

Elevated Deck Waterproofing - Membranes

Servidek®/Servipak® System

Liquid applied structural waterproofing for concrete and steel bridge and trafficked decks.

Description

Servidek® is a two component, rubber/bitumen, liquid applied waterproofing system. Cold applied by squeegee or trowel, the mixed liquid cures chemically to form a seamless, elastomeric, structural waterproofing membrane for concrete and steel bridge and trafficked decks.

Servipak® protection boards comprise selected fillers bound in a bitumen compound, laminated between two layers of durable bituminous felt. The boards are laid bonded to the Servidek membrane to provide protection against damage from hot and cold applied finishes. Available in 3 mm, 6 mm and 12 mm thicknesses.

Armourtape™ is a rubber/bitumen self adhesive tape with a bituminous felt facing. Used for strapping and sealing butt joints between Servipak Protection Boards.

Installation

General

Servidek/Servipak should only be installed by contractors that have been trained by Grace in correct application procedures.

Servidek/Servipak application ambient temperature range is between +4°C and rising and 35°C. Substrate temperature should exceed the dew point.

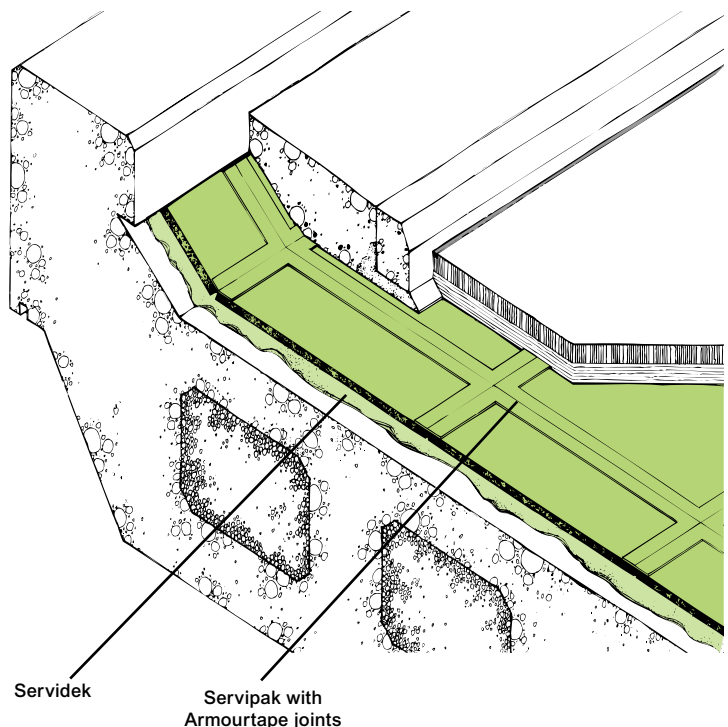
The application should not be made if rain or frost is imminent or in conditions where it is likely to freeze before curing takes place.

Application Equipment

- Broom or airline
- Sharp knife
- Chalk and stringline
- 50 mm square wooden batten
- Rubber bladed squeegee
- Steel or rubber trowel
- 100 mm roller or paint brush
- Hot air gun or gas torch
- Rags and cleaning spirits
- Heavy hand roller

Advantages

- **Damp surface tolerant** - wide 'weather window' for application.
- **Green concrete tolerant** - where necessary, can be applied to newly poured concrete surfaces, typically after 24 hours, also acts as a curing compound.
- **Elastomeric** - will accept cracking in substrates caused by deflection or shrinkage.
- **Low temperature performance** - adhesion and flexibility properties maintained in -40°C service conditions.
- **Critical path** - finishes can be installed 4 hours after waterproofing installation.
- **Simple application by squeegee/trowel** - no specialist application equipment.
- **No priming** - Servidek® waterproofing applied directly to clean substrates.
- **Robust Servipak® Protection Boards** - prevent membrane damage from following trades and asphalt laying equipment.
- **Proven performance** - over 25 years on domestic and international road/rail bridges and car parking structures.



Surface Preparation

Concrete Surfaces

Shall be levelled and screeded to form a uniform surface. On hardening and after bleed water evaporation, the concrete should be trowelled to produce a hard dense surface free of screed marks and exposed aggregate. Finally lightly texture the surface with a wooden float or equivalent.

Maximum deviation in surface profile shall be 10 mm over a 3 m gauge length and any abrupt irregularities over 3 mm shall be removed or filled with high strength repair mortar.

The concrete deck should be clean, and free from ice, frost, laitance, loose aggregate, oil, grease, moss, algae growth, dust and any other contaminants that could decrease adhesion between the concrete and Servidek.



Damp surfaces are acceptable but any surface water should be removed by sweeping or with air lances.

