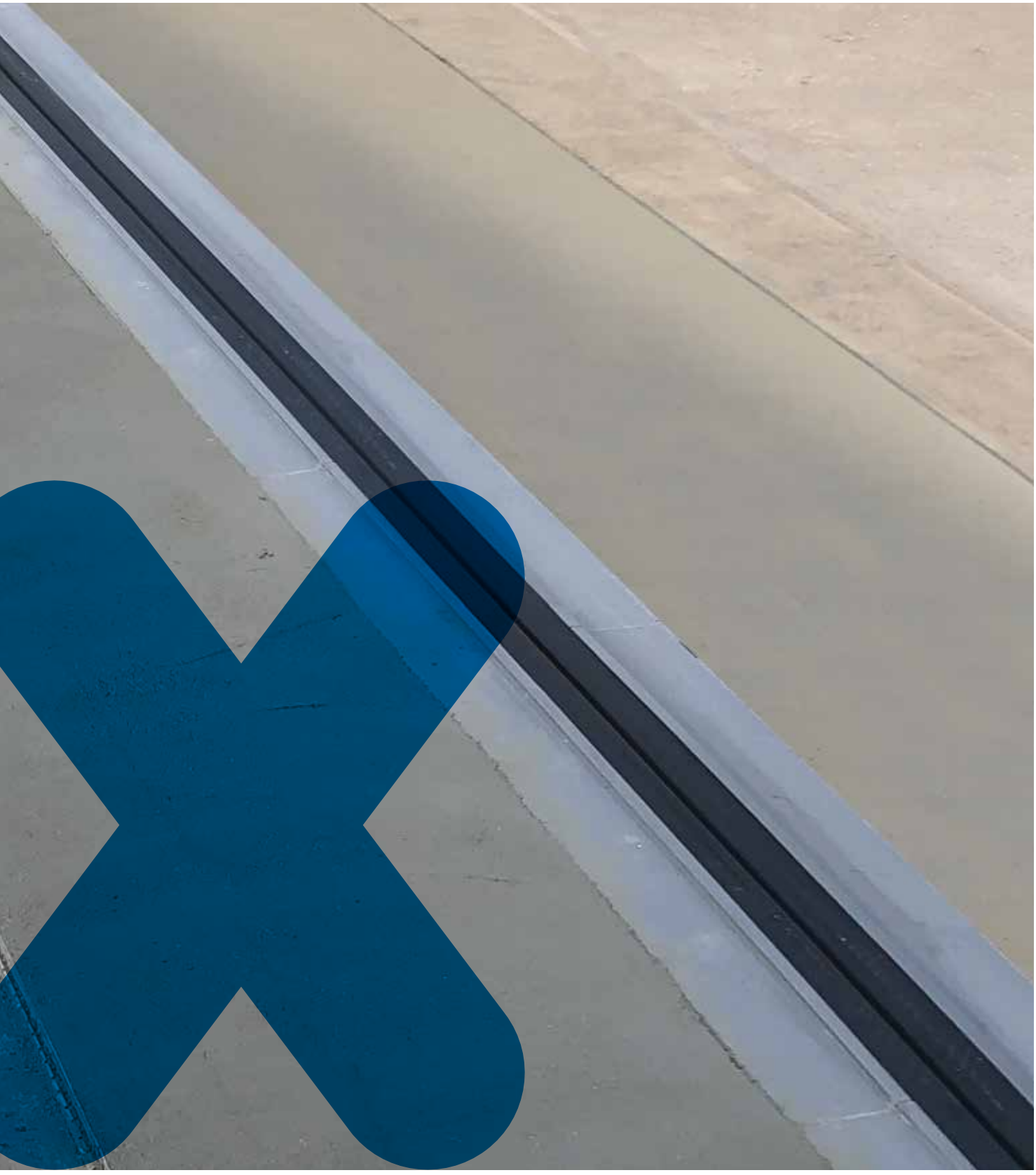
Triflex

Delivering solutions together.

Planning documents

Expansion joint waterproofing system

Triflex ProJoint+



PARKING DECKS | UNDERGROUND CAR PARKS

Expansion joint waterproofing system

Triflex ProJoint+

Applications

Flexible solution for joints

Liquid-applied joint waterproofing is flexible and moulds to the contours of the joint. Thus, not only straight joints but also more complex constructions can be reliably and seamlessly waterproofed. Even a height difference can be accommodated. Different joint widths can be waterproofed with the same system.

The low build-up of the liquid-applied waterproofing facilitates a smooth transition from joint to surface with only minimal milling of the substrate. Rainwater cannot seep in because the system adheres to the entire substrate. Roots and rhizomes are prevented from penetrating into the otherwise at-risk interfaces.

Top decks and parking decks are often large areas that are subject to severe loads and stresses. Expansion joints absorb the movements from subsidence, expansion, vibrations and additional traffic loads. The joints themselves must be reliably sealed for the parking deck waterproofing or coating to provide reliable protection for the concrete substrate.

Triflex ProJoint+ is a joint waterproofing system comprising fleece-reinforced liquid-applied waterproofing and protected by a carbon fibre-reinforced polymer joint profile. Expansion joints and surfaces can be waterproofed with the same resin. There is no need to change materials.
For more than 45 years, Triflex has been supplying tailor-made systems for multi-storey and underground car parks. Property references throughout Europe demonstrate the quality of our solutions. Triflex liquid-applied waterproofing offers reliable protection against all external influences and provides a long-lasting seal.

Advantages at a glance

Waterproof down to the smallest detail
Comprising fleece-reinforced liquid-applied waterproofing, the expansion joint waterproofing system Triflex ProJoint+ forms a homogeneous surface. The frictional bond between the waterproofing and the substrate prevents rainwater infiltration.

