S&P C-Sheet 640

Carbon fibre sheet for structural reinforcement

A Simpson Strong-Tie® Company

The information in this technical data sheet is valid for the S&P range of products, systems and solutions.
Please note that the information in your country may vary. Visit sp-reinforcement.eu to find your local branch.

DESCRIPTION

S&P C-Sheet 640 is a unidirectional carbon fibre fabric with high strength and low elongation.
S&P C-Sheet 640 is applied (stuck-on) to the building element in question using laminating resin (S&P Resin 55 HP).

GENERAL FEATURES

WHERE TO USE

- Strengthening or reinforcement of bearing structures made from reinforced concrete and steel, mainly in cases of shear stress
- Increasing imposed loads
- Replacement of corroded or missing shear reinforcement
- For system adjustments
- In case of a change in the structure's use
- Extension of service life and durability
- Complying with the latest standards

PERFORMANCE FEATURES

- Simple, flexible and economical strengthening method
- Flexible application, e.g. around rafters and beams, or also on curved surfaces such as pipes etc.
- Low self-weight and small installation thickness
- Simple, flexible and economical strengthening method
- No corrosion
- Very short interruption in normal use of the relevant building or infrastructure
- No noise and no vibration during installation

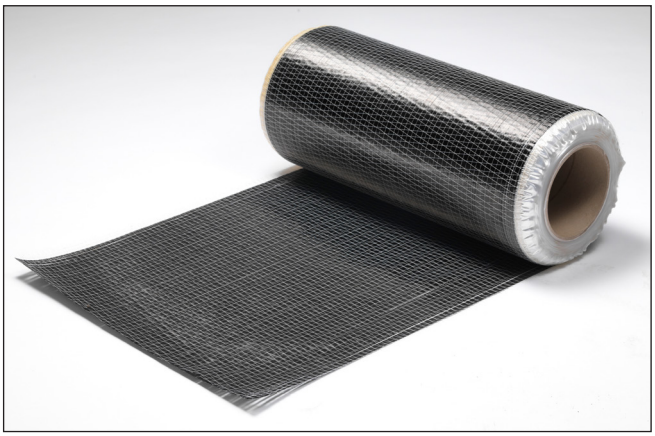
PRODUCT DATA

Generic description
S&P C-Sheet 640

Appearance
Black carbon fibre fabric with a protective backing material

Size
Length: 50 m rolls
Width: 300 mm

Storage
Store in a dry place and without direct sunlight at a temperature between +5 °C and +35 °C



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PREPARATION

Condition of the substrate

Minimum adhesive pull strength of substrate: ≥ 1 N/mm² or as required according to structural calculations.
The temperature of the bearing substrate should be at least 8 °C and at least 3 °C above the dew point.
When using S&P Resin 55 HP (impermeable), the concrete moisture content must be < 4 wt. % (calcium carbide method).

Substrate preparation – concrete and steel

The substrate must be load-bearing, dry, clean and free of dust and loose particles, dirt, oil, grease and other separating substances.
The substrate should be prepared using suitable methods such as grinding, sand blasting or high pressure water jets (> 800 bar). Dust must be removed with a vacuum cleaner.

Concrete repairs and uneven places must be evened out with the re-profiling mortar S&P Resin 230 HP. Whenever possible, work 'wet-on-wet'. If this is not possible, roughen the surface before application of the sheets to guarantee a good adhesion between the S&P Resin 230 HP and S&P Resin 55 HP.

APPLICATION

Treatment

Cut sheets with scissors or a knife and ruler.
Never bend the sheets in longitudinal direction (Sheet may only be folded parallel to the fibre)!
The S&P C-Sheet 640 can be applied in a dry or wet lay-up process.
For more details, please refer to the application manual for S&P C-Sheet 640.

