

# S&P C-Sheet 240

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](http://sp-reinforcement.eu) to find your local branch.

## DESCRIPTION

S&P C-Sheet 240 is a unidirectional carbon fibre fabric with high strength properties for structural reinforcement. It can be applied in a dry or wet lay-up process.

S&P C-Sheet 240 is applied (stuck-on) to the building element in question using laminating resin (S&P Resin 55 HP or S&P Resicem HP).

## WHERE TO USE

- For system adjustments
- Changes in use of the structure
- Strengthening or reinforcement of bearing structures made from reinforced concrete and masonry, against bending, axial and shear stresses
- Increasing strength and ductility of columns and walls
- Increasing axial load by 'wrapping' columns
- Increasing imposed loads
- Replacement of corroded or missing steel reinforcement
- Extension of service life and durability
- Complying with the latest standards

## PERFORMANCE FEATURES

- Simple, flexible and economical strengthening method
- Flexible application, even on curved surfaces such as pillars, columns, silos, chimneys, walls, arched slabs, etc.
- Available in a variety of widths and thicknesses
- Low self-weight and small installation thickness
- No corrosion
- Very short interruption in normal use of the building
- No noise and no vibration during installation

## PRODUCT DATA

### Generic description

S&P C-Sheet 240

### Appearance

Black carbon fibre fabric with a protective backing material

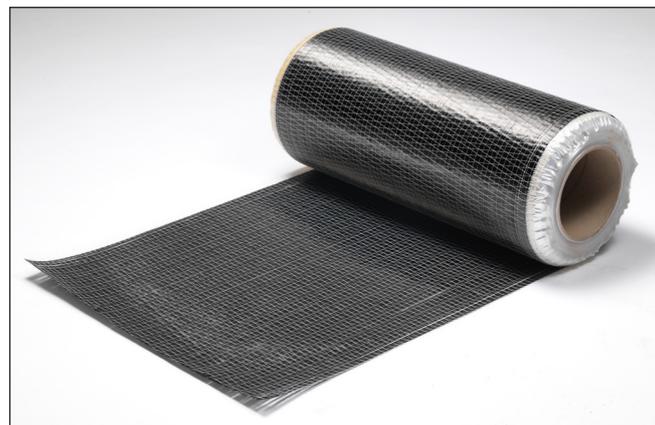
### Size

Length: 100 m rolls

Width: 300 mm / 600 mm

### Storage

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



### Condition of the substrate

Minimum adhesive pull strength of substrate: 1.0 N/mm<sup>2</sup> 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). When using S&P Resicem HP (better behavior to vapour permeability), the concrete moisture content must be maximum 12 wt. %.

### Substrate preparation – concrete/masonry

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.

If laminating with S&P Resicem HP (better behavior to vapour permeability) or with S&P Resin 55 HP (impermeable), S&P Tecnogrout-K can be used as levelling mortar. Masonry walls must previously be reprofiled with S&P Tecnogrout-K.

### 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 240 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 240.

### 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.

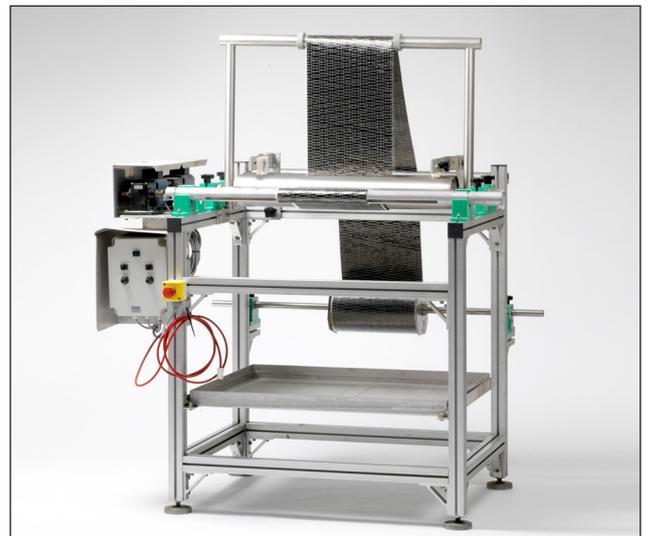
During application, observe the epoxy adhesive agent's pot life (maximum time the substance may be left open).

