

METHOD STATEMENT
SikaWrap® System
Manual Wet Application

08.2020 / VERSION 2.0 / SIKA AUSTRALIA

BUILDING TRUST

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1 SCOPE

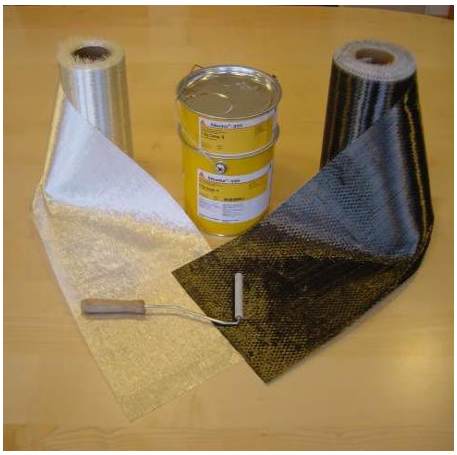
This Method Statement is written as a guideline for the use of the SikaWrap® composite system. This document shall be used and referred to, in combination with all other relevant Product Data Sheets (PDS), Material Safety Data Sheets (MSDS) and the specific Project Specifications.

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 Service Department who will be pleased to assist you.

This document only describes the manual wet application process. For dry application using a saturator, please refer to their respective Method Statements.

2 SYSTEM DESCRIPTION

The SikaWrap® composite system is a high-performance strengthening system containing FRP fabrics and impregnation resins. They are applied on the strengthening site and formed into a fibre composite. The picture below shows glass- (left) and carbon- (right) fibre fabrics, with the two-part epoxy-based impregnation resin in the middle.



The main range of applications is as follows:

- Increasing the load bearing capacity of structural elements
- Shear strengthening
- Flexural strengthening
- Masonry strengthening
- Column strengthening (for Confinement and / or Ductility)
- Changes of building use
- Structural upgrading to comply with current standards
- Improved functionality
- General seismic upgrading and / or retrofitting
- Prevention of damage by seismic action
- Improved seismic performance for masonry walls
- Blast mitigation (accidents or terrorism)
- Impact protection
- Structural design construction defects
- To replace and substitute missing rebars

2.1 REFERENCES

This method statement has been written in accordance with the recommendations contained in **fib technical report bulletin 14**, especially Chapter 8: “Practical execution and quality control” as well as with the advice contained in **ACI 440.2R-2017** and **AS 5100.8:2017**.

Pull-off tests shall be performed according to **EN 1542** or **AS 1012.24:2015**, and considering the values mentioned in the text below.

2.2 LIMITATIONS

- The products must only be used in accordance for their intended applications. The system configuration as described in the Product Data Sheets must be fully complied with and may not be changed.
- The SikaWrap® systems may only be used by experienced professionals. All strengthening works must be carried out as directed by a suitably qualified Structural Engineer as the Supervising Officer.
- For any other specific construction / build information please refer to the relevant Engineer's specifications, details, drawings, and risk assessments.
- Local differences in product may result in performance variations. The most recent and relevant local Product Data Sheets (PDS) and Material Safety Data Sheets (MSDS) apply.
- Always record the batch numbers for the SikaWrap® fabrics and Sikadur® resins that are used each day. Additionally, at the end of each working say also check to make sure that the fabric application is uniform and smooth.
- Large mixing quantities of the Sikadur® resins and /or high temperatures result in shortening of the pot life. In order to prolong the pot life, reduce the quantity of the mixing components and/or the material's temperature (i.e. store the sealed units in cool conditions until immediately prior to mixing and application).
- For application in cold or hot conditions, pre-condition the resin materials for at least 24 hours in temperature-controlled storage facilities to improve the on-site mixing, application and pot life limitations.
- Special attention should be paid to the ambient environment and conditions. Observe the minimum / maximum temperatures for substrate, atmosphere and the materials, as well as taking care to avoid application in dew point conditions (Application temperature must be at least +3 °C above the dew point)
- The substrate moisture content must be less than 4 %. All the concrete surfaces to be treated must be dry free of surface water or ice.
- **This Method Statement is produced and intended as a guide and must be adapted to suit the local Products, Standards, Legislation or any other specific local requirements.**

