

# solidian GRID Q27-CCE-68 (F01R02)

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



Fiber material	C (Carbon)	
Impregnation agent	E (Epoxy resin)	ن ينزمون بمناها
Color	black	
Surface finish	smooth	
	XD3	Chlorides, except seawater
Chemical resistance of the reinforcement in relation to the exposure classes in accordance with EN 206-1	XS3	Chlorides from seawater
exposure classes in accordance with EN 200-1	XA3	Chemical attack

Geo	metry and structure		Unit	Value	Standard
	Directions of the fiber strands	longitudinal		0	
	Directions of the liber strands	transversal	- [°]	90	
1	Mean value of fiber strand width	longitudinal		5,3	
φh	Mean value of fiber strand width	transversal	– [mm] <del>–</del>	3,9	
1	Maan value of fiber strand beight	longitudinal		1,4	
φ∨	Mean value of fiber strand height	transversal	– [mm] <del>–</del>	1,9	
1	Nominal diameter	longitudinal		2,37	
ф <sub>пт</sub>	Nominal diameter	transversal	– [mm] <del>–</del>	2,37	
^	Name is all areas as estimated areas and file are store of	longitudinal	[2]	4,4	ICO 1040C 1
A <sub>nm</sub>	Nominal cross-sectional area per fiber strand	transversal	– [mm²] —	4,4	— ISO 10406-1
_	Name and are as a settlement are a set as a	longitudinal	[2/]	65	
a <sub>nm</sub>	Nominal cross-sectional area per meter	transversal	– [mm²/m] –	65	
^	File out out on a continue of out of the cut of the cut of	longitudinal	[2]	1,81	
A <sub>f,nm</sub>	Fiber cross-sectional area per fiber strand	transversal	– [mm²] –	1,81	
	File or organizational area and reactor	longitudinal	[2/]	27	
a <sub>f,nm</sub>	Fiber cross-sectional area per meter	transversal	– [mm²/m] –	27	
	C.A. Add	longitudinal	[]	68	
S	Grid width	transversal	– [mm] <del>–</del>	68	
_		longitudinal	f 1	64,1	
SI	Clear distance of the fiber strands	transversal	– [mm] <del>–</del>	62,9	
٦ <sub>G</sub>	Grid height (average value of the maximum height)		[mm]	2,9	-
g	Weight per unit area of the non-metallic reinforcement	ent	[g/m²]	183	-
<ü	Degree of coverage of the grid		[%]	13,0	-
r <sub>min</sub>	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 <sup>-6</sup> 1/K]	0,5	-
T <sub>g0</sub>	Glass transition temperature (DMA)		[°C]	≥ 110	DIN 65583
	Recommended operating temperature range		[°C]	-20 to +80	-
	Building material class components <sup>1)</sup>		[-]	A2, non-combustible	DIN 4102-1
	Building material class reinforcement grid		[-]	E, normally flammable	EN 13501-1

Mec	hanical properties		Unit	Value	Standard
t	Characteristic short-term tensile strength related to	longitudinal	- [MDo] -	1150	— ISO 10406-1
f <sub>nm,k</sub>	the nominal cross-sectional area	transversal	- [MPa] —	1150	130 10406-1
Г	Young's modulus related to the nominal cross-	longitudinal	- [MDo] -	94000	
E <sub>nm</sub>	section	transversal	- [MPa] —	94000	— ISO 10406-1
t	Mean short-time tensile strength related to the	longitudinal	- [MDo] -	≥ 3880	
† <sub>f,nm,m</sub>	fiber cross-sectional area	transversal	- [MPa] —	≥ 3880	— ISO 10406-1
t	Characteristic short-term tensile strength	longitudinal	- [MDo] -	≥ 2900	
Ť <sub>f,nm,k</sub>	related to the fiber cross-sectional area	transversal	- [MPa] —	≥ 2900	— ISO 10406-1
Г	Mean Young's modulus related to the fiber	longitudinal	- [MDo] -	≥ 235000	
E <sub>f,nm,m</sub>	cross-sectional area	transversal	- [MPa] —	≥ 235000	— ISO 10406-1
	Characteristic elongation at failure under tensile	longitudinal	ΓO/ 1	≥ 12,2	150 10406 1
€ <sub>nm,uk</sub>	load of the non-metallic reinforcement	transversal	- [‰] —	≥ 12,2	— ISO 10406-1
_	Characteristic tensile force transmission of the non-	longitudinal	FL N L / 7	74	160 10 106 1
F <sub>nm,k</sub>	metallic reinforcement per m width	transversal	- [kN/m] –	74	— ISO 10406-1

Further key values		Unit	Value	Standard
dg	Recommended maximum grain size in concrete	[mm]	16	-

Standard goods variety		Unit	Value	Tolerance
Single grid	Length	_ [	6,0	± 16 mm
	Width	- [m] —	2,30	± 12 mm
Roll in CARGO System CS <sup>2)</sup>	Length	[]	≤ 130,0	-
	Width	- [m] -	3,0	± 12 mm
Dell's CADCO C stars CC 11 as CC (2)	Length	[]	≤ 130,0	-
Roll in CARGO System CS-U or CS-S <sup>2)</sup>	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**

<sup>&</sup>lt;sup>1)</sup> 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.

<sup>&</sup>lt;sup>2)</sup> 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 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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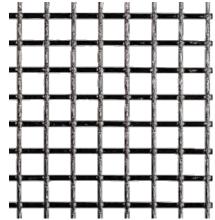






# **solidian** GRID Q43-CCE-21 (F01R01)

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



Fiber material	C (Carbon)	
Impregnation agent	E (Epoxy resin)	
Color	black	
Surface finish	smooth	
	XD3	Chlorides, except seawater
Chemical resistance of the reinforcement in relation to the exposure classes in accordance with EN 206-1	XS3	Chlorides from seawater
exposure classes in accordance with EN 200-1	XA3	Chemical attack

Geo	metry and structure		Unit	Value	Standard
	Directions of the fiber strands	longitudinal		0	
	Directions of the liber straints	transversal	- [°]	90	
L	Mean value of fiber strand width	longitudinal	[mm]	2,2	
h	Mean value of liber strand width	transversal	– [mm] <del>–</del>	3,0	
L	Mean value of fiber strand height	longitudinal	– [mm] —	1,4	
) <sub>V</sub>	iviean value of fiber strand height	transversal	[111111]	1,1	
	Nominal diameter	longitudinal	- [mm]	1,67	
nm	NOTHINAL GIATHETEI	transversal	[111111]	1,67	_
Anm	Nominal cross-sectional area per fiber strand	longitudinal	– [mm²] —	2,2	— ISO 10406-1
¹nm	nominal cross-sectional area per liber strand	transversal	נווווו ן	2,2	130 10400-1
	Nominal cross-sectional area per meter	longitudinal	– [mm²/m] –	105	
Inm	Nominal cross-sectional area per meter	transversal	- [mm-/m] -	105	
	Fiber cross sectional area per fiber strand	longitudinal	- [mm²]	0,91	
\f,nm	Fiber cross-sectional area per fiber strand	transversal	– [mm²] <del>–</del>	0,91	
	Fiber cross sectional area per meter	longitudinal	- [mm²/m]	43	
f,nm	Fiber cross-sectional area per meter	transversal	[[[[[]]]	43	_
	Grid width	longitudinal	- [mm]	21	
	Grid widti	transversal	[111111]	21	
	Clear distance of the fiber strands	longitudinal	[mm]	18,3	
	Clear distance of the liber strands	transversal	– [mm] <del>–</del>	19,1	_
G	Grid height (average value of the maximum height)		[mm]	2,2	-
	Weight per unit area of the non-metallic reinforcement	ent	[g/m²]	280	_
ü	Degree of coverage of the grid		[%]	18,9	_
min	Minimum permissible radius of curvature		[mm]	350	_



Ma	terial 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 <sup>-6</sup> 1/K]	0,5	-
T <sub>g0</sub>	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

Standard	Value	Unit		chanical properties	Mecl
ISO 10406-1	1300	[MDa] -	longitudinal	Characteristic short-term tensile strength related to	£
130 10400-1	1300	[MPa] -	transversal	the nominal cross-sectional area	f <sub>nm,k</sub>
ISO 10406 1	94000	[MDa] -	longitudinal	Young's modulus related to the nominal cross-	г
ISO 10406-1	94000	[MPa] -	transversal	section	E <sub>nm</sub>
ISO 10406 1	≥ 4290	[MDa] -	longitudinal	Mean short-time tensile strength related to the	£
– ISO 10406-1	≥ 4290	[MPa] -	transversal	fiber cross-sectional area	† <sub>f,nm,m</sub>
— ISO 10406-1	≥ 3200	[MDa] -	longitudinal	Characteristic short-term tensile strength	£
	≥ 3200	[MPa] -	transversal	related to the fiber cross-sectional area	f <sub>f,nm,k</sub>
— ISO 10406-1	≥ 235000	[] (D = ]	longitudinal	Mean Young's modulus related to the fiber	_
	≥ 235000	[MPa] -	transversal	m cross-sectional area	E <sub>f,nm,m</sub>
— ISO 10406-1	≥ 13,8	ro/ 1	longitudinal	Characteristic elongation at failure under tensile	
	≥ 13,8	— [‰] -	transversal	k load of the non-metallic reinforcement	≿ <sub>nm,uk</sub>
150 40 405 1	136	[].N.I./	longitudinal	Characteristic tensile force transmission of the non-	
ISO 10406-1	136	[KIN/M] —	transversal	metallic reinforcement per m width	Fnm,k
	≥ 13,8 136	[‰] –	transversal longitudinal	load of the non-metallic reinforcement  Characteristic tensile force transmission of the non-	E <sub>nm,uk</sub>

Further key values		Unit	Value	Standard
$d_g$	Recommended maximum grain size in concrete 2)	[mm]	5	-

Standard goods variety		Unit	Value	Tolerance
Single grid	Length	[ma]	6,0	± 16 mm
	Width	- [m] -	2,30	± 12 mm
Roll in CARGO System CS <sup>3)</sup>	Length	[]	≤ 130,0	-
	Width	- [m] -	3,0	± 12 mm
Roll in CARGO System CS-U or CS-S <sup>3)</sup>	Length	F1	≤ 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**

<sup>&</sup>lt;sup>1)</sup> 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.

 $<sup>^{2)}</sup>$  d<sub>q</sub> = 8 mm possible depending on the manufacturing process.

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

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#### **Processing information**

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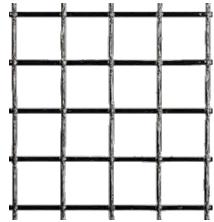






# solidian GRID Q47-CCE-38 (F01R01)

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



Fiber material	C (Carbon)	1 1 1	
Impregnation agent	E (Epoxy resin)		1 1
Color	black	<del></del>	
Surface finish	smooth		
	XD3	Chlorides, except seawater	
Chemical resistance of the reinforcement in relation to the exposure classes in accordance with EN 206-1	XS3	Chlorides from seawater	
exposure classes in accordance with EN 200-1	XA3	Chemical attack	

Geo	metry and structure		Unit	Value	Standard
	Directions of the fiber strands	longitudinal		0	
	Directions of the liber straints	transversal	- [°]	90	
L	Mean value of fiber strand width	longitudinal	[mm]	3,5	
<b>þ</b> h	iviean value of fiber strand width	transversal	– [mm] <del>–</del>	4,2	_
L	Mean value of fiber strand height	longitudinal	– [mm] —	1,9	
) <sub>V</sub>	iviean value of fiber strand height	transversal	[111111]	1,8	
	Nominal diameter	longitudinal	- [mm]	2,37	
nm	NOTHINAL GIATHETEI	transversal	[111111]	2,37	_
٨	Nominal cross-sectional area per fiber strand	longitudinal	– [mm²] —	4,4	— ISO 10406-1
Anm	nominal cross-sectional area per liber strand	transversal	נווווו ן	4,4	130 10400-1
	Nominal cross-sectional area per meter	longitudinal	– [mm²/m] –	116	
nm	Nominal cross-sectional area per meter	transversal	[111111 /111]	116	
١.	Fiber cross-sectional area per fiber strand	longitudinal	– [mm²] –	1,81	
₹,nm	riber cross-sectional area per liber strand	transversal	נווווו ן	1,81	_
	Fiber cross sectional area per meter	longitudinal	- [mm²/m]	47	
f,nm	Fiber cross-sectional area per meter	transversal	[111111 /111]	47	
	Grid width	longitudinal	- [mm]	38	
	Grid widti	transversal	[111111]	38	
	Clear distance of the fiber strands	longitudinal	[mm]	34,2	
l	Clear distance of the liber strands	transversal	– [mm] <del>–</del>	34,9	-
lG	Grid height (average value of the maximum height)		[mm]	2,3	-
	Weight per unit area of the non-metallic reinforcement	ent	[g/m²]	309	-
ű	Degree of coverage of the grid		[%]	18,9	-
min	Minimum permissible radius of curvature		[mm]	350	-



