solidian REBAR D4-RRE

Unidirectional reinforcement bar made of
media-resistant glass fiber reinforced plastic

Material

Shape	Profiled round bar
Surface structure	Additive profiling
Geometry of profiling	Rib
Fiber material core	R (ECR-glass)
Impregnant material	E (epoxy resin)
Color	greenish

Geometry and structure

	Unit	Value	Tolerance	Standard
Nominal diameter	[mm]	4,0	-	-
Outer diameter	[mm]	5,0	± 0,5 mm	-
Static cross-sectional area	[mm²]	12,57	-	-
Weight per meter	[g/m]	32,2	± 4 %	-
Fiber volume content	[%]	≥ 67	-	-

Material properties

		Unit	Value	Tolerance	Standard
Bulk density of the fiber composite material		[g/cm³]	2,16	2,14 - 2,18	ISO 1183-1
Coefficient of thermal expansion	longitudinal	[10⁻⁶/K]	ca. 6,1	-	-
	transversal		ca. 19,5	-	
Coefficient of thermal conductivity	longitudinal	[W/(m·K)]	ca. 0,8	-	-
	transversal		ca. 0,5	-	
Glass transition temperature (DSC)		[°C]	≥ 110	-	DIN EN ISO 11357-2
Residual strength rate (alkali resistance)		[%]	≥ 70	-	ISO 10406-1
Building material class		[-]	E	-	EN 13501-1

Mechanical properties

		Unit	Value	Tolerance	Standard
Average short-time tensile strength regarding to nominal cross-sectional area		[N/mm²]	≥ 1350	-	ISO 10406-1
Characteristic short-time tensile strength regarding to nominal cross-sectional area		[N/mm²]	≥ 1100	-	ISO 10406-1
Average modulus of elasticity regarding to nominal cross-sectional area		[N/mm²]	≥ 60000	-	ISO 10406-1
Characteristic elongation at break		[%]	≥ 1,83	-	ISO 10406-1
Average shear strength	longitudinal	[N/mm²]	-		ASTM D4475-02
	transversal	[N/mm²]	≥ 250	-	ISO 10406-1
Characteristic short-term bond strength	for ≥ C20/25	[N/mm²]	-	-	RILEM RC6
Characteristic value of mean bond stress for w_k = 0,15 mm	for ≥ C20/25	[N/mm²]	-	-	RILEM RC6
Characteristic resisting force		[kN]	13,8	-	ISO 10406-1

Further characteristic values

	Unit	Value	Tolerance
Cross-sectional force transmission at w_k = 0,1 mm at 20°C for C50/60	[N/mm²]	-	-

Delivery forms

		Unit	Value	Tolerance
Bar (standard)	Length	[m]	6,0	-
Bar (maximum length)	Length	[m]	12,0	-

Storage conditions

Protect from weather conditions, especially from direct sunlight.

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.

Country-specific regulations

The use of the product is governed by the respective national regulations at the place of use, in Germany for example the building codes 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, although adjustments must be made for fiber composite plastic reinforcements if applicable standards, guidelines, etc. for fiber composite plastic reinforcements are not available. Accordingly, the respective national standards and regulations must be taken into account in the design.

Processing information

All work must be carried out by trained/instructed personnel only. 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, in particular with regard to tensile strength, only apply if the product is used as intended.
For further information, please refer to the current Technical Information for our solidian REBAR reinforcement bars (www.solidian.com/downloads).

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

Protective measures must be observed during all work with cutting equipment, such as wearing cut-resistant gloves, safety goggles and a dust mask. The actual handling of fiber composites should be based on the Technical Rules for Hazardous Substances (TRGS) of the German Federal Institute for Occupational Safety and Health (baua). Furthermore, we refer to the DGUV information "Machining of CFRP materials - Guidance for protective measures" (FB-HM 074, issue 10/2014).

