

S&P G-Sheet E 90/10, Type A and AR 90/10, Type A

E- or AR-glass fibre sheets 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 G-Sheet 90/10 is a bidirectional glass fibre fabric with high strength for structural reinforcement. It can be applied in a dry or wet lay-up process. S&P G-Sheets are applied (stuck-on) to the building element in question using laminating resin (S&P Resin 55 HP or S&P Resicem HP).

GENERAL FEATURES

WHERE TO USE

- Strengthening or reinforcement of bearing structures made from reinforced concrete and masonry, against flexural (bending tensile) and axial stresses
- Increasing strength and ductility of columns and walls
- Increasing resistance against earthquakes
- Increasing imposed loads
- Replacement of corroded or missing reinforcement
- In case of a change in the nature of imposed loads
- Correction of design and/or building mistakes
- Extension of service life and durability
- Complying with the latest standards

PERFORMANCE FEATURES

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

PRODUCT DATA

Generic description

S&P G-Sheet E 90/10, Type A

S&P G-Sheet AR 90/10, Type A

Appearance

White high performance, bidirectional (90% longitudinal and 10% transversal) glass fibre fabric made from E-Glass or AR-Glass (alkali resistant)

Size

Length: 50 m rolls

Width: 670 mm

Storage

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



PREPARATION

Condition of the substrate

Minimum adhesive pull strength of substrate: 0.2 N/mm² or as required according to structural calculations.

The temperature of the concrete 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 (water vapour permeable), the concrete moisture content must be maximum 12 wt. %.

Surface Preparation

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. 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 and S&P Resin 55 HP.

If laminating with S&P Resicem HP (water vapour permeable), use the cementitious S&P Rescem 15 as reprofiling mortar.

APPLICATION

Treatment

Cut sheets with scissors or a knife and ruler.

Never bend the sheets! (Sheet may only be folded parallel to the fibre)

The S&P G-Sheets can be applied in a dry or wet lay-up process.

For more details, please refer to the application manual for S&P G-Sheet E/AR.

Application

Reinforcing work should be carried out by well-trained and experienced specialists.

Smallest radius for reinforcement around corners: > 25 mm

In the fibre direction, the overlapping length must be at least 100 mm.

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 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.

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

MECHANICAL PROPERTIES

S&P G-Sheet E 90/10, Type A / S&P G-Sheet AR 90/10, Type A			
Technical data	Unit	G-Sheet E 90/10, Type A	G-Sheet AR 90/10, Type A
Modulus of elasticity	kN/mm ²	≥ 73	≥ 72
Tensile strength	N/mm ²	≥ 3 400	≥ 3 000
Fibre weight, longitudinal direction	g/m ²	401	401
Weight per unit area of sheet	g/m ²	442	442
Density	g/cm ³	2.6	2.6
Elongation at break	%	≥ 2.5	≥ 2.5
Design thickness (fibre weight/density) longitudinal direction	mm	0.154	0.154
Theoretical design cross-section Width: 1000 mm, longitudinal direction	mm ²	154	154
Reduction factor "γ" for the design (manual lamination / Bi-directional sheet)		1,4 (recommended by S&P)	1,4 (recommended by S&P)
Tensile force, ultimate, Width: 1000 mm With "γ" / Without "γ"	kN main direction	374 / 524	330 / 462
Tensile force for design (flexural strength) Width: 1000 mm at ε = 0.6 % With "γ" / Without "γ"	kN each direction	48 / 68	48 / 67
Tensile force for design (axial load) Width: 1000 mm at ε = 0.4 % With "γ" / Without "γ"	kN each direction	32 / 45	32 / 44
Sizes (Special sheets available upon request)		Width: 670 mm ± 10 mm Length: 50 m	Width: 670 mm ± 10 mm Length: 50 m

The values given are typical values according to the technical details of the fibre used ± 5%.

CONSUMPTION

Product	S&P Resin 55 HP (impermeable)	S&P Resicem HP (vapour permeable)
S&P G Sheet E or AR 90/10 Type A (440 g/m ²)	900–1300 g/m ²	1400–1800 g/m ²
The material consumption depends on the flatness and the roughness of the substrate. The actual consumption could be higher.		

CLEANING

Tools cleaning

Tools and application equipment must be washed immediately after use. If the product hardens, it can only be removed by mechanical means

ACCESSORY PRODUCTS

S&P Cleaner

For cleaning of the tools.

S&P press roller

For the manual laminating of the S&P G-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.

S&P Wet lay-up machine

To impregnate thicker sheets (> 400 g/m²)

FIRE PROTECTION

If necessary, the S&P G-Sheet 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.

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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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.

Head Office

S&P Clever Reinforcement Company AG

Seewernstrasse 127

CH-6423 Seewen

Phone: +41 41 825 00 70

Fax: +41 41 825 00 75

Web: www.sp-reinforcement.ch

E-Mail: info@sp-reinforcement.ch

