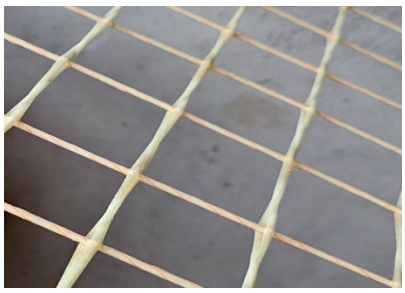
TENSOBAR FLEX/MESH 2MM

CELL SIZE 50x50, 100x100

Uniform GFRP mesh for concrete reinforcement against cracks and shrinkage

NON-structural reinforcement.



Shape	Round bar
Surface structure	Smooth
Geometry of profiling	None
Fiber material core	ECR-glass fiber
Impregnant material	Epoxy resin
Color	Greenish to Yellow

Geometry and structure

	Unit	Value	Tolerance	Standard
Nominal diameter	[mm]	2,00	± 0,2 mm	EAD 260023-00-0301
Static cross-sectional area	[mm^2]	3,14	-	EAD 260023-00-0301
Weight per square meter 50x50	[g/m^2]	245	± 4 %	
Weight per square meter 100x100	[g/m^2]	125	± 4 %	

Material properties

		Unit	Value	Tolerance	Standard
Glass transition temperature (DSC)		[°C]	≥ 100	-	EN ISO 11357-2
Bulk density of the fiber composite		[g/cm^3]	2,2	2,1 - 2,2	ISO 1183-1
Coefficient of thermal expansion αsp	longitudinal	[10^{-6} K^{-1}]	5	± 0,6	ISO 11359-2
	transversal	[10^{-6} K^{-1}]	2,2	± 0,4	ISO 11359-2
Building material class		[-]	E	-	EN 13501-1

Mechanical properties

		Unit	Value	Standard
Average short-time tensile strength regarding to nominal cross-sectional area		[N/mm^2]	≥ 900	EAD 260023-00-0301
Average modulus of elasticity regarding to nominal cross-sectional area		[N/mm^2]	≥ 50000	EAD 260023-00-0301
Characteristic elongation at break		[%]	≥ 2,2	EAD 260023-00-0301
Characteristic maximum service temperature		[Tmax °C]	70	EAD 260023-00-0301
Average compressive strength		[N/mm^2]	546	ASTM D695-10
Average compressive modulus		[N/mm^2]	52200	ASTM D695-10
Average shear strength	longitudinal	[N/mm^2]	≥ 56	EAD 260023-00-0301
	transversal	[N/mm^2]	≥ 241	EAD 260023-00-0301
Characteristic resisting force		[kN]	3,02	EAD 260023-00-0301

Delivery forms

		Unit	Value	Tolerance
Rolls (standard) 1m height	Length	[m]	20-50	0,1
Sheets (min-max length) 1m wide	Length	[m]	1-3	0,1

Storage conditions

Protect from direct sunlight.

Alternative to substitute steel

3-4mm; 100x100 - 150x150

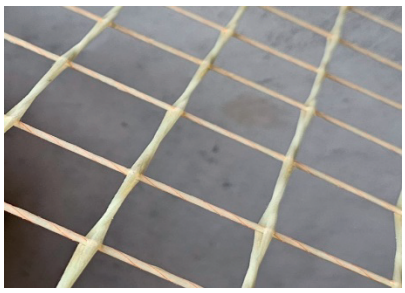
TENSOBAR FLEX/MESH 3MM

CELL SIZE 50x50, 100x100

Uniform GFRP mesh for concrete reinforcement against cracks and shrinkage

NON-structural reinforcement.

