

TRACKFIX SIL

**Approval by the German Federal Railway Authority for
operational testing of ballast bonding**



Properties:

TRACKFIX SIL is a two-component, fast-reacting, non-foaming injection resin based on silicate with good adhesive properties, very fast strength development and high final strength, especially for the consolidation of track ballast in railway construction.

The resin is universally applicable in railway construction.

Fields of application:

- Transitions from ballasted track to slab track
- Suitable for full and partial bonding I + II
- Ballast embankment protection
- Protection against gravel flow
- Protection against flying gravel
- Securing during work on the track
- Position stabilization and/or correction
- Reduction of tamping intervals
- Underpinning and fixing of sleepers
- Easier cleaning of track ballast beds
- Reduction of dust formation during operation

Due to its low viscosity *TRACKFIX SIL* penetrates excellently into the track ballast to be consolidated. As a rule, the product is processed in dry to maximum matt damp areas. However, application is also possible on wet ballast/subsoil.

Technical Data:

Substance data of components:

Component A

| | | |
|-----------------------|--------------------------------|-------------------|
| Consistency | liquid | |
| Colour | colourless | |
| Odour | characteristic | |
| Spec. density (23°C) | approx. 1,42 g/cm ³ | DIN EN ISO 2811-1 |
| Dyn. viscosity (23°C) | approx. 280 mPas | DIN EN ISO 2555 |

Component B

| | |
|-------------|--------|
| Consistency | liquid |
| Colour | brown |

| | | |
|-----------------------|--------------------------------|-------------------|
| Odour | characteristic | |
| Spec. density (23°C) | approx. 1,18 g/cm ³ | DIN EN ISO 2811-1 |
| Dyn. viscosity (23°C) | approx. 40 mPas | DIN EN ISO 2555 |

Mixture of A- and B-component:

Mixing ratio A : B 1 : 1 (parts by volume)

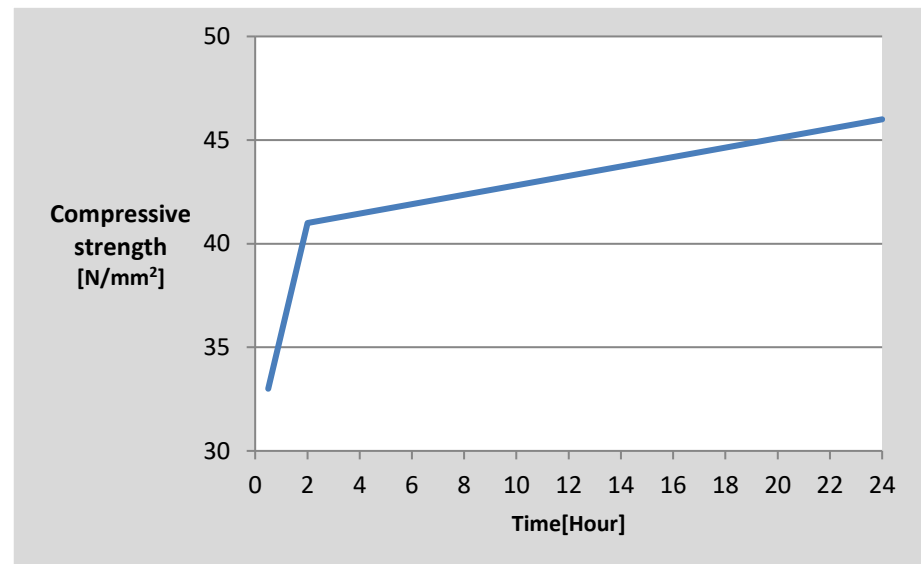
Reaction data (at 23°C):

| | | |
|----------------------------|--------------------|------------|
| String gel time (Pot-life) | approx. 1 : 20 min | ASTM D7487 |
| Final curing | approx. 20 min | |

Properties of silicate resin:

| | | |
|----------------------|------------------------------|--------------|
| Compressive strength | | DIN EN 12190 |
| 15 min | approx. 32 N/mm ² | |
| 30 min | approx. 33 N/mm ² | |
| 2 h | approx. 41 N/mm ² | |
| 24 h | approx. 46 N/mm ² | |
| 7 d | approx. 51 N/mm ² | |

Compressive strength after 24 h:



| | | |
|--------------------------|--------------------------------|----------------|
| Bending tensile strength | approx. 24 N/mm ² | DIN EN 12390-5 |
| E-modulus | approx. 1100 N/mm ² | DIN EN ISO 527 |

Processing:

Both components are pumped directly from the containers in a mixing ratio of 1 : 1 (volume parts) using two-component pumps.

Suitable pumps: *TPH INJECT PS 25-II*
TPH INJECT PS 5-II

At the end of the separate delivery hoses, the components are brought together in a T or Y piece and then mixed homogeneously (free of streaks) in the mixing tube by means of a static mixer.

Suitable static mixer: Static mixer 13-32

The reaction mixture is applied to the prepared track ballast via a subsequent injection lance in such a way that an even distribution of the product is achieved (flooding method). For a simple and even distribution we recommend the use of an appropriate distribution head (approx. 40 cm long T-shaped discharge pipe with outlet openings).

The low-viscosity product penetrates quickly into the pore structure of the ballast and permanently sticks or consolidates the ballast.

The areas to be consolidated must be reworked at intervals depending on the penetration behaviour until the required quantities of resin have been used up and have led to overall consolidation of the ballast.

Alternatively, *TRACKFIX SIL* can also be injected into the ballast by means of ram lances or placed under the sleeper body.

Technical consumption approaches:

- ~ 3 - 4 kg/m² for gravel embankment protection
- ~ 1 - 2 kg/m² with track ballast bonding up to 15 cm ballast depth
- ~ 2 - 4 kg/m² with track bed ballast bonding up to 30 cm ballast depth
- ~ 5 - 8 kg/m² with track bed consolidation up to 50 cm ballast depth

The consumption figures are based on experience. Irrespective of this information, a test field must be created before work begins and the site-specific consumption determined.

For a quantity consumption of up to 102 kg *TRACKFIX SIL* on 1 m³ track ballast according to DBS 918061 (08/2021), the classification of the fire behavior according to DIN EN 13501-1:2019-05 with A2fl-s1 exists as a mandatory requirement for the use in traffic tunnels.

Applicable at ambient temperatures of : 5°C to 40°C
Recommended product temperature : 15°C to 30°C

Depending on the product and ambient temperature, different viscosities and reaction times must be observed during processing.

Viscosity at different temperatures:

| Temperature [°C] | Dyn. viscosity A component [mPas] | Dyn. viscosity B component [mPas] |
|---------------------|--------------------------------------|--------------------------------------|
| 5 | 790 | 140 |
| 10 | 520 | 100 |
| 15 | 440 | 70 |
| 20 | 310 | 50 |
| 25 | 270 | 35 |
| 30 | 200 | 25 |
| 40 | 190 | 15 |

* Norm DIN EN ISO 2555

Reaction times at different temperatures:

| Temperature [°C] | Pot life (String gel time) [min:s] |
|---------------------|---------------------------------------|
| 5 | 2 : 40 |
| 10 | 2 : 00 |
| 15 | 1 : 50 |
| 20 | 1 : 30 |
| 25 | 1 : 10 |
| 30 | 0 : 55 |
| 40 | 0 : 47 |

* Norm ASTM D7487

Safety information:

Die *TRACKFIX SIL* A- and B is classified as hