

# solidian GRID Q27-CCE-68 (F01R02)

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



### Material

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

### Geometry and structure

		Unit	Value	Standard
Directions of the fiber strands	longitudinal	[°]	0	-
	transversal		90	
$\phi_h$ Mean value of fiber strand width	longitudinal	[mm]	5,3	-
	transversal		3,9	
$\phi_v$ Mean value of fiber strand height	longitudinal	[mm]	1,4	-
	transversal		1,9	
$\phi_{nm}$ Nominal diameter	longitudinal	[mm]	2,37	-
	transversal		2,37	
$A_{nm}$ Nominal cross-sectional area per fiber strand	longitudinal	[mm <sup>2</sup> ]	4,4	ISO 10406-1
	transversal		4,4	
$a_{nm}$ Nominal cross-sectional area per meter	longitudinal	[mm <sup>2</sup> /m]	65	-
	transversal		65	
$A_{f,nm}$ Fiber cross-sectional area per fiber strand	longitudinal	[mm <sup>2</sup> ]	1,81	-
	transversal		1,81	
$a_{f,nm}$ Fiber cross-sectional area per meter	longitudinal	[mm <sup>2</sup> /m]	27	-
	transversal		27	
s Mesh spacing	longitudinal	[mm]	68	-
	transversal		68	
s <sub>I</sub> Clear spacing of the fiber strands	longitudinal	[mm]	64,1	-
	transversal		62,9	
$h_G$ Mesh height (average value of the maximum height)		[mm]	2,9	-
g Weight per unit area of the non-metallic reinforcement		[g/m <sup>2</sup> ]	183	-
$K_u$ Degree of coverage of the mesh		[%]	13,0	-
$r_{min}$ Minimum permissible radius of curvature		[mm]	350	-

**Material properties**

		Unit	Value	Standard
$\rho$	Bulk density of the fiber composite material	[g/cm <sup>3</sup> ]	1,30	ISO 1183-1
$\alpha$	Coefficient of thermal expansion	along the fiber [10 <sup>-6</sup> 1/K]	0,5	-
$T_{g0}$	Glass transition temperature (DMA)	[°C]	≥ 110	DIN 65583
	Recommended operating temperature range	[°C]	-20 to +80	-
	Building material class components <sup>1)</sup>	[-]	A2, non-combustible	DIN 4102-1
	Building material class reinforcement mesh	[-]	E, normally flammable	EN 13501-1

**Mechanical properties**

		Unit	Value	Standard
$f_{nm,k}$	Characteristic short-term tensile strength related to the nominal cross-sectional area	longitudinal	1150	ISO 10406-1
		transversal	1150	
$E_{nm}$	Young's modulus related to the nominal cross-section	longitudinal	94000	ISO 10406-1
		transversal	94000	
$f_{f,nm,m}$	Mean short-time tensile strength related to the fiber cross-sectional area	longitudinal	≥ 3880	ISO 10406-1
		transversal	≥ 3880	
$f_{f,nm,k}$	Characteristic short-term tensile strength related to the fiber cross-sectional area	longitudinal	≥ 2900	ISO 10406-1
		transversal	≥ 2900	
$E_{f,nm,m}$	Mean Young's modulus related to the fiber cross-sectional area	longitudinal	≥ 235000	ISO 10406-1
		transversal	≥ 235000	
$\epsilon_{nm,uk}$	Characteristic elongation at failure under tensile load of the non-metallic reinforcement	longitudinal	≥ 12,2	ISO 10406-1
		transversal	≥ 12,2	
$F_{nm,k}$	Characteristic tensile force transmission of the non-metallic reinforcement per m width	longitudinal	74	ISO 10406-1
		transversal	74	

**Further key values**

		Unit	Value	Standard
$d_g$	Recommended maximum grain size in concrete	[mm]	16	-

**Standard goods variety**

		Unit	Value	Tolerance
Single mesh	Length	[m]	6,0	± 16 mm
	Width		2,30	± 12 mm
Roll in CARGO SYSTEM	Length	[m]	≤ 130,0	-
	Width		2,30	± 12 mm
Roll	Length	[m]	≤ 250,0	-
	Width		3,0	± 12 mm

Single mesh up to 3.0 m wide on request. The maximum length of the mesh as a roll depends on the product type and the type of transport. Please enquire before ordering. Please specify the required length of the mesh as a roll when ordering.

The CARGO SYSTEM is a stacking and transport rack with unrolling device for our reinforcement mesh.

**Transport and storage**

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

<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 mesh.