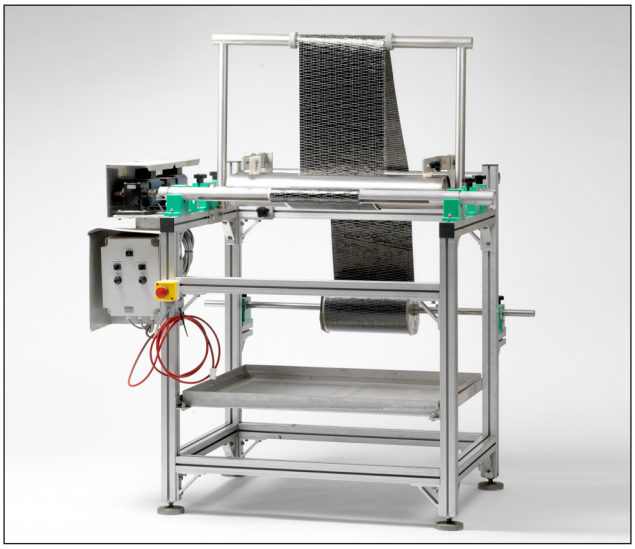
Application

Reinforcing work should be carried out by well-trained and experienced specialists.
Minimum radius for reinforcement around corners: > 25 mm
In the fibre direction, the overlapping length must be at least 150 mm. No overlapping is required in the transverse direction.
During application, observe the epoxy adhesive agent's pot life (maximum time the substance may be left open).
The sheets can be covered in a suitable bonding agent / primer (S&P Resin 55 HP and quartz sand) in order to add a coloured paint or plaster coat.

S&P provides design guidelines, as well as a special design software for FRP systems:

- FRP Lamella – flexural and shear reinforcement of slabs and beams

For detailed advice, please contact our engineering department.



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MECHANICAL PROPERTIES

S&P C-Sheet 640 Carbon fibre sheet for structural reinforcement		
Technical data	**Unit**	**C-Sheet 640 400g/m²**
Modulus of elasticity*	kN/mm²	640
Tensile strength*	N/mm²	2600
Fibre weight, longitudinal direction	g/m²	400
Weight per unit area of sheet	g/m²	430
Density*	g/cm³	2.12
Elongation at break*	%	0.4
Design thickness (fibre weight/density) longitudinal direction	mm	0.189
Theoretical design cross-section Width: 1000 mm, longitudinal direction	mm²	189
Reduction factor "γ" for the design (manual lamination / Uni-directional sheet)		1.2 (recommended by S&P)
Tensile force, ultimate, Width: 1000 mm With "γ" / Without "γ"	kN longitudinal	410 / 491
Tensile force for design Width: 1000 mm at ε = 0.2 % With "γ" / Without "γ"	kN longitudinal	202 / 242
Sizes (Special sheets available upon request)		Width: 300 mm Length: 50 m

* The values given are typical values according to the technical details of the fibre used.

CONSUMPTION

Product	**S&P Resin 55 HP (impermeable)**
S&P C-Sheet 640 - 400 g/m²	900–1300 g/m²
The material consumption depends on the flatness and the roughness of the substrate. The actual consumption could be higher.	

FIRE PROTECTION

If necessary, the S&P C-Sheets can be protected with fire protection plates. Depending on the requirements of the fire resistance, there are various alternative solutions.

Please contact our technical services department.

CLEANING

Tools cleaning
Mixture that has not yet hardened can be washed off with S&P Cleaner. Mixture that has hardened can only be removed by mechanical means.

ACCESSORY PRODUCTS

S&P Cleaner
For cleaning of the tools.

S&P press roller (see picture on page 2)
For the manual laminating of the S&P C-Sheet. Available piecewise in 3 different widths (60. 90, 130 mm).

S&P squeeze (rubber spatula)
For smoothing of the sheets and for distributing the laminating resin. The spatula is 20 cm in width and available piecewise.

S&P Wet lay-up machine (see picture on page 2)
To impregnate the sheets. Suitable when installing large quantities.

TESTING

All technical data stated in this product data sheet are based on laboratory tests. Circumstances beyond our control may lead to deviations of actual values.

Please contact us if you require any information regarding tests that have been conducted.
Test reports may be available.

HEALTH & SAFETY

Important safety instructions

For detailed safety information, we recommend that you see the current safety data sheet which is available on www.sp-reinforcement.eu or you can contact us on +41 41 825 00 70.

S&P's range of products are for industrial use. They must be installed by specialised personnel and competent professionals with adequate training. The installation instructions must be followed and can be found in S&P application manuals and several "Guideline" documents / existing technical notes.

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