Ma	terial 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 <sup>-6</sup> 1/K]	0,5	-
T <sub>g0</sub>	Glass transition temperature (DMA)		[°C]	≥ 110	DIN 65583
	Recommended operating temperature range		[°C]	-20 to +80	-
	Building material class components <sup>1)</sup>		[-]	A2, non-combustible	DIN 4102-1
	Building material class reinforcement grid		[-]	E, normally flammable	EN 13501-1

Mec	hanical properties		Unit	Value	Standard
t	Characteristic short-term tensile strength related to	longitudinal	- [MDo] -	1250	— ISO 10406-1
f <sub>nm,k</sub>	the nominal cross-sectional area	transversal	- [MPa] —	1250	130 10406-1
Г	Young's modulus related to the nominal cross-	longitudinal	- [MDo] -	99000	
E <sub>nm</sub>	section	transversal	- [MPa] —	99000	— ISO 10406-1
t	Mean short-time tensile strength related to the	longitudinal	- [MDo] -	≥ 4070	
T <sub>f,nm,m</sub>	fiber cross-sectional area	transversal	- [MPa] —	≥ 4070	— ISO 10406-1
£	Characteristic short-term tensile strength	longitudinal	- [MDo] -	≥ 3039	
† <sub>f,nm,k</sub>	related to the fiber cross-sectional area	transversal	- [MPa] —	≥ 3039	— ISO 10406-1
Г	Mean Young's modulus related to the fiber	longitudinal	- [MDo] -	≥ 247000	
E <sub>f,nm,m</sub>	cross-sectional area	transversal	- [MPa] —	≥ 247000	— ISO 10406-1
	Characteristic elongation at failure under tensile	longitudinal	ΓO/ 1	≥ 12,6	100 10406 1
E <sub>nm,uk</sub>	load of the non-metallic reinforcement	transversal	- [‰] —	≥ 12,6	— ISO 10406-1
	Characteristic tensile force transmission of the non-	- longitudinal	[[.]]	145	100 10400 1
F <sub>nm,k</sub>	metallic reinforcement per m width	transversal	- [kN/m] –	145	— ISO 10406-1

Fur	ther key values	Unit	Value	Standard
dg	Recommended maximum grain size in concrete 2)	[mm]	8	-

Standard goods variety		Unit	Value	Tolerance
	Length	[]	6,0	± 16 mm
Single grid	Width	- [m] -	2,30	± 12 mm
Roll in CARGO System CS <sup>3)</sup>	Length	[]	≤ 130,0	-
	Width	- [m] -	3,0	± 12 mm
Dallin CADCO (vetero CC II es CC (3)	Length	[]	≤ 130,0	-
Roll in CARGO System CS-U or CS-S 3)	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**

<sup>&</sup>lt;sup>1)</sup> 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.

 $<sup>^{2)}</sup>$  d<sub>q</sub> = 16 mm possible depending on the manufacturing process.

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#### Measurement

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#### **Tests**

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#### **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.

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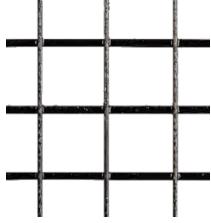






# solidian GRID Q71-CCE-51 (F01R01)

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



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

Geo	metry and structure		Unit	Value	Standard
	Directions of the fiber strands	longitudinal		0	
	Directions of the fiber strands	transversal	- [°]	90	
	Mean value of fiber strand width	longitudinal	[mama]	5,0	
φh	Mean value of fiber strand width	transversal	– [mm] <del>–</del>	5,8	
1	Mass value of fiber strand baight	longitudinal		2,7	
ф <sub>∨</sub>	Mean value of fiber strand height	transversal	– [mm] <del>–</del>	2,6	
	Nominal diameter	longitudinal	[mama]	3,35	
ф <sub>пт</sub>	Nominal diameter	transversal	– [mm] <del>–</del>	3,35	
^	No seignal aggress and tip and aggress of the aggress of	longitudinal	[2]	8,8	100 10 400 1
A <sub>nm</sub>	Nominal cross-sectional area per fiber strand	transversal	– [mm²] –	8,8	— ISO 10406-1
_	Nieuderland aus der	longitudinal	r2/1	173	
a <sub>nm</sub>	Nominal cross-sectional area per meter	transversal	– [mm²/m] –	173	
^	Character de Caralter de Character de	longitudinal	r21	3,62	
A <sub>f,nm</sub>	Fiber cross-sectional area per fiber strand	transversal	– [mm²] –	3,62	
_		longitudinal	r2/1	71	
a <sub>f,nm</sub>	Fiber cross-sectional area per meter	transversal	- [mm²/m]	71	
	C. c. d. C. c. d. C.	longitudinal	ſ1	51	
5	Grid width	transversal	– [mm] <del>–</del>	51	
		longitudinal	ſ1	45,4	
5	Clear distance of the fiber strands	transversal	– [mm] <del>–</del>	46,2	
1 <sub>G</sub>	Grid height (average value of the maximum height)		[mm]	3,5	-
]	Weight per unit area of the non-metallic reinforcement	ent	[g/m²]	454	-
ζü	Degree of coverage of the grid		[%]	20,1	-
r <sub>min</sub>	Minimum permissible radius of curvature		[mm]	350	-