Flexible in use
Triflex ProJoint+ allows complex structural joints, height differences and varying joint widths to be seamlessly and reliably waterproofed with a simple system. The Triflex ProJoint+ system can absorb both vertical and horizontal joint movements. Moreover, it is suitable for both new builds and refurbishment of expansion joints.

Durable and long-lasting
Maintenance joints made with Triflex ProJoint+ are protected by a carbon fibre-reinforced polymer joint profile, giving them high mechanical strength and abrasion-resistance. They have been tested and certified in a wear test with 8 million wheel passages, and are classified as F 900 in a load test as per DIN EN 1433 for surfaces with extremely high wheel loads and dynamics.

No metals are used in the Triflex ProJoint joint profiles, so they cannot corrode and are resistant to frost and aggressive de-icing salts. The Triflex ProJoint joint profile and the adjacent Triflex multi-storey car park coating have a similar coefficient of thermal expansion. This means that a leak-tight and frictional bond between the materials is guaranteed. Refurbishment intervals are thus extended by years.

Certified reliability
The quality of the waterproofing component is certified by a test report. The waterproofing is root- and rhizome-resistant in line with FLL specifications. It is function-tested (dynamic loading at -20 °C to +50 °C) by an external test institute. The Triflex ProPark system has the fire classification B_{fl}-s1 (flame-retardant) as per DIN EN 13501-1.

Short closure periods
The Triflex ProJoint+ system offers the combined advantages of low build-up and ease of installation. The Triflex ProJoint joint profile is ready for vehicle traffic after just a few hours. As a result, interruptions to operation are kept very short when repairing joints.

Triflex ProJoint+

And this is how it's done …

1. The substrate is milled and then ground or shot-blasted.

2. Concrete substrates are primed with Triflex Cryl Primer 287.

3. After affixing the Triflex support strip with Triflex Cryl Paste, …

4. … the joint is waterproofed with fleece reinforcement and …

5. … Triflex ProDetail.

6. The waterproofing can be recoated after approximately one hour.

7. The Triflex ProJoint joint profiles are affixed to the full surface along the joint.

8. For a surface-mounted profile (variant 2), the height difference is levelled with Triflex Cryl RS 240.

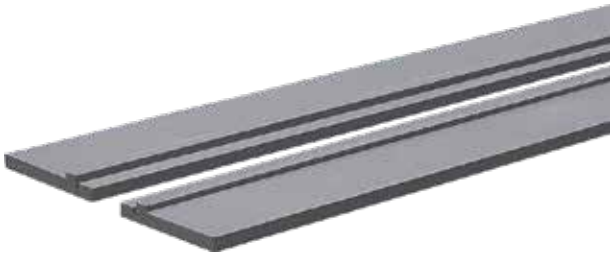
9. The profile recess for the Triflex ProJoint expansion strip is cleaned with Triflex ProJoint Cleaner.

10. The expansion strip is then affixed with Triflex ProJoint Fix.

11. The surface protection system can then be laid right up to the joint profile.

Compatible system components

All the Triflex products mentioned in this system are carefully coordinated on the basis of laboratory testing and years of experience. This standard of quality ensures optimum results during both application and use.