## Measurement

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

## Tests

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

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

## Country-specific regulations

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

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

## Processing information

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

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

## Ecology and health protection

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

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

## Industrial safety and health

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

## Legal information

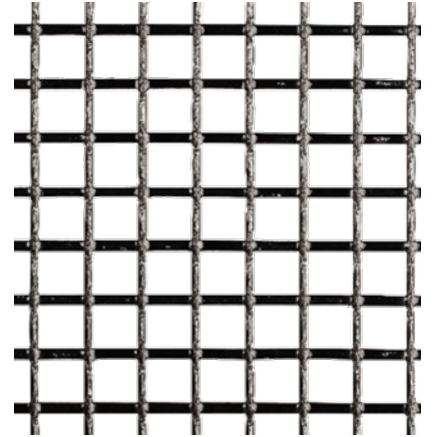
The above information is based on our knowledge and experience under normal circumstances, provided that the product has been transported, stored and used or processed properly and in accordance with the information in this product data sheet and the Technical Information for our solidian reinforcement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

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

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

# solidian GRID Q43-CCE-21 (F01R01)

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



## Material

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

## Geometry and structure

		Unit	Value	Standard
Directions of the fiber strands	longitudinal	[°]	0	-
	transversal		90	
$\phi_h$ Mean value of fiber strand width	longitudinal	[mm]	2,2	-
	transversal		3,0	
$\phi_v$ Mean value of fiber strand height	longitudinal	[mm]	1,4	-
	transversal		1,1	
$\phi_{nm}$ Nominal diameter	longitudinal	[mm]	1,67	-
	transversal		1,67	
$A_{nm}$ Nominal cross-sectional area per fiber strand	longitudinal	[mm <sup>2</sup> ]	2,2	ISO 10406-1
	transversal		2,2	
$a_{nm}$ Nominal cross-sectional area per meter	longitudinal	[mm <sup>2</sup> /m]	105	-
	transversal		105	
$A_{f,nm}$ Fiber cross-sectional area per fiber strand	longitudinal	[mm <sup>2</sup> ]	0,91	-
	transversal		0,91	
$a_{f,nm}$ Fiber cross-sectional area per meter	longitudinal	[mm <sup>2</sup> /m]	43	-
	transversal		43	
$s$ Mesh spacing	longitudinal	[mm]	21	-
	transversal		21	
$s_l$ Clear spacing of the fiber strands	longitudinal	[mm]	18,3	-
	transversal		19,1	
$h_G$ Mesh height (average value of the maximum height)		[mm]	2,2	-
$g$ Weight per unit area of the non-metallic reinforcement		[g/m <sup>2</sup> ]	280	-
$K_u$ Degree of coverage of the mesh		[%]	18,9	-
$r_{min}$ Minimum permissible radius of curvature		[mm]	350	-

**Material properties**

		Unit	Value	Standard
$\rho$	Bulk density of the fiber composite material	[g/cm <sup>3</sup> ]	1,30	ISO 1183-1
$\alpha$	Coefficient of thermal expansion	along the fiber [10 <sup>-6</sup> 1/K]	0,5	-
$T_{g0}$	Glass transition temperature (DMA)	[°C]	≥ 110	DIN 65583
	Recommended operating temperature range	[°C]	-20 to +80	-
	Building material class components <sup>1)</sup>	[-]	A2, non-combustible	DIN 4102-1
	Building material class reinforcement mesh	[-]	E, normally flammable	EN 13501-1

**Mechanical properties**

		Unit	Value	Standard
$f_{nm,k}$	Characteristic short-term tensile strength related to the nominal cross-sectional area	longitudinal	1300	ISO 10406-1
		transversal	1300	
$E_{nm}$	Young's modulus related to the nominal cross-section	longitudinal	94000	ISO 10406-1
		transversal	94000	
$f_{f,nm,m}$	Mean short-time tensile strength related to the fiber cross-sectional area	longitudinal	≥ 4290	ISO 10406-1
		transversal	≥ 4290	
$f_{f,nm,k}$	Characteristic short-term tensile strength related to the fiber cross-sectional area	longitudinal	≥ 3200	ISO 10406-1
		transversal	≥ 3200	
$E_{f,nm,m}$	Mean Young's modulus related to the fiber cross-sectional area	longitudinal	≥ 235000	ISO 10406-1
		transversal	≥ 235000	
$\epsilon_{nm,uk}$	Characteristic elongation at failure under tensile load of the non-metallic reinforcement	longitudinal	≥ 13,8	ISO 10406-1
		transversal	≥ 13,8	
$F_{nm,k}$	Characteristic tensile force transmission of the non-metallic reinforcement per m width	longitudinal	136	ISO 10406-1
		transversal	136	

**Further key values**

		Unit	Value	Standard
$d_g$	Recommended maximum grain size in concrete	[mm]	5	-

**Standard goods variety**

		Unit	Value	Tolerance
Single mesh	Length	[m]	6,0	± 16 mm
	Width		2,30	± 12 mm
Roll in CARGO SYSTEM	Length	[m]	≤ 130,0	-
	Width		2,30	± 12 mm
Roll	Length	[m]	≤ 250,0	-
	Width		3,0	± 12 mm

Single mesh up to 3.0 m wide on request. The maximum length of the mesh as a roll depends on the product type and the type of transport. Please enquire before ordering. Please specify the required length of the mesh as a roll when ordering.

The CARGO SYSTEM is a stacking and transport rack with unrolling device for our reinforcement mesh.

**Transport and storage**

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

<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 mesh.

<sup>2)</sup>  $d_g$  = 8 mm possible depending on the manufacturing process.

