



METHOD STATEMENT

Sika® CarboDur® System

03.01.2023 / VERSION 2.1 / SIKA® LIMITED / ROB DOHERTY

TABLE OF CONTENTS

1	Introduction	3
2	System Description	3
2.1	References	3
3	Products	3
3.1	Material Storage	3
4	Equipment	4
4.1	Tools	4
4.2	Cleaning	4
4.3	Additional Tools	4
5	Health and Safety	6
5.1	Risk Assessment	6
5.2	Personal Protection	6
5.3	First Aid	6
5.4	Waste Disposal	6
6	Substrate Preparation	7
6.1	Damaged Substrates	7
6.2	Testing	7
6.3	Surface Levelling, Cleaning and Pre-Treatment	8
7	Application	9
7.1	Adhesive	9
7.2	Sika® CarboDur® Plates	10
7.3	Additional Information	11
8	Inspection, Sampling, Quality Control	12
8.1	Before Application	12
8.2	Quality Control After Installation	12
9	Appendix	14
9.1	Construction Records	14
9.2	On-Site Checklist: Equipment and Materials	14
9.3	On-Site Checklist: Quality Assurance	15
10	Legal Note	16

1 INTRODUCTION

This Method Statement is written as a guideline for the use of the Sika® CarboDur® System. This document must be used and referred to, in combination with all other relevant Product Data Sheets (PDS), Material Safety Data Sheets (MSDS) and any Project Specifications.

Structural strengthening must only be carried out by trained and experienced specialists. If additional clarification or advice is needed, please do not hesitate to contact your local Sika® Technical Services Department who will be pleased to assist you.

2 SYSTEM DESCRIPTION

The Sika® CarboDur® System is a high-performance Structural Strengthening System consisting of Sika® CarboDur® Plates and Sikadur®-30 adhesive. It is used for the post-construction reinforcement of buildings and civil engineering structures.

2.1 REFERENCES

This Method Statement has been written in accordance with the recommendations contained in **fib Technical Report Bulletin No. 14**, especially Chapter 8: *“Practical execution and quality control”* as well as with the advice contained in **ACI 440.2R-17** and Chapter 10 of **Concrete Society Technical Report TR55 – Design Guidance for Strengthening Concrete Structures Using Fibre Reinforced Composite Materials**.

Pull-off tests for Quality Control purposes should be performed according to **BS EN 1542**.

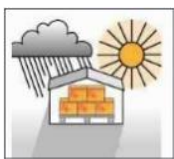
Limitations:

- The products must only be used in accordance with their intended applications.
- Local differences in some products may result in performance variations. The most recent and relevant local Product Data Sheets (PDS) and Material Safety Data Sheets (MSDS) shall apply and must be referred to.
- For any other specific construction / build information refer to the Architect’s, Engineer’s or Specialist Contractor’s details, drawings, specifications and risk assessments.
- All of the works must be carried out as directed by a suitably qualified Engineer as the Supervising Officer.

3 PRODUCTS

Sika® Brand	Description
Sika® CarboDur®	Pultruded carbon fibre reinforced polymer (CFRP) laminates designed for strengthening concrete, steel, timber and masonry structures. Available in various cross sections.
Sikadur®-30	Thixotropic, structural two-part adhesive, based on a combination of epoxy resins and special fillers, designed for use at normal temperatures between +8°C and +35°C.

3.1 MATERIAL STORAGE



Materials must be stored properly in undamaged original sealed packaging, in dry and cooled conditions. Refer to specific information contained in the Product Data Sheets regarding minimum and maximum storage temperatures. Protect the products from direct sunlight.

Sika® CarboDur® Plates may only be transported in their original packaging or otherwise adequately protected against any mechanical damage.