Legal information

The above information is based on our knowledge and experience under normal conditions, provided that the product has been transported, stored, used and processed properly and in accordance with the specifications in this Product Data Sheet and the Technical Information for our solidian REBAR reinforcement bars. 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 (e.g. approvals in individual cases).
We reserve the right to make changes to the product specifications. Third-party industrial property rights must be observed. In all other respects, our respective terms and conditions of sale and delivery shall apply. The latest technical product data sheet at the time of purchase of our products shall apply.

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solidian REBAR D6-RRE

Unidirectional reinforcement bar made of
media-resistant glass fiber reinforced plastic

Material

Shape	Profiled round bar
Surface structure	Additive profiling
Geometry of profiling	Rib
Fiber material core	R (ECR-glass)
Impregnant material	E (epoxy resin)
Color	greenish

Geometry and structure

	Unit	Value	Tolerance	Standard
Nominal diameter	[mm]	6,0	-	-
Outer diameter	[mm]	7,0	± 0,5 mm	-
Static cross-sectional area	[mm²]	28,27	-	-
Weight per meter	[g/m]	66,0	± 3 %	-
Fiber volume content	[%]	≥ 67	-	-

Material properties

		Unit	Value	Tolerance	Standard
Bulk density of the fiber composite material		[g/cm³]	2,16	2,14 - 2,18	ISO 1183-1
Coefficient of thermal expansion	longitudinal	[10⁻⁶/K]	ca. 6,1	-	-
	transversal		ca. 19,5	-	
Coefficient of thermal conductivity	longitudinal	[W/(m·K)]	ca. 0,8	-	-
	transversal		ca. 0,5	-	
Glass transition temperature (DSC)		[°C]	≥ 110	-	DIN EN ISO 11357-2
Residual strength rate (alkali resistance)		[%]	≥ 75	-	ISO 10406-1
Building material class		[-]	E	-	EN 13501-1

Mechanical properties

		Unit	Value	Tolerance	Standard
Average short-time tensile strength regarding to nominal cross-sectional area		[N/mm²]	≥ 1350	-	ISO 10406-1
Characteristic short-time tensile strength regarding to nominal cross-sectional area		[N/mm²]	≥ 1100	-	ISO 10406-1
Average modulus of elasticity regarding to nominal cross-sectional area		[N/mm²]	≥ 60000	-	ISO 10406-1
Characteristic elongation at break		[%]	≥ 1,83	-	ISO 10406-1
Average shear strength	longitudinal	[N/mm²]	≥ 50		ASTM D4475-02
	transversal	[N/mm²]	≥ 195	-	ISO 10406-1
Characteristic short-term bond strength	for ≥ C20/25	[N/mm²]	-	-	RILEM RC6
Characteristic value of mean bond stress for w_k = 0,15 mm	for ≥ C20/25	[N/mm²]	-	-	RILEM RC6
Characteristic resisting force		[kN]	31,1	-	ISO 10406-1

Further characteristic values

	Unit	Value	Tolerance
Cross-sectional force transmission at w_k = 0,1 mm at 20°C for C50/60	[N/mm²]	-	-

Delivery forms

		Unit	Value	Tolerance
Bar (standard)	Length	[m]	6,0	-
Bar (maximum length)	Length	[m]	12,0	-

Storage conditions

Protect from weather conditions, especially from direct sunlight.

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.

Country-specific regulations

The use of the product is governed by the respective national regulations at the place of use, in Germany for example the building codes 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, although adjustments must be made for fiber composite plastic reinforcements if applicable standards, guidelines, etc. for fiber composite plastic reinforcements are not available. Accordingly, the respective national standards and regulations must be taken into account in the design.