3 PRODUCTS

3.1 SYSTEM COMPONENTS

Fabric:

Dependent on the application, fabrics with different fibre types (i.e. Carbon, glass etc.), fabrics with different weights (from 230 g/m^2 to 930 g/m^2) and fabrics with different widths (500 mm) are used. The table below gives an overview of these different fabric types, weights and widths available.

Sika Brand	Description	Area weight [g/m^2]	Available widths [mm]
SikaWrap®-300C	Unidirectional woven carbon fibre fabric for installation by the dry or wet application process	300	500
SikaWrap®-600C	Unidirectional stitched, heavy carbon fibre fabric for installation by the wet application process.	600	500

The fabric rolls are wrapped in PE sheets and packed in cardboard boxes. The standard roll length is 50 meters.

Impregnation resin:

Sika Brand	Description
Sikadur®-300 / Sikadur®HEX-300	Sikadur®-300 or Sikadur HEX 300 is a two-part, epoxy based, low-viscous, unfilled primer or impregnation resin with an extra-long pot life and a slow curing speed. It is designed to be used for SikaWrap® fabric installation by the wet application method.

Additional Products:

Sikadur®-330	Epoxy-based primer, impregnation resin and adhesive
Sikadur®-30	Epoxy-based structural adhesive paste
Sikadur®-31 / 41	Epoxy-based repair mortar
Sikadur®-52	Epoxy-based injection resin
Sikadur®-501	Quartz sand

3.2 MATERIALS STORAGE



Materials must be stored properly in undamaged, original sealed packaging, in dry cooled conditions at temperatures between +5°C and +25°C (Resins), or between +5°C and +35°C (Fabrics). Protect all the products from direct sunlight. Please refer to the specific information contained in the respective product data sheets regarding the minimum and maximum storage temperatures and times. All these Sikadur® epoxy resin-based products can be stored for up to 24 months from the date of production.

4 EQUIPMENT

4.1 TOOLS



Concrete grinder



Vacuum cleaner



Brush



Application trowels



Brush



Plastic roller



Paint roller



Mixing container



Mixing spindle



Mixing paddle (for larger quantities)

4.2 CLEANING

Clean all tools and application equipment with ***Sika® Colma Cleaner*** immediately after use. Any uncured epoxy should be wiped up with a rag wetted with solvent. Hardened material can only be removed mechanically.

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 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 shoes, gloves and other appropriate skin protection should always be worn. The use of disposable or new / clean protective clothing during the materials preparation and application is strongly recommended.

Always wear nitrile based protective gloves when handling epoxy adhesives / impregnating resins, as they can otherwise cause skin irritation. Additionally, apply barrier cream to hands and any unprotected areas of skin before starting work.

Appropriate eye protection should always be worn whilst handling, mixing and installing the products. Carrying an eye wash with you always 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.

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

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 and 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.

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

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 relevant authorities' requirements. Also avoid any chemical materials run-off into soil or into waterways, drains or sewers.

Any uncured adhesive waste, spillages and / or leftover Sika® Colma Cleaner must be disposed of as hazardous waste and according to local regulations. Cured adhesive waste can be disposed of safely as normal building materials waste according to local regulations.

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

6 PREPARATION

6.1 PRE-PROJECT

Review the project specifications in detail. Inspect the site conditions and the concrete surfaces to receive the treatment and report immediately in writing to the responsible Engineer if anything is unsuitable for proper execution of the works.

Obtain all the necessary tools and equipment, plus materials required (for a checklist example, see Section 0), together with any special project requirements. It is recommended that the SikaWrap® fabrics to be applied are cut into their prescribed lengths with sharp scissors in advance of the mixing of the Sikadur® resin. Caution should be taken when handling the fabrics to ensure that the fibres are not bent or broken. Do not fold the fabrics.