## 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.

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## 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

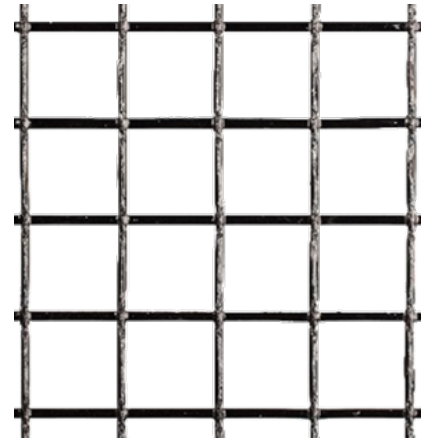
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Since non-metallic reinforcements are not yet regulated by building authorities in most countries, planners, specialist planners, building authorities, structural engineers, experts, etc. must be consulted for load-bearing components and country-specific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

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

# solidian GRID Q47-CCE-38 (F01R01)

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



### Material

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

### Geometry and structure

		Unit	Value	Standard
Directions of the fiber strands	longitudinal	[°]	0	-
	transversal		90	
$\phi_h$ Mean value of fiber strand width	longitudinal	[mm]	3,5	-
	transversal		4,2	
$\phi_v$ Mean value of fiber strand height	longitudinal	[mm]	1,9	-
	transversal		1,8	
$\phi_{nm}$ Nominal diameter	longitudinal	[mm]	2,37	-
	transversal		2,37	
$A_{nm}$ Nominal cross-sectional area per fiber strand	longitudinal	[mm <sup>2</sup> ]	4,4	ISO 10406-1
	transversal		4,4	
$a_{nm}$ Nominal cross-sectional area per meter	longitudinal	[mm <sup>2</sup> /m]	116	-
	transversal		116	
$A_{f,nm}$ Fiber cross-sectional area per fiber strand	longitudinal	[mm <sup>2</sup> ]	1,81	-
	transversal		1,81	
$a_{f,nm}$ Fiber cross-sectional area per meter	longitudinal	[mm <sup>2</sup> /m]	47	-
	transversal		47	
s Mesh spacing	longitudinal	[mm]	38	-
	transversal		38	
s <sub>I</sub> Clear spacing of the fiber strands	longitudinal	[mm]	34,2	-
	transversal		34,9	
h <sub>G</sub> Mesh height (average value of the maximum height)		[mm]	2,3	-
g Weight per unit area of the non-metallic reinforcement		[g/m <sup>2</sup> ]	309	-
K <sub>ü</sub> Degree of coverage of the mesh		[%]	18,9	-
r <sub>min</sub> Minimum permissible radius of curvature		[mm]	350	-

**Material properties**

		Unit	Value	Standard
$\rho$	Bulk density of the fiber composite material	[g/cm <sup>3</sup> ]	1,30	ISO 1183-1
$\alpha$	Coefficient of thermal expansion	along the fiber [10 <sup>-6</sup> 1/K]	0,5	-
$T_{g0}$	Glass transition temperature (DMA)	[°C]	≥ 110	DIN 65583
	Recommended operating temperature range	[°C]	-20 to +80	-
	Building material class components <sup>1)</sup>	[-]	A2, non-combustible	DIN 4102-1
	Building material class reinforcement mesh	[-]	E, normally flammable	EN 13501-1

**Mechanical properties**

		Unit	Value	Standard
$f_{nm,k}$	Characteristic short-term tensile strength related to the nominal cross-sectional area	longitudinal	1250	ISO 10406-1
		transversal	1250	
$E_{nm}$	Young's modulus related to the nominal cross-section	longitudinal	99000	ISO 10406-1
		transversal	99000	
$f_{f,nm,m}$	Mean short-time tensile strength related to the fiber cross-sectional area	longitudinal	≥ 4070	ISO 10406-1
		transversal	≥ 4070	
$f_{f,nm,k}$	Characteristic short-term tensile strength related to the fiber cross-sectional area	longitudinal	≥ 3039	ISO 10406-1
		transversal	≥ 3039	
$E_{f,nm,m}$	Mean Young's modulus related to the fiber cross-sectional area	longitudinal	≥ 247000	ISO 10406-1
		transversal	≥ 247000	
$\epsilon_{nm,uk}$	Characteristic elongation at failure under tensile load of the non-metallic reinforcement	longitudinal	≥ 12,6	ISO 10406-1
		transversal	≥ 12,6	
$F_{nm,k}$	Characteristic tensile force transmission of the non-metallic reinforcement per m width	longitudinal	145	ISO 10406-1
		transversal	145	

**Further key values**

		Unit	Value	Standard
$d_g$	Recommended maximum grain size in concrete <sup>2)</sup>	[mm]	8	-

**Standard goods variety**

		Unit	Value	Tolerance
Single mesh	Length	[m]	6,0	± 16 mm
	Width		2,30	± 12 mm
Roll in CARGO SYSTEM	Length	[m]	≤ 130,0	-
	Width		2,30	± 12 mm
Roll	Length	[m]	≤ 250,0	-
	Width		3,0	± 12 mm

Single mesh up to 3.0 m wide on request. The maximum length of the mesh as a roll depends on the product type and the type of transport. Please enquire before ordering. Please specify the required length of the mesh as a roll when ordering.

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**Transport and storage**

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<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 mesh.

<sup>2)</sup>  $d_g$  = 16 mm possible depending on the manufacturing process.