4 EQUIPMENT

4.1 TOOLS



Brush



Vacuum
Cleaner



Application
Trowels



Scraper



Rubber Roller



Concrete Grinder



Mixing
Container



Mixing Spindle



Mixing Paddle



Hand-Held Mixer

4.2 CLEANING

Clean all tools and application equipment with Sika® Thinner C (or a suitable Isopropanol based cleaner), immediately after use. Hardened material can only be removed mechanically.

4.3 ADDITIONAL TOOLS

Sika® Carboheater 2

The Sika® Carboheater 2 equipment is a special tool that can be used in three situations:

- If the ambient temperature during application is to be low (below 10 °C).
- If the service temperature will be above 50 °C and curing at high temperatures is therefore necessary.
- If the adhesive needs to be cured rapidly, in order to be able to take load very soon after installation.

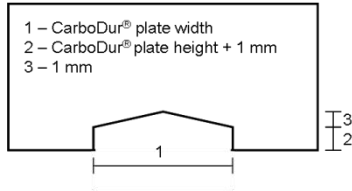
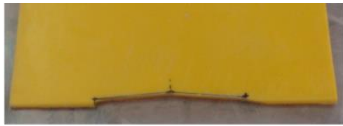
The Sika® Carboheater 2 is connected to both ends of a Sika® CarboDur® Plate and a high current is applied. Due to the high resistance of the carbon fibers, the Plate heats up, which also heats the adhesive. This reduces its curing time.

For detailed information please refer to your local Sika® Technical Services Department.

Adhesive Application

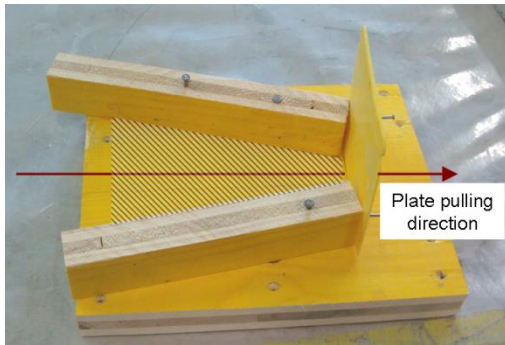
It is recommended that installers make a small tool which facilitates application of the adhesive onto the Plates. A plastic or metal scraping tool is cut to shape suiting the desired adhesive profile on the Plates, as shown in the picture overleaf, together with a simple wooden framework for the Plates to be fed through. This tool can be cleaned after use (i.e., when using a durable metal scraper), or it can simply be discarded and remade on demand (i.e., when using plastic scrapers). The pictures below illustrate the application tool construction and the adhesive application process.

Application Tool Construction and Assembly



Top: Plastic Scraper with the cut-out made in the base.

Bottom: Dimensions: $\geq 80\text{mm}$: 3mm – 5mm
 $\geq 90\text{mm}$: 3mm – 6mm



Application tool for applying the Sikadur adhesive onto the Sika® CarboDur® Plates.

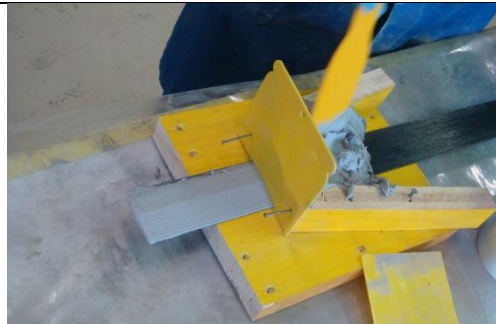
The hatched area shows the adhesive 'feed area'.

Application



Adding the Sikadur® adhesive.

Tip: *Always keep the bulk of the adhesive close to the pre-cut scraper to ensure uniform coverage!*



Simple and uniform application of the Sikadur® adhesive onto a Sika® CarboDur® Plate in the desired domed shape, by simply pulling the Plate through the tool.

If Sika® CarboDur® Plates of different widths are regularly applied, a more durable tool that accommodates all different Plate sizes may be useful – please contact your local Sika® Technical Services Department for advice.