Protect any adjacent surfaces, vehicles etc., surrounding the work area from any dust or damage due to the preparation and execution of the strengthening works.

6.2 SUBSTRATE

The SikaWrap® strengthening system can be used on concrete, masonry and wooden structures. Where others are not specifically mentioned below, as the statements refer to concrete.

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

Where concrete repairs are necessary on a structure prior the application of a SikaWrap® strengthening system, it is important that the repair materials are designed and installed to be fully compatible with the Sikadur® adhesive and suitable for use in a structural situation (i.e. they must have low shrinkage, compatible modulus of elasticity, good interface bond, adequate strength and an appropriate finished surface).

Repairs to concrete surface irregularities such as blowholes or voids must be made with a suitable repair mortar such as Sikadur®-31, Sikadur®-41, or Sikadur®-30 and Sikadur®-501 quartz sand mixed in a ratio of 1:1 by weight to get a mortar with the ideal consistency and thixotropic nature. Sikadur®-30 adhesive must also be used as a bonding bridge layer for both of these surface repair options, to ensure a good bond with the substrate and no voids in the repairs. Any non-moving structural cracks can be filled by injection with Sikadur®-52 or other suitable Sikadur® injection resin with the Structural Engineer's agreement.

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

The actual strength of the concrete substrate must be verified on all projects. If the concrete has to be repaired, then another test must be performed after the repairs are completed and adequately cured. Please refer to Section 8 of this Method Statement for more details of testing procedures and the necessary concrete strengths.

Concrete must normally be older than 28 days (dependent on the environmental situation, the mix design and effective strength requirements).

The concrete, stone and masonry substrates must be prepared mechanically using abrasive blast cleaning or grinding equipment. During this preparation work, an integrated vacuum system (see picture on the right) should be used, in order to reduce the risk of contamination, plus a dust mask should be worn to prevent the inhalation of concrete dust.



The concrete surface should be prepared to a surface profile not less than **CSP 3**, as defined by **ICRI 310.2R** or to the tolerances recommended by the relevant authority. The mechanical preparation is carried out to remove cement laitance, any loose and friable materials and achieve a profiled, open textured surface. Any surface defects such as honeycombing, blowholes and voids must be fully exposed.

Timber substrates must be planed or sanded to remove all dust and any loose or friable materials completely from all surfaces.



All prepared surfaces must be brushed, air blasted and vacuumed to achieve a dust free condition (see pictures left). No loose particles should be left on any of the substrate surfaces.

External corners and arises must generally be rounded to a minimum radius according to Standards below or as per the recommendation of the Design Engineer. This can be achieved either by grinding, or by building up with Sikadur® mortars. Internal corners must be made smooth by trowel application of Sikadur® epoxy mortar into the prepared corners.



Standard	**FIB Bulletin 14**	**ACI 440.2R-2017**	**AS 5100.8:2017**
Corners rounded radius (minimum)	25 mm	13 mm	25 mm

The surfaces to be strengthened must be levelled to ensure that the specified tolerances are achieved and maintained as detailed in the table below. The plane and level of the substrate is to be checked with a suitable straight edge. The tolerance required depends on the specified standards to be achieved. Sika generally recommends tolerance testing according to the Standards below or as per the recommendation of the **Design Engineer**, but obviously testing must only be carried out in relation to one standard or another.



Standard	**FIB Bulletin 14**	**ACI 440.2R-2017**	**AS 5100.8:2017**
Tolerance for 2 m length	10 mm	10 mm	4 mm
Tolerance for 0.3 m length	4 mm	-	1 mm

The final surface must be smooth, dry and free of damaged concrete and any other contaminants as dust, foreign particles, cement laitance, oil, grease, surface coatings, curing compounds, waxes and impregnations etc., which could adversely affect or inhibit the bond of the strengthening system to the concrete.