ETA 25/0467



Shape	Round bar
Surface structure	Smooth
Geometry of profiling	None
Fiber material core	ECR-glass fiber
Impregnant material	Epoxy resin
Color	Greenish to Yellow

Geometry and structure		Unit	Value	Tolerance	Standard
Nominal diameter		[mm]	3,00	± 0,2 mm	EAD 260023-00-0301
Static cross-sectional area		[mm^2]	7,06	-	EAD 260023-00-0301
Weight per square meter 50x50		[g/m^2]	490	± 4 %	
Weight per square meter 100x100		[g/m^2]	250	± 4 %	

Material properties		Unit	Value	Tolerance	Standard
Glass transition temperature (DSC)		[°C]	≥ 100	-	EN ISO 11357-2
Bulk density of the fiber composite		[g/cm^3]	2,2	2,1 - 2,2	ISO 1183-1
Coefficient of thermal expansion αsp	longitudinal	[10^{-6} K^{-1}]	5	± 0,6	ISO 11359-2
	transversal	[10^{-6} K^{-1}]	2,2	± 0,4	ISO 11359-2
Building material class		[-]	E	-	EN 13501-1

Mechanical properties		Unit	Value	Standard
Average short-time tensile strength regarding to nominal cross-sectional area		[N/mm^2]	≥ 900	EAD 260023-00-0301
Average modulus of elasticity regarding to nominal cross-sectional area		[N/mm^2]	≥ 50000	EAD 260023-00-0301
Characteristic elongation at break		[%]	≥ 2,2	EAD 260023-00-0301
Characteristic maximum service temperature		[Tmax °C]	70	EAD 260023-00-0301
Average compressive strength		[N/mm^2]	546	ASTM D695-10
Average compressive modulus		[N/mm^2]	52200	ASTM D695-10
Average shear strength	longitudinal	[N/mm^2]	≥ 56	EAD 260023-00-0301
	transversal	[N/mm^2]	≥ 241	EAD 260023-00-0301
Characteristic resisting force		[kN]	6,36	EAD 260023-00-0301

Delivery forms		Unit	Value	Tolerance
Rolls (standard) 1m height	Length	[m]	20-50	0,1
Sheets (min-max length) 1m wide	Length	[m]	1-3	0,1

Storage conditions

Protect from direct sunlight.

Alternative to substitute steel

4-6mm; 100x100 - 150x150

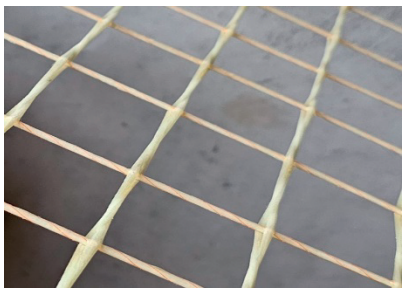
TENSOBAR FLEX/MESH 4MM

CELL SIZE 50x50, 100x100, 150x150

Uniform GFRP mesh for concrete reinforcement against cracks and shrinkage

NON-structural reinforcement.

ETA 25/0467



Shape	Round bar
Surface structure	Smooth
Geometry of profiling	none
Fiber material core	ECR-glass fiber
Impregnant material	Epoxy resin
Color	Greenish to Yellow

Geometry and structure

	Unit	Value	Tolerance	Standard
Nominal diameter	[mm]	4,00	± 0,2 mm	EAD 260023-00-0301
Static cross-sectional area	[mm^2]	12,56	-	EAD 260023-00-0301
Weight per square meter 50x50	[g/m^2]	930	± 4 %	EAD 260023-00-0301
Weight per square meter 100x100	[g/m^2]	470	± 4 %	EAD 260023-00-0301
Weight per square meter 150x150	[g/m^2]	350	± 4 %	EAD 260023-00-0301

Material properties

		Unit	Value	Tolerance	Standard
Glass transition temperature (DSC)		[°C]	≥ 100	-	EN ISO 11357-2
Bulk density of the fiber composite		[g/cm^3]	2,2	2,1 - 2,2	ISO 1183-1
Coefficient of thermal expansion αsp	longitudinal	[10^{-6} K^{-1}]	5	± 0,6	ISO 11359-2
	transversal	[10^{-6} K^{-1}]	2,2	± 0,4	ISO 11359-2
Building material class		[-]	E	-	EN 13501-1