Green/fresh concrete - apply to green concrete only when necessary. If concrete curing compounds/membranes that could impair waterproof membrane adhesion have been used, test a sample of Servidek for adhesion to determine if removal is necessary. Full thickness finishes must be installed as soon as possible after membrane application, ideally within 48 hours.

Steel Surfaces

Remove all rust, scale, oil, grease and other contaminants from steel surfaces by grit blasting. Where required steel surfaces may be primed with an anti-corrosive agent.

Mixing Servidek

DO NOT DIRECTLY HEAT, POWER MIX OR USE PART MIXES.



When the ambient temperature is below +10°C, storage at +20°C for several hours will ease mixing and application.

Pour all of the Part B (small tub) into the Part A and stir with a timber paddle in a folding motion until a consistent colour, free from streaks, is obtained. Ideally this should take no longer than two minutes. Mix and use one unit at a time, applying the Servidek immediately once mixed. Pot life is approximately 20 minutes at +20°C.

Application of Servidek/Servipak

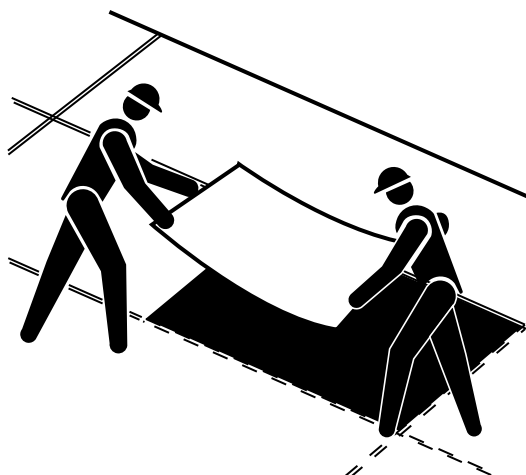
Pour the mixed Servidek on to the deck surface and spread with a squeegee at a rate of 10-12 m²/22.5 lit unit, depending on substrate surface and temperature. Nominal applied thickness is 1.8 mm.



Day Joints

Always leave a 50 mm leading edge of Servidek compound to enable subsequent overlapping. Seal the exposed edges of Servipak protection boards with Servidek compound. Commence work the following day by ensuring the 50 mm leading edge is clean and dry, then overlap with fresh Servidek compound.

Servipak protection boards must be laid while the Servidek compound is still wet and laid progressively to minimise applicator trafficking until the Servidek has cured. The boards must be close butt jointed to ensure continuous protection to the Servidek. Where gaps occur between boards, these must be filled with Servidek prior to applying Armourtape to all board joints.



Where Servipak boards abut the parapet, pipe bays or abutments they should be pre-measured, and accurately cut to size by incising with a sharp knife and breaking on edge.

The joints between the Servipak boards should be dry and primed with Primer B2.

Apply primer in 100 mm wide bands with a brush or roller and allow to dry before applying self-adhesive Armourtape centrally over the joint. Careful application of heat will assist in promoting adhesion of the Armourtape at low temperatures.



Armourtape must be firmly rolled with a lap roller along its length and at junctions to ensure continuity. It is advisable to seal the exposed edge of the Servipak boards at the end of each working period to prevent the ingress of moisture overnight, by tooling the Servidek compound against the exposed edge of the Servipak boards.

Minimum cure time for Servidek/Servipak is 4 hours, after which bridge surfacing or trafficable deck finishes should be applied as soon as possible. It is good practice to ensure that the Servipak boards are fully bonded to the Servidek by firmly rolling with a heavy hand roller before final application of deck finishes.

Repairs To Damaged Servidek/Servipak

Minor repairs:

Eg. stone penetration through membrane and protection board.

Cut a section of new Servipak protection board a minimum of 50 mm beyond the damaged area. Using this section as a template, position over the damaged area and cut around the template through the Servipak. Remove the damaged Servipak and debris or damaged section of membrane. Mix and apply fresh Servidek and reinstate the new section of protection board. Apply B2 primer and Armourtape™ to lap the Servipak repair patch. A heated spatula/trowel can be used to remove the damaged board.

Major repairs:

Repeat the procedure for minor repairs, ensuring a minimum 50 mm Servidek to Servidek lap is achieved before replacement boards are laid.

Where extensive damage or contamination has occurred it is necessary to remove all damaged Servidek and Servipak from the deck by heating and scraping off.

Apply fresh Servidek/Servipak as detailed above for minor repairs.

Expansion/Movement Joints

Grace provide a range of joint systems for both buried and exposed movement joints in bridge and trafficked decks. All these joint systems can be used with the Servidek/Servipak waterproofing system. The range summary is given in the table below, for full technical details refer to separate product data sheets.

Suitable Overlays/Wearing Courses

Full thickness overlays must be laid as soon as possible after the waterproofing is installed, ideally within 48 hours.