## 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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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

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

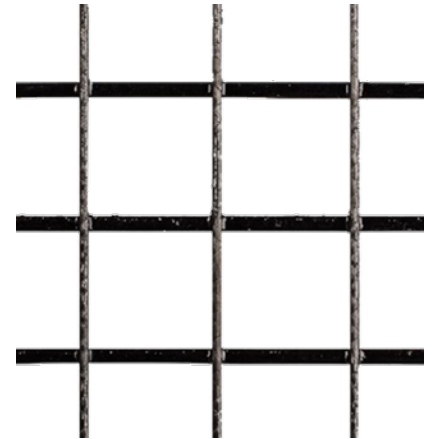
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We reserve the right to make changes to the product specifications. Third-party property rights must be observed. In all other respects, our respective terms and conditions of sale and delivery apply. The latest technical product data sheet at the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

# solidian GRID Q71-CCE-51 (F01R01)

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



### Material

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

### Geometry and structure

		Unit	Value	Standard
Directions of the fiber strands	longitudinal	[°]	0	-
	transversal		90	
$\phi_h$ Mean value of fiber strand width	longitudinal	[mm]	5,0	-
	transversal		5,8	
$\phi_v$ Mean value of fiber strand height	longitudinal	[mm]	2,7	-
	transversal		2,6	
$\phi_{nm}$ Nominal diameter	longitudinal	[mm]	3,35	-
	transversal		3,35	
$A_{nm}$ Nominal cross-sectional area per fiber strand	longitudinal	[mm <sup>2</sup> ]	8,8	ISO 10406-1
	transversal		8,8	
$a_{nm}$ Nominal cross-sectional area per meter	longitudinal	[mm <sup>2</sup> /m]	173	-
	transversal		173	
$A_{f,nm}$ Fiber cross-sectional area per fiber strand	longitudinal	[mm <sup>2</sup> ]	3,62	-
	transversal		3,62	
$a_{f,nm}$ Fiber cross-sectional area per meter	longitudinal	[mm <sup>2</sup> /m]	71	-
	transversal		71	
$s$ Mesh spacing	longitudinal	[mm]	51	-
	transversal		51	
$s_l$ Clear spacing of the fiber strands	longitudinal	[mm]	45,4	-
	transversal		46,2	
$h_G$ Mesh height (average value of the maximum height)		[mm]	3,5	-
$g$ Weight per unit area of the non-metallic reinforcement		[g/m <sup>2</sup> ]	454	-
$K_u$ Degree of coverage of the mesh		[%]	20,1	-
$r_{min}$ Minimum permissible radius of curvature		[mm]	350	-

**Material properties**

		Unit	Value	Standard
$\rho$	Bulk density of the fiber composite material	[g/cm <sup>3</sup> ]	1,30	ISO 1183-1
$\alpha$	Coefficient of thermal expansion	along the fiber [10 <sup>-6</sup> 1/K]	0,5	-
$T_{g0}$	Glass transition temperature (DMA)	[°C]	≥ 110	DIN 65583
	Recommended operating temperature range	[°C]	-20 to +80	-
	Building material class components <sup>1)</sup>	[-]	A2, non-combustible	DIN 4102-1
	Building material class reinforcement mesh	[-]	E, normally flammable	EN 13501-1

**Mechanical properties**

		Unit	Value	Standard
$f_{nm,k}$	Characteristic short-term tensile strength related to the nominal cross-sectional area	longitudinal	1200	ISO 10406-1
		transversal	1200	
$E_{nm}$	Young's modulus related to the nominal cross-section	longitudinal	97000	ISO 10406-1
		transversal	97000	
$f_{f,nm,m}$	Mean short-time tensile strength related to the fiber cross-sectional area	longitudinal	≥ 3910	ISO 10406-1
		transversal	≥ 3910	
$f_{f,nm,k}$	Characteristic short-term tensile strength related to the fiber cross-sectional area	longitudinal	≥ 2917	ISO 10406-1
		transversal	≥ 2917	
$E_{f,nm,m}$	Mean Young's modulus related to the fiber cross-sectional area	longitudinal	≥ 243000	ISO 10406-1
		transversal	≥ 243000	
$\epsilon_{nm,uk}$	Characteristic elongation at failure under tensile load of the non-metallic reinforcement	longitudinal	≥ 12,4	ISO 10406-1
		transversal	≥ 12,4	
$F_{nm,k}$	Characteristic tensile force transmission of the non-metallic reinforcement per m width	longitudinal	207	ISO 10406-1
		transversal	207	

**Further key values**

		Unit	Value	Standard
$d_g$	Recommended maximum grain size in concrete <sup>2)</sup>	[mm]	8	-

**Standard goods variety**

		Unit	Value	Tolerance
Single mesh	Length	[m]	6,0	± 16 mm
	Width		2,30	± 12 mm
Roll in CARGO SYSTEM	Length	[m]	≤ 130,0	-
	Width		2,30	± 12 mm
Roll	Length	[m]	≤ 250,0	-
	Width		3,0	± 12 mm

Single mesh up to 3.0 m wide on request. The maximum length of the mesh as a roll depends on the product type and the type of transport. Please enquire before ordering. Please specify the required length of the mesh as a roll when ordering.

The CARGO SYSTEM is a stacking and transport rack with unrolling device for our reinforcement mesh.

**Transport and storage**

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

<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 mesh.

<sup>2)</sup>  $d_g$  = 16 mm possible depending on the manufacturing process.