Expansion joint waterproofing system

Triflex ProJoint+

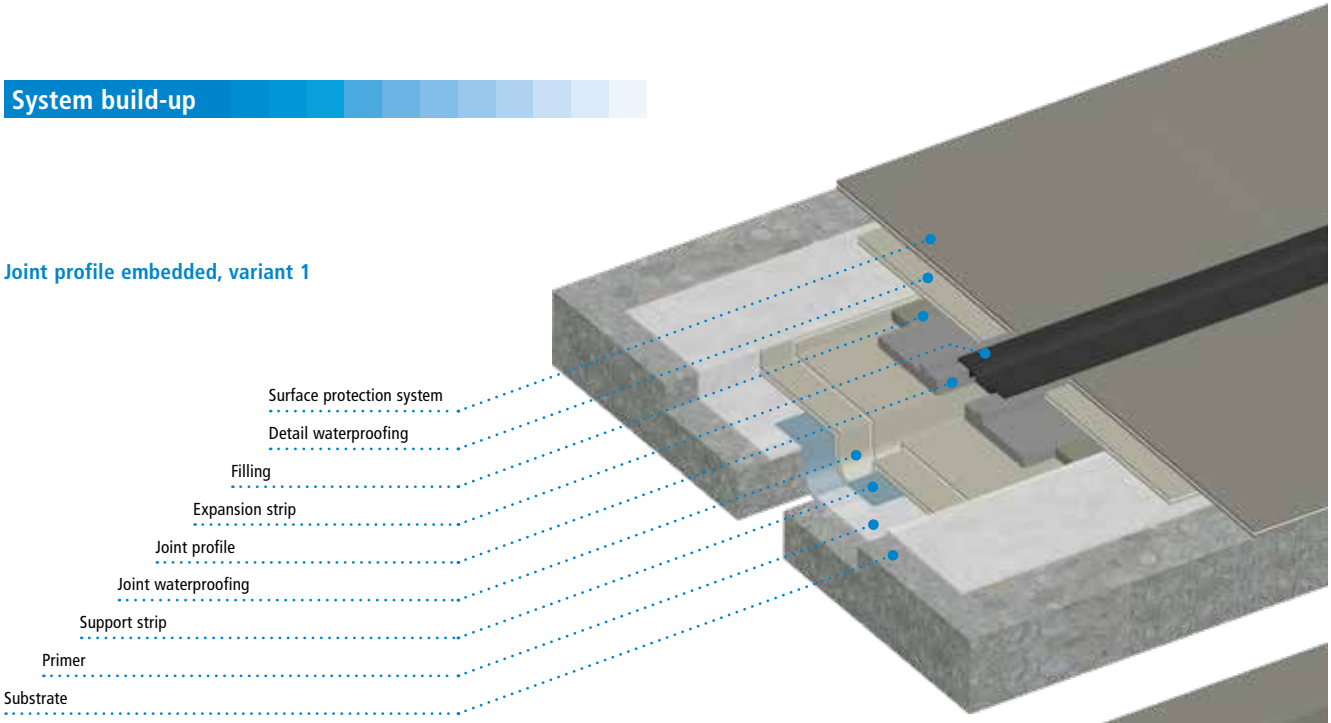
System description

Properties

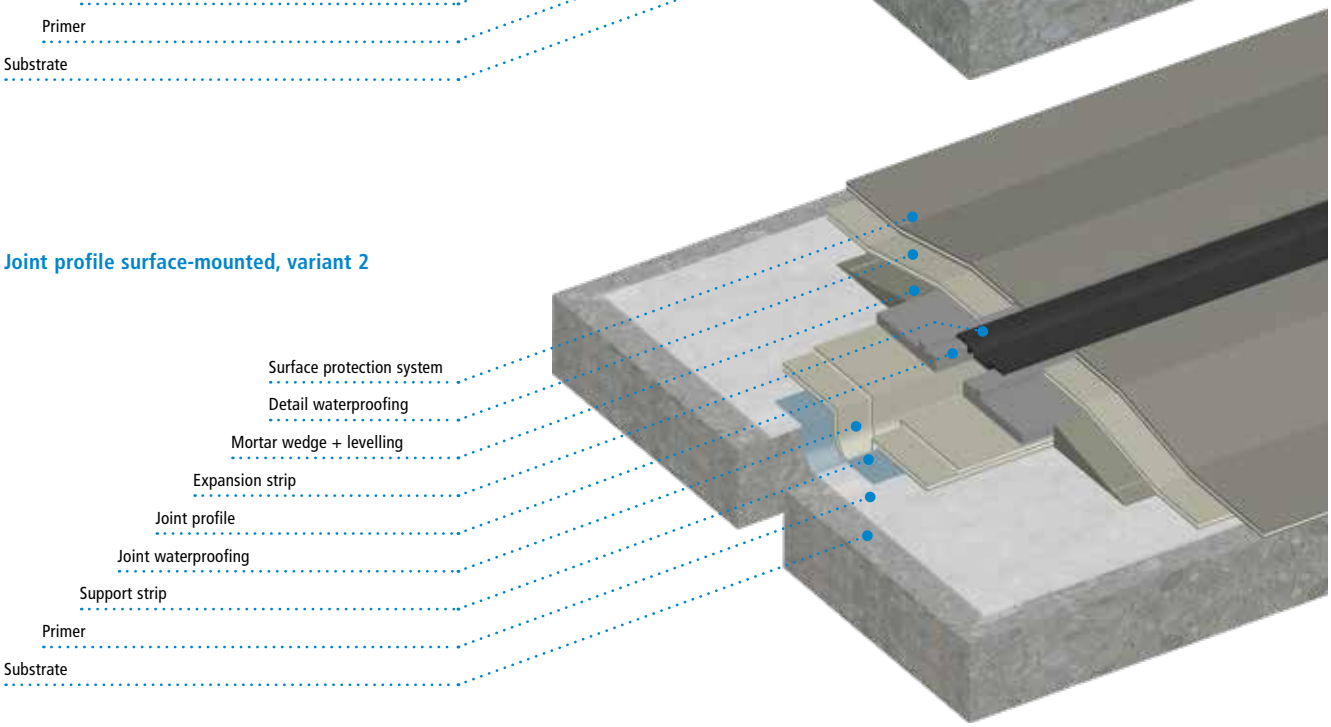
- Full-surface reinforced expansion joint waterproofing system with a polymethyl methacrylate (PMMA) base
- Absorbs vertical and horizontal dynamic movements
- High mechanical strength and suitable for vehicle traffic (heavy traffic with 900 kN as per DIN EN 1433)
- Tested functionality at -20 °C to +50 °C
- Fast-curing
- Root and rhizome-resistant in accordance with FLL
- Fire classification tested as per EN 13501-1 B_{fl}-s1 (flame-retardant)
- Joint profile made of carbon fibre composite for protection of the joint waterproofing
- Resistant to frost and de-icing salt
- Low installation height
- Standard-compliant 10 cm coating flange for frictional bond with liquid applied waterproofing
- Easy maintenance expansion strip
- Vibration-free when driven over
- For maximum joint widths of up to 50 mm

System build-up

Joint profile embedded, variant 1



Joint profile surface-mounted, variant 2



System description

Substrate pretreatment

Substrate	Pretreatment	Primer
Aluminium[1]	Rub down with Triflex Cleaner	Triflex Metal Primer[2]
Asphalt	Grinding, milling or dust-free shot-blasting in criss-cross pattern	Triflex Cryl Primer 222
Composite thermal insulation systems[1]	Remove any loose material	Triflex Pox Primer 116+
Concrete	Grinding, milling or dust-free shot-blasting in criss-cross pattern	Triflex Cryl Primer 287
Copper[1]	Rub down with Triflex Cleaner	Triflex Metal Primer[2]
Epoxy resin coating	Roughen surface and test adhesive strength and compatibility	No primer
Lightweight concrete[1]	Remove any loose material	Triflex Cryl Primer 287
Mortar, resin-modified	Grinding, milling or dust-free shot-blasting; test adhesive strength and compatibility	Triflex Pox Primer 116+
Paint	Grinding or milling to remove completely	See substrate
Plaster/render/masonry[1]	Remove any loose material	Triflex Cryl Primer 287
PU coating	Roughen surface and test adhesive strength and compatibility	No primer
PVC mouldings, rigid[1]	Rub down with Triflex Cleaner, roughen surface	No primer
Screeds	Grinding, milling or dust-free shot-blasting in criss-cross pattern	Triflex Cryl Primer 287
Stainless steel[1]	Rub down with Triflex Cleaner	Triflex Metal Primer[2]
Steel, galvanised[1]	Rub down with Triflex Cleaner	Triflex Metal Primer[2]
Tiles	Mechanically remove glaze	Triflex Cryl Primer 287
Wood[1]	Remove any paint	Triflex Cryl Primer 287
Zinc[1]	Rub down with Triflex Cleaner	Triflex Metal Primer[2]

