover from bond requi	rement ³⁾	[mm]	14	-
h _{min}	Minimum component thickness ³⁾		[mm]	≥ 30	-
n	Proof of robustness for predominantly stat (number of tested cycles)	ic loading	[-]	≥ 200.000	-
Stan	ıdard goods variety		Unit	Value	Tolerance
Le		Length	[no]	6,0	± 16 mm
Single	grid	Width		2,30	± 12 mm
Dellis		Length	[]	≤ 130,0	-
Koli in	CARGO System CS 7/	Width	[m]	3,0	± 12 mm
Roll in CARGO System CS-U or CS-S ⁴⁾		Length	[]	≤ 130,0	-
		Width	[m]	2,30	± 12 mm
Roll		Length	[]	≤ 250,0	-
		Width	[m]	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

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 im-purities (e.g. grease, soil, loose concrete residues).

All values given in accordance with or based on DAfStb guideline "Concrete components with nonmetallic reinforcement", Part 4.

- ¹⁾ To use $\alpha_{Tt} = 1$ and $\alpha_{Tb} = 1$: proof required that the temperature loading does not exceed 70°C.
- ²⁾ For smaller lap lengths, the transferable tensile stresses can be taken from the approval document Table 2, line 10.
- ³⁾ A component thickness of 30 mm is permissible for components with a single layer of centrally arranged reinforcement grid.
- ⁴⁾ 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.

Schematic illustration





solidian.

Confirmation of conformity



As part of the confirmation of the conformity of our construction product in accordance with section 2.3 of the German national technical approval/construction technique permit Z-1.6-308 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-1.6-308 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

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The design is always carried out in accordance with the currently valid German guideline "Concrete components with non-metallic reinforcement" of the German Committee for Reinforced Concrete (DAfStb) and the applicable standards cited in the guideline.

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

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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

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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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solidian GRID Q85-C-EP-s21-F262 (F01R01)

Symmetrical, bidirectional reinforcement grid (type Q, grid family 1) made of media-resistant carbon fiber composite material for the reinforcement of concrete components with predominantly static loads in accordance with German national technical approval/construction technique permit Z-1.6-308

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Material

Fiber material	C (Carbon)	
Impregnation agent	EP (Epoxy resin)	
Color	schwarz	
Surface finish	smooth	
Bending stiffness class	III, stiff	
Validity for concrete strength classes	C30/37 to C70/8	35
Chemical resistance of the reinforcement in relation to the	XD3	Chlorides, except seawater
exposure classes in accordance with DIN EN 206-1 in con-	XS3	Chlorides from seawater
iunction with DIN 1045-2	XA3	Chemical attack

Geometry and structure Unit Value Tolerance longitudinal ± 5° Directions of the fiber strands [°] transversal 90 ±5° 3.4 ± 10% longitudinal **φ**h Mean value of fiber strand width [mm] 4,2 ± 10% transversal longitudinal 1,8 ± 10% Mean value of fiber strand height ϕ_{\vee} [mm] ± 10% transversal 1,5 longitudinal 2,37 Nominal diameter **φ**nm [mm] 2,37 transversal 4,4 longitudinal Anm Nominal cross-sectional area per fiber strand [mm²]4,4 transversal longitudinal 210 $[mm^2/m]$ Nominal cross-sectional area per meter anm 210 transversal longitudinal 1,81 Fiber cross-sectional area per fiber strand $[mm^2]$ $A_{f,nm}$ 1,81 transversal 85 longitudinal Fiber cross-sectional area per meter $[mm^2/m]$ a_{f,nm} transversal 85 longitudinal 21 ± 3 mm Grid width S [mm] 21 transversal ± 3 mm ± 10% 17,0 longitudinal Clear distance of the fiber strands S [mm] transversal 18,0 ± 10% hg Grid height (average value of the maximum height) 2,1 ± 10% [mm] Weight per unit area of the non-metallic reinforcement 512 $[g/m^2]$ ± 10% g Degree of coverage of the grid [%] 32,6 Κü Minimum permissible radius of curvature [mm] r_{min} **Material properties** Unit Value Tolerance

ρ	Bulk density of the fiber composite material		[g/cm ³]	1,30	-
CX	Coefficient of thermal expansion	along the fiber	[10 ⁻⁶ 1/K]	0,5	-
T _{g0}	Glass transition temperature (DMA)		[°C]	≥ 110	-
	Recommended operating temperature range		[°C]	-20 bis +80	-
	Building material class reinforcement grid acc. to	DIN EN 13501-1	[-]	E, normally flammable	-