## Measurement

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

## Tests

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

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

## Country-specific regulations

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

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

## Processing information

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

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

## Ecology and health protection

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

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

## Industrial safety and health

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

## Legal information

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

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

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

# solidian GRID Q85-CCE-21 (F01R01)

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



### Material

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

### Geometry and structure

		Unit	Value	Standard
Directions of the fiber strands	longitudinal	[°]	0	-
	transversal		90	
$\phi_h$ Mean value of fiber strand width	longitudinal	[mm]	3,4	-
	transversal		4,2	
$\phi_v$ Mean value of fiber strand height	longitudinal	[mm]	1,8	-
	transversal		1,5	
$\phi_{nm}$ Nominal diameter	longitudinal	[mm]	2,37	-
	transversal		2,37	
$A_{nm}$ Nominal cross-sectional area per fiber strand	longitudinal	[mm <sup>2</sup> ]	4,4	ISO 10406-1
	transversal		4,4	
$a_{nm}$ Nominal cross-sectional area per meter	longitudinal	[mm <sup>2</sup> /m]	210	-
	transversal		210	
$A_{f,nm}$ Fiber cross-sectional area per fiber strand	longitudinal	[mm <sup>2</sup> ]	1,81	-
	transversal		1,81	
$a_{f,nm}$ Fiber cross-sectional area per meter	longitudinal	[mm <sup>2</sup> /m]	85	-
	transversal		85	
$s$ Mesh spacing	longitudinal	[mm]	21	-
	transversal		21	
$s_l$ Clear spacing of the fiber strands	longitudinal	[mm]	17,0	-
	transversal		18,0	
$h_G$ Mesh height (average value of the maximum height)		[mm]	2,1	-
$g$ Weight per unit area of the non-metallic reinforcement		[g/m <sup>2</sup> ]	512	-
$K_u$ Degree of coverage of the mesh		[%]	32,6	-
$r_{min}$ Minimum permissible radius of curvature		[mm]	350	-

**Material properties**

		Unit	Value	Standard
$\rho$	Bulk density of the fiber composite material	[g/cm <sup>3</sup> ]	1,30	ISO 1183-1
$\alpha$	Coefficient of thermal expansion	along the fiber [10 <sup>-6</sup> 1/K]	0,5	-
$T_{g0}$	Glass transition temperature (DMA)	[°C]	≥ 110	DIN 65583
	Recommended operating temperature range	[°C]	-20 to +80	-
	Building material class components <sup>1)</sup>	[-]	A2, non-combustible	DIN 4102-1
	Building material class reinforcement mesh	[-]	E, normally flammable	EN 13501-1

**Mechanical properties**

		Unit	Value	Standard
$f_{nm,k}$	Characteristic short-term tensile strength related to the nominal cross-sectional area	longitudinal	1250	ISO 10406-1
		transversal	1250	
$E_{nm}$	Young's modulus related to the nominal cross-section	longitudinal	99000	ISO 10406-1
		transversal	99000	
$f_{f,nm,m}$	Mean short-time tensile strength related to the fiber cross-sectional area	longitudinal	≥ 4070	ISO 10406-1
		transversal	≥ 4070	
$f_{f,nm,k}$	Characteristic short-term tensile strength related to the fiber cross-sectional area	longitudinal	≥ 3039	ISO 10406-1
		transversal	≥ 3039	
$E_{f,nm,m}$	Mean Young's modulus related to the fiber cross-sectional area	longitudinal	≥ 247000	ISO 10406-1
		transversal	≥ 247000	
$\epsilon_{nm,uk}$	Characteristic elongation at failure under tensile load of the non-metallic reinforcement	longitudinal	≥ 12,6	ISO 10406-1
		transversal	≥ 12,6	
$F_{nm,k}$	Characteristic tensile force transmission of the non-metallic reinforcement per m width	longitudinal	262	ISO 10406-1
		transversal	262	

**Further key values**

		Unit	Value	Standard
$d_g$	Recommended maximum grain size in concrete <sup>2)</sup>	[mm]	5	-

**Standard goods variety**

		Unit	Value	Tolerance
Single mesh	Length	[m]	6,0	± 16 mm
	Width		2,30	± 12 mm
Roll in CARGO SYSTEM	Length	[m]	≤ 130,0	-
	Width		2,30	± 12 mm
Roll	Length	[m]	≤ 250,0	-
	Width		3,0	± 12 mm

Single mesh up to 3.0 m wide on request. The maximum length of the mesh as a roll depends on the product type and the type of transport. Please enquire before ordering. Please specify the required length of the mesh as a roll when ordering.

The CARGO SYSTEM is a stacking and transport rack with unrolling device for our reinforcement mesh.

**Transport and storage**

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

<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 mesh.

<sup>2)</sup>  $d_g$  = 8 mm possible depending on the manufacturing process.