Processing information

All work must be carried out by trained/instructed personnel only. 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, in particular with regard to tensile strength, only apply if the product is used as intended.
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Ecology and health protection

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solidian REBAR D8-RRE

Unidirectional reinforcement bar made of
media-resistant glass fiber reinforced plastic

Material

Shape	Profiled round bar
Surface structure	Additive profiling
Geometry of profiling	Rib
Fiber material core	R (ECR-glass)
Impregnant material	E (epoxy resin)
Color	greenish

Geometry and structure

	Unit	Value	Tolerance	Standard
Nominal diameter	[mm]	8,0	-	-
Outer diameter	[mm]	9,5	± 0,5 mm	-
Static cross-sectional area	[mm²]	50,27	-	-
Weight per meter	[g/m]	119	± 2 %	-
Fiber volume content	[%]	≥ 67	-	-

Material properties

		Unit	Value	Tolerance	Standard
Bulk density of the fiber composite material		[g/cm³]	2,16	2,14 - 2,18	ISO 1183-1
Coefficient of thermal expansion	longitudinal	[10⁻⁶/K]	ca. 6,1	-	-
	transversal		ca. 19,5	-	
Coefficient of thermal conductivity	longitudinal	[W/(m·K)]	ca. 0,8	-	-
	transversal		ca. 0,5	-	
Glass transition temperature (DSC)		[°C]	≥ 110	-	DIN EN ISO 11357-2
Residual strength rate (alkali resistance)		[%]	≥ 80	-	ISO 10406-1
Building material class		[-]	E	-	EN 13501-1

Mechanical properties

		Unit	Value	Tolerance	Standard
Average short-time tensile strength regarding to nominal cross-sectional area		[N/mm²]	≥ 1350	-	ISO 10406-1
Characteristic short-time tensile strength regarding to nominal cross-sectional area		[N/mm²]	≥ 1100	-	ISO 10406-1
Average modulus of elasticity regarding to nominal cross-sectional area		[N/mm²]	≥ 60000	-	ISO 10406-1
Characteristic elongation at break		[%]	≥ 1,83	-	ISO 10406-1
Average shear strength	longitudinal	[N/mm²]	≥ 50		ASTM D4475-02
	transversal	[N/mm²]	≥ 185	-	ISO 10406-1
Characteristic short-term bond strength	for ≥ C20/25	[N/mm²]	≥ 9	-	RILEM RC6
Characteristic value of mean bond stress for w_k = 0,15 mm	for ≥ C20/25	[N/mm²]	≥ 6	-	RILEM RC6
Characteristic resisting force		[kN]	55,3	-	ISO 10406-1

Further characteristic values

	Unit	Value	Tolerance
Cross-sectional force transmission at w_k = 0,1 mm at 20°C for C50/60	[N/mm²]	-	-

Delivery forms

		Unit	Value	Tolerance
Bar (standard)	Length	[m]	6,0	-
Bar (maximum length)	Length	[m]	12,0	-

Storage conditions

Protect from weather conditions, especially from direct sunlight.

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.

Country-specific regulations

The use of the product is governed by the respective national regulations at the place of use, in Germany for example the building codes 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, although adjustments must be made for fiber composite plastic reinforcements if applicable standards, guidelines, etc. for fiber composite plastic reinforcements are not available. Accordingly, the respective national standards and regulations must be taken into account in the design.

Processing information

All work must be carried out by trained/instructed personnel only. 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, in particular with regard to tensile strength, only apply if the product is used as intended.
For further information, please refer to the current Technical Information for our solidian REBAR reinforcement bars (www.solidian.com/downloads).

Ecology and health protection

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Industrial safety and health

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solidian REBAR D10-RRE

Unidirectional reinforcement bar made of
media-resistant glass fiber reinforced plastic

Material

Shape	Profiled round bar
Surface structure	Additive profiling
Geometry of profiling	Rib
Fiber material core	R (ECR-glass)
Impregnant material	E (epoxy resin)
Color	greenish

Geometry and structure

	Unit	Value	Tolerance	Standard
Nominal diameter	[mm]	10,0	-	-
Outer diameter	[mm]	11,5	± 0,5 mm	-
Static cross-sectional area	[mm²]	78,54	-	-
Weight per meter	[g/m]	177	± 2 %	-
Fiber volume content	[%]	≥ 67	-	-