5 HEALTH AND SAFETY

5.1 RISK ASSESSMENT



The risks to health and safety from everything including any defects in the structure, working procedures and all of the chemicals used during the materials' installation must be properly assessed and safely accommodated.

Any working areas on platforms and temporary structures must also provide a stable and safe area to work. All work and working procedures must be carried out fully in accordance with the relevant local health and safety legislation.

5.2 PERSONAL PROTECTION

Work Safely!

Safety boots, gloves and other appropriate skin protection should be worn at all times. The use of disposable or new / clean protective clothing during the materials' preparation and application is highly recommended.

Always wear nitrile based protective gloves when handling epoxy adhesives as they can cause skin irritation.

Apply barrier cream to hands and any unprotected skin before starting work.

Appropriate eye protection should be worn at all times whilst handling, mixing and installing the products. Carrying an eye wash with you at all times is recommended.

Always wash hands with suitable soap and clean water after handling the products and before food consumption, smoking, visiting the toilet and after finishing work.

The work area needs to be well ventilated, and operatives should take frequent breaks in fresh air to avoid any other health issues.

Silica dust produced by the grinding or blast cleaning of concrete can be hazardous. Protect yourself and others by using a vacuum grinder or vacuum blast cleaning equipment with dust extraction and abrasive recycling attachments respectively. Always wear a dust mask / respirator when grinding concrete. Do not inhale the concrete dust.



5.3 FIRST AID



If the epoxy resin based adhesive products come into contact with eyes or mucous membranes, remove any glasses or contact lenses, rinse with clean warm water for 10 to 15 minutes then seek medical attention.

Any chemical spillages on skin must be cleaned immediately and rinsed thoroughly with clean warm water.

5.4 WASTE DISPOSAL



Do not empty any surplus material into drainage or water systems; dispose of all waste materials and packaging responsibly through licensed waste disposal facilities or contractors, fully in accordance with local legislation and the authority's requirements. Also avoid any chemical materials run-off into soil or into waterways, drains or sewers.

Any uncured adhesive waste or spillages must be disposed of as hazardous waste. Waste and / or leftover Sika® Thinner C must be disposed of according to local regulations. Cured adhesive waste can be disposed of safely as normal building materials waste according to the relevant local regulations.

For more detailed health and safety information, please refer to the relevant Material Safety Data Sheet (MSDS).

6 SUBSTRATE PREPARATION

Note: This Section only treats the preparation of **concrete substrates** for the installation of Sika® CarboDur® Plates. For the use of this System on alternative substrates, please refer to Method Statement 850-41-10 Substrate Preparation for Sika® Rigid Bonding and Structural Strengthening Systems.

6.1 DAMAGED SUBSTRATES



Before preparing the substrate for the application of the Sika® CarboDur® Plates, the substrate must be thoroughly inspected and any unsound material (such as areas of damaged concrete or pieces of the original wooden formwork or tie-wires, etc.) must be removed.

Damaged or weak concrete must be removed, and uneven surfaces levelled prior to installation. The following Sika® Repair Materials / Systems can be applied to repair these areas (for full details on these materials and their application / limitations, please refer to the relevant Product Data Sheets):

- For the protection of prepared, exposed or corroded steel reinforcement: SikaTop® Armatec®-110 EpoCem® or Sika® MonoTop®-1010.
- As structural concrete repair / replacement materials:

Fast repairs in small areas: Epoxy resin-based materials such as Sikadur®-41, Sikadur®-30 or Sikadur®-31+ adhesive.

Larger areas or volumes: Cement based materials or Systems: Sika® MonoTop®-4012 (multipurpose for horizontal, vertical or overhead applications), or Sika® MonoTop®-614 F for a flowable consistency.

The choice of the repair material largely depends on the timeframe of the project: Curing time until installation of Strengthening Systems for epoxy resin materials is 3-4 days, for cement-based products it is 28 days.