Mechanical properties

Mec	hanical properties		Unit	Value	Tolerance
£	Characteristic short-term tensile strength related	longitudinal		1.250	-
Inm,k	to the nominal cross-sectional area	transversal	[IVIPa]	1.250	-
Г	Young's modulus related to the nominal cross-	longitudinal		99.000	-
⊑nm	section	transversal	[IVIPa]	99.000	-
£	Characteristic short-term tensile strength related	longitudinal		≥ 3.039	-
lf,nm,k	to the fiber cross-sectional area	transversal	[IVIPa]	≥ 3.039	-
Г	Mean Young's modulus related to the fiber	longitudinal		≥ 247.000	-
⊑f,nm,m	cross-sectional area	transversal	[IVIPa]	≥ 247.000	-
	Characteristic elongation at failure under tensile	longitudinal	[0/] _	≥ 12,6	-
۲nm,uk	load of the non-metallic reinforcement	transversal	[700]	≥ 12,6	-
£	Characteristic short-term bond strength for an-	longitudinal		1,7	-
lbk	choring for ≥ C30/37	transversal	[IVIPa]	1,7	-
_	Characteristic value of the mean bond stress ($k_t=0$)	longitudinal		7,1	-
Lbm,k	for ≥ C30/37	transversal	[IVIPa]	7,1	-
Г	Characteristic tensile force transmission of the	longitudinal	[[.].]	262	-
⊏nm,k	non-metallic reinforcement per m width	transversal	[KIN/[1]] -	262	-

Coe	fficients	Unit	Value	Tolerance
α _{Tt}	Coefficient for considering influences from short-term particularly high temperature stress on the tensile strength ¹⁾	[-]	1,0 bei -20°C ≤ T ≤ 70°C 0 95 bei 70°C < T < 80°C	-
α _{Tb}	Coefficient for considering influences from short-term particularly high temperature stress on the bond behavior ¹⁾	[-]	1,0 bei -20°C ≤ T ≤ 70°C 0,95 bei 70°C < T ≤ 80°C	-
α _{nmt}	Coefficient for considering durability influences and long-term stresses on the tensile strength	[-]	0,83	-
α _{nmb}	Coefficient for considering durability influences and long-term stresses on the bond strength	[-]	0,83	_

Cha	Characteristic values for anchoring and lapping			Value	Tolerance
	Applicable reinforcement stress for the anchorage	longitudinal		885	-
	proof	transversal		885	-
	Minimum anchoring langth	longitudinal	[]	42	-
l _{b,min} Minimum anchoring length	Minimum anchoring length	transversal		42	-
1	Minimum lon lon oth	longitudinal	[]	63	-
I0,min	_{lin} Minimum iap length transversal	[[[]]]	63	-	
	Minimum lap length for transferring f _{nm,k} in lap	longitudinal	[]	700	-
	ioint ²⁾	transversal	[[[]]]	700	-

	her ken velves				T 1
Furt	Further key values			Value	lolerance
Cmin,b	Minimum concrete cover from bond requ	irement ³⁾	[mm]	14	-
h _{min}	Minimum component thickness ³⁾		[mm]	≥ 30	-
n	Proof of robustness for predominantly sta (number of tested cycles)	tic loading	[-]	≥ 200.000	-
Stan	ıdard goods variety		Unit	Value	Tolerance
		Length	[]	6,0	± 16 mm
Single	gria	Width	[m]	2,30	± 12 mm
Dellis		Length	[]	≤ 130,0	-
Roll in CARGO System CS 4)		Width	[m]	3,0	± 12 mm
Roll in CARGO System CS-U or CS-S ⁴⁾		Length	[]	≤ 130,0	-
		Width	[m]	2,30	± 12 mm
Dell		Length	[]	≤ 250,0	-

_____ [m] _____ Roll 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

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 im-purities (e.g. grease, soil, loose concrete residues).

All values given in accordance with or based on DAfStb guideline "Concrete components with nonmetallic reinforcement", Part 4.

- ¹⁾ To use $\alpha_{Tt} = 1$ and $\alpha_{Tb} = 1$: proof required that the temperature loading does not exceed 70°C.
- ²⁾ For smaller lap lengths, the transferable tensile stresses can be taken from the approval document Table 2, line 10.
- ³⁾ A component thickness of 30 mm is permissible for components with a single layer of centrally arranged reinforcement grid.
- ⁴⁾ 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.