Mechanical properties

		Unit	Value	Standard
Average short-time tensile strength regarding to nominal cross-sectional area		[N/mm^2]	≥ 900	EAD 260023-00-0301
Average modulus of elasticity regarding to nominal cross-sectional area		[N/mm^2]	≥ 50000	EAD 260023-00-0301
Characteristic elongation at break		[%]	≥ 2,2	EAD 260023-00-0301
Characteristic maximum service temperature		[Tmax °C]	70	EAD 260023-00-0301
Average compressive strength		[N/mm^2]	546	ASTM D695-10
Average compressive modulus		[N/mm^2]	52200	ASTM D695-10
Average shear strength	longitudinal	[N/mm^2]	≥ 56	EAD 260023-00-0301
	transversal	[N/mm^2]	≥ 241	EAD 260023-00-0301
Characteristic resisting force		[kN]	12,9	EAD 260023-00-0301

Delivery forms

		Unit	Value	Tolerance
Sheets (min-max length) 1m wide	Length	[m]	1-3	0,1

Storage conditions

Protect from direct sunlight.

Alternative to substitute steel

5-8mm; 100x100 - 150x150

Main benefits

1. **Crack Control**: GFRP mesh helps to distribute tensile stresses evenly, thereby controlling the formation and propagation of cracks caused by shrinkage and other tensile forces.

2. **Corrosion Resistance**: Unlike steel, GFRP does not corrode, which enhances the durability and lifespan of concrete structures, especially in harsh environments.

3. **Lightweight**: GFRP is significantly lighter than steel, making it easier to handle and install, and reducing transportation costs.

4. **High Strength-to-Weight Ratio**: Despite being lightweight, GFRP offers high tensile strength, contributing to the structural integrity of the concrete.

5. **Non-Magnetic and Non-Conductive**: GFRP is non-magnetic and electrically non-conductive, making it suitable for applications where electromagnetic interference or conductivity is a concern.

6. **Reduced protective concrete layer**: Due to the specific properties of GFRP material, the concrete cover can be reduced to a minimum of 10 mm, except in cases where the concrete has a compressive strength of >= 80 MPa; in these cases, the cover can be reduced to 5 mm. The cover is solely for adhesion purposes, so the mesh in cut areas can remain fully exposed to any environment, except for prolonged sun exposure, which would degrade the material only in the exposed area. In such cases, use of special UV protection for the material is needed.

Applications of GFRP Mesh:

- **Concrete Slabs**: GFRP mesh is used in concrete slabs to control shrinkage and temperature-induced cracks. It is particularly beneficial in slabs exposed to corrosive environments, such as coastal areas or industrial floors.
- **Pavements and Driveways**: Used to reinforce concrete pavements and driveways, providing crack control and extending the service life of the concrete.
- **Precast Concrete Elements**: GFRP mesh is incorporated into precast concrete elements like panels, pipes, and barriers, enhancing their durability and crack resistance.
- **Architectural and Decorative Concrete**: For architectural applications, GFRP mesh helps maintain the aesthetic integrity of decorative concrete by preventing visible cracks.

Installation and Best Practices:

1. Ensure the GFRP mesh is placed in the correct position within the concrete. It should be located at the tensile zone where cracks are likely to form.
2. Maintain sufficient concrete cover over the GFRP mesh to protect it from potential damage during construction and to ensure it is fully embedded.
3. The mesh should be securely fixed in place to prevent displacement during concrete pouring and compaction.
4. Overlap adjacent mesh sheets sufficiently (typically by at least one grid spacing) and ensure joints are properly managed to maintain uniform reinforcement.