Material properties

		Unit	Value	Tolerance	Standard
Bulk density of the fiber composite material		[g/cm³]	2,14	2,12 - 2,16	ISO 1183-1
Coefficient of thermal expansion	longitudinal	[10⁻⁶/K]	ca. 6,1	-	-
	transversal		ca. 19,5	-	
Coefficient of thermal conductivity	longitudinal	[W/(m·K)]	ca. 0,8	-	-
	transversal		ca. 0,5	-	
Glass transition temperature (DSC)		[°C]	≥ 110	-	DIN EN ISO 11357-2
Residual strength rate (alkali resistance)		[%]	≥ 80	-	ISO 10406-1
Building material class		[-]	E	-	EN 13501-1

Mechanical properties

		Unit	Value	Tolerance	Standard
Average short-time tensile strength regarding to nominal cross-sectional area		[N/mm²]	≥ 1200	-	ISO 10406-1
Characteristic short-time tensile strength regarding to nominal cross-sectional area		[N/mm²]	≥ 1050	-	ISO 10406-1
Average modulus of elasticity regarding to nominal cross-sectional area		[N/mm²]	≥ 55000	-	ISO 10406-1
Characteristic elongation at break		[%]	≥ 1,91	-	ISO 10406-1
Average shear strength	longitudinal	[N/mm²]	≥ 50		ASTM D4475-02
	transversal	[N/mm²]	≥ 180	-	ISO 10406-1
Characteristic short-term bond strength	for ≥ C20/25	[N/mm²]	≥ 9	-	RILEM RC6
Characteristic value of mean bond stress for w_k = 0,15 mm	for ≥ C20/25	[N/mm²]	≥ 6	-	RILEM RC6
Characteristic resisting force		[kN]	82,5	-	ISO 10406-1

Further characteristic values

	Unit	Value	Tolerance
Cross-sectional force transmission at w_k = 0,1 mm at 20°C for C50/60	[N/mm²]	ca. 100	-

Delivery forms

		Unit	Value	Tolerance
Bar (standard)	Length	[m]	6,0	-
Bar (maximum length)	Length	[m]	12,0	-

Storage conditions

Protect from weather conditions, especially from direct sunlight.

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.

Country-specific regulations

The use of the product is governed by the respective national regulations at the place of use, in Germany for example the building codes 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, although adjustments must be made for fiber composite plastic reinforcements if applicable standards, guidelines, etc. for fiber composite plastic reinforcements are not available. Accordingly, the respective national standards and regulations must be taken into account in the design.

Processing information

All work must be carried out by trained/instructed personnel only. 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, in particular with regard to tensile strength, only apply if the product is used as intended.
For further information, please refer to the current Technical Information for our solidian REBAR reinforcement bars (www.solidian.com/downloads).

Ecology and health protection

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Industrial safety and health

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Legal information

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solidian REBAR D12-RRE

Unidirectional reinforcement bar made of
media-resistant glass fiber reinforced plastic

Material

Shape	Profiled round bar
Surface structure	Additive profiling
Geometry of profiling	Rib
Fiber material core	R (ECR-glass)
Impregnant material	E (epoxy resin)
Color	greenish

Geometry and structure

	Unit	Value	Tolerance	Standard
Nominal diameter	[mm]	12,0	-	-
Outer diameter	[mm]	13,5	± 0,5 mm	-
Static cross-sectional area	[mm²]	113,10	-	-
Weight per meter	[g/m]	257	± 2 %	-
Fiber volume content	[%]	≥ 67	-	-

Material properties

		Unit	Value	Tolerance	Standard
Bulk density of the fiber composite material		[g/cm³]	2,14	2,12 - 2,16	ISO 1183-1
Coefficient of thermal expansion	longitudinal	[10⁻⁶/K]	ca. 6,1	-	-
	transversal		ca. 19,5	-	
Coefficient of thermal conductivity	longitudinal	[W/(m·K)]	ca. 0,8	-	-
	transversal		ca. 0,5	-	
Glass transition temperature (DSC)		[°C]	≥ 110	-	DIN EN ISO 11357-2
Residual strength rate (alkali resistance)		[%]	≥ 80	-	ISO 10406-1
Building material class		[-]	E	-	EN 13501-1

