

# Technical Datasheet

## FRS-W U600 Carbon Fibre Fabric



### Characteristics



- Unidirectional CF fabric with increased area density for structural strengthening of concrete elements with externally bonded reinforcements
- Broad scope of applications such as axial strengthening of columns, shear strengthening of beams and flexural strengthening of slabs and beams
- High young's modulus (230 000 N/mm<sup>2</sup>) and high tensile strength (4200 N/mm<sup>2</sup>)
- Component of ICC Evaluation Service Report 4774
- High alkaline resistance and high environmental and mechanical durability
- Low density and good transvers stability for improved handling

### General Information

Composition	Unidirectional carbon fibre fabric stabilized with transvers thermoplastic threads
Appearance	Black fabric with periodic transvers threads
Delivery Unit	Roll of 100-150 m
Shelf life	24 months if stored appropriately in original packaging
Storage conditions	Storage under dry conditions, below + 50 °C temperature. The product must be protected from direct sun light. Do not kink the carbon fibers.
Transport conditions	Only in original packaging or in adequate packaging protected against mechanical impact and aggressive environments.
Packaging	Roll in plastic foil and carton overpack

### Product Geometries

Art.-No.	Width [mm]	Area density [g/m <sup>2</sup> ]	Total area [m <sup>2</sup> ]	Roll length [m]
562074	500	600	50	100
562075	200	600	30	150

### Approvals and Assessments

ESR-4774 (ICC-ES Evaluation Report)	According to AC 125
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## Technical Data of the FRS-W U600 CF Fabric

Property	Performance	
Construction	Fiber orientation (0°, unidirectional)	
	Carbon fiber (Warp, 98,8 M/M %)	
	Thermoplastic fibers (Weft, 1,12 M/M %)	
Tensile strength <sup>1,2</sup>	Mean value	4200 N/mm <sup>2</sup>
Young's Modulus <sup>1,2</sup>	Mean value	230 000 N/mm <sup>2</sup>
Elongation at break <sup>1,2</sup>	Mean value	1,80 %
Area density <sup>3</sup>	Mean value	600 g/m <sup>2</sup>
Density of carbon fibers	Mean value	1,77 g/cm <sup>3</sup>

The values stated represent typical characteristics of the product.

<sup>1</sup>According to ISO 13934-1 or internal standard (TAV PQL 06.01)

<sup>2</sup>Values determined in 0° longitudinal fiber direction.

<sup>3</sup>According to ISO 3374:2000

**Note that the technical parameters included in the technical assessments (ICC-ES Evaluation Report) are decisive for structural design. In case of questions regarding the structural design, please contact our national technical team.**

## Technical Data of the cured CFRP laminate using FRS-W U600 CF Fabric and FRS-CF Saturating Resin

Property	Performance	
Laminate nominal thickness	1,02 mm (1 ply)	
Tensile strength (ASTM D3039) <sup>1</sup>	Mean value	950 N/mm <sup>2</sup>
	Guaranteed value	790 N/mm <sup>2</sup>
Tensile Modulus (ASTM D3039) <sup>1</sup>	Mean value	77 000 N/mm <sup>2</sup>
Elongation at break (ASTM D3039) <sup>1</sup>	Mean value	1,26 %
	Guaranteed value	1,02 %
Glass transition temperature (ASTM D1640)	Mean value	67 °C
Interlaminar shear strength (ASTM D2344)	Mean value	35,6 N/mm <sup>2</sup>

The values stated represent typical characteristics of the product and are not to be understood as binding products specifications.

<sup>1</sup>According to ASTM D3039 calculated with a nominal thickness of 1,02mm per ply. Single ply measured. Values determined in 0° longitudinal fiber direction.

Calculated strength with respect to fiber cross section: 3000 N/mm<sup>2</sup>, calculated elastic modulus with respect to fiber cross section: 230 000 N/mm<sup>2</sup>

**Consumption of FRS-CF Saturating Resin for externally bonded FRS-W U600 Carbon Fibre Fabric**

	Required amount of FRS-CF [kg/m <sup>2</sup> ]
Surface priming	Ca. 0,75-0,90
Each further ply	Ca. 0,75-0,90
Final topcoat	Ca. 0,50

The required amount of FRS-CF Saturating Resin may strongly depend on the concrete surface condition, roughness, layout of laminate crossings and layer thickness. Wet lay-up procedures are recommended for the application of FRS-W U600 CF-fabric, but dry lay-up procedures can be employed if desired. Care should be taken in dry lay-up to ensure complete saturation of the fabric. Consumption may differentiate depending on the saturation procedure.

**System components of ESR-4774 (ICC-ES Evaluation Report)**

Externally bonded unidirectional CF fabrics	fischer FRS-W U300 / FRS-W U600
Saturating resin for CF Fabric application	fischer FRS-CF
Fire protection coating against flame spread and smoke development	fischer FRS-FP
CFRP Laminates	fischer FRS-L-H / FRS-L-S
Epoxy mortar for the application of the CFRP laminate	fischer FRS-CS

**Measurement data**

The technical data given in this datasheet are based on laboratory testing according to given EN or ASTM norms. Actual measured data may deviate depending on the measurement procedures, devices and norms used.

**Further information**

- The structural design must be carried out by an experienced structural engineer.
- Applications out of the scope of the product approvals is out of the responsibility of the fischer group.
- The application of the FRS-W U600 CF Fabric using epoxy resins from other manufacturers is out of the responsibility range of the fischer group.
- Well trained and experienced contractors are to be commissioned to carry out the installation works.
- Wear protective clothing, gloves, goggles, and a face mask when cutting the fabrics. fabrics can be cut with technical scissors or a suitable circle cutter. It is recommended to cut in well-ventilated spaces due to fiber fly.
- For further information, please refer to your national fischer technical team or the Installation Manual for “C-Fiber Force Strengthening System with Carbon Fiber Fabrics”.

Please note that the data and information provided above are guidelines from laboratory and real-life experience and are not binding. This general information describes our products and their use, but due to varied working conditions, not every case can be covered. We recommend conducting tests or consulting the fischer technical team if in doubt. We provide information to outline our products and services, without guaranteeing specific properties or suitability for a particular purpose. Please always refer to the latest Technical Data Sheet as well as any national and international regulations. Upon publication of a new version, the previous Technical Data Sheet becomes invalid. Product users must retrieve the latest product data sheet at [www.fischer-international.com](http://www.fischer-international.com). Our current general terms and conditions apply.