[1] Only in areas not subject to mechanical stress, e.g. details and flashing.
[2] Alternative to priming: Rub down with Triflex Cleaner and roughen surface.
Information on other substrates is available on request (technik@triflex.de).

Important:
Adhesion must always be tested on the specific substrate!

System components

Primer
Triflex Primer for sealing the substrate and ensuring substrate adhesion (see substrate pretreatment table).

Joint waterproofing
Triflex ProDetail waterproofing membrane, reinforced with a double layer of sturdy Triflex Special Fleece made of polyester.

Joint profile
To protect the joint waterproofing, Triflex ProJoint joint profiles are fastened on both sides of the joint edge and a Triflex ProJoint expansion strip is affixed.

Substrate

The suitability of the specific substrate should always be tested. The substrate must be clean, dry and free of cement bloom, dust, oil, grease and other adhesion-inhibiting substances. The substrate must be pretreated in accordance with the specifications in the Repair Guideline (RL SIB). The volumes specified below assume a surface roughness of $R_t = 0.5$ mm.

Moisture: When carrying out the work, the substrate moisture must not exceed 6 % by weight.
Ensure that structural measures are taken to prevent moisture penetration of the coating from underneath.
Dew point: During application, the surface temperature must be at least 3 °C above the dew point temperature. Below this temperature, a separating film of moisture can form on the surface.
Hardness: Mineral substrates must be allowed to fully harden for at least 28 days.
Adhesion: The following minimum tensile adhesion strengths must be met on pretreated test areas:
Concrete: at least 1.5 N/mm² on average,
and no single value below 1.0 N/mm².

System description

Primer

Triflex Cryl Primer 222
Apply evenly and cross-coat using a Triflex Universal Roller.
Volume: at least 0.40 kg/m².
Can be recoated after approx. 45 mins.

Triflex Cryl Primer 287
Apply evenly and cross-coat using a Triflex Universal Roller.
Volume: at least 0.35 kg/m².
Can be recoated after approx. 45 mins.

Triflex Metal Primer
Apply a thin coat with a short-pile roller (e.g. MP roller) or alternatively, apply a thin coat with a spray can.
Volume: approx. 80 ml/m².
Can be recoated after approx. 30 to 60 mins.

Triflex Pox Primer 116+
Apply evenly and cross-coat using a Triflex Universal Roller.
Do not allow puddles to form.
Dress the fresh primer – not to excess.
Volume of Triflex Pox Primer 116+: at least 0.30 kg/m².
Volume of quartz sand 0.3–0.8 mm: at least 0.70 kg/m².
Can be recoated after approx. 12 hrs. to 24 hrs max.

For highly absorbent substrates and substrate moisture levels of 4–6 wt%, an additional layer of primer has to be applied to the surface.
Only the second layer is dressed with quartz sand.
Volume of Triflex Pox Primer 116+: at least 0.30 kg/m².

Repairing

Triflex Cryl Paste
For filling shrinkage cracks, minor damage and unevenness.
Volume: at least 1.40 kg/m² per mm layer thickness.
Can be recoated after approx. 1 hr.

In the case of roughness R_t >10 mm:

Triflex Cryl RS 240
Mortar for repairing mineral substrates with a volume of at least 2.20 kg/m² per mm of layer thickness.
Can be recoated after approx. 45 mins.

Triflex Cryl RS 242
Mortar for repairing bituminous substrates.
Volume: at least 2.20 kg/m² per mm layer thickness.
Can be recoated after approx. 1 hr.

Joint waterproofing

If joints are waterproofed in combination with Triflex waterproofing or coating systems, the joints must be waterproofed first. The fleece width of 35 cm stated here must be increased to 52.5 cm to ensure a junction of at least 10 cm to the subsequent Triflex system. To prevent abutting edges, joints should always be embedded in the substrate (see system drawings).

1. **Triflex Cryl Paste**
   Apply a width of approx. 4 cm to both sides of the joint to bond the Triflex Support Strip.
2. **Triflex Support Strip**
   Lay in the joint as a loop.
   Can be recoated after approx. 1 hr.

Points 3 to 7 below are implemented wet-on-wet.

3. **Triflex ProDetail**
   Apply to both sides of the joint and on the support strip using a radiator roller.
   Volume: at least 0.70 kg/m.
4. **Triflex Special Fleece/Triflex Special Fleece PF**
   Lay a 35 cm wide strip as the first loop, making sure there are no air bubbles.
   Overlap the ends of the fleece by at least 5 cm.
5. **Triflex ProDetail**
   Apply to fully saturate the Triflex Special Fleece and as a preliminary layer for the next fleece loop.
   Volume: at least 0.70 kg/m.
6. **Triflex Special Fleece/ Triflex Special Fleece PF**
   Lay a 35 cm wide strip as the second loop, making sure there are no air bubbles.
   Overlap the ends of the fleece by at least 5 cm.
7. **Triflex ProDetail**
   Apply until the Triflex Special Fleece is fully saturated.
   Volume: at least 0.70 kg/m.