Ma	terial 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 <sup>-6</sup> 1/K]	0,5	-
T <sub>g0</sub>	Glass transition temperature (DMA)		[°C]	≥ 110	DIN 65583
	Recommended operating temperature range		[°C]	-20 to +80	-
	Building material class components <sup>1)</sup>		[-]	A2, non-combustible	DIN 4102-1
	Building material class reinforcement grid		[-]	E, normally flammable	EN 13501-1

Mec	hanical properties		Unit	Value	Standard
£	Characteristic short-term tensile strength related to	longitudinal	- [MPa] —	1200	— ISO 10406-1
f <sub>nm,k</sub>	the nominal cross-sectional area	transversal	[IVIPa]	1200	130 10400-1
Г	Young's modulus related to the nominal cross-	longitudinal	- [MDa] —	97000	— ISO 10406-1
E <sub>nm</sub>	section	transversal	- [MPa] —	97000	150 10400-1
£	Mean short-time tensile strength related to the	longitudinal	- [MDa] —	≥ 3910	
† <sub>f,nm,m</sub>	fiber cross-sectional area	transversal	- [MPa] —	≥ 3910	— ISO 10406-1
£	Characteristic short-term tensile strength	longitudinal	- [MDa] —	≥ 2917	
$f_{f,nm,k}$	related to the fiber cross-sectional area	transversal	- [MPa] —	≥ 2917	— ISO 10406-1
_	Mean Young's modulus related to the fiber	longitudinal	[], (D, a)	≥ 243000	100 10 100 1
E <sub>f,nm,m</sub>	cross-sectional area	transversal	- [MPa] —	≥ 243000	— ISO 10406-1
	Characteristic elongation at failure under tensile	longitudinal	ro/ 1	≥ 12,4	100 10 100 1
E <sub>nm,uk</sub>	load of the non-metallic reinforcement	transversal	- [‰] —	≥ 12,4	— ISO 10406-1
_	Characteristic tensile force transmission of the non-	longitudinal	[  N   / ]	207	160 10 106 1
F <sub>nm,k</sub>	metallic reinforcement per m width	transversal	- [kN/m] —	207	— ISO 10406-1

Furt	ther key values	Unit	Value	Standard
$d_g$	Recommended maximum grain size in concrete 2)	[mm]	8	-

Standard goods variety		Unit	Value	Tolerance
Cinala anid	Length	[ma]	6,0	± 16 mm
Single grid	Width	- [m] -	2,30	± 12 mm
Roll in CARGO System CS <sup>3)</sup>	Length	[]	≤ 130,0	-
	Width	- [m] -	3,0	± 12 mm
D-III: - CADCO C -1 CC II CC C 3)	Length	F1	≤ 130,0	-
Roll in CARGO System CS-U or CS-S <sup>3)</sup>	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**

<sup>&</sup>lt;sup>1)</sup> 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.

 $<sup>^{2)}</sup>$  d<sub>q</sub> = 16 mm possible depending on the manufacturing process.

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**

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## **Industrial safety and health**

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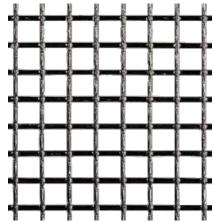






# solidian GRID Q85-CCE-21 (F01R01)

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



Fiber material	C (Carbon)	
Impregnation agent	E (Epoxy resin)	
Color	black	
Surface finish	smooth	
	XD3	Chlorides, except seawater
Chemical resistance of the reinforcement in relation to the exposure classes in accordance with EN 206-1	XS3	Chlorides from seawater
exposure classes in accordance with EN 200-1	XA3	Chemical attack

Geo	metry and structure		Unit	Value	Standard
	Discretions of the file or stress de	longitudinal	[0]	0	
	Directions of the fiber strands	transversal	- [°]	90	
	Mean value of fiber strand width	longitudinal	[mama]	3,4	
φh	Mean value of fiber strand width	transversal	– [mm] <del>–</del>	4,2	
1	Mass value of fiber strand baight	longitudinal		1,8	
φ∨	Mean value of fiber strand height	transversal	– [mm] <del>–</del>	1,5	
	Nominal diameter	longitudinal	[mama]	2,37	
\$nm	Nominal diameter	transversal	- [mm] —	2,37	
٨	Nicolaria de la compania del compania del compania de la compania del compania del compania de la compania del compania de	longitudinal	r21	4,4	160 10 10 1
A <sub>nm</sub>	Nominal cross-sectional area per fiber strand	transversal	- [mm²] —	4,4	— ISO 10406-1
	N	longitudinal	. 2/ 1	210	
a <sub>nm</sub>	Nominal cross-sectional area per meter	transversal	- [mm²/m]	210	
^		longitudinal	r 21	1,81	
A <sub>f,nm</sub>	Fiber cross-sectional area per fiber strand	transversal	– [mm²] –	1,81	
		longitudinal	. 2/ 1	85	
a <sub>f,nm</sub>	Fiber cross-sectional area per meter	transversal	- [mm²/m]	85	
		longitudinal	r 1	21	
5	Grid spacing	transversal	– [mm] <del>–</del>	21	
		longitudinal	r 1	17,0	
5	Clear spacing of the fiber strands	transversal	– [mm] <del>–</del>	18,0	
٦ <sub>G</sub>	Grid height (average value of the maximum height)		[mm]	2,1	-
9	Weight per unit area of the non-metallic reinforcement	ent	[g/m²]	512	-
<ü	Degree of coverage of the grid		[%]	32,6	-
r <sub>min</sub>	Minimum permissible radius of curvature		[mm]	350	-



Ma	terial 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 <sup>-6</sup> 1/K]	0,5	-
T <sub>g0</sub>	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