Tensobar GFRP Flex/Mesh in UHPC (Ultra-High-Performance Concrete) applications

For **Tensobar GFRP Flex/Mesh** in **UHPC (Ultra-High Performance Concrete)** applications, there is a possibility to reduce the concrete cover below the typical 10mm. This is because UHPC has a much denser matrix and higher compressive strength, which generally provides superior protection for embedded materials compared to standard concrete.

Considerations for Reducing Cover:

1. **Increased Durability**: UHPC's higher density and lower permeability reduce the risk of moisture and chemical penetration, which are the main factors requiring protective cover in traditional concrete.
2. **Bond Strength**: With GFRP, bond strength relies less on cover thickness and more on the adhesive bond with the UHPC mix. A high-performance mix might allow for a thinner cover while maintaining adequate bond performance.
3. **Potential Reduction**: Depending on project specifications and exposure conditions, it could be feasible to reduce the cover by a few millimeters. However, I would recommend **conducting a small-scale test** or consulting with a structural engineer familiar with UHPC applications to confirm the minimum cover that provides sufficient bond strength and durability in this specific case.

By using uniform **TENSOBAR GFRP Flex/Mesh,** you can significantly enhance the performance of concrete structures in terms of crack control and resistance to shrinkage, ensuring **long-term durability** and **reduced maintenance costs**.

Measurement

The identified values have been determined directly from the product. Variations in these properties might be observed in the structural element or throughout its processing. It is advised to validate these values through appropriate tests on the structural component, using the specific formulation employed in each instance.

Country- specific regulations

The application of this product is subject to the relevant national regulations in the country of use. Design processes are conducted following the standards applicable to reinforced concrete components. This includes adherence to EU EN 1992 Eurocode 2 and the forthcoming Annex R, which pertains to Embedded FRP (Fiber-Reinforced Polymer) reinforcement.

Processing information

Only qualified and trained personnel should install GFRP. Do not use damaged rebars, as this compromises load -bearing capacity. The product's specified values, especially tensile strength, are valid only when used as intended.

Ecology and health protection

This product is classified as an 'article' under Article 3 of Regulation (EC) No 1907/2006 (REACH) and does not release substances during normal usage. Consequently, a safety data sheet as per Article 31 is not necessary for its marketing, transportation, or usage. Adherence to the guidelines in this data sheet is essential for safe use. Based on current knowledge, the product does not contain any Substances of Very High Concern (SVHC) listed in Annex XIV of REACH or on the European Chemicals Agency's Candidate List in concentrations exceeding 0.1% (w/w).

Industrial safety and health

When cutting, sanding, or drilling fiber composites, fine particles and fibers can be released into the air. These can be harmful if inhaled or if they come into contact with the skin or eyes. Thus, proper personal protective equipment (PPE) like masks, safety goggles, and gloves are essential. Good ventilation or extraction systems are also important in work areas. Special tools and techniques are often required for cutting and machining fiber composites. Standard tools can wear out quickly due to the abrasive nature of the fibers. Diamond-coated tools are recommended to be used.

Legal information

This information is grounded in our expertise and experience, assuming the product is correctly transported, stored, used, and processed as per the guidelines in this Product Data Sheet and the Technical Information for our TENSOBAR PRO reinforcement bars. The effectiveness of our products largely depends on their usage and processing. It is your responsibility to verify the product's appropriateness for your specific application.

As most countries do not yet have building regulations for non-metallic reinforcements, it is vital to consult with planners, specialists, building authorities, structural engineers, and experts for load-bearing structures, and adhere to country-specific regulations (like obtaining individual approvals, where necessary). Non-load-bearing use is generally less regulated, but it's still crucial to ensure compliance with local standards and safety norms to guarantee the integrity and longevity of the project.

We retain the authority to modify product specifications. Any existing third-party industrial property rights should be respected. Our standard terms and conditions of sale and delivery apply in all other aspects. The most recent technical product data sheet at the time of your product purchase is applicable.

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