Total volume of Triflex ProDetail: at least 2.10 kg/m.
Can be recoated after approx. 1 hr.
For dimensions, see Triflex ProJoint+ system drawings.

Important:
Joints can also be waterproofed with Triflex ProPark waterproofing resin.

Joint profile embedded, variant 1

The joint profile is embedded flush in the substrate.
To do this, the surface has to be milled centrally in relation to the joint, to a width of at least 43.5 cm and a depth of approximately 2.5 cm.
The joint waterproofing is then applied in accordance with the system description.

1. **Triflex Cryl Paste**
   Mix with quartz sand, grain size 0.7–1.2 mm, at a mix ratio of 1:1, and apply to the marked substrate using an 8 x 8 notched trowel.
   Volume of Triflex Cryl Paste approx. 1.50 kg/m.
   Volume of quartz sand 0.7–1.2 mm approx. 1.50 kg/m.
2. **Triflex ProJoint Joint Profile**
   Affix correctly by pressing into the previously applied paste, and remove any excess paste.
   Complete one side of the entire joint first.

System description

3. **Straightedge**
   Once the entire side has cured, insert a straightedge, 10 cm in width, as a spacer between the profile webs.
4. **Triflex ProJoint Joint Profile**
   Affix correctly by pressing into the previously applied paste, and remove any excess paste.
   Use a straightedge for alignment.
5. **Triflex Cryl RS 240**
   The cut-outs to the left and right of the joint profiles are filled to top edge level.
   Volume: at least 2.20 kg/m² per mm layer thickness.
   Can be recoated after approx. 45 mins.
6. **Triflex ProJoint Cleaner**
   Clean the Triflex ProJoint joint profiles and Triflex ProJoint expansion strip thoroughly with a cloth soaked with Triflex ProJoint Cleaner. Flash time: approx. 30 mins.
7. **Triflex ProJoint Fix**
   Apply both in the grooves and on the web using a commercially available tubular bag applicator gun (600 ml).
   Volume: 0.06 l/m joint
8. **Triflex ProJoint Expansion Strip**
   Press firmly into the grooves and affix again firmly with a seam and joint roller.
9. **Triflex Duct Tape**
   For the further connection work, mask the Triflex ProJoint expansion strip completely with Triflex Duct Tape to protect it.

The subsequent waterproofing is implemented wet-on-wet.

10. **Triflex ProDetail**
    Apply on both sides of the joint profile, 10 cm on the profile and 17 cm on the substrate using a radiator roller.
    Volume: at least 2.00 kg/m.
11. **Triflex Special Fleece**
    Insert a 26 cm wide strip, making sure there are no air bubbles.
12. **Triflex ProDetail**
    Apply until the Triflex Special Fleece is fully saturated.
    Volume: at least 1.00 kg/m.
13. Connection on the waterproofed surfaces up to the web of the profile with the requisite build-up of the surface protection system.
14. **Triflex Cryl Finish 209**
    Apply evenly beyond the web and up to the masked Triflex ProJoint expansion strip using a Triflex finish roller.
    Volume: at least 0.02 kg/m

Important:

1. **The protective and wearing layer of the surface protection system is recessed to a width of 2.5 cm where the profile abuts. See system drawing.**
2. **The expansion joints are maintenance joints only, as per IVD (German Sealants Industry Association) leaflet "Waterproofing of Floor Joints" and DIN EN 14188-2. The ingress protection may need to be renewed for aesthetic reasons after increased movements.**

Joint profile surface-mounted, variant 2

The joint profile is placed on the existing substrate, positioned centrally to the joint, with a width of 33 cm. The joint itself must be at least 3 cm wide. Otherwise it must be widened by cutting open. The substrate pretreatment for detail waterproofing must also be implemented expertly.
The joint waterproofing is then applied in accordance with the system description.

1. **Triflex Cryl Paste**
   Mix with quartz sand, grain size 0.7–1.2 mm, at a mix ratio of 1:1, and apply to the marked substrate using an 8 x 8 notched trowel.
   Volume of Triflex Cryl Paste approx. 1.50 kg/m.
   Volume of quartz sand 0.7–1.2 mm approx. 1.50 kg/m.
2. **Triflex ProJoint Joint Profile**
   Affix correctly by pressing into the previously applied paste, and remove any excess paste.
   Complete one side of the entire joint first.
3. **Straightedge**
   Once the entire side has cured, insert a straightedge, 10 cm in width, as a spacer between the profile webs.
4. **Triflex ProJoint Joint Profile**
   Affix correctly by pressing into the previously applied paste, and remove any excess paste.
   Use a straightedge for alignment.
5. **Triflex ProJoint Cleaner**
   Clean the Triflex ProJoint joint profiles and Triflex ProJoint sealing strip thoroughly with a cloth soaked with Triflex ProJoint Cleaner.
   Flash time: approx. 30 mins.
6. **Triflex ProJoint Fix**
   Apply both in the grooves and on the web using a commercially available tubular bag applicator gun (600 ml).
   Volume: 0.06 l/m joint
7. **Triflex ProJoint Expansion Strip**
   Press firmly into the grooves and affix again firmly with a seam and joint roller.
8. **Triflex Duct Tape**
   For the further connection work, mask the Triflex ProJoint expansion strip completely with Triflex Duct Tape to protect it.
9. **Triflex Cryl RS 240**
   To make the fitted Triflex ProJoint joint profile suitable for vehicle traffic, a mortar wedge with a width of 30 cm is applied to the right and left of the profile using Triflex Cryl RS 240. For this, a stainless steel L profile with a flange length of 0.5 cm is affixed with Triflex Cryl Paste to the left and right of the joint in order to then fill the defined incline with the mortar. Between the profile and the mortar wedge, a joint of approx. 0.5 cm must be produced in the fresh mortar on both sides of the joint to enable subsequent waterproofing.
   The joint waterproofing is then applied in accordance with the system description.
   Volume of Triflex Cryl RS 240: approx. 18 kg/m.