Mechanical properties

		Unit	Value	Tolerance	Standard
Average short-time tensile strength regarding to nominal cross-sectional area		[N/mm²]	≥ 1200	-	ISO 10406-1
Characteristic short-time tensile strength regarding to nominal cross-sectional area		[N/mm²]	≥ 1050	-	ISO 10406-1
Average modulus of elasticity regarding to nominal cross-sectional area		[N/mm²]	≥ 55000	-	ISO 10406-1
Characteristic elongation at break		[%]	≥ 1,91	-	ISO 10406-1
Average shear strength	longitudinal	[N/mm²]	≥ 47		ASTM D4475-02
	transversal	[N/mm²]	≥ 170	-	ISO 10406-1
Characteristic short-term bond strength	for ≥ C20/25	[N/mm²]	≥ 9	-	RILEM RC6
Characteristic value of mean bond stress for w_k = 0,15 mm	for ≥ C20/25	[N/mm²]	≥ 6	-	RILEM RC6
Characteristic resisting force		[kN]	118,8	-	ISO 10406-1

Further characteristic values

	Unit	Value	Tolerance
Cross-sectional force transmission at w_k = 0,1 mm at 20°C for C50/60	[N/mm²]	ca. 90	-

Delivery forms

		Unit	Value	Tolerance
Bar (standard)	Length	[m]	6,0	-
Bar (maximum length)	Length	[m]	12,0	-

Storage conditions

Protect from weather conditions, especially from direct sunlight.

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.

Country-specific regulations

The use of the product is governed by the respective national regulations at the place of use, in Germany for example the building codes 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, although adjustments must be made for fiber composite plastic reinforcements if applicable standards, guidelines, etc. for fiber composite plastic reinforcements are not available. Accordingly, the respective national standards and regulations must be taken into account in the design.

Processing information

All work must be carried out by trained/instructed personnel only. 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, in particular with regard to tensile strength, only apply if the product is used as intended.
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Ecology and health protection

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Legal information

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solidian REBAR D14-RRE

Unidirectional reinforcement bar made of
media-resistant glass fiber reinforced plastic

Material

Shape	Profiled round bar
Surface structure	Additive profiling
Geometry of profiling	Rib
Fiber material core	R (ECR-glass)
Impregnant material	E (epoxy resin)
Color	greenish

Geometry and structure

	Unit	Value	Tolerance	Standard
Nominal diameter	[mm]	14,0	-	-
Outer diameter	[mm]	16,2	± 0,5 mm	-
Static cross-sectional area	[mm²]	153,94	-	-
Weight per meter	[g/m]	362	± 2 %	-
Fiber volume content	[%]	≥ 67	-	-

Material properties

		Unit	Value	Tolerance	Standard
Bulk density of the fiber composite material		[g/cm³]	2,14	2,12 - 2,16	ISO 1183-1
Coefficient of thermal expansion	longitudinal	[10⁻⁶/K]	ca. 6,1	-	-
	transversal		ca. 19,5	-	
Coefficient of thermal conductivity	longitudinal	[W/(m·K)]	ca. 0,8	-	-
	transversal		ca. 0,5	-	
Glass transition temperature (DSC)		[°C]	≥ 110	-	DIN EN ISO 11357-2
Residual strength rate (alkali resistance)		[%]	≥ 80	-	ISO 10406-1
Building material class		[-]	E	-	EN 13501-1

Mechanical properties

		Unit	Value	Tolerance	Standard
Average short-time tensile strength regarding to nominal cross-sectional area		[N/mm²]	≥ 1200	-	ISO 10406-1
Characteristic short-time tensile strength regarding to nominal cross-sectional area		[N/mm²]	≥ 1050	-	ISO 10406-1
Average modulus of elasticity regarding to nominal cross-sectional area		[N/mm²]	≥ 55000	-	ISO 10406-1
Characteristic elongation at break		[%]	≥ 1,91	-	ISO 10406-1
Average shear strength	longitudinal	[N/mm²]	≥ 47		ASTM D4475-02
	transversal	[N/mm²]	≥ 170	-	ISO 10406-1
Characteristic short-term bond strength	for ≥ C20/25	[N/mm²]	≥ 9	-	RILEM RC6
Characteristic value of mean bond stress for w_k = 0,15 mm	for ≥ C20/25	[N/mm²]	≥ 6	-	RILEM RC6
Characteristic resisting force		[kN]	161,6	-	ISO 10406-1

