

High-performance reinforcement  
carbon fibre sheet for structural  
strengthening

# weber.tec force carbon sheet

enforce carbon fibre sheet



## Uses

- Confinement reinforcement for structural strengthening
- Shear
- Impact resistance
- Strengthen against tensile stresses and bending
- Circular and square members
- Control crack propagation
- Used in conjunction with **weber.tec force carbon plate** for combined tensile strengthening and wrap reinforcement

## Typical applications

- Columns
- Beams
- Chimneys
- Silos
- Tunnels

## Features and benefits

- ▲ Lightweight and easy to apply
- ▲ High strength to weight ratio
- ▲ Minimal applied thicknesses
- ▲ Very flexible for details and easy to mould in situ around complex shapes
- ▲ Corrosion resistant
- ▲ Two grades of carbon fibre enabling selection in design
- ▲ Impact and blast resistant
- ▲ Factory produced with consistent mechanical properties
- ▲ Small, easy-to-handle rolls allowing precise location and embedment
- ▲ Unidirectional fibres allowing utilisation of high-strength fibres
- ▲ Special widths can be manufactured for specific projects

## About this product

**weber.tec force carbon sheet** is a uni-directional sheet for structural confinement reinforcement, manual wrap lamination and tensile strength reinforcement to structural members. Manufactured by S&P, Switzerland, the sheet is available in two grades and applied with **weber.tec force EP primer** and **weber.tec force EP bonding adhesive** to form part of the **weber.tec force composite strengthening system**.

## Technical data

The following test results were obtained in laboratory conditions at 20°C and 4% relative humidity

### Physical properties

	S&P C Sheet 240	S&P C Sheet 640
Colour	Black	Black
Size	300 mm width	300 mm width
Fibre density	1.7 kg/cm <sup>3</sup>	2.1 kg/cm <sup>3</sup>
Sheet weight	200 g/cm <sup>2</sup>	400 g/cm <sup>2</sup>
Thickness for design (weight/density)	0.117 mm	0.190 mm
Cross section for design*	117 mm <sup>2</sup>	190 mm <sup>2</sup>
Fibre content v <sub>f</sub>	100%	100%
Max number of layers	10	4
Delivery	150 m rolls	150 m rolls

### Mechanical properties

Modulus of elasticity E <sub>cu</sub>	240 kN/mm <sup>2</sup>	640 kN/mm <sup>2</sup>
Tensile strength f <sub>cu</sub>	4000 N/mm <sup>2</sup>	2650 N/mm <sup>2</sup>
Ultimate elongation ε <sub>cu</sub>	1.6%	0.4%
Tensile force at 0.6% elongation (area x E <sub>c</sub> x ε)/1.2*	140 kN	400 kN

\*based upon 1000 mm width of sheet

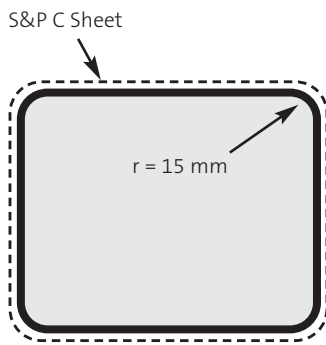
# weber.tec force carbon sheet

## Preparation

Before the application of S&P C sheets, the quality of the substrate has to be checked. The tensile strength has to be tested with a pull-off bond test. For load to be transferred from the carbon sheet into the bearing substrate a tensile surface strength of at least 1 N/mm<sup>2</sup> is required.

The bearing substrate must be roughened by light grit blasting or sand blasting or grinding. Any unevenness must be tested with a straight edge. Maximum deviation is 5 mm per 2 metre.

The edges of the structural member must be rounded by grinding to achieve a minimum radius of 15 mm.



The substrate must be cleaned of any dust and the moisture content must be less than 4%. Ensure all surfaces are clean and free from any contamination.

## Application

### weber.tec force EP primer

The epoxy resin primer must be mixed in accordance with the product data sheet and applied to the prepared substrate. Allow to go tacky – normally up to 2 hours, but do not allow to dry.

### weber.tec force EP bonding adhesive

The epoxy resin adhesive must be mixed in accordance with the data sheet and applied evenly to the primed substrate as a first coat.

Immediately after the adhesive is applied, the first layer of carbon fibre sheet is applied by hand and pressed into the surface with a rubber roller and squeegee.

Another layer of adhesive is applied by brush or roller over the carbon fibre sheet and is pressed into the sheet with a squeegee. Additional layers are applied in the same way onto uncured, wet epoxy resin adhesive.

For the C sheet 640, a wet lay-up lamination process will need to be employed. Pre-wet the sheet with **weber.tec force EP bonding adhesive** and place the wetted-out sheet onto the first coat of adhesive. Encapsulate this layer with a second coat of **weber.tec force EP bonding adhesive**. For multiple layers repeat the above steps.

Pre-wetting of the carbon fibre sheet can be achieved by either:

- 1 Manual lamination on a table protected with plastic sheeting.
- 2 Machine lamination using the **weber.tec force laminator**, details available on request.

For multiple layers of C240 sheet, use the wet lay-up process described above.

Allow the epoxy resin adhesive to fully cure.

## Cleaning

Clean tools carefully, using **weber.tec solvent 3**.

## Packaging

S&P C Sheets are supplied in 150 m length rolls at 300 mm width and come with a protective plastic film for ease of handling.

## Coverage

Area coverage is 45 m<sup>2</sup> per roll.

## Storage and shelf life

Store the carbon fibre sheets in dry conditions and protect from exposure to direct sunlight.

Unlimited shelf life if stored correctly.

## Health and safety

Sheet reinforcement material.

Loose fibres may be sharp, strong and irritating. Always wear gloves when handling fibre sheets and avoid contact with the skin. Cut the rolls by applying adhesive tape across the width of the roll and cut with industrial scissors through the tape to avoid fraying loose fibres.

**For further information, please request the Material Safety Data Sheet for this product.**

### weber.tec force laminator machine



## Technical services

Weber's Customer Services Department has a team of experienced advisors available to provide on-site advice both at the specification stage and during application. Detailed specifications can be provided for specific projects or more general works. Site visits and on-site demonstrations can be arranged on request.

**Technical helpline**  
Tel: (01525) 722110

## Sales enquiries

Weber products are distributed throughout the UK through selected stockists and distributors. For UK sales enquiries and overseas projects, contact **Weber's** Sales office.

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Tel: (01525) 722100  
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