System description

10. Height differences
Both sides of the mortar wedge are filled from 0.5 cm to zero using Triflex Cryl Paste, with added quartz sand 0.7–1.2 mm at a mix ratio of 1:1.
Volume of Triflex Cryl Paste: 0.20 kg/m.
Volume of quartz sand 0.7–1.2 mm: 0.20 kg/m.

11. Waterproofing in the profile transition area
Once the mortar has cured, the joint wedge between the profiles and the mortar wedges must be filled with Triflex ProDetail.
Volume of Triflex ProDetail: 0.60 kg/m

Points 12 to 14 below are implemented wet-on-wet.

12. Triflex ProDetail
Apply using a universal roller on both sides of the joint profile, 10 cm onto the profile and 60 cm onto the substrate.
Volume: at least 5.60 kg/m.

13. Triflex Special Fleece/Special Fleece PF
Insert a 70 cm wide strip, making sure there are no air bubbles.

14. Triflex ProDetail
Apply until the Triflex Special Fleece is fully saturated.
Volume: at least 2.80 kg/m.

15. Connection on the waterproofed surfaces up to the web of the profile with the requisite build-up of the surface protection system.

16. Triflex Cryl Finish 209
Apply evenly beyond the web and up to the masked Triflex ProJoint expansion strip using a Triflex finish roller.
Volume: at least 0.02 kg/m

Important:
1. **The protective and wearing layer of the surface protection system is recessed to a width of 2.5 cm where the profile abuts. See system drawing.**
2. **The expansion joints are maintenance joints only, as per IVD (German Sealants Industry Association) leaflet "Waterproofing of Floor Joints" and DIN EN 14188-2. The ingress protection may need to be renewed for aesthetic reasons after increased movements.**

System components

For information on applications, conditions of use and instructions for mixing, see product information (request if necessary):

Triflex Cryl Primer 222
Triflex Cryl Primer 287
Triflex Cryl RS 240
Triflex Cryl RS 242
Triflex Cryl Paste
Triflex Metal Primer
Triflex Pox Primer 116+
Triflex ProDetail
Triflex ProJoint Cleaner
Triflex ProJoint Expansion Strip
Triflex ProJoint Fix
Triflex ProJoint Joint Profile
Triflex Special Fleece
Triflex Special Fleece PF
Triflex Support Strip

Quality standard

All Triflex products are manufactured in accordance with the standards defined in ISO 9001. To ensure quality of workmanship, Triflex products are only installed by fully trained and qualified specialist contractors.

Dimensional tolerances

When carrying out the work, always ensure compliance with the permissible tolerances for building construction (DIN 18202, Table 3, line 4).

Safety tips / Accident prevention

Read the safety data sheets before using the products.

Required volumes / Waiting times

The specified volumes apply only to smooth, flat substrates with a maximum roughness of R_t = 0.5 mm. Special allowance must be made for unevenness, roughness and porosity.
Specified flash times and waiting times apply to a substrate and ambient temperature of +20 °C.

Information about tools

The Triflex tools mentioned in the system description are a guideline for correct application of the individual functional layers with the respective volumes of product. The use of Triflex tools is not mandatory as long as correct application of the Triflex products is assured.

Remarks on use

Subsidence in the substrate or adhesive can lead to cracks in the Triflex ProJoint joint profile. Such cracks do not constitute defects unless they compromise the joint profile's serviceability and load bearing capacity.
The maximum grinding depth of 2 mm must not be exceeded, as the mechanical strength will otherwise be compromised.
The Triflex expansion strip is a wearing part. It must be checked regularly to ensure it is still functional, and replaced as necessary.

Triflex ProJoint Joint Profile

- Carbon fibre composite technology
- Length: 120 cm
- Width: 14 cm
- Installation height: 1.6 cm
- Recess of the coating flange: 7 mm
- Width of the coating flange: 10 cm
- Horizontal joint movement: 50 mm (-20/+30)
- Vertical joint movement: 30 mm (-15/+15) for profile + expansion strip

Triflex ProJoint+

System description

Triflex ProJoint Expansion Strip

- Dimensions:
  10 cm × 26 m
  10 cm × 13 m
  10 cm × 6.5 m

General information

The system descriptions, system drawings and product information sheets form the basis for using Triflex products, and it is essential to follow these when planning and carrying out your building project. Any deviation from the technical information provided by Triflex GmbH & Co. KG that is current at the time the work is carried out may invalidate the warranty. Any project-related deviations require written approval from Triflex.
All the information is based on general regulations, directives and other technical rules. The general regulations applicable in the particular country of use must be respected.
Since the parameters can vary from case to case, the contractor is required to test the suitability, e.g. of the substrate.
Non-Triflex products must not be used in combination with Triflex systems.
Triflex reserves the right to make modifications in the interest of technical enhancement or optimisation of Triflex products.