Schematic illustration





solidian.

Confirmation of conformity



As part of the confirmation of the conformity of our construction product in accordance with section 2.3 of the German national technical approval/construction technique permit Z-1.6-308 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-1.6-308 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-1.6-308 verifies the usability respectively applicability of the subject of regulation in terms of the German state building regulations.

The design is always carried out in accordance with the currently valid German guideline "Concrete components with non-metallic reinforcement" of the German Committee for Reinforced Concrete (DAfStb) and the applicable standards cited in the guideline.

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 sub-stances 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, the Technical Information for our solidian reinforcement products and the German national technical approval/ construction technique permit Z-1.6-308. 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.

Date: 11.11.2024 | Version: 2411 | solidian GRID Q85-C-EP-s21-F262 Technical Product Data Sheet v2411.docx



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solidian GRID Q95-C-EP-s38-F278 (F01R01)

Symmetrical, bidirectional reinforcement grid (type Q, grid family 2) made of media-resistant carbon fiber composite material for the reinforcement of concrete components with predominantly static loads in accordance with German national technical approval/construction technique permit Z-1.6-308

	R	

Material

Fiber material	C (Carbon)	
Impregnation agent	EP (Epoxy resin)	
Color	schwarz	
Surface finish	smooth	
Bending stiffness class	III, stiff	
Validity for concrete strength classes	C30/37 to C70/8	35
Chemical resistance of the reinforcement in relation to the	XD3	Chlorides, except seawater
exposure classes in accordance with DIN EN 206-1 in con-	XS3	Chlorides from seawater
junction with DIN 1045-2	XΔ3	Chemical attack

Geo	metry and structure		Unit	Value	Tolerance
		longitudinal	503	0	± 5°
	rections of the fiber strands	transversal	- [°]	90	± 5°
	Manual un of filoso strand width	longitudinal	[]	4,8	± 10%
φh	Mean value of fiber strand width	transversal	- [mm]	5,5	± 10%
	Mana velva of filosy strend la siglat	longitudinal	[]	2,6	± 10%
ϕ_{\vee}	Mean value of fiber strand height	transversal	[mm] —	2,5	± 10%
	Na seis el die meter	longitudinal	[]	3,35	-
φnm	Nominal diameter	transversal		3,35	-
٨	Nominal cross-sectional area per fiber strand	longitudinal	21	8,8	-
Anm	Nominal cross-sectional area per liber strand	transversal		8,8	-
2	Nominal cross-sectional area per meter	longitudinal	- [mm²/m]	232	-
dnm		transversal		232	-
Δ.	Eiber cross sectional area per fiber strand	longitudinal	- [mm ²]	3,62	-
Af,nm	Tiber cross-sectional area per fiber strand	transversal		3,62	-
2	Fiber cross castional area par mater	longitudinal	- [mm²/m]	95	-
d _{f,nm}	Fiber cross-sectional area per meter	transversal		95	-
c	Grid width	longitudinal	- [mm]	38	± 3 mm
2	Ghà wiath	transversal		38	± 3 mm
<i>c</i>	Clear distance of the fiber strands	longitudinal	_ [rom]	32,8	± 10%
SI	Clear distance of the liber strands	transversal		33,5	± 10%
hg	Grid height (average value of the maximum height)		[mm]	3,3	± 10%
g	Weight per unit area of the non-metallic reinforcem	ient	[g/m²]	559	± 10%
Kü	Degree of coverage of the grid		[%]	25,2	-
r _{min}	Minimum permissible radius of curvature		[mm]	350	-
Mat	erial properties		Unit	Value	Tolerance

Ivia	erial properties		Unit	Value	lolerance
ρ	Bulk density of the fiber composite material		[g/cm ³]	1,30	-
C(Coefficient of thermal expansion	along the fiber	[10 ⁻⁶ 1/K]	0,5	-
T _{g0}	Glass transition temperature (DMA)		[°C]	≥ 110	-
	Recommended operating temperature range		[°C]	-20 bis +80	-
	Building material class reinforcement grid acc. to D	DIN EN 13501-1	[-]	E, normally flammable	-



