BUILDING TRUST

PRODUCT DATA SHEET

Sika® CarboDur® Plate UHM

Ultra High Modulus (UHM) Carbon Fibre Reinforced Polymer (CFRP) Plates

PRODUCT DESCRIPTION

Sika CarboDur® Ultra High Modulus (UHM) Plates are high performance, corrosion resistant carbon fibre plates for strengthening metallic structures.
The plates are manufactured to individual project dimensional specifications.
When used in conjunction with SikaDur®-30 structural epoxy adhesive, they form the Sika CarboDur® Ultra High Modulus (UHM) Plate System.

USES

Sika® CarboDur® Plate UHM may only be used by experienced professionals.

To strengthen structures for:
- Load increase.
- Increasing the capacity of floor slabs and beams.
- Increasing the capacity of bridges to accommodate increase axle loads.
- Deterioration of original construction materials.
- Service improvements.
- Reduced deflection.
- Stress reduction in steel.
- Reduced fatigue.
- Change in structural system.
- Removal of walls or columns.
- Change of specification.

CHARACTERISTICS / ADVANTAGES

- Excellent durability.
- Lightweight.
- Low overall thickness; can be coated.
- Easy transportation.
- Outstanding fatigue resistance.
- Minimal preparation of plate.
- Combinations of high strength and modulus of elasticity available.
- High alkali resistance.
- Clean edges without exposed fibres.
- Particularly suited to strengthening metallic structures.
- Individually manufactured plates to required dimensions.
- Excellent durability and resistance to corrosion.
- Lightweight.
- Tapered ends to minimise peel stresses.
- Single adhesive substrate/plate bond line.
- Minimum disruption to service environment.
- Fast and economical - no heavy handling and installation equipment.
- Low aesthetic impact.
- Non-corrosive.
- Ultra High Modulus.

PRODUCT INFORMATION

Fibre Volume Content	>55%
Packaging	Manufactured individually on a project basis.
Shelf Life	Unlimited, provided the storage conditions are met.
Storage Conditions	Store in original, unopened, sealed and undamaged packaging in dry conditions at temperatures of max. +50 °C. Protect from direct sunlight.
Appearance / Colour	Carbon fibre reinforced polymer with an epoxy matrix, black.

Dimensions	Manufactured individually on a project basis.

TECHNICAL INFORMATION

Laminate Tensile Strength	~1110 MPa (mean)
Laminate Tensile Modulus of Elasticity	~360,000 MPa (mean)
Laminate Elongation at Break	0.3%

VALUE BASE

All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

LIMITATIONS

- A suitably qualified Engineer must be responsible for the design of the strengthening works.
- **This application is structural and great care must be taken in selecting suitably experienced and trained specialist applicators.**
- Only apply plates within the open time of Sikadur®-30 .
- Site quality control should be supported/monitored by an independent testing authority.
- Care must be taken when cutting plates. Use suitable protective clothing, gloves, eye protection and respirator.
- The Sika®CarboDur® System must be protected from permanent exposure to direct sunlight.
- Maximum permissible service temperature is approx. +50°C.
- The instructions in the Product Data Sheet must be followed when applying Sikadur®-30 adhesive.

ECOLOGY, HEALTH AND SAFETY

For information and advice on the safe handling, storage and disposal of chemical products, users shall refer to the most recent Material Safety Data Sheet containing physical, ecological, toxicological and other safety-related data.

APPLICATION INSTRUCTIONS

SUBSTRATE PREPARATION

Metallic Surface

- The metallic surface shall be grit blasted to ISO 8501-1 grade SA 2.5 using a hard angular grit, free from grease, oil, rust and any other contaminants which could reduce or prevent adhesion, to give a blast surface (peak to trough) amplitude between 50 and 100 microns. A maximum variation in level of +/- 3 mm over a distance of 300 mm in any direction should be achieved.
- Following grit blasting all dust shall be removed from the surface.
- In the event that bonding of the plate is to take place more than 4 hours after exposure of the bare substrate. A corrosion protection primer of SikaCor®-EG1 at a dry film thickness of 50-75 microns should be applied and cured for a minimum of 12 hours at 15°C.
- The bonding surface of the plate is protected with a disposable peel ply layer. The peel ply should be fully removed immediately before the bonding operation starts. The layer is easiest to remove as a continuous strip.
- The metallic surfaces must be cleaned and degreased using Sika® Thinner C by lightly brushing with a stiff brush prior to the application of SikaCor®-EG1 and SikaDur-®30 structural epoxy adhesive. Refer to separate Product Data Sheets.

	+10°C	+20°C	+30°C
1) Maximum waiting time between - Blast cleaning of steel and - Primer / or Sikadur® -30 (application without priming possible, if no corrosion protection is needed)	48 hours	48 hours	48 hours
2) Minimum waiting time between - Primer and - Sikadur®-30 application (**without** additional preparation of the Primer)	48 hours	24 hours	12 hours
3) Maximum waiting time between - Primer and - Sikadur®-30 application (**without** additional preparation of the Primer)	7 days	3 days	36 hours
4) Waiting time between - Primer and - Sikadur®-30 application (**with** additional preparation of the Primer)*	>7 days	>3 days	>36 hours

*If additional preparation of the Primer is necessary (**4**), it shall be done the day before application. After preparation of the Primer, the surface has to be cleaned/vacuumed free from dust.

CFRP Plate Surface
Immediately prior to the application of Sikadur®-30, solvent wipe the bonding surface with Thinner C to remove any contaminants. Wait until the surface is dry before applying the adhesive.

APPLICATION METHOD / TOOLS

Application Method
- Place the Sika® CarboDur®plate on a table and remove the peel ply from the bonding surface.
- Apply the mixed Sikadur®-30 adhesive with a special 'dome' shaped spatula onto the clean Sika® CarboDur®plate. Refer to separate Product Data Sheet.
- Apply the Sikadur®-30 adhesive carefully to the properly cleaned and prepared substrate, with a spatula to form a thin layer.
- Within the open time of the adhesive, place the Sikadur®-30 coated Sika® CarboDur®plate onto the Sikadur®-30 coated metallic surface. Press the plate into the adhesive until the material is extruded out of both sides of the plate. Remove surplus adhesive.

Fire Protection
- If required Sika® CarboDur®plates may be protected with fire resistant material.

Aesthetic Coating
- The exposed plate-surface can be painted with a coating such as Sikagard®-550W Elastic or Sikagard®-675W GB Elastocolor.

Quality Assurance
- Sikadur®-30 samples should be produced on site for quality control purposes as required within the specification and contract documentation.

Tools
- Specific to Contractor and project.

Cleaning of Tools
- Clean all tools and application equipment with Sika® Thinner C immediately after use. Hardened/cured material can only be mechanically removed.

LOCAL RESTRICTIONS

Please note that as a result of specific local regulations the performance of this product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the application fields.

LEGAL NOTES

The information, and, in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the product's suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.

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