The substrate moisture content must be less than 4% pbw.

6.3 RESIN

For the wet application of the SikaWrap® system, Sikadur®-300 or Sikadur®HEX-300 is normally used for the resin priming coat and as the impregnating resin, whilst Sikadur®-330 can be used as the resin primer on rougher concrete

surfaces (see below). Sikadur®-330 should also be used as primer if heavy fabrics or multiple layers are applies, as it increases the green tack of the system. The resins should be mixed and used as described below. Avoid aeration during all mixing actions.

The pot life begins when the resin and hardener are mixed. It is shorter at high temperatures and longer at low temperatures. The greater the quantity that is mixed, the shorter the pot life becomes. To obtain longer workability at high temperatures, the mixed adhesive may be divided into portions. Another method is to chill components A and B before mixing them.

The sequence of operations shall be planned to ensure that the adhesive can be applied, joined and the work with it completed within three hours of mixing the adhesive or within 80% of the pot life, whichever comes first.

For details on the performance, pot life and other characteristics of the Sikadur® resins products, please refer to the relevant Product Data Sheet.

Resin Primer Coat:

Ground substrates are generally 'smoother', abrasive blast cleaned ones are generally 'rougher'. This difference is the deciding factor for the selection of the most appropriate Sikadur® primer resin. For ‘smoother’ surfaces, the more liquid resin products such as Sikadur®-300 should be used. When dealing with rough surfaces, the more filled resins such as Sikadur®-330 are best suited to accommodate the surface profile and irregularities.

Sikadur®-330:

Sikadur®-330 serves as both primer and impregnation resin for the fabrics. It is supplied in pre-batched units and larger bulk packaging.

Pre-batched Units:
Continuously mix all of Part A in its container at a low speed (max 500 rpm) then gradually add all of Part B until a fully homogeneous mix, with a uniform grey colour and appearance has been achieved. Then pour the whole mix into a clean container and mix for a second time (3 minutes, max 500 rpm).

Bulk Packaging:
Weigh the correct proportions of Parts A and B and pour into separate clean containers before mixing by the same process as outlined above for the pre-batched units.

Sikadur®-300 / Sikadur®HEX-300:

Sikadur®-300 / Sikadur®HEX-300 has an extended, longer pot life and a slow curing speed. It is also supplied in pre-batched units and larger bulk packaging.

Pre-batched Units:
Continuously mix all of Part A in container then gradually add all of Part B continuing to mix at a low speed (max 500 rpm) for 3 minutes.

Bulk Packaging:
Full Quantity: Continuously mix all of Part A in a container then gradually add all of Part B continuing to mix at a low speed (max 500 rpm) for 3 minutes.
Partial Quantities: Weigh the correct proportions of Parts A and B and pour into a clean container before mixing by the same process as outlined above for the pre-batched units.

Consumption:

The actual consumption, especially of the priming layer, is primarily dependent on the roughness of the substrate and the type and amount of SikaWrap® fabric to be impregnated. The table below shows the estimated consumption for the different fabric weights (excluding loss and wastage).

SikaWrap® Product	Area weight [kg/m²]	Resin type	Resin consumption [kg/m²]	
			First layer incl. priming	Following layers
SikaWrap®-300C	300	Sikadur®-300 / Sikadur®HEX-300	1.0-1.5	0.7
SikaWrap®-600C	600	Sikadur®-300 / Sikadur®HEX-300	1.3-1.8	≥0.75

7 APPLICATION

7.1 GENERAL

Prior to starting the application, measure and record the substrate moisture content (to be less than 4%), the relative humidity and determine the dew point. The temperature must be min. 3°C above the dew point. Cut the SikaWrap® fabric to the desired dimensions for the installation.

Always work in the same direction as the fibres. Avoid excessive force and moving the roller back and forth when laminating to prevent any folding or creasing of the SikaWrap® fabric.

