Technical Datasheet

FRS-L-S Externally Bonded CFRP Laminate

Characteristics

- CFRP laminate for structural strengthening of concrete elements with externally bonded reinforcements
- Standard young's modulus (≥ 170 000 N/mm^2) and high tensile strength (≥ 3000 N/mm^2)
- Component of European Technical Assessment ETA-24/0281
- Component of ESR-4774 (ICC-ES Evaluation Report)
- Very high alkaline resistance and high environmental and mechanical durability
- Low density

General Information

Composition	Precured unidirectional carbon fiber reinforced composite with epoxy matrix
Appearance	Black strip with periodically printed product name and batch number
Delivery Unit	Coil of 100 – 150 m, Inner coil diameter Ø ≥ 800 mm
Shelf life	Infinite 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
Transport conditions	Only in original packaging or in adequate packaging protected against mechanical impact and aggressive environments
Packaging	Coil in sealed plastic foil and carton overpack

Product Geometries

Art.-No.	Width [mm]	Thickness [mm]	Cross section [mm^2]	Coil length [m]
562436	50	1,2	60	150
562437	75	1,2	90	150
562438	100	1,2	120	100
562442	50	1,4	70	150
562443	75	1,4	105	150
562444	100	1,4	140	100

Approvals and Assessments

ETA 24/0281	According to EAD 160086-01-0301
ESR-4774 (ICC-ES Evaluation Report)	According to AC 125

Technical Data

Property	Performance	
Tensile strength (EN 2561)[1]	Mean value	3000 N/mm^2
	Characteristic 5 % fractile value	2700 N/mm^2
Tensile Modulus (EN 2561) [1]	Mean value	170 000 N/mm^2
Elongation at break (EN 2561) [1]	Mean value	1,74 %
Tensile strength (ASTM D3039) [1]	Mean value	2900 N/mm^2
	Guaranteed strength	2500 N/mm^2
Tensile Modulus (ASTM D3039) [1]	Mean value	165 000 N/mm^2
Elongation at break (ASTM D3039) [1]	Mean value (ultimate strain)	1,74 %
Fiber content (DIN EN 2564)	≥ 67 %	
Density of laminate	1,60 g/cm^3	
Glass transition temperature (EN 12614 & ASTM E1640)	≥ 100 °C	

[1]Values determined in 0° longitudinal fiber direction.

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

Consumption of Epoxy Mortar FRS-CS for externally bonded FRS-L-S CFRP Laminates

Width of the laminate [mm]	Required amount of FRS-CS [kg/m]
50	0,3 – 0,4
75	0,4 – 0,5
100	0,6 – 0,7

The required amount of Epoxy Mortar FRS-CS may strongly depend on the concrete surface condition, roughness, layout of laminate crossings and layer thickness. The values given above may be considered as upper bound consumptions.

System components of ETA-24/0281	
CFRP laminates	fischer FRS-L-H / FRS-L-S / FRS-L-S NSM
Cleaning agent for the laminate	fischer FRS-CA
Epoxy mortar for the application of the CFRP laminate	fischer FRS-CS
Epoxy repair mortar	fischer FRS-PC 11
Bonding agent	fischer FRS-BA

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

Related products	
Adhesion application device	fischer FRS-AD
Laminate coiler	fischer FRS-LC

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-L-S CFRP laminates 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 laminates. Laminates can be cut with angle grinders or a suitable metal handsaw. It is recommended to tape the spot where the CFRP is cut to prevent longitudinal splitting and fiber fly.
- For further information, please refer to your national fischer technical team or the Installation Manual “C-Fiber Force Strengthening System with FRS-L-S and FRS-L-H Externally Bonded CFRP Laminates”.