Mec	hanical properties		Unit	Value	Standard
	Characteristic short-term tensile strength related to	longitudinal	[] (D a)	1250	100 10 100 1
f <sub>nm,k</sub>	the nominal cross-sectional area	transversal	- [MPa] —	1250	— ISO 10406-1
_	Young's modulus related to the nominal cross-	longitudinal	[] (D a)	99000	100 10 100 1
E <sub>nm</sub>	section transversal	- [MPa] —	99000	— ISO 10406-1	
	Mean short-time tensile strength related to the	longitudinal	[] (D a)	≥ 4070	100 10 100 1
† <sub>f,nm,m</sub>	fiber cross-sectional area	transversal	- [MPa] —	≥ 4070	— ISO 10406-1
	Characteristic short-term tensile strength	longitudinal	[] (D a)	≥ 3039	— ISO 10406-1
$f_{f,nm,k}$	related to the fiber cross-sectional area	transversal	- [MPa] —	≥ 3039	
_	Mean Young's modulus related to the fiber	longitudinal	D. 4D - 1	≥ 247000	— ISO 10406-1
E <sub>f,nm,m</sub>	cross-sectional area	transversal	- [MPa] —	≥ 247000	
	Characteristic elongation at failure under tensile	longitudinal	1 \01	≥ 12,6	— ISO 10406-1
€ <sub>nm,uk</sub>	load of the non-metallic reinforcement	transversal	- [‰] —	≥ 12,6	
_	Characteristic tensile force transmission of the non-	longitudinal	FI N I / 3	262	150 10 105 1
Fnm,k	metallic reinforcement per m width	transversal	- [KIN/M] —	262	— ISO 10406-1
F <sub>nm,k</sub>			- [kN/m] —		— ISO

Fur	ther key values	Unit	Value	Standard
dg	Recommended maximum grain size in concrete <sup>2)</sup>	[mm]	5	-

Standard goods variety		Unit	Value	Tolerance
Single grid	Length	- [m] -	6,0	± 16 mm
	Width	[m] —	2,30	± 12 mm
Roll in CARGO System CS <sup>3)</sup>	Length	[ma]	≤ 130,0	-
	Width	[m] —	3,0	± 12 mm
Roll in CARGO System CS-U or CS-S <sup>3)</sup>	Length	[ma]	≤ 130,0	-
	Width	[m] —	2,30	± 12 mm
Roll	Length	[ma]	≤ 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**

<sup>&</sup>lt;sup>1)</sup> 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.

 $<sup>^{2)}</sup>$  d<sub>q</sub> = 8 mm possible depending on the manufacturing process.

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

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#### **Processing information**

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## **Ecology and health protection**

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## **Industrial safety and health**

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# solidian GRID Q95-CCE-38 (F01R01)

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



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

Geo	metry and structure		Unit	Value	Standard
	Directions of the fiber strands	longitudinal		0	
	Directions of the liber strands	transversal	- [°]	90	
1	Mean value of fiber strand width	longitudinal		4,8	
φ <sub>h</sub>	Mean value of fiber strand width	transversal	– [mm] <del>–</del>	5,5	
4	Mean value of fiber strand height	longitudinal	[mm]	2,6	
φ <sub>ν</sub>	Mean value of fiber strand height	transversal	– [mm] <del>–</del>	2,5	
1	Nominal diameter	longitudinal		3,35	
ф <sub>пт</sub>	Nominal diameter	transversal	- [mm] —	3,35	
^	No reignal agrees another all agree and file agreement	longitudinal	[2]	8,8	ICO 1040C 1
A <sub>nm</sub>	Nominal cross-sectional area per fiber strand	transversal	- [mm²] —	8,8	— ISO 10406-1
	Naminal cross sectional area per meter	longitudinal	[2/1	232	
a <sub>nm</sub>	Nominal cross-sectional area per meter	transversal	– [mm²/m] –	232	
٨		longitudinal	[2]	3,62	
A <sub>f,nm</sub>	Fiber cross-sectional area per fiber strand	transversal	– [mm²] –	3,62	
_	File of green continued area and restor	longitudinal	[2/]	95	
a <sub>f,nm</sub>	Fiber cross-sectional area per meter	transversal	– [mm²/m] –	95	
	مادان مادان	longitudinal	[]	38	
S	Grid width	transversal	– [mm] <del>–</del>	38	
_		longitudinal	f 1	32,8	
Sı	Clear distance of the fiber strands	transversal	– [mm] <del>–</del>	33,5	
h <sub>G</sub>	Grid height (average value of the maximum height)		[mm]	3,3	-
g	Weight per unit area of the non-metallic reinforcement	ent	[g/m²]	559	-
Kü	Degree of coverage of the grid		[%]	25,2	-
r <sub>min</sub>	Minimum permissible radius of curvature		[mm]	350	-



Ma	terial 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 <sup>-6</sup> 1/K]	0,5	-
T <sub>g0</sub>	Glass transition temperature (DMA)		[°C]	≥ 110	DIN 65583
	Recommended operating temperature range		[°C]	-20 to +80	-
	Building material class components <sup>1)</sup>		[-]	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	- [MDo] -	1200	— ISO 10406-1
the nominal cross-sectional area	transversal	[IVIPd]	1200	130 10406-1
Young's modulus related to the nominal cross-	longitudinal	- [MDo] -	97000	
section	transversal	- [MPa] -	97000	— ISO 10406-1
Mean short-time tensile strength related to the	longitudinal	- [MDo] -	≥ 3910	
fiber cross-sectional area	transversal	[IVIPd]	≥ 3910	— ISO 10406-1
Characteristic short-term tensile strength	longitudinal	- [MDo] -	≥ 2917	
related to the fiber cross-sectional area	transversal	[IVIPd]	≥ 2917	— ISO 10406-1
Mean Young's modulus related to the fiber	longitudinal	[] ([] -]	≥ 243000	— ISO 10406-1
cross-sectional area	transversal	[IVIPa] =	≥ 243000	
Characteristic elongation at failure under tensile	longitudinal	[0/ ]	≥ 12,4	ICO 10 40C 1
load of the non-metallic reinforcement	transversal	[%0]	≥ 12,4	— ISO 10406-1
Characteristic tensile force transmission of the non-	longitudinal	[LN1/1	278	100 10 100 1
metallic reinforcement per m width	transversal	- [KIN/M] —	278	— ISO 10406-1
	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 elongation at failure under tensile load of the non-metallic reinforcement  Characteristic tensile force transmission of the non-	Characteristic short-term tensile strength related to the nominal cross-sectional area transversal  Young's modulus related to the nominal cross-section transversal  Mean short-time tensile strength related to the fiber cross-sectional area transversal  Characteristic short-term tensile strength longitudinal related to the fiber cross-sectional area transversal  Mean Young's modulus related to the fiber longitudinal cross-sectional area transversal  Characteristic elongation at failure under tensile longitudinal transversal  Characteristic tensile force transmission of the non-longitudinal	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  Characteristic short-term tensile strength related to the fiber cross-sectional area  Characteristic short-term tensile strength related to the fiber cross-sectional area  Characteristic short-term tensile strength related to the fiber cross-sectional area  Characteristic short-term tensile strength related to the fiber cross-sectional area  Characteristic longitudinal related to the fiber cross-sectional area  Characteristic elongation at failure under tensile longitudinal ransversal  Characteristic tensile force transmission of the non-longitudinal ransversal	Characteristic short-term tensile strength related to the nominal cross-sectional arealongitudinal transversal[MPa]1200Young's modulus related to the nominal cross-sectionlongitudinal transversal[MPa]97000Mean short-time tensile strength related to the fiber cross-sectional arealongitudinal transversal[MPa]≥ 3910Characteristic short-term tensile strength related to the fiber cross-sectional arealongitudinal transversal[MPa]≥ 2917Mean Young's modulus related to the fiber cross-sectional arealongitudinal transversal[MPa]≥ 243000Characteristic elongation at failure under tensile load of the non-metallic reinforcementlongitudinal transversal[MPa]≥ 12,4Characteristic tensile force transmission of the non-longitudinal[MPa]≥ 12,4