## 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.

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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

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

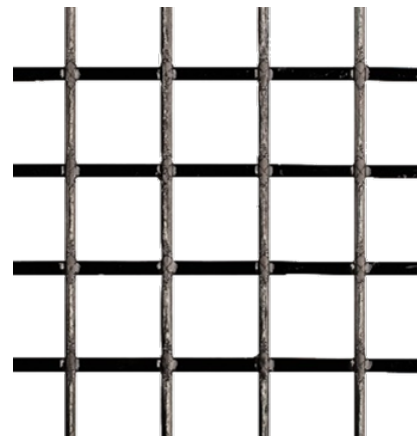
Since non-metallic reinforcements are not yet regulated by building authorities in most countries, planners, specialist planners, building authorities, structural engineers, experts, etc. must be consulted for load-bearing components and country-specific regulations must be observed.

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



# solidian GRID Q95-CCE-38 (F01R01)

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



### Material

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

### Geometry and structure

		Unit	Value	Standard
Directions of the fiber strands	longitudinal	[°]	0	-
	transversal		90	
$\phi_h$ Mean value of fiber strand width	longitudinal	[mm]	4,8	-
	transversal		5,5	
$\phi_v$ Mean value of fiber strand height	longitudinal	[mm]	2,6	-
	transversal		2,5	
$\phi_{nm}$ Nominal diameter	longitudinal	[mm]	3,35	-
	transversal		3,35	
$A_{nm}$ Nominal cross-sectional area per fiber strand	longitudinal	[mm <sup>2</sup> ]	8,8	ISO 10406-1
	transversal		8,8	
$a_{nm}$ Nominal cross-sectional area per meter	longitudinal	[mm <sup>2</sup> /m]	232	-
	transversal		232	
$A_{f,nm}$ Fiber cross-sectional area per fiber strand	longitudinal	[mm <sup>2</sup> ]	3,62	-
	transversal		3,62	
$a_{f,nm}$ Fiber cross-sectional area per meter	longitudinal	[mm <sup>2</sup> /m]	95	-
	transversal		95	
s Mesh spacing	longitudinal	[mm]	38	-
	transversal		38	
s <sub>I</sub> Clear spacing of the fiber strands	longitudinal	[mm]	32,8	-
	transversal		33,5	
h <sub>G</sub> Mesh height (average value of the maximum height)		[mm]	3,3	-
g Weight per unit area of the non-metallic reinforcement		[g/m <sup>2</sup> ]	559	-
K <sub>ü</sub> Degree of coverage of the mesh		[%]	25,2	-
r <sub>min</sub> Minimum permissible radius of curvature		[mm]	350	-



**Material properties**

		Unit	Value	Standard
$\rho$	Bulk density of the fiber composite material	[g/cm <sup>3</sup> ]	1,30	ISO 1183-1
$\alpha$	Coefficient of thermal expansion	along the fiber [10 <sup>-6</sup> 1/K]	0,5	-
$T_{g0}$	Glass transition temperature (DMA)	[°C]	≥ 110	DIN 65583
	Recommended operating temperature range	[°C]	-20 to +80	-
	Building material class components <sup>1)</sup>	[-]	A2, non-combustible	DIN 4102-1
	Building material class reinforcement mesh	[-]	E, normally flammable	EN 13501-1

**Mechanical properties**

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

**Further key values**

		Unit	Value	Standard
$d_g$	Recommended maximum grain size in concrete <sup>2)</sup>	[mm]	8	-

**Standard goods variety**

		Unit	Value	Tolerance
Single mesh	Length	[m]	6,0	± 16 mm
	Width		2,30	± 12 mm
Roll in CARGO SYSTEM	Length	[m]	≤ 130,0	-
	Width		2,30	± 12 mm
Roll	Length	[m]	≤ 250,0	-
	Width		3,0	± 12 mm

Single mesh up to 3.0 m wide on request. The maximum length of the mesh as a roll depends on the product type and the type of transport. Please enquire before ordering. Please specify the required length of the mesh as a roll when ordering.

The CARGO SYSTEM is a stacking and transport rack with unrolling device for our reinforcement mesh.

**Transport and storage**

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

<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 mesh.

<sup>2)</sup>  $d_g$  = 16 mm possible depending on the manufacturing process.

## 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.

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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

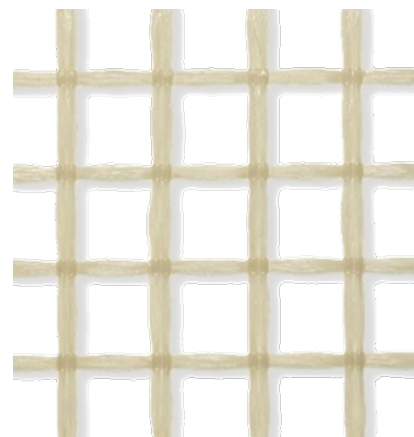
The above information is based on our knowledge and experience under normal circumstances, provided that the product has been transported, stored and used or processed properly and in accordance with the information in this product data sheet and the Technical Information for our solidian reinforcement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

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

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

# solidian GRID Q121-RRE-38 (F02R01)

Symmetrical, bidirectional reinforcement mesh (type Q) made of alkali-resistant glass fiber reinforced polymer (GFRP) for the reinforcement of concrete components



### Material

Fiber material	R (ECR glass)
Impregnation material	E (Epoxy resin)
Color	yellowish
Surface finish	smooth