If there are large blowholes or honeycombing in the concrete surface, these must first be filled with a suitable repair mortar, such as Sikadur®-41 epoxy mortar Sikadur®-30 adhesive or Sikadur®-31+ adhesive / repair mortar. Sikadur®-30 adhesive must be used as a bonding bridge layer for these options to ensure a good bond with the concrete substrate and no voids in the repairs.

Cracks $\geq 0.2\text{mm}$ wide should be suitably infilled using a crack injection. Sika® have a number of products suitable for this application such as Sikadur®-31+ as the patching or facing material, and Parex Epoxy Injection Grout or Sikadur®-52 as the injection resins. Refer to Sika® Crack Injection, Structural Method Statement for more information.



Where concrete repairs are necessary to a structure prior to bonding the Sika® CarboDur® Plates, it is important that the repair materials are fully compatible with the adhesive and suitable for use in a structural situation (i.e., low shrinkage, compatible modulus of elasticity, good interface bond and adequate strengths). If the repair materials are not suitable, the effect will be detrimental to the long-term performance of the bonded Plates.

Further advice on all aspects of concrete repairs can be obtained from your local Sika® Technical Services Department.

6.2 TESTING

The actual strength of the concrete substrate must be verified on all projects. If the necessary pull-off values cannot be achieved (see Section 8.1), then strengthening may still be possible by use of the SikaWrap® Fabric System. Please refer to the SikaWrap® Fabric Product Data Sheets and Method Statements for this alternative Sika® solution.

If the concrete is considered too weak for use and must be repaired as outlined in Section 6.1 above, then further pull-off tests shall be performed after the repairs are completed and adequately cured. Please refer to Section 8 of this Method Statement for information on these testing procedures and the necessary concrete strength.

Concrete should normally be older than 28 days before installing the Sika® CarboDur® System (dependent on the environmental situation, the mix design and effective strength requirements).

6.3 SURFACE LEVELLING, CLEANING AND PRE-TREATMENT

The surface to be strengthened must be levelled to ensure that the specified tolerances are achieved and maintained as detailed in the Table below. Any protrusions such as formwork joints must be ground off and any areas of grout loss or blowholes must be filled as previously advised in Section 6.1 to achieve the minimum tolerances required. The plane and level of the substrate is to be checked with a suitable wood or metal straight-edged batten. The tolerance required depends on the specified standard to be achieved. Sika® generally recommends tolerance measurement and testing according to the fib Bulletin No. 14 (see Table below), however, it can also be aligned to local guidelines. Testing must only be carried out in relation to one standard or another.



Acceptable Deviance from Level	
Standard	fib Bulletin No. 14
Tolerance for 2m length	10 mm
Tolerance for 0.3m length	4 mm



The leveling / grinding of the concrete surface should be performed shortly before the installation of the Plates. Otherwise, it is possible that the surface will get contaminated / dirty again, then additional cleaning will be required so as not to impair the quality of the adhesive bond. During the concrete grinding works, an integrated vacuum (see picture on the left) should again be used, to reduce the risk of contamination. A dust mask should be

worn to prevent the inhalation of concrete dust.

After levelling the concrete substrate surface, it must also be prepared and cleaned as necessary so that it is free from oil, grease and any other contaminants, together with any loose or friable particles. The surface must finally be brushed and vacuumed immediately prior to the Plate installation works. The picture on the left shows an example of a sufficiently ground substrate surface with the grains showing.

The areas of concrete or masonry surface where the Sika® CarboDur® System is to be applied must be clean, dry and prepared to achieve a laitance and contaminant free, open textured surface. The substrate moisture content must be less than 4% pbw (percentage by weight).

The exact locations on the substrate surface where the Sika® CarboDur® Plates will be applied can also then be marked out with tape, so the adhesive can be applied and spread very precisely, plus any excess can also be removed easily and neatly.