The sheets can be covered in a suitable bonding agent / primer (S&P Resin 55 HP or S&P Resicem HP + 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
- FRP Colonna – axial reinforcement of columns

*For detailed advice, please contact our engineering department.*



MECHANICAL PROPERTIES

<b>S&amp;P C-Sheet 240</b> Carbon fibre sheet for structural reinforcement					
Technical data	Unit	C-Sheet 240 200 g/m <sup>2</sup>	C-Sheet 240 300 g/m <sup>2</sup>	C-Sheet 240 400 g/m <sup>2</sup>	C-Sheet 240 600 g/m <sup>2</sup>
Modulus of elasticity*	kN/mm <sup>2</sup>	240	≥ 265	≥ 265	≥ 265
Tensile strength*	N/mm <sup>2</sup>	4400	5100	5100	5100
Fibre weight, longitudinal direction	g/m <sup>2</sup>	200	300	400	600
Weight per unit area of sheet	g/m <sup>2</sup>	230	330	430	630
Density*	g/cm <sup>3</sup>	1.77	1.8	1.8	1.8
Elongation at break*	%	1.8	≥ 1.8	≥ 1.8	≥ 1.8
Design thickness (fibre weight/density) longitudinal direction	mm	0.113	0.167	0.222	0.333
Theoretical design cross-section Width: 1'000 mm, longitudinal direction	mm <sup>2</sup>	113	167	222	333
Reduction factor "γ" for design (manual lamination / Uni-directional sheet)		1.2 (recommended by S&P)	1.2 (recommended by S&P)	1.2 (recommended by S&P)	1.2 (recommended by S&P)
Tensile force ultimate, Width: 1000 mm With "γ" / Without "γ"	kN longitudinal	414 / 497	710 / 852	944 / 1132	1415 / 1698
Tensile force for design, (flexural strength) Width: 1000 mm at ε = 0.6 % With "γ" / Without "γ"	kN longitudinal	136 / 163	221 / 266	294 / 353	441 / 529
Tensile force for design, (axial load) Width: 1000 mm at ε = 0.4 % With "γ" / Without "γ"	kN longitudinal	90 / 108	148 / 177	196 / 235	294 / 353
Sizes (Special sheets available upon request)	Width	300 or 600 mm	300 or 600 mm	300 or 600 mm	300 mm
	Length	100 m	100 m	100 m	100 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 Resicem HP (better behavior to vapour permeability)
S&P C-Sheet 240 - 200 g/m <sup>2</sup>	600–800 g/m <sup>2</sup>	1100–1500 g/m <sup>2</sup>
S&P C-Sheet 240 - 300 g/m <sup>2</sup>	700–1000 g/m <sup>2</sup>	1300–1600 g/m <sup>2</sup>
S&P C-Sheet 240 - 400 g/m <sup>2</sup>	900–1300 g/m <sup>2</sup>	1400–1800 g/m <sup>2</sup>
S&P C-Sheet 240 - 600 g/m <sup>2</sup>	1000–1400 g/m <sup>2</sup>	1500–1900 g/m <sup>2</sup>

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-Sheet 240 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 thicker sheets (> 400 g/m<sup>2</sup>) or 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](http://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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The information and data in this technical data sheet serve to ensure the normal intended use and normal application suitability; the information and data are based on our knowledge and experience. They do not absolve the user from their own responsibility to check the suitability and application method.

The rights to make changes to product specifications are reserved. Furthermore, our general sales and delivery terms apply. The current, most recent product data sheet is valid, and should be requested from us.

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