Servidek/Servipak is designed to be self - protecting during the installation of all conventional bridge and trafficked deck structure overlays and wearing courses, including:

- Asphalt concrete for roads and paved areas (BS EN 12591)
- Sand asphalt
- Hot rolled asphalt
- Gussasphalt
- Reinforced concrete
- Pre-cast concrete paving slabs on sand or sand/cement bedding
- Pre-cast concrete block paviors on sand or sand/cement bedding
- Stone ballast (12 mm Servipak protection boards only)
- Root barrier and drainage geocomposites for green roof systems.

Asphalt concrete should be laid on Servidek/Servipak at a minimum placement temperature of +145°C and a maximum placement temperature of 185°C. In the event of ambient application temperature exceeding +30°C it may be necessary to restrict machine placement of asphalt finishes to cooler periods of the day.

Specification Clause

Servidek® and Servipak® ...mm protection boards with Armourtape joints to be applied strictly in accordance with manufacturer's instructions and supplied by Grace Construction Products Limited, Ipswich Road, Slough, Berkshire, SL1 4EQ, United Kingdom.

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Health And Safety

For Servidek, Primer B2 and Bituthene Mastic read the product label and Material Safety Data Sheet (MSDS) before use. Users must comply with all risk and safety phrases. MSDS's can be obtained from Grace Construction Products.

There is no requirement for a Material Safety Data Sheet for Servipak, Armourtape, Serviseal Type B or Bitustik. For health and safety questions on these products please contact Grace Construction Products Limited.

Type of deck movement joint	Grace recommendation	Movement joint type	Maximum movement range
Fully buried beneath waterproofing and deck finishes	Serviseal® Type B	Extruded PVC	± 5 mm (10 mm total)
Fully buried beneath waterproofing and deck finishes	Serviseal® Type B	Extruded PVC with steel reinforcing plate	± 10 mm (20 mm total)
Fully buried beneath waterproofing and deck finishes	Serviband™	Flexible strap bedded with epoxy adhesive	± 25% of joint width (total 50% of joint width)

Supply

Servidek®	22.5 litre pack (Parts A & B)
Coverage	10-12 m ² per mixed pack
Palletisation	Part A - 18 x 20.47 kg buckets per pallet Part B - 72 x 4.5 kg buckets per pallet
Storage	Under cover in original sealed containers above +5°C and below +27°C
Shelf life	12 months
Servipak® 3	3 mm x 1 m x 1.5 m (1.5 sq m) - weight 7.5 kg/board (200 boards/pallet)
Servipak® 6	6 mm x 1 m x 1.5 m (1.5 sq m) - weight 16.5 kg/board (80 boards/pallet)
Servipak® 12	12 mm x 1 m x 1 m (1 sq m) - weight 23.0 kg/board (60 boards/pallet)
Storage	Servipak may be stored outside but should be kept flat on original pallets
Armourtape™	75 mm x 10 m roll - 16 rolls/carton - 25 kg per carton
Primer B2	5 and 25 litre drums
Coverage	10 m ² per litre
Palletisation	5 litre - 108 x 5 kg drums per pallet 25 litre - 24 x 25 kg drums per pallet
Ancillary Products	
Bituthene® Mastic	4.5 litre can - weight 6.5 kg/unit
Serviseal® Type B	230 mm wide PVC extrusion for buried expansion joints. Supplied in 15 m rolls - 25 kg/roll
Bitustik™ 4000	Double sided tape 150 mm x 12 m rolls - 6 rolls/carton - 21 kg/carton
Serviband™	Buried movement joints - see separate data sheet

Physical Properties

Property	Typical Value	Test Method
Elongation (36 hour cure at 20°C)	500 %	Meedus NFP 98 283
Resistance to water penetration	> 6 m when fully supported	DTP BE 27
Water Vapour Permeability	0.8 g/m ² /day	BS 3177
Resistance to cracking at 20°C and 0°C	No damage at 0.6 mm crack width	DTP BE 27
Tensile adhesion to concrete and steel at: 10°C 23°C 40°C	0.3 N/mm ² 0.2 N/mm ² 0.1 N/mm ²	UK Specification for Highway Works BD 47/94
Shear adhesion to concrete and steel at: 10°C 23°C 40°C	0.05 N/mm ² 0.03 N/mm ² 0.02 N/mm ²	UK Specification for Highway Works BD 47/94
Aggregate indentation	No penetration of system under load of 2.45 N/mm ²	BBA Test method
Mandrel bend at -40°C	No visible cracking	Grace test
Three point cyclic flex test at -40°C. 100 cycles at 1 Hz.	No visible signs of loss of adhesion, no visible cracking	Grace test
Electrical resistivity	> 3 x 10 ¹⁰ Ohm.m	BS 903/C2

All declared values shown in this data sheet are based on test results determined under laboratory conditions and with the product sample taken directly from stock in its original packing without any alteration or modification of its component parts.

www.graceconstruction.com

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