7 APPLICATION

Before starting the works on site, we always recommend that you prepare a checklist (an example is shown in Section 9.2) to ensure that all of the necessary tools and materials are available on site when installing the Plates. Review the ambient conditions and confirm that the Sikadur® adhesive is suited to the conditions on site, the specified program and the desired performance and exposure in service.

Immediately prior to commencing the actual installation works on site, make a final inspection and check that the substrate is fully repaired / prepared, level to the specified tolerances and that the surface is clean and as described above.

7.1 ADHESIVE

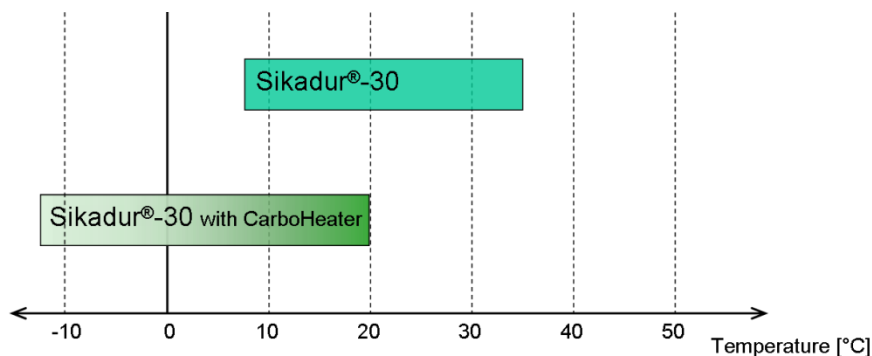
Sikadur®-30 adhesive is used with Sika® CarboDur® Plates. For more details on its performance, pot-life and other characteristics, please refer to the relevant Product Data Sheet. The adhesive is mixed in pre-batched units.

Mixing:

Add component B to component A and mix with a spindle fitted to an electric low speed mixer (maximum 500 rpm) to avoid entrapping air. Mix thoroughly for about 3 minutes to a homogeneous mix with a uniform grey color and appearance. Then, pour the whole mix into a clean container and stir again for approximately one more minute, again at low speed to keep air entrapment at a minimum.

The adhesive pot-life begins when the resin and hardener are mixed. It is shorter at high temperatures and longer at low temperatures.

The graph below shows the application temperature ranges for the Sikadur®-30 adhesive. This is intended as a guideline only; please also refer to the Product Data Sheet prior to use.



Excess adhesive extruded from under the Plates during the bonding operation should be scraped neatly away before curing. Do not reuse this material for bonding additional Plates.

The sequence of operations should be planned to ensure that the adhesive is applied, the Plates bonded, and the installation completed within one hour of mixing the adhesive, or within 80% of the pot-life, whichever comes first.

Adhesive Consumption

Width of Sika® CarboDur® Plate	Typical Consumption of Sikadur®-30
50 mm	0.20 - 0.28 kg/m
60 mm	0.24 - 0.32 kg/m
80 mm	0.32 - 0.44 kg/m
90 mm	0.40 - 0.56 kg/m
100 mm	0.44 - 0.64 kg/m
120 mm	0.45 - 0.80 kg/m
150 mm	0.68 - 1.00 kg/m

Important Note: Dependent on the substrate surface plane, profile and roughness, together with any Plate crossings and the degree of loss or wastage, the actual consumption of adhesive could be higher.

7.2 SIKA® CARBODUR® PLATES

The Sika® CarboDur® Plates can either be ordered pre-cut to length, or as a continuous roll with the required lengths to be cut on site. When unpacking the rolled product on site, it must be handled very carefully to ensure controlled uncoiling. Special care should also be taken to avoid splintering of the Plate ends. Loose carbon fibers may well also be present, so gloves, masks and goggles are recommended to be worn whilst handling and working with the Plate strips.