Overlapping pieces of fabric must be installed in the same direction as the fibres and the overlap must be at least 100 mm, or according to the project specifications.

When placing several uni-directional SikaWrap® fabrics side by side, no overlapping in the weft direction (perpendicular to the fibres) is generally required, unless specified otherwise in the strengthening design. For multi-directional fabrics, overlapping in the weft direction must be by at least 100 mm (dependent on the SikaWrap® fabric type) or again according to the project specifications.

After application, protect the finished installation of SikaWrap® FRP Reinforcement from rain, sand, dust and any other contaminants using protective plastic sheets or other barriers. Do not allow the protective sheets to come into contact with the finished SikaWrap® installation.

7.2 WET APPLICATION PROCESS

The name of the 'wet' application method comes from the state of the fabric at the time it is applied in its final position. For this process, Sikadur®-300 / Sikadur®HEX-300 is used as impregnating resin and Sikadur®-330 (rougher substrates) or Sikadur®-300 / Sikadur®HEX-300 (smooth substrates) can be used as primer.

The wet application method is suitable for the non-woven fabrics as well as for any woven fabric, especially with an area weight of higher than 300 g/m2, depending on the fibre type.

Please refer to the PDS for information regarding open time and waiting times between the different primer / resin application steps.

Primer Application



Primer application is the same procedure for manual impregnation or mechanical saturator impregnation. Apply the primer (Sikadur®-330 for 'rougher' substrates, Sikadur®-300 / Sikadur®HEX-300 for 'smoother' substrates) to the prepared substrate with a trowel, brush or roller. The Sikadur®-300 / Sikadur®HEX-300 resin is very liquid and if necessary, it is possible to apply a second coat after the first coat has penetrated into the concrete substrate.



Manual Resin Application

Distribute 2/3 of the expected Sikadur®-300 / Sikadur®HEX-300 quantity on a clean PE sheet and then place the pre-cut fabric onto the resin covered sheet. Saturate SikaWrap® fabric by rolling with a mohair or plastic roller in the fibre direction until the resin penetrates through the fabric. Distribute the remaining 1/3 of the Sikadur®-300 / Sikadur®HEX-300 onto the fabric and evenly spread with roller to fully saturate fabric. Remove the excess resin. The resin consumption can be checked by taking the weight of the fabric before and re-weighing after wetting with Sikadur®-300 / Sikadur®HEX-300.

Fabric Positioning / Lamination



Place the pre-wetted, saturated SikaWrap® fabric onto the primed wet surface in the required direction (within the open time of the primer) and smooth by hand to remove folds, creases and large air entrapments.

The easiest way to transport the impregnated fabric is to roll it onto a cardboard tube as illustrated on the right. This way the fabric is less likely to get distorted or wrinkled. If possible, leave the fabric on the roll for 5-10 minutes, so the resin can soak into the fibre bundles. For a better grip of the fabric to the tube, it is possible to cover it with quartz sand before use.

Heavy fabrics (>600 g/m2)



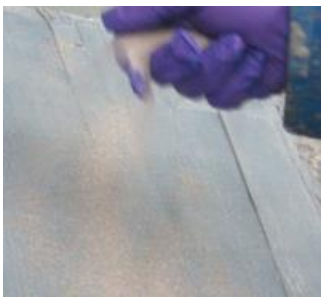
After smoothing and placement, the fabric is laminated onto the substrate using the plastic Sika® impregnating roller or a squeegee, working parallel to the fibre direction and until the resin is distributed evenly over the fabric and all entrapped air is released. Avoid excessive force when laminating to prevent folding or creasing of the SikaWrap® fabric.

Additional Fabric Layers

If additional layers are required, repeat the impregnation and lamination process described above. The application must take place wet on wet and within 60 minutes (at +23 °C) of the previous layer. If it is not possible to apply the subsequent layers of fabric within 60 minutes of the previous one, then a waiting time of at least 12 hours must be observed before application of the next layer, and again a priming layer is necessary. Take note of the open times mentioned in the PDS of Sikadur®-300. In all situations where application is onto a cured layer of the epoxy resin, the surface must be dry and free of dust prior to the application. The overlapping sections of the additional layers should be distributed around the circumference of the column.