TECHNICAL PRODUCT DATA SHEET



Mechanical properties

Mec	hanical properties		Unit	Value	Tolerance
f.	Characteristic short-term tensile strength related	longitudinal		1.200	-
Inm,k	to the nominal cross-sectional area	transversal	[IVIPa]	1.200	-
Г	Young's modulus related to the nominal cross-	longitudinal		97.000	-
⊑nm	section	transversal	[IVIPa]	97.000	-
£	Characteristic short-term tensile strength related	longitudinal		≥ 2.917	-
lf,nm,k	to the fiber cross-sectional area	transversal	[IVIPa]	≥ 2.917	-
Г	Mean Young's modulus related to the fiber	longitudinal		≥ 243.000	-
Ef,nm,m	cross-sectional area	transversal	[IVIPa]	≥ 243.000	-
~	Characteristic elongation at failure under tensile	longitudinal	[0/]	≥ 12,4	-
۲nm,uk	load of the non-metallic reinforcement	transversal	[700]	≥ 12,4	-
f	Characteristic short-term bond strength for an-	longitudinal		2,9	-
lbk	choring for \geq C30/37	transversal	[IVIPa]	2,9	-
-	Characteristic value of the mean bond stress (k_t =0)	longitudinal		5,9	-
Lbm,k	for ≥ C30/37	transversal	[IVIPa]	5,9	-
Г	Characteristic tensile force transmission of the	longitudinal	[k]/m]	278	-
Enm,k	non-metallic reinforcement per m width	transversal	[KIN/[11]	278	-