To cut the Plates to length on site, tape the area to be cut to prevent excessive dust generation and cut using a rotary disc cutter or a normal hacksaw. Always support the Sika® CarboDur® Plate strip on both sides during cutting to avoid splintering of the ends and cut perpendicular to the fibres. Please note that carbon fibres are electrically conductive, so protect electrical equipment and electronics from the dust produced by cutting Sika® CarboDur® Plates.



Clean the surface of the Plates with a clean white cloth and Sika® Thinner C (or an Isopropanol based cleaner) to remove any dust or grease. The solvent must have evaporated, and the surface of the Plate must be completely dry before the application of the adhesive. Apply the Sikadur®-30 adhesive onto the Sika® CarboDur® Plates, so it is approximately 1 mm thick on the sides and 2 mm thick in the middle of the Plate. Apply the adhesive to the plain side so the printed side is facing outwards, with the product name and batch number visible for later inspection. It is recommended that a special adhesive application tool is made to facilitate even application of adhesive (see Section 0).

Scrape a very thin layer of the thoroughly mixed Sikadur®-30 adhesive carefully into the prepared, dust free substrate with a spatula, then place the coated Sika® CarboDur® Plate onto the prepared concrete surface. Using a Sika® Hard Rubber Roller, press the Plate firmly onto the substrate until the material is forced out on both sides of the Plate (see pictures below). Finally remove and dispose of this surplus Sikadur®-30 epoxy adhesive.

In situations with Plate intersections, the first Sika® CarboDur® Plate applied is allowed to cure and then the surface in the intersecting area is again cleaned and degreased with Sika® Thinner C (or an Isopropanol based cleaner). When dry, the Sikadur® 30 adhesive for the next Plate should be applied to the clean and prepared concrete substrate on both sides of the existing Plate to level out the variation from the underlying Plate, so the overlapping Plate will also lie on a smooth, flat surface.



In general, we recommend putting Plates next to each other. If space is limited and more than one Plate has to be bonded together for higher loading capabilities, they must be cleaned on both sides with Sika® Thinner C, (or an Isopropanol based cleaner) in all areas of Plate-adhesive contact. To bond a second Plate on top of the first layer, Sikadur®-30 is used. Make sure that not all adhesive is squeezed out and a thin layer of adhesive (0.5-1 mm) remains between the Plates.

Dependent on the structure, the loading and the anchoring needs, many different details and detailing solutions are possible to anchor the ends of the Sika® CarboDur® Plates into the concrete in an appropriate position. Please refer to your local Sika® Technical Services Department for more information and specific advice.

The freshly bonded System should not be disturbed for at least 24 hours and any vibrations should normally be kept at a minimum during the curing period of the adhesive. The full design strengths of Sikadur®-30 are reached after approximately 7 days at 20 °C.

7.3 ADDITIONAL INFORMATION

Once installed, the Sika® CarboDur® Plates must be protected from:

- permanent exposure to direct sunlight to prevent UV degradation of the epoxy matrix;
- permanent immersion in water;
- mechanical abrasion or impact, which could affect their mechanical properties.

Therefore, dependent on the anticipated future exposure and environmental conditions of the project, additional protection of the Plates may be necessary. This is easily achieved by means of a suitable Sikagard®, Sikalastic® or Sika® MonoTop® Protective Coating System as outlined in the Table overleaf.

To apply a protective coating product to the installed Sika® CarboDur® Plates, thoroughly clean the surfaces with Sika® Thinner C (or an Isopropanol based cleaner), allow it to evaporate and the surfaces to dry completely, before applying the selected coating.

If a cementitious based overlay needs to be applied over the Sika® CarboDur® Plates, then it is necessary to apply an additional layer of Sikadur®-30 (0.10 – 0.30 kg/m, depending on the width of the Plate). Before applying the additional layer of Sikadur®-30, thoroughly clean the surfaces with Sika® Thinner C (or an Isopropanol based cleaner), allow it to evaporate and the surfaces to dry completely. Following adhesive application, broadcast, whilst the adhesive is still wet, with a kiln-dried quartz sand of a suitable grade, which will improve the adhesion of the overlay (see picture right).