### Geometry and structure

		Unit	Value	Standard
Directions of the fiber strands	longitudinal	[°]	0	-
	transversal		90	
$\phi_h$ Mean value of fiber strand width	longitudinal	[mm]	5,7	-
	transversal		7,7	
$\phi_v$ Mean value of fiber strand height	longitudinal	[mm]	3,2	-
	transversal		2,4	
$\phi_{nm}$ Nominal diameter	longitudinal	[mm]	3,57	-
	transversal		3,57	
$A_{nm}$ Nominal cross-sectional area per fiber strand	longitudinal	[mm <sup>2</sup> ]	10,0	ISO 10406-1
	transversal		10,0	
$a_{nm}$ Nominal cross-sectional area per meter	longitudinal	[mm <sup>2</sup> /m]	263	-
	transversal		263	
$A_{f,nm}$ Fiber cross-sectional area per fiber strand	longitudinal	[mm <sup>2</sup> ]	4,62	-
	transversal		4,62	
$a_{f,nm}$ Fiber cross-sectional area per meter	longitudinal	[mm <sup>2</sup> /m]	121	-
	transversal		121	
$s$ Mesh spacing	longitudinal	[mm]	38	-
	transversal		38	
$s_l$ Clear spacing of the fiber strands	longitudinal	[mm]	30,7	-
	transversal		33,1	
$h_G$ Mesh height (average value of the maximum height)		[mm]	5,3	-
$g$ Weight per unit area of the non-metallic reinforcement		[g/m <sup>2</sup> ]	901	-
$\kappa_u$ Degree of coverage of the mesh		[%]	31,8	-
$r_{min}$ Minimum permissible radius of curvature		[mm]	300	-

### Material properties

		Unit	Value	Standard
$\rho$	Bulk density of the fiber composite material	[g/cm <sup>3</sup> ]	1,68	ISO 1183-1
$\alpha$	Coefficient of thermal expansion	along the fiber [10 <sup>-6</sup> 1/K]	6,0	-
$T_{g0}$	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 mesh	[-]	E, normally flammable	EN 13501-1

**Mechanical properties**

			Unit	Value	Standard
$f_{nm,k}$	Characteristic short-term tensile strength related to the nominal cross-sectional area	longitudinal	[MPa]	550	ISO 10406-1
		transversal		550	
$E_{nm}$	Young's modulus related to the nominal cross-section	longitudinal	[MPa]	33000	ISO 10406-1
		transversal		33000	
$f_{f,nm,m}$	Mean short-time tensile strength related to the fiber cross-sectional area	longitudinal	[MPa]	$\geq 1600$	ISO 10406-1
		transversal		$\geq 1600$	
$f_{f,nm,k}$	Characteristic short-term tensile strength related to the fiber cross-sectional area	longitudinal	[MPa]	$\geq 1200$	ISO 10406-1
		transversal		$\geq 1200$	
$E_{f,nm,m}$	Mean Young's modulus related to the fiber cross-sectional area	longitudinal	[MPa]	$\geq 78000$	ISO 10406-1
		transversal		$\geq 78000$	
$\epsilon_{nm,uk}$	Characteristic elongation at failure under tensile load of the non-metallic reinforcement	longitudinal	[%]	$\geq 16,7$	ISO 10406-1
		transversal		$\geq 16,7$	
$F_{nm,k}$	Characteristic tensile force transmission of the non-metallic reinforcement per m width	longitudinal	[kN/m]	145	ISO 10406-1
		transversal		145	

**Further key values**

		Unit	Value	Standard
$d_g$	Recommended maximum grain size in concrete <sup>2)</sup>	[mm]	8	-

**Standard goods variety**

		Unit	Value	Tolerance
Single mesh	Length	[m]	6,0	$\pm 16$ mm
	Width		2,30	$\pm 12$ mm
Roll in CARGO SYSTEM	Length	[m]	$\leq 130,0$	-
	Width		2,30	$\pm 12$ mm
Roll	Length	[m]	$\leq 250,0$	-
	Width		3,0	$\pm 12$ mm

Single mesh up to 3.0 m wide on request. The maximum length of the mesh as a roll depends on the product type and the type of transport. Please enquire before ordering. Please specify the required length of the mesh as a roll when ordering.

The CARGO SYSTEM is a stacking and transport rack with unrolling device for our reinforcement mesh.

**Transport and storage**

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

<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 mesh.

<sup>2)</sup>  $d_g = 16$  mm possible depending on the manufacturing process.

## Measurement

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

## Tests

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

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

## Country-specific regulations

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

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

## Processing information

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

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

## Ecology and health protection

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

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

## Industrial safety and health

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

## Legal information

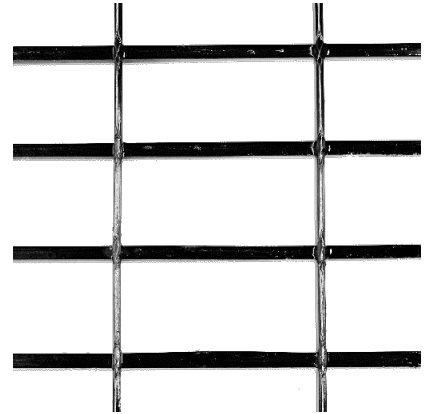
The above information is based on our knowledge and experience under normal circumstances, provided that the product has been transported, stored and used or processed properly and in accordance with the information in this product data sheet and the Technical Information for our solidian reinforcement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