Model tender documents

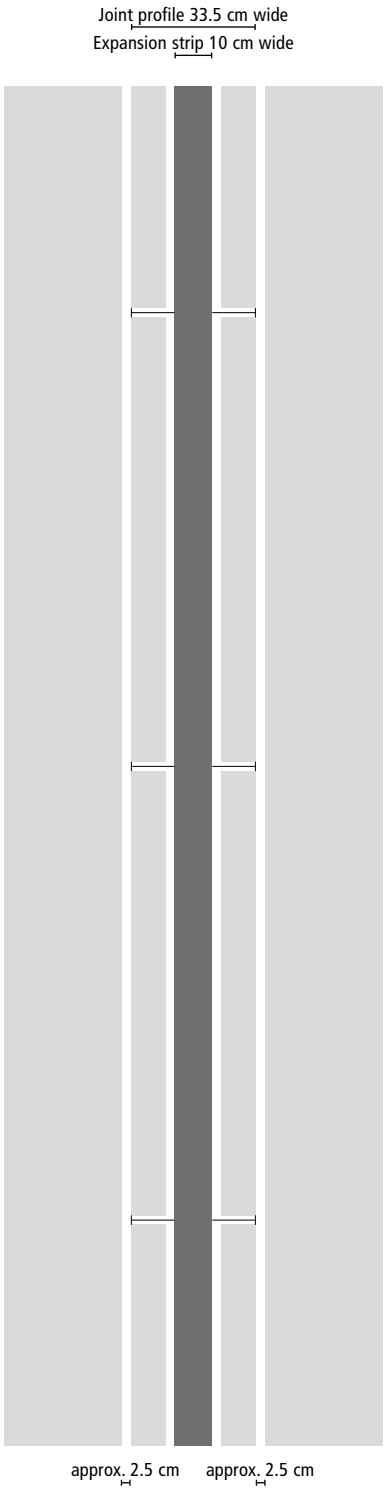
Please visit the Download section of the Triflex website at www.triflex.com to obtain the current standard specifications, which are available in a range of different file formats. Alternatively, visit the website www.ausschreiben.de or www.heinze.de.

CAD drawings

All CAD system drawings can be downloaded free of charge from the Download section of the Triflex website www.triflex.com. Contact us at technik@triflex.de to request further true-to-scale CAD drawings.

System drawings

Subdivision of surface protection system



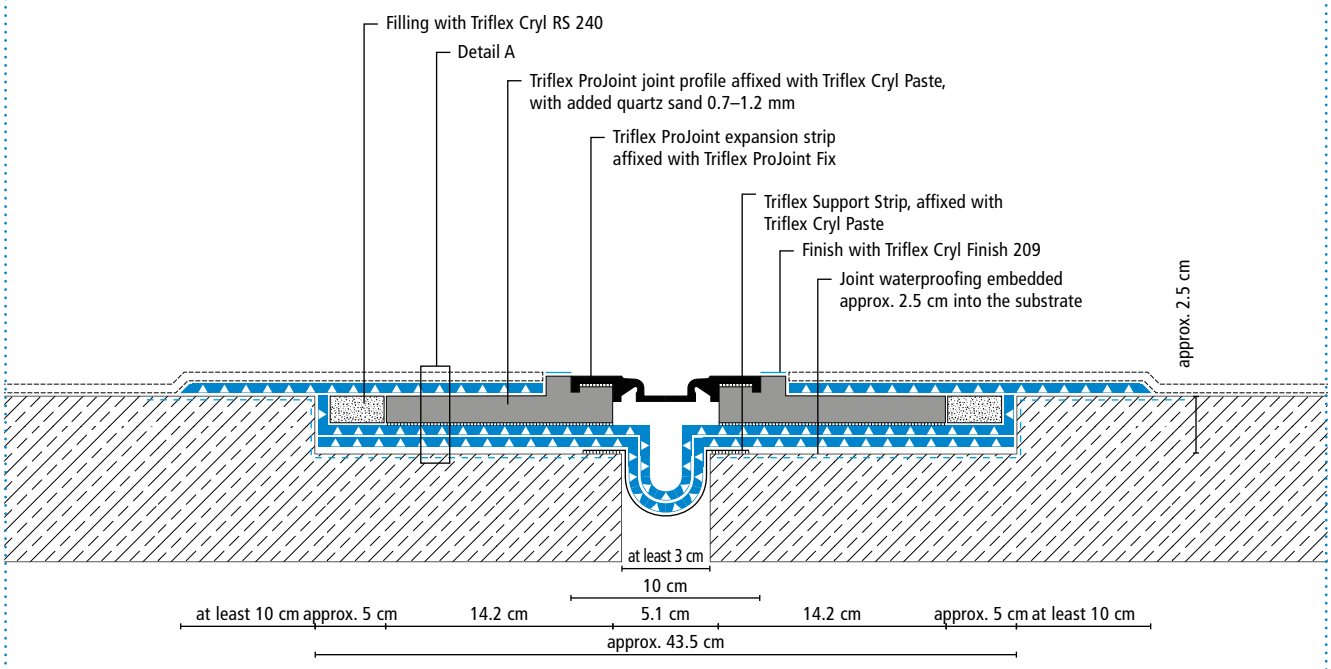
Where the joint profile abuts, the surface protection system is recessed by approx. 2.5 cm.