The Table below summarizes a few of the coatings that can be used for further protection of the Sika® CarboDur® Plates when this is necessary. Please refer to the relevant Product Data Sheets and Method Statements for the Product / System details and application requirements. Further advice on these additional protective Products and Systems can also be obtained from your local Sika® Technical Services Department.

Situation	Special Need	Sika® Solutions
Direct sunlight	UV protection	Sikagard®-550 W Elastic Sikagard®-675 W GB ElastoColor
Use in humid or wet environment	Protection against water ingress	Sikagard®-680 S
Use near / in water - Immersion in water	Protection against water ingress	Sikagard®-63 N Sikalastic®-1K SikaTop® Seal-107
Increased fire resistance required	Fire protection	Sikacrete®-213 F

8 INSPECTION, SAMPLING, QUALITY CONTROL

8.1 BEFORE APPLICATION

The substrate strength (concrete, masonry, natural stone) must be checked and verified in all situations by means of a series of pull-off tests (as outlined in **BS EN 1542**). **The mean adhesive tensile strength of the prepared concrete substrate must be 2.0 N/mm², with a minimum of 1.5 N/mm². If the strengthening work has to be performed according to fib Bulletin No. 14, then the concrete needs to have a minimum tensile strength of 3 N/mm².**

Concrete substrates must generally be at least 28 days old (dependent on the environmental situation, the mix design and effective strength requirements).

If the substrate is too weak, then either preliminary repair of the substrate, or application of the SikaWrap® Fabric Strengthening System, as an alternative to using Sika® CarboDur® Plates, could be considered. If the substrate is weak or damaged and needs to be repaired, a repetition of these substrate strength pull-off tests is necessary after the repair work is completed and prior to installation of the Strengthening System.

8.2 QUALITY CONTROL AFTER INSTALLATION

After the installation of the Sika® CarboDur® Plates, additional installation quality tests can be performed to ensure a high quality and high strength bond is achieved.

For longer term inspection and monitoring guidance, please see Concrete Society Technical Report 57 (TR57) – Strengthening concrete structures using fibre composite materials: acceptance, inspection and monitoring.

Plate Pull-Off Testing

As a pull-off test is semi-destructive, it is recommended that an additional / leftover length of Sika® CarboDur® Plate is applied to the substrate in an adjacent area which has comparable concrete quality and strength. This additional Plate must be applied in the same manner and at the same time as the remaining plates.

A series of pull-off tests should then be performed on the reference Plates at 3 and / or 7 days after installation, according to the methodology in **BS EN 1542**. The overall procedure is the same and the different details and values required are summarised in the Table below. Please choose only one column and test according to your local requirements.

To test the adhesion of the Sika® CarboDur® Plate to the concrete and the failure mode, at least 3 (but usually 5) tests are required. Holes are drilled with a diamond core drill of a suitable diameter, to a certain depth in the concrete substrate. A steel 'dolly' is then glued onto the surface of the drilled core using Sikadur®-30 or Sikadur®-31+ and the maximum force at failure is measured to calculate the pull-off strength of the system. The failure should always be in the concrete and the mean adhesive tensile strength of the prepared concrete substrate must meet the requirements stipulated in the Table below.

A written test record for the Engineer's approval should be produced for every test on every project.

Test Standard	BS EN 1542	ACI 440.3 L.1
Specimen shape	Round	Round or square
Diameter	50 ±1 mm	25-40 mm
Drill depth into substrate	15 ±5 mm	6-12 mm
Minimum pull-off strength	1.5 N/mm²	1.4 N/mm²
Mean pull-off strength	2.0 N/mm ²	/
Failure	Break 100% in concrete	Break 100% in concrete

The step-by-step procedure for this pull-off testing is described in **BS EN 1542**.