Coef	ificients	Unit	Value	Tolerance
α _{Tt}	Coefficient for considering influences from short-term particularly	[-]	1,0 bei -20°C ≤ T ≤ 70°C	_
	high temperature stress on the tensile strength "		0,90 bei 70°C < T ≤ 80°C	
~~~	Coefficient for considering influences from short-term particularly	[_]	1,0 bei -20°C ≤ T ≤ 70°C	-
α _{Tb}	high temperature stress on the bond behavior ¹⁾	[-]	0,90 bei 70°C < T ≤ 80°C	
0	Coefficient for considering durability influences and long-term	[]	CO 0 1	-
α _{nmt}	stresses on the tensile strength	[-]	0,85	
α _{nmb}	Coefficient for considering durability influences and long-term	[]	0.02	
	stresses on the bond strength	[_]	0,05	-

Characteristic values for anchoring and lapping		pping	Unit	Value	Tolerance
	Applicable reinforcement stress for the anchorage	longitudinal		1.020	-
	proof	transversal	[IVIPa]	1.020	-
	Minimum anchoring length	longitudinal	[]	76	-
lb,min		transversal		76	-
	Minimum lap length	longitudinal	[]	117	-
I _{0,min}		transversal		117	-
	Minimum lap length for transferring $f_{nm,k}$ in lap	longitudinal	[]	500	-
	ioint ²⁾	transversal	[mm] —	500	-

Furt	her key values		Unit	Value	Tolerance
Cmin,b	Minimum concrete cover from bond requ	irement ³⁾	[mm]	14	-
h _{min}	Minimum component thickness ³⁾		[mm]	≥ 30	-
n	Proof of robustness for predominantly sta (number of tested cycles)	tic loading	[-]	≥ 200.000	-
Stan	ıdard goods variety		Unit	Value	Tolerance
		Length	[ree]	6,0	± 16 mm
Single	e gria	Width	[m]	2,30	± 12 mm
Dellin		Length	[res]	≤ 130,0	-
ROII IN	I CARGO System CS 7	Width	[m]	3,0	± 12 mm
Dellin		Length	[res]	≤ 130,0	-
ROII IN	CARGO System CS-U or CS-S *	Width	[m]	2,30	± 12 mm
Dell		Length	[100]	≤ 250,0	-
KOII		Width	[m]	3.0	+ 12 mm

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**

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 im-purities (e.g. grease, soil, loose concrete residues).

All values given in accordance with or based on DAfStb guideline "Concrete components with nonmetallic reinforcement", Part 4.

- ¹⁾ To use  $\alpha_{Tt} = 1$  and  $\alpha_{Tb} = 1$ : proof required that the temperature loading does not exceed 70°C.
- ²⁾ For smaller lap lengths, the transferable tensile stresses can be taken from the approval document Table 2, line 10.
- ³⁾ A component thickness of 30 mm is permissible for components with a single layer of centrally arranged reinforcement grid.
- ⁴⁾ 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.

#### **Schematic illustration**





# solidian.

#### **Confirmation of conformity**



As part of the confirmation of the conformity of our construction product in accordance with section 2.3 of the German national technical approval/construction techniaue permit Z-1.6-308 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-1.6-308 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-1.6-308 verifies the usability respectively applicability of the subject of regulation in terms of the German state building regulations.

The design is always carried out in accordance with the currently valid German guideline "Concrete components with non-metallic reinforcement" of the German Committee for Reinforced Concrete (DAfStb) and the applicable standards cited in the guideline.

#### **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 sub-stances 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, the Technical Information for our solidian reinforcement products and the German national technical approval/ construction technique permit Z-1.6-308. 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.

Date: 11.11.2024 | Version: 2411 | solidian GRID Q95-C-EP-s38-F278 Technical Product Data Sheet v2411.docx

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# solidian GRID R24/95-C-C-EP-s76/38-F72/278 (F01R01)

Symmetrical, bidirectional reinforcement grid (type Q, grid family 3) made of media-resistant carbon fiber composite material for the reinforcement of concrete components with predominantly static loads in accordance with German national technical approval/construction technique permit Z-1.6-308

	<u>R/2</u>	
an C		

#### Material

Fiber material	C (Carbon)			
Impregnation agent	EP (Epoxy resin	1)	and the standard	Commencer and Earder or
Color	schwarz		心理了了	
Surface finish	smooth		4.2	
Bending stiffness class	longitudinal	II, mid	-	
	transversal	III, stiff		
Validity for concrete strength classes	C30/37 to C70,	/85		
Chemical resistance of the reinforcement in relation to the	XD3	Chlorides, e	xcept seawat	er
exposure classes in accordance with DIN EN 206-1 in con-	XS3	Chlorides fro	om seawater	
iunction with DIN 1045-2	XA3	Chemical at	tack	

### Geometry and structure

Geo	metry and structure		Unit	Value	Tolerance
	Directions of the fiber strands	longitudinal		0	± 5°