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Preparation for Cementitious Overlays



The surface must be wiped until it is clean and dry before application of any coatings to ensure an adequate bond.

If a cementitious overlay is to be applied over the SikaWrap® fabric, then an additional layer of Sikadur®-300 / Sikadur®HEX-300 resin must be applied over final laminating layer (approximately 0.3 kg/m2) and broadcast whilst still wet with Sikadur®-501 quartz sand, which will improve the adhesion of the overlay (see picture right). If a colored coating is to be applied, the 'wet' Sikadur®-300 surface can also be smoothed with a brush.

7.3 ADDITIONAL OVERCOATING

The applied and cured SikaWrap® fabric can be coated with a colored protective coating for aesthetic and/or protective purposes. Selection of the appropriate product will be dependent on the exposure requirements. The table below illustrates some common demands and suitable coating products. Please refer to the relevant Product Data Sheet for specific information on application, properties and performance.

Situation	Special need	Sika® solution
Direct sunlight	UV protection	*Sikagard®-550W Elastic*
Use in humid or wet environment	Protection against water ingress	*Sikagard®-680 S*
Use near/in water - Immersion in water	Potable water ingress Chemical water ingress	*Sikagard®-62* *Sikagard®-63N*
Increased fire resistance required	Fire protection	*Sikacrete®-213F*

Note: ***Sikacrete®-213F*** – non stock item, lead times and minimum quantities apply

If the top layer of resin was broadcast with Sikadur®-501 quartz sand, a mortar coat can be applied over the strengthening system after curing (for example Sikacrete®-213F for increased fire resistance).

8 INSPECTION AND TESTING

8.1 BEFORE APPLICATION

The substrate strength (concrete, masonry, natural stone) must always be checked and verified in all situations. This is done by means of a series of pull-off tests as outlined in Document 810 4: "Description of Test Procedure: Surface Adhesion Strength of Concrete". The mean adhesive tensile strength of the prepared concrete substrate must be 2.0 MPa and no individual result shall be below 1.5 MPa, unless otherwise detailed in the Engineer's specifications.

If the strengthening work has to be performed according to the AS5100.8:2017 or Vic Roads Spec 688-2, then the concrete must have a minimum tensile strength of 3 N/mm^2. Concrete substrates must generally be at least 28 days old.

If the substrate is damaged and needs to be repaired, a repetition of the substrate strength tests is necessary after repair.

8.2 SITE INSPECTION

On site, all aspects of preparation, mixing, and application of materials should be continuously observed and recorded, including the following:

- Surface preparation and testing
- Materials labels and batch numbers
- Mixing of the resin materials
- Application of the resin to the substrate and the fabric
- Curing of the materials
- System testing
- All other details relating to the strengthening requirement and system specification

Upon completion of the curing process the installed system should be checked again for any areas where the impregnation resin has not fully penetrated, or where any resin has not completely cured. Any such areas covering more than 25 x 25 mm on the surface must be repaired. Any repairs must be made subject to the same application, curing and quality control specifications as the original work.

Small delamination's and / or bubbles can be injected with a compatible resin system to re-establish bond between the substrate and the strengthening system.

If large defects are found, removal of the applied system and re-application, or the application of additional layers of FRP Reinforcement may be necessary. The repair type, the preparatory works, the number of layers to be added and the overlapping lengths must all be approved by the responsible Structural Engineer.

8.3. Pull off test – procedure

This pull-off test, based on European Standard **EN 1542** or **AS 1012.24**, is used to verify the concrete substrate quality as well as the quality of the installed SikaWrap® system. The table below shows „step by step" how to perform the test.



Locating the Test Position:

Ensure there are no reinforcement bars within the locality of the test area. In the absence of specialist equipment use a magnet with appropriate strength.
Mark the test area.