Air Pocket Check

To check the installed Plates for air pockets / voids within the adhesive layer, or at the bond interfaces, they can be tapped lightly with a metal bar (there are distinctly different sounds for fully bonded Plate areas and any Plate areas with air pockets / voids). Alternatively, this can be tested more precisely using ultrasonic methods. If a significant amount of air pockets / voids are found, then the load transfer will not be sufficient and the Sika® CarboDur® Plate will need to be replaced or supplemented.

9 APPENDIX

9.1 CONSTRUCTION RECORDS

Throughout the project, a record should be written and maintained that details all aspects of the works involved in the installation, including the preparation, mixing and application:

- Surface preparation
- Materials delivery / batch numbers
- Mixing and application of adhesive
- Ambient conditions (ambient temperature, substrate temperature, humidity, dew point)
- Any possible contamination
- Details of all test samples and results
- Any significant vibration
- Any other points of note or concern on site

9.2 ON-SITE CHECKLIST: EQUIPMENT AND MATERIALS

The list below is a suggestion; please adapt it to your site needs:

- Brushes
- Vacuum
- Trowels / spatulas
- Roof-shaped spatula
- Scraper tool
- Sika® Hard Rubber Roller
- Mixing container
- Mixing spindle, or;
- Mixing paddle
- Grinding / blast cleaning equipment (dependent on substrate)
- Rotary cutter or hacksaw
- Suitable masking and sticky tape
- Clean white cloths
- Thermometer
- Moisture meter
- Sika® CarboDur® Plates
- Sikadur®-30 adhesive, or;
- Sika® Thinner C (or an Isopropanol based cleaner)
- Safety goggles
- Safety hard hat
- Skin protection cream
- Protective gloves
- Nitrile gloves
- Clean water
- Eye wash kit

9.3 ON-SITE CHECKLIST: QUALITY ASSURANCE

Substrate Preparation:	YES	NO
Have at least 3 pull-off tests been carried out?		
Average value measured on 3 locations: [N/mm ²] (avg. should be 2.0 N/mm ² , no value below 1.5 N/mm ² .)		
Are there any cracks above 0.2 mm wide in the concrete?		
Have any cracks been injected?		
Has any damage to the structure been repaired?		
Is the concrete surface even? (see Table in Section 6.3)		
Environment:		
Does the air and surface temperature exceed 8°C?		
The actual average temperature is: [°C]		
Is the ambient temperature at least 3° above the dew point?		
Is the average relative humidity on the concrete surface below 4% pbw?		
Is there free moisture on the surfaces?		
Are the surfaces to be bonded clean?		
Is there any dust or other contaminants present?		
After Installation:		
Has the bond been checked by tapping?		
Has the bond been checked with ultrasound equipment?		
Has the bond been checked with thermography?		
Are there any voids?		
Is there any adhesive with areas of discoloration?		
Have pull-off tests been carried out on test specimens?		
Average pull-off strength x3 specimens [N/mm ²] (avg. should be 2.0 N/mm ²)		
Have there been any deviations or changes from the initial specification and schedule?		
If Yes, please describe them below:		

10 LEGAL NOTE

The information contained herein, and any other advice 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. The information only applies to the application(s) and product(s) expressly referred to herein and is based on laboratory tests which do not replace practical tests. In case of changes in the parameters of the application, such as changes in substrates etc., or in case of a different application, consult Sika®'s Technical Services prior to using Sika® products. The information contained herein does not relieve the user of the products from testing them for the intended application and purpose. 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.

FOR MORE SIKA® CARBODUR® INFORMATION:

Please refer to the relevant Product Data Sheets.

SIKA® LIMITED
Target Market SCS
Watchmead
Welwyn Garden City
Hertfordshire
United Kingdom
AL7 1BQ

Version Provided By:
Rob Doherty
Phone: 01707 394444

Email: scs.technical@uk.sika.com