Furt	ther 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	[m] —	2,30	± 12 mm
Roll in CARGO System CS <sup>3)</sup>	Length	[ma]	≤ 130,0	-
	Width	[m] —	3,0	± 12 mm
Roll in CARGO System CS-U or CS-S <sup>3)</sup>	Length	[ma]	≤ 130,0	-
	Width	[m] —	2,30	± 12 mm
Roll	Length	[ma]	≤ 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**

<sup>&</sup>lt;sup>1)</sup> 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.

 $<sup>^{2)}</sup>$  d<sub>q</sub> = 16 mm possible depending on the manufacturing process.

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 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.

Date: 11.11.2024 | Version: 2411 | solidian GRID Q95-CCE-38 Technical Product Data Sheet v2411.docx

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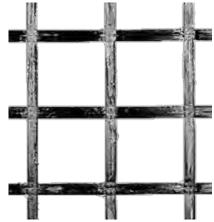






# solidian GRID Q122-CCE-59 (F01R02)

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



Fiber material	C (Carbon)	
Impregnation agent	E (Epoxy resin)	
Color	black	
Surface finish	smooth	
	XD3	Chlorides, except seawater
Chemical resistance of the reinforcement in relation to the exposure classes in accordance with EN 206-1	XS3	Chlorides from seawater
exposure classes in accordance with EN 200-1	XA3	Chemical attack

Geo	metry and structure		Unit	Value	Standard
	Directions of the fiber strands	longitudinal		0	
	Directions of the liber strands	transversal	- [°]	90	
ı	Mana valva of flaggatura di visitla	longitudinal	[]	9,3	
þh	Mean value of fiber strand width	transversal	– [mm] <del>–</del>	8,6	
	Maan value of fiber strand baight	longitudinal	[mm]	3,1	
) <sub>V</sub>	Mean value of fiber strand height	transversal	– [mm] <del>–</del>	3,2	
	Nominal diameter	longitudinal	[mm]	4,73	
nm	Nominal diameter	transversal	– [mm] <del>–</del>	4,73	
^	Naminal cross sactional area per fiber strand	longitudinal		17,6	
A <sub>nm</sub>	Nominal cross-sectional area per fiber strand	transversal	– [mm²] —	17,6	— ISO 10406-1
	Naminal cross sectional area per meter	longitudinal	– [mm²/m] –	298	
nm	Nominal cross-sectional area per meter	transversal	[111111-7111]	298	
	Fiber cross sectional area per fiber strand	longitudinal		7,24	
∖f,nm	Fiber cross-sectional area per fiber strand	transversal	– [mm²] —	7,24	
	File or areas as attacked area as a reaction	longitudinal	– [mm²/m] –	122	
lf,nm	Fiber cross-sectional area per meter	transversal	[111111-7111]	122	
	Grid width	longitudinal	[]	59	
	Grid Width	transversal	– [mm] <del>–</del>	59	
		longitudinal	[]	51,0	
	Clear distance of the fiber strands	transversal	– [mm] <del>–</del>	50,3	
G	Grid height (average value of the maximum height)		[mm]	3,8	-
	Weight per unit area of the non-metallic reinforcement	ent	[g/m²]	709	-
ü	Degree of coverage of the grid		[%]	27,7	-
min	Minimum permissible radius of curvature		[mm]	-	_



Ma	terial 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 <sup>-6</sup> 1/K]	0,5	-
T <sub>g0</sub>	Glass transition temperature (DMA)		[°C]	≥ 110	DIN 65583
	Recommended operating temperature range		[°C]	-20 to +80	-
	Building material class components <sup>1)</sup>		[-]	A2, non-combustible	DIN 4102-1
	Building material class reinforcement grid		[-]	E, normally flammable	EN 13501-1