Substrate Preparation:

Grind the existing concrete surface locally, or carefully remove any weak cement laitance layer using blast cleaning or water jetting with adequate water pressure. Take care not to damage the concrete or any repair mortar. If testing an installed SikaWrap® product, clean the surface so that it is free from any dust and grease.



Drilling:
The drilling equipment must be free from any significant vibration and should not allow lateral movement of the coring bit.
Drill with a diamond coring barrel at 90 ±1 degrees to the surface. Carefully bore into the concrete substrate (through the strengthening system) to a depth of 15 ±5 mm.



Cleaning:
Carefully remove the diamond coring barrel without damaging the test specimen.
Using a wire and then a soft-bristled brush, clean any debris away from around the core.
If necessary, dry the surface i.e. using warm air, not with an open flame.



Test Sample Preparation:
Degrease, clean and dry the dolly to remove any oil, dust or contamination which could reduce bond strength.
Use an approved cleaner (i.e. *Sika Colma® Cleaner*)
If necessary, warm the dolly so condensation does not form below dew point.



Adhesive Application:
Ensure the surface is dry before applying the adhesive.
Carefully apply a thin layer of adhesive on the surface of the concrete, or the SikaWrap® system. Do not fill the annulus around the core with adhesive.
Apply a thin even layer of adhesive on the dolly.



Press the dolly firmly onto the surface

Remove any adhesive from around the core area.



Prevent creep while the adhesive is curing to bond the dolly to the surface with suitable sticky tape

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Attach the pull-off equipment to the dolly in accordance with the manufacturer's instructions
The pull-off equipment must be concentric to the dolly and at 90 ±1 degrees to the cored surface.
Secure the equipment so that it does not change position during the test

Carry out this test in at least three different locations and create a test report according to **EN 1542** or **AS 1012.24**.
For the actual pull-off system equipment, two different types of machine are possible as illustrated in the pictures below.

Electronic



Manual



9 APPENDIX

9.1 CONSTRUCTION JOURNAL

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

- Surface preparation
- Materials delivery / batch numbers
- Mixing and application of resin
- 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: MATERIALS

- Brush
- Vacuum cleaner
- Brush roller
- SikaWrap® fabric
- Sikadur®-330 resin
- Sikadur®-300 / Sikadur®HEX-300 resin

- Sika plastic roller
- Mixing container
- Mixing spindle
- Mixing paddle
- PE sheets
- Grinding / blast cleaning equipment (dependent on substrate)
- Fabric scissors
- Concrete core drill
- Steel dollies
- Pull-off tester
- Adhesive for dollies
- Thermometer
- Moisture meter
- Sikadur®-501 quartz sand
- Sika® Colma® Cleaner

- Safety goggles
- Safety hard hat
- Skin protection cream
- Protective gloves
- Nitrile gloves
- Clean water
- Eye wash kit

9.3 ON-SITE CHECKLIST: QUALITY CONTROL

Substrate preparation:	YES	NO
Have 3 pull-off tests been carried out?		
Average value measured on 3 locations: [MPa] (avg. should be 2.0 MPa, no value below 1.5 MPa) or as specified		
Are there cracks above 0.2 mm wide in the concrete?		
Has any damage to the structure been repaired?		
Have the cracks been injected?		
Is the concrete surface even? (see table in section 6.2)		
Climate:		
Does the air and surface temperature exceed 5°C?		
The actual average temperature is: [°C]		
Is the ambient temperature at least 3° above the dew point?		
Is the average moisture content of the concrete below 4%?		
Is there free standing water on the surfaces?		
Are the surfaces to be bonded cleaned?		
Is there any dust or other contaminants present?		
After installation:		
Are there any voids?		
Is there any adhesive with areas of discoloration?		
Have there been any deviations or changes from the initial specification and schedule?		
If Yes, please describe them below:		

10 LEGAL NOTE

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 products 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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