	Directions of the liber strands	transversal	[*]	90	± 5°
1	Mean value of fiber strand width	longitudinal	_ []	3,1	± 10%
φh		transversal	[mm]	5,5	± 10%
1	Maan value of fiber strand beight	longitudinal	_ []	1,8	± 10%
$\phi_{\vee}$	Mean value of fiber strand height	transversal		3,1	± 10%
	Niemainel diementer	longitudinal	[]	2,37	-
φnm	Nominal diameter	transversal	- [mm]	3,35	-
٨	Namical cross as tional and a set file or stress of	longitudinal	[	4,4	-
A _{nm}	Nominal cross-sectional area per fiber strand	transversal	– [mm²] —	8,8	-
_	Nominal cross-sectional area per meter	longitudinal	[	58	-
a _{nm}		transversal	- [mm²/m]	232	-
		longitudinal	r 21	1,81	-
A _{f,nm}	Fiber cross-sectional area per fiber strand	transversal	- [mm²]	3,62	-
_		longitudinal	[	24	-
a _{f,nm}	Fiber cross-sectional area per meter	transversal	- [mm²/m]	95	-
		longitudinal	r 7	76	± 3 mm
S	Grid width	transversal	- [mm]	38	± 3 mm
		longitudinal	r 7	72,8	± 10%
SI	Clear distance of the fiber strands	transversal	- [mm]	32,5	± 10%
h _G	Grid height (average value of the maximum height)		[mm]	3,0	± 10%
g	Weight per unit area of the non-metallic reinforceme	ent	[g/m ² ]	381	± 10%
Kü	Degree of coverage of the grid		[%]	18,0	-
r _{min}	Minimum permissible radius of curvature		[mm]	350	-
	· · · · · · · · · · · · · · · · · · ·				
	antal announting				

Mat	erial properties		Unit	Value	Tolerance
ρ	Bulk density of the fiber composite material		[g/cm ³ ]	1,30	-
CX	Coefficient of thermal expansion	along the fiber	[10 ⁻⁶ 1/K]	0,5	-
T _{g0}	Glass transition temperature (DMA)		[°C]	≥ 110	-
	Recommended operating temperature range		[°C]	-20 bis +80	-
	Building material class reinforcement grid acc. to D	DIN EN 13501-1	[-]	E, normally flammable	-





Mechanical properties

Mec	hanical properties		Unit	Value	Tolerance
£	Characteristic short-term tensile strength related	longitudinal		1.250	-
Inm,k	to the nominal cross-sectional area	transversal	[IVIPa]	1.200	-
Г	Young's modulus related to the nominal cross-	longitudinal		99.000	-
⊏nm	section	transversal	[IVIPa]	97.000	-
f.	Characteristic short-term tensile strength related	longitudinal		≥ 3.039	-
lf,nm,k	to the fiber cross-sectional area	transversal	[IVIPa]	≥ 2.917	-
Г	Mean Young's modulus related to the fiber	longitudinal		≥ 247.000	-
⊏f,nm,m	cross-sectional area	transversal	[IVIPa]	≥ 243.000	-
6	Characteristic elongation at failure under tensile	longitudinal	. [0/ ]	≥ 12,6	-
۲nm,uk	load of the non-metallic reinforcement	transversal	[%00]	≥ 12,4	-
£	Characteristic short-term bond strength for an-	longitudinal		1,7	-
lbk	choring for $\geq$ C30/37	transversal	[IVIPa]	2,9	-
-	Characteristic value of the mean bond stress ( $k_t$ =0)	longitudinal		7,1	-
l bm,k	for ≥ C30/37	transversal	[IVIPa]	5,9	-
Г	Characteristic tensile force transmission of the	longitudinal		72	-
Fnm,k	non-metallic reinforcement per m width	transversal	[KIN/[11]	278	-

Coe	Coefficients		Unit	Value	Tolerance	
$\alpha_{Tt}$	Coefficient for considering influences from short- term particularly high temperature stress on the tensile strength ¹⁾	longitudinal		1,0 bei -20°C ≤ T ≤ 70°C 0,95 bei 70°C < T ≤ 80°C	-	
		transversal	[-]	1,0 bei -20°C ≤ T ≤ 70°C 0,90 bei 70°C < T ≤ 80°C	-	
$\alpha_{Tb}$	Coefficient for considering influences from short- term particularly high temperature stress on the bond behavior ¹⁾	longitudinal		1,0 bei -20°C ≤ T ≤ 70°C 0,95 bei 70°C < T ≤ 80°C	-	
		transversal	[-]	1,0 bei -20°C ≤ T ≤ 70°C 0,90 bei 70°C < T ≤ 80°C	-	
α _{nmt}	Coefficient for considering durability influences and long-term stresses on the tensile strength		[-]	0,83	-	
α _{nmb}	Coefficient for considering durability influences and stresses on the bond strength	long-term	[-]	0,83	-	

Characteristic values for anchoring and lapping		Unit	Value	Tolerance	
	Applicable reinforcement stress for the anchorage	longitudinal		885	-
	proof	transversal	[IVIPa] —	1.020	-
1	Minimum ancharing langth	longitudinal	[]	42	-
lb,min	Minimum anchoring length	transversal		76	-
1	Minimum lap length [mm] transversal	[]	228	-	
I0,min		transversal		117	-
	Minimum lap length for transferring $f_{nm,k}$ in lap	longitudinal	[]	700	-
	joint ²⁾	transversal		500	-

Furt	her key values	Unit	Value	Tolerance
Cmin,b	Minimum concrete cover from bond requirement ³⁾	[mm]	14	-
h _{min}	Minimum component thickness ³⁾	[mm]	≥ 30	-
n	Proof of robustness for predominantly static loading (number of tested cycles)	[-]	≥ 200.000	-





Value

#### Standard goods variety

5 mm
2 mm
-
2 mm
-
2 mm
-
2 mm

L Init

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**

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 im-purities (e.g. grease, soil, loose concrete residues).

All values given in accordance with or based on DAfStb guideline "Concrete components with nonmetallic reinforcement", Part 4.