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

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

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

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



### Material

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

### Geometry and structure

		Unit	Value	Standard
Directions of the fiber strands	longitudinal	[°]	0	-
	transversal		90	
$\phi_h$ Mean value of fiber strand width	longitudinal	[mm]	3,1	-
	transversal		5,5	
$\phi_v$ Mean value of fiber strand height	longitudinal	[mm]	1,8	-
	transversal		3,1	
$\phi_{nm}$ Nominal diameter	longitudinal	[mm]	2,37	-
	transversal		3,35	
$A_{nm}$ Nominal cross-sectional area per fiber strand	longitudinal	[mm <sup>2</sup> ]	4,4	ISO 10406-1
	transversal		8,8	
$a_{nm}$ Nominal cross-sectional area per meter	longitudinal	[mm <sup>2</sup> /m]	58	-
	transversal		232	
$A_{f,nm}$ Fiber cross-sectional area per fiber strand	longitudinal	[mm <sup>2</sup> ]	1,81	-
	transversal		3,62	
$a_{f,nm}$ Fiber cross-sectional area per meter	longitudinal	[mm <sup>2</sup> /m]	24	-
	transversal		95	
s Mesh spacing	longitudinal	[mm]	76	-
	transversal		38	
s <sub>I</sub> Clear spacing of the fiber strands	longitudinal	[mm]	72,8	-
	transversal		32,5	
h <sub>G</sub> Mesh height (average value of the maximum height)		[mm]	3,0	-
g Weight per unit area of the non-metallic reinforcement		[g/m <sup>2</sup> ]	381	-
K <sub>ü</sub> Degree of coverage of the mesh		[%]	18,0	-
r <sub>min</sub> Minimum permissible radius of curvature		[mm]	350	-

**Material properties**

		Unit	Value	Standard
$\rho$	Bulk density of the fiber composite material	[g/cm <sup>3</sup> ]	1,30	ISO 1183-1
$\alpha$	Coefficient of thermal expansion	along the fiber [10 <sup>-6</sup> 1/K]	0,5	-
$T_{g0}$	Glass transition temperature (DMA)	[°C]	≥ 110	DIN 65583
	Recommended operating temperature range	[°C]	-20 to +80	-
	Building material class components <sup>1)</sup>	[-]	A2, non-combustible	DIN 4102-1
	Building material class reinforcement mesh	[-]	E, normally flammable	EN 13501-1

**Mechanical properties**

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

**Further key values**

		Unit	Value	Standard
$d_g$	Recommended maximum grain size in concrete <sup>2)</sup>	[mm]	8	-

**Standard goods variety**

		Unit	Value	Tolerance
Single mesh	Length	[m]	6,0	± 16 mm
	Width		2,30	± 12 mm
Roll in CARGO SYSTEM	Length	[m]	≤ 130,0	-
	Width		2,30	± 12 mm
Roll	Length	[m]	≤ 250,0	-
	Width		3,0	± 12 mm

Single mesh up to 3.0 m wide on request. The maximum length of the mesh as a roll depends on the product type and the type of transport. Please enquire before ordering. Please specify the required length of the mesh as a roll when ordering.

The CARGO SYSTEM is a stacking and transport rack with unrolling device for our reinforcement mesh.

**Transport and storage**

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

<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 mesh.

<sup>2)</sup>  $d_g$  = 16 mm possible depending on the manufacturing process.



## 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

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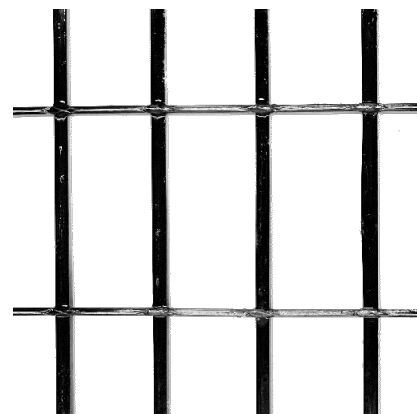
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# solidian GRID R95/24-CCE-38/76 (F01R01)

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



## Material

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

## Geometry and structure

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

**Material properties**

		Unit	Value	Standard
$\rho$	Bulk density of the fiber composite material	[g/cm <sup>3</sup> ]	1,30	ISO 1183-1
$\alpha$	Coefficient of thermal expansion	along the fiber [10 <sup>-6</sup> 1/K]	0,5	-
$T_{g0}$	Glass transition temperature (DMA)	[°C]	≥ 110	DIN 65583
	Recommended operating temperature range	[°C]	-20 to +80	-
	Building material class components <sup>1)</sup>	[-]	A2, non-combustible	DIN 4102-1
	Building material class reinforcement mesh	[-]	E, normally flammable	EN 13501-1

**Mechanical properties**

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

**Further key values**

		Unit	Value	Standard
$d_g$	Recommended maximum grain size in concrete <sup>2)</sup>	[mm]	8	-

**Standard goods variety**

		Unit	Value	Tolerance
Single mesh	Length	[m]	6,0	± 16 mm
	Width		2,30	± 12 mm
Roll in CARGO SYSTEM	Length	[m]	≤ 130,0	-
	Width		2,30	± 12 mm
Roll	Length	[m]	≤ 250,0	-
	Width		3,0	± 12 mm

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