nanical properties		Unit	Value	Standard
Characteristic short-term tensile strength related to	longitudinal	- [MDa]	1050	— ISO 10406-1
the nominal cross-sectional area	transversal	[IVIPa]	1050	130 10406-1
Young's modulus related to the nominal cross-	longitudinal	- [MDa]	94000	
section	transversal	- [IMPa]	94000	— ISO 10406-1
Mean short-time tensile strength related to the	longitudinal	- [MDa]	≥ 3480	— ISO 10406-1
fiber cross-sectional area	transversal	[IVIPa]	≥ 3480	130 10406-1
Characteristic short-term tensile strength	longitudinal	- [MDa]	≥ 2600	— ISO 10406-1
related to the fiber cross-sectional area	transversal	[IVIPa]	≥ 2600	
Mean Young's modulus related to the fiber	longitudinal	[1,40-1	≥ 235000	100 10 100 1
cross-sectional area	transversal	- [MPa] —	≥ 235000	— ISO 10406-1
Characteristic elongation at failure under tensile	longitudinal	[0/ ]	≥ 11,2	100 10 100 1
load of the non-metallic reinforcement	transversal	[%0]	≥ 11,2	— ISO 10406-1
Characteristic tensile force transmission of the non-	longitudinal	[  N   / ]	313	16.0 10.406 1
metallic reinforcement per m width	transversal	- [KIN/M] —	313	— ISO 10406-1
	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 elongation at failure under tensile load of the non-metallic reinforcement  Characteristic tensile force transmission of the non-	the nominal cross-sectional area transversal  Young's modulus related to the nominal cross- section transversal  Mean short-time tensile strength related to the longitudinal transversal  Characteristic short-term tensile strength longitudinal related to the fiber cross-sectional area transversal  Mean Young's modulus related to the fiber longitudinal cross-sectional area transversal  Characteristic elongation at failure under tensile longitudinal load of the non-metallic reinforcement transversal  Characteristic tensile force transmission of the non-longitudinal	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  Characteristic short-term tensile strength related to the fiber cross-sectional area  Transversal  [MPa]  [MPa]  [MPa]  [MPa]  [MPa]  [MPa]  Characteristic short-term tensile strength related to the fiber cross-sectional area  [MPa]  [	the nominal cross-sectional area transversal [MPa] 1050  Young's modulus related to the nominal cross-section transversal [MPa] 1050  Mean short-time tensile strength related to the fiber cross-sectional area transversal [MPa] 23480  Characteristic short-term tensile strength related to the fiber cross-sectional area transversal [MPa] 2600  Mean Young's modulus related to the fiber cross-sectional area transversal [MPa] 235000  Characteristic elongation at failure under tensile longitudinal transversal [MPa] 235000  Characteristic elongation at failure under tensile longitudinal transversal [%o] 211,2  Characteristic tensile force transmission of the non-longitudinal transversal 313

Furt	ther key values	Unit	Value	Standard
dg	Recommended maximum grain size in concrete	[mm]	16	-

Standard goods variety		Unit	Value	Tolerance
Single grid	Length	f 1	6,0	± 16 mm
	Width	- [m] —	2,30	± 12 mm
Single grid up to 3.0 m wide on request				

#### **Transport and storage**

<sup>&</sup>lt;sup>1)</sup> 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.



#### 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.

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## **Country-specific regulations**

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#### **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.

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

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# **solidian** GRID R24/95-CCE-76/38 (F01R01)

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



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

Geo	metry and structure		Unit	Value	Standard
	Directions of the fiber street	longitudinal	F01	0	
	Directions of the fiber strands	transversal	- [°]	90	
	Mean value of fiber strand width	longitudinal	[]	3,1	
φh	Mean value of fiber strand width	transversal	– [mm] —	5,5	
1	Many value of fiber strand beight	longitudinal		1,8	
φν	Mean value of fiber strand height	transversal	– [mm] —	3,1	
1	Nominal diameter	longitudinal		2,37	
φ <sub>nm</sub>	Nominal diameter	transversal	– [mm] <del>–</del>	3,35	
٨	Naminal grass sactional area par fiber strand	longitudinal		4,4	ICO 10406 1
A <sub>nm</sub>	Nominal cross-sectional area per fiber strand	transversal	– [mm²] –	8,8	— ISO 10406-1
	Naminal grass sactional area per mater	longitudinal		58	
a <sub>nm</sub>	Nominal cross-sectional area per meter	transversal	– [mm²/m] –	232	
٨	Fiber cross sectional area per fiber strand	longitudinal	– [mm²] –	1,81	
A <sub>f,nm</sub>	Fiber cross-sectional area per fiber strand	transversal		3,62	
	Fiber cross sectional area per meter	longitudinal	– [mm²/m] –	24	
a <sub>f,nm</sub>	Fiber cross-sectional area per meter	transversal	_ [uuu-\u] _	95	
_	Grid width	longitudinal		76	
S	Grid Width	transversal	– [mm] <del>–</del>	38	
_	Clear distance of the fiber strands	longitudinal		72,8	
Sı	Clear distance of the liber strands	transversal	– [mm] <del>–</del>	32,5	_
h <sub>G</sub>	Grid height (average value of the maximum height)		[mm]	3,0	-
g	Weight per unit area of the non-metallic reinforcement	ent	[g/m²]	381	-
Κü	Degree of coverage of the grid		[%]	18,0	-
r <sub>min</sub>	Minimum permissible radius of curvature		[mm]	350	-



Ma	terial 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 <sup>-6</sup> 1/K]	0,5	-
T <sub>g0</sub>	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

Mec	hanical properties		Unit	Value	Standard
t	Characteristic short-term tensile strength related to	longitudinal	- [MDo] -	1250	— ISO 10406-1
f <sub>nm,k</sub>	the nominal cross-sectional area	transversal	- [MPa] —	1200	130 10406-1
Г	Young's modulus related to the nominal cross-	longitudinal	- [MDo] -	99000	
E <sub>nm</sub>	section	transversal	- [MPa] —	97000	— ISO 10406-1
t	Mean short-time tensile strength related to the	longitudinal	- [MDo] -	≥ 4070	
† <sub>f,nm,m</sub>	fiber cross-sectional area	transversal	- [MPa] —	≥ 3910	— ISO 10406-1
t	Characteristic short-term tensile strength	longitudinal	- [MDo] -	≥ 3039	- ISO 10406-1
Ť <sub>f,nm,k</sub>	related to the fiber cross-sectional area	transversal	- [MPa] —	≥ 2917	130 10406-1
Г	Mean Young's modulus related to the fiber	longitudinal	- [MDo] -	≥ 247000	
E <sub>f,nm,m</sub>	cross-sectional area	transversal	- [MPa] —	≥ 243000	— ISO 10406-1
	Characteristic elongation at failure under tensile	longitudinal	FO/ 1	≥ 12,6	100 10 100 1
€ <sub>nm,uk</sub>	load of the non-metallic reinforcement	transversal	- [‰] —	≥ 12,4	— ISO 10406-1
	Characteristic tensile force transmission of the non-	longitudinal	[[.]] [/]	72	100 10400 1
F <sub>nm,k</sub>	metallic reinforcement per m width	transversal	- [kN/m] —	278	— ISO 10406-1

Fur	ther key values	Unit	Value	Standard
dg	Recommended maximum grain size in concrete 2)	[mm]	8	-

Standard goods variety		Unit	Value	Tolerance
Single grid	Length	[ma]	6,0	± 16 mm
	Width	- [m] -	2,30	± 12 mm
Roll in CARGO System CS <sup>3)</sup>	Length	[]	≤ 130,0	-
	Width	- [m] -	3,0	± 12 mm
D-III: - CADCO C -1 CC II CC C 3)	Length	F1	≤ 130,0	-
Roll in CARGO System CS-U or CS-S <sup>3)</sup>	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**

<sup>&</sup>lt;sup>1)</sup> 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.