Drawing no.: ProJoint+-1560

Triflex ProJoint+

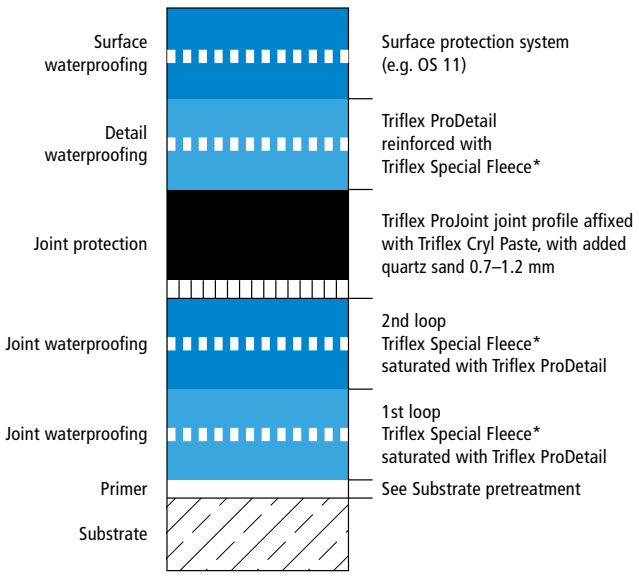
System drawings

Expansion joint – Joint profile embedded, variant 1

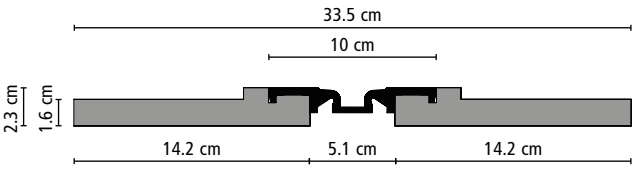


Drawing no.: ProJoint+-1561

System build-up – Detail A



Joint profile – Detail drawing



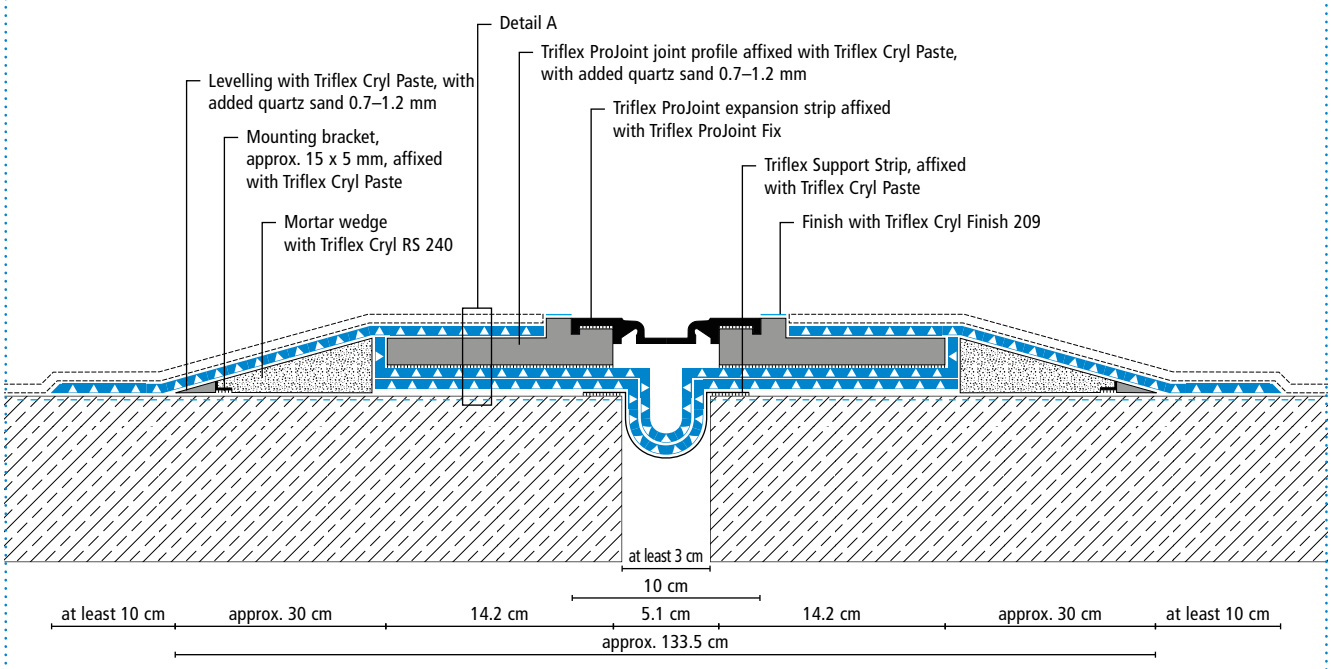
* Triflex Special Fleece or Triflex Special Fleece PF.

Height differences where the fleece overlaps are exaggerated.

Triflex ProJoint+

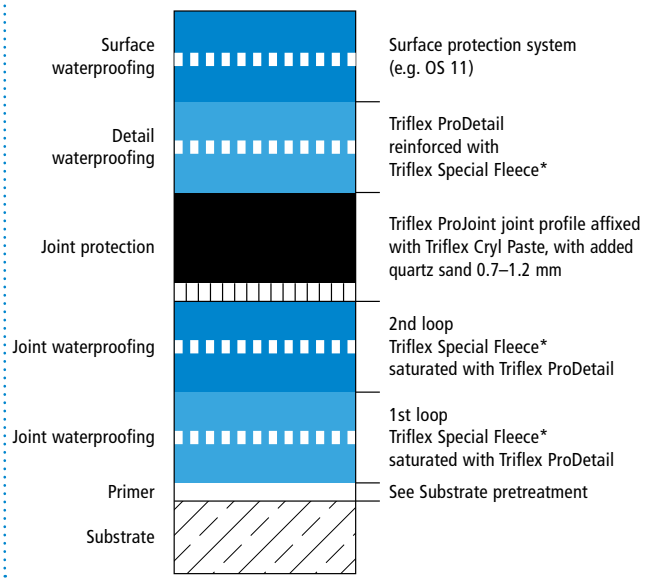
System drawings

Expansion joint – Joint profile surface-mounted, variant 2

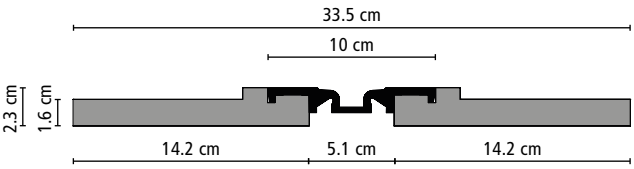


Drawing no.: ProJoint+-1562

System build-up – Detail A



Joint profile – Detail drawing



* Triflex Special Fleece or Triflex Special Fleece PF.

Height differences where the fleece overlaps are exaggerated.

Triflex

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