 $^{1)}$  To use  $\alpha_{Tt}$  = 1 and  $\alpha_{Tb}$  = 1: proof required that the temperature loading does not exceed 70°C.

²⁾ For smaller lap lengths, the transferable tensile stresses can be taken from the approval document Table 2, line 10.

³⁾ A component thickness of 30 mm is permissible for components with a single layer of centrally arranged reinforcement grid.

⁴⁾ 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.

#### **Schematic illustration**





# solidian.

#### **Confirmation of conformity**



As part of the confirmation of the conformity of our construction product in accordance with section 2.3 of the German national technical approval/construction techniaue permit Z-1.6-308 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-1.6-308 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-1.6-308 verifies the usability respectively applicability of the subject of regulation in terms of the German state building regulations.

The design is always carried out in accordance with the currently valid German guideline "Concrete components with non-metallic reinforcement" of the German Committee for Reinforced Concrete (DAfStb) and the applicable standards cited in the guideline.

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

#### **Industrial safety and health**

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#### Legal information

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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.

Date: 11.11.2024 | Version: 2411 | solidian GRID R24_95-C-C-EP-s76_38-F72_278 Technical Product Data Sheet v2411.docx



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BUILEAU



**Material** Fiber material

### TECHNICAL **PRODUCT DATA SHEET**



# solidian GRID R95/24-C-C-EP-s38/76-F278/72 (F01R01)

Symmetrical, bidirectional reinforcement grid (type Q, grid family 3) made of media-resistant carbon fiber composite material for the reinforcement of concrete components with predominantly static loads in accordance with German national technical approval/construction technique permit Z-1.6-308

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Impregnation agent	EP (Epoxy resir	ר)			1 Cal
Color	schwarz			-	20
Surface finish	smooth				
Bending stiffness class	longitudinal	III, stiff			
	transversal	II, mid			
Validity for concrete strength classes	C30/37 to C70	/85			
Chemical resistance of the reinforcement in relation to the	XD3	Chlorides, e	xcept seawater		
exposure classes in accordance with DIN EN 206-1 in con-	XS3	Chlorides fr	om seawater		
junction with DIN 1045-2	XA3	Chemical at	tack		

C (Carbon)

Geo	metry and structure		Unit	Value	Tolerance
	Directions of the fiber strands	longitudinal	[0]	0	± 5°
	Directions of the liber strands	transversal		90	± 5°
T	Maan value of fiber strend width	longitudinal	_ []	5,1	± 10%
φh		transversal	[mm] [mm]	3,8	± 10%
4	Mean value of fiber strand beight	longitudinal	- [mm]	3,1	± 10%
Ψν		transversal	[11111]	1,8	± 10%
4	Nominal diameter	longitudinal	- [mm]	3,35	-
φnm		transversal		2,37	-
Δ	Nominal cross sactional area par fiber strand	longitudinal	- [mm ² ]	8,8	-
Anm	Norminal cross-sectional area per moer strand	transversal		4,4	-
2	Naminal cross soctional area par motor	longitudinal	- [mm²/m]	232	-
dnm	Norminal cross-sectional area per meter	transversal		58	-
Δ.	Fiber cross sectional area per fiber strand	longitudinal	- [mm²]	3,62	-
Af,nm	Fiber cross-sectional area per fiber strand	transversal		1,81	-
2.	Eiber cross sectional area per meter	longitudinal	- [mm²/m]	95	-
a _{t,nm}	Tiber cross-sectional area per meter	transversal		24	-
c	Crid width	longitudinal	- [mm]	38	± 3 mm
5	Gild width	transversal		76	± 3 mm
C.	Clear dictance of the fiber strands	longitudinal	- [mm]	33,4	± 10%
5		transversal	[11111]	72,8	± 10%
h _G	Grid height (average value of the maximum height)		[mm]	3,3	± 10%
g	Weight per unit area of the non-metallic reinforceme	ent	[g/m ² ]	350	± 10%
Kü	Degree of coverage of the grid		[%]	17,4	-
r .	Minimum permissible radius of curvature		[mm]	350	_

Mat	erial properties		Unit	Value	Tolerance
ρ	Bulk density of the fiber composite material		[g/cm ³ ]	1,30	-
CX	Coefficient of thermal expansion	along the fiber	[10 ⁻⁶ 1/K]	0,5	-
T _{g0}	Glass transition temperature (DMA)		[°C]	≥ 110	-
	Recommended operating temperature range		[°C]	-20 bis +80	-
	Building material class reinforcement grid acc. to [	DIN EN 13501-1	[-]	E, normally flammable	-





Mechanical properties

Mec	hanical properties		Unit	Value	Tolerance
£	Characteristic short-term tensile strength related	longitudinal		1.200	-
Inm,k	to the nominal cross-sectional area	transversal	[IVIPa]	1.250	-