 $<sup>^{2)}</sup>$  d<sub>q</sub> = 16 mm possible depending on the manufacturing process.

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

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#### **Processing information**

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## **Ecology and health protection**

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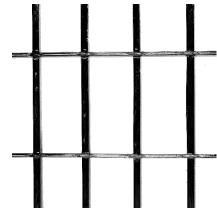






# **solidian** GRID R95/24-CCE-38/76 (F01R01)

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



Fiber material	C (Carbon)		
Impregnation agent	E (Epoxy resin)		
Color	black		11
Surface finish	smooth		
	XD3	Chlorides, except seawater	
Chemical resistance of the reinforcement in relation to the exposure classes in accordance with EN 206-1	XS3	Chlorides from seawater	
	XA3	Chemical attack	

Geometry and structure			Unit	Value	Standard
	Directions of the fiber street	longitudinal	[0]	0	
	Directions of the fiber strands	transversal	- [°]	90	
	Mean value of fiber strand width	longitudinal	[]	5,1	
φh	Mean value of fiber strand width	transversal	– [mm] –	3,8	_
1	Many value of fiber strand beight	longitudinal		3,1	
φν	Mean value of fiber strand height	transversal	– [mm] <del>–</del>	1,8	
1		longitudinal		3,35	
ф <sub>nm</sub>	Nominal diameter	transversal	– [mm] –	2,37	
٨		longitudinal		8,8	ICO 10406 1
A <sub>nm</sub>	Nominal cross-sectional area per fiber strand	transversal	– [mm²] –	4,4	— ISO 10406-1
	No reignal agrees another polymer and agree agree and agree and agree agree and agree agree and agree ag	longitudinal	[2/]	232	
a <sub>nm</sub>	Nominal cross-sectional area per meter	transversal	– [mm²/m] –	58	_
۸	File out out on a continue of out of the out of the out of	longitudinal	[2]	3,62	
A <sub>f,nm</sub>	Fiber cross-sectional area per fiber strand	transversal	– [mm²] –	1,81	_
		longitudinal	[2/]	95	
a <sub>f,nm</sub>	Fiber cross-sectional area per meter	transversal	– [mm²/m] –	24	_
	Grid width	longitudinal	[]	38	
S		transversal	– [mm] –	76	_
		longitudinal	[]	33,4	
Sı	Clear distance of the fiber strands	transversal	– [mm] <del>–</del>	72,8	
h <sub>G</sub>	Grid height (average value of the maximum height)		[mm]	3,3	-
g	Weight per unit area of the non-metallic reinforcement	ent	[g/m²]	350	-
Κü	Degree of coverage of the grid		[%]	17,4	-
r <sub>min</sub>	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 <sup>-6</sup> 1/K]	0,5	-
T <sub>g0</sub>	Glass transition temperature (DMA)		[°C]	≥ 110	DIN 65583
	Recommended operating temperature range		[°C]	-20 to +80	-
	Building material class components <sup>1)</sup>		[-]	A2, non-combustible	DIN 4102-1
	Building material class reinforcement grid		[-]	E, normally flammable	EN 13501-1

Mec	hanical properties		Unit	Value	Standard
	Characteristic short-term tensile strength related to the nominal cross-sectional area	longitudinal	[\ \ ( \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	1200	150 10406 1
f <sub>nm,k</sub>		transversal	- [MPa] —	1250	— ISO 10406-1
_	Young's modulus related to the nominal cross- section	longitudinal	[\ \ ( \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	97000	150 10406 1
E <sub>nm</sub>		transversal	- [MPa] —	99000	— ISO 10406-1
	Mean short-time tensile strength related to the fiber cross-sectional area	longitudinal	[\ \ ( \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	≥ 3910	- ISO 10406-1
† <sub>f,nm,m</sub>		transversal	- [MPa] —	≥ 4070	
t	Characteristic short-term tensile strength	longitudinal	- [MDo] -	≥ 2917	
Ť <sub>f,nm,k</sub>	related to the fiber cross-sectional area	transversal	- [MPa] —	≥ 3039	— ISO 10406-1
Г	Mean Young's modulus related to the fiber cross-sectional area	longitudinal	- [MDo] -	≥ 243000	— ISO 10406-1
E <sub>f,nm,m</sub>		transversal	- [MPa] —	≥ 247000	
	Characteristic elongation at failure under tensile	longitudinal	ΓO/ 1	≥ 12,4	— ISO 10406-1
€ <sub>nm,uk</sub>	load of the non-metallic reinforcement	transversal	- [‰] —	≥ 12,6	130 10400-1
Г	Characteristic tensile force transmission of the non- metallic reinforcement per m width	longitudinal	- [[,]]/po]	278	
F <sub>nm,k</sub>		transversal	- [kN/m] –	72	— ISO 10406-1
	<u> </u>				

Further key values		Unit	Value	Standard
dg	Recommended maximum grain size in concrete 2)	[mm]	8	-

Standard goods variety		Unit	Value	Tolerance
Single grid	Length	[]	6,0	± 16 mm
	Width	- [m] -	2,30	± 12 mm
Roll in CARGO System CS <sup>3)</sup>	Length	[ma]	≤ 130,0	-
	Width	- [m] -	3,0	± 12 mm
Roll in CARGO System CS-U or CS-S <sup>3)</sup>	Length	[ma]	≤ 130,0	-
	Width	- [m] -	2,30	± 12 mm
Roll	Length	[ma]	≤ 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**

<sup>&</sup>lt;sup>1)</sup> 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.

 $<sup>^{2)}</sup>$  d<sub>q</sub> = 16 mm possible depending on the manufacturing process.

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 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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