Further characteristic values

	Unit	Value	Tolerance
Cross-sectional force transmission at w_k = 0,1 mm at 20°C for C50/60	[N/mm²]	-	-

Delivery forms

		Unit	Value	Tolerance
Bar (standard)	Length	[m]	6,0	-
Bar (maximum length)	Length	[m]	12,0	-

Storage conditions

Protect from weather conditions, especially from direct sunlight.

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.

Country-specific regulations

The use of the product is governed by the respective national regulations at the place of use, in Germany for example the building codes 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, although adjustments must be made for fiber composite plastic reinforcements if applicable standards, guidelines, etc. for fiber composite plastic reinforcements are not available. Accordingly, the respective national standards and regulations must be taken into account in the design.

Processing information

All work must be carried out by trained/instructed personnel only. 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, in particular with regard to tensile strength, only apply if the product is used as intended.
For further information, please refer to the current Technical Information for our solidian REBAR reinforcement bars (www.solidian.com/downloads).

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

Protective measures must be observed during all work with cutting equipment, such as wearing cut-resistant gloves, safety goggles and a dust mask. The actual handling of fiber composites should be based on the Technical Rules for Hazardous Substances (TRGS) of the German Federal Institute for Occupational Safety and Health (baua). Furthermore, we refer to the DGUV information "Machining of CFRP materials - Guidance for protective measures" (FB-HM 074, issue 10/2014).

Legal information

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solidian REBAR D16-RRE

Unidirectional reinforcement bar made of
media-resistant glass fiber reinforced plastic

Material

Shape	Profiled round bar
Surface structure	Additive profiling
Geometry of profiling	Rib
Fiber material core	R (ECR-glass)
Impregnant material	E (epoxy resin)
Color	greenish

Geometry and structure

	Unit	Value	Tolerance	Standard
Nominal diameter	[mm]	16,0	-	-
Outer diameter	[mm]	18,4	± 0,5 mm	-
Static cross-sectional area	[mm²]	201,06	-	-
Weight per meter	[g/m]	476	± 2 %	-
Fiber volume content	[%]	≥ 67	-	-

Material properties

		Unit	Value	Tolerance	Standard
Bulk density of the fiber composite material		[g/cm³]	2,14	2,12 - 2,16	ISO 1183-1
Coefficient of thermal expansion	longitudinal	[10⁻⁶/K]	ca. 6,1	-	-
	transversal		ca. 19,5	-	
Coefficient of thermal conductivity	longitudinal	[W/(m·K)]	ca. 0,8	-	-
	transversal		ca. 0,5	-	
Glass transition temperature (DSC)		[°C]	≥ 110	-	DIN EN ISO 11357-2
Residual strength rate (alkali resistance)		[%]	-	-	ISO 10406-1
Building material class		[-]	E	-	EN 13501-1

Mechanical properties

		Unit	Value	Tolerance	Standard
Average short-time tensile strength regarding to nominal cross-sectional area		[N/mm²]	≥ 1100	-	ISO 10406-1
Characteristic short-time tensile strength regarding to nominal cross-sectional area		[N/mm²]	≥ 1000	-	ISO 10406-1
Average modulus of elasticity regarding to nominal cross-sectional area		[N/mm²]	≥ 55000	-	ISO 10406-1
Characteristic elongation at break		[%]	≥ 1,82	-	ISO 10406-1
Average shear strength	longitudinal	[N/mm²]	≥ 47		ASTM D4475-02
	transversal	[N/mm²]	≥ 155	-	ISO 10406-1
Characteristic short-term bond strength	for ≥ C20/25	[N/mm²]	≥ 9	-	RILEM RC6
Characteristic value of mean bond stress for w_k = 0,15 mm	for ≥ C20/25	[N/mm²]	≥ 6	-	RILEM RC6
Characteristic resisting force		[kN]	201,0	-	ISO 10406-1

Further characteristic values

	Unit	Value	Tolerance
Cross-sectional force transmission at w_k = 0,1 mm at 20°C for C50/60	[N/mm²]	ca. 74	-

Delivery forms

		Unit	Value	Tolerance
Bar (standard)	Length	[m]	6,0	-
Bar (maximum length)	Length	[m]	12,0	-

Storage conditions

Protect from weather conditions, especially from direct sunlight.