Г	Young's modulus related to the nominal cross-	longitudinal		97.000	-
⊏nm	section	transversal	[IVIP d]	99.000	-
f.	Characteristic short-term tensile strength related	longitudinal		≥ 2.917	-
It,nm,k	to the fiber cross-sectional area	transversal	[IVIP d]	≥ 3.039	-
Г	Mean Young's modulus related to the fiber	longitudinal		≥ 243.000	-
⊏f,nm,m	cross-sectional area	transversal	[IVIP d]	≥ 247.000	-
6	Characteristic elongation at failure under tensile	longitudinal	[0/_]	≥ 12,4	-
۲nm,uk	load of the non-metallic reinforcement	transversal	[700]	≥ 12,6	-
£	Characteristic short-term bond strength for an-	longitudinal		2,9	-
lbk	choring for ≥ C30/37	transversal	[IVIP d]	1,7	-
<b>T</b>	Characteristic value of the mean bond stress ( $k_t$ =0)	longitudinal		5,9	-
l bm,k	for ≥ C30/37	transversal	[IVIP d]	7,1	-
Г	Characteristic tensile force transmission of the	longitudinal		278	-
r⁼nm,k	non-metallic reinforcement per m width	transversal	[KIN/111]	72	-

Coe	Coefficients		Unit	Value	Tolerance
	Coefficient for considering influences from short-	longitudinal		1,0 bei -20°C ≤ T ≤ 70°C 0,90 bei 70°C < T ≤ 80°C	-
α _{Tt}	term particularly high temperature stress on the tensile strength ¹⁾	transversal	[-]	1,0 bei -20°C ≤ T ≤ 70°C 0,95 bei 70°C < T ≤ 80°C	-
	Coefficient for considering influences from short-	longitudinal		1,0 bei -20°C ≤ T ≤ 70°C 0,90 bei 70°C < T ≤ 80°C	-
α _{tb}	term particularly high temperature stress on the bond behavior ¹⁾	transversal	[-]	1,0 bei -20°C ≤ T ≤ 70°C 0,95 bei 70°C < T ≤ 80°C	-
α _{nmt}	Coefficient for considering durability influences and stresses on the tensile strength	long-term	[-]	0,83	-
α _{nmb}	Coefficient for considering durability influences and stresses on the bond strength	long-term	[-]	0,83	-

Characteristic values for anchoring and lapping		pping	Unit	Value	Tolerance
	Applicable reinforcement stress for the anchorage	longitudinal		1.020	-
	proof	transversal	[IVIPa]	885	-
	Minimum ancharing langth	longitudinal	[mm]	76	-
lb,min	Minimum anchoring length	transversal		42	-
	Minimum lan langth	longitudinal	[mm]	117	-
I _{0,min}	Minimum iap length	transversal		228	-
	Minimum lap length for transferring f _{nm,k} in lap	longitudinal	[	500	-
	joint ²⁾	transversal	[[[]]]	700	-

Furt	her key values	Unit	Value	Tolerance
Cmin,b	Minimum concrete cover from bond requirement ³⁾	[mm]	14	-
h _{min}	Minimum component thickness ³⁾	[mm]	≥ 30	-
n	Proof of robustness for predominantly static loading (number of tested cycles)	[-]	≥ 200.000	-





Value

#### Standard goods variety

Standard goods variety		Unit	Value	Tolerance
Single grid	Length	[no]	6,0	± 16 mm
	Width		2,30	± 12 mm
Roll in CARGO System CS ⁴⁾	Length	[m]	≤ 130,0	-
	Width		3,0	± 12 mm
Roll in CARGO System CS-U or CS-S ⁴⁾	Length	[no]	≤ 130,0	-
	Width		2,30	± 12 mm
Roll	Length	[m]	≤ 250,0	-
	Width	[[[]]	3,0	± 12 mm

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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**

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 im-purities (e.g. grease, soil, loose concrete residues).

All values given in accordance with or based on DAfStb guideline "Concrete components with nonmetallic reinforcement", Part 4.

 $^{1)}$  To use  $\alpha_{Tt}$  = 1 and  $\alpha_{Tb}$  = 1: proof required that the temperature loading does not exceed 70°C.

²⁾ For smaller lap lengths, the transferable tensile stresses can be taken from the approval document Table 2, line 10.

³⁾ A component thickness of 30 mm is permissible for components with a single layer of centrally arranged reinforcement grid.

⁴⁾ 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.

#### **Schematic illustration**





# solidian.

#### **Confirmation of conformity**



As part of the confirmation of the conformity of our construction product in accordance with section 2.3 of the German national technical approval/construction technique permit Z-1.6-308 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-1.6-308 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-1.6-308 verifies the usability respectively applicability of the subject of regulation in terms of the German state building regulations.

The design is always carried out in accordance with the currently valid German guideline "Concrete components with non-metallic reinforcement" of the German Committee for Reinforced Concrete (DAfStb) and the applicable standards cited in the guideline.

#### **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 sub-stances 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, the Technical Information for our solidian reinforcement products and the German national technical approval/ construction technique permit Z-1.6-308. 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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