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.

Country-specific regulations

The use of the product is governed by the respective national regulations at the place of use, in Germany for example the building codes 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, although adjustments must be made for fiber composite plastic reinforcements if applicable standards, guidelines, etc. for fiber composite plastic reinforcements are not available. Accordingly, the respective national standards and regulations must be taken into account in the design.

Processing information

All work must be carried out by trained/instructed personnel only. 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, in particular with regard to tensile strength, only apply if the product is used as intended.
For further information, please refer to the current Technical Information for our solidian REBAR reinforcement bars (www.solidian.com/downloads).

Ecology and health protection

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Industrial safety and health

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solidian REBAR D20-RRE

Unidirectional reinforcement bar made of
media-resistant glass fiber reinforced plastic

Material

Shape	Profiled round bar
Surface structure	Additive profiling
Geometry of profiling	Rib
Fiber material core	R (ECR-glass)
Impregnant material	E (epoxy resin)
Color	greenish

Geometry and structure

	Unit	Value	Tolerance	Standard
Nominal diameter	[mm]	20,0	-	-
Outer diameter	[mm]	22,9	± 0,75	-
Static cross-sectional area	[mm^2]	314,16	-	-
Weight per meter	[g/m]	725	± 2 %	-
Fiber volume content	[%]	≥ 67	-	-

Material properties

		Unit	Value	Tolerance	Standard
Bulk density of the fiber composite material		[g/cm^3]	2,14	2,12 - 2,16	ISO 1183-1
Coefficient of thermal expansion	longitudinal	[10^{-6}/K]	ca. 6,1	-	-
	transversal		ca. 19,5	-	
Coefficient of thermal conductivity	longitudinal	[W/(m·K)]	ca. 0,8	-	-
	transversal		ca. 0,5	-	
Glass transition temperature (DSC)		[°C]	≥ 110	-	DIN EN ISO 11357-2
Residual strength rate (alkali resistance)		[%]	-	-	ISO 10406-1
Building material class		[-]	E	-	EN 13501-1

Mechanical properties

		Unit	Value	Tolerance	Standard
Average short-time tensile strength regarding to nominal cross-sectional area		[N/mm^2]	≥ 1050	-	ISO 10406-1
Characteristic short-time tensile strength regarding to nominal cross-sectional area		[N/mm^2]	≥ 950	-	ISO 10406-1
Average modulus of elasticity regarding to nominal cross-sectional area		[N/mm^2]	≥ 55000	-	ISO 10406-1
Characteristic elongation at break		[%]	≥ 1,73	-	ISO 10406-1
Average shear strength	longitudinal	[N/mm^2]	≥ 47		ASTM D4475-02
	transversal	[N/mm^2]	≥ 140	-	ISO 10406-1
Characteristic short-term bond strength	for ≥ C20/25	[N/mm^2]	≥ 9	-	RILEM RC6
Characteristic value of mean bond stress for w_k = 0,15 mm	for ≥ C20/25	[N/mm^2]	≥ 6	-	RILEM RC6
Characteristic resisting force		[kN]	298,5	-	ISO 10406-1

Further characteristic values

	Unit	Value	Tolerance
Cross-sectional force transmission at w_k = 0,1 mm at 20°C for C50/60	[N/mm^2]	-	-

Delivery forms

		Unit	Value	Tolerance
Bar (standard)	Length	[m]	6,0	-
Bar (maximum length)	Length	[m]	12,0	-

Storage conditions

Protect from weather conditions, especially from direct sunlight.

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.

Country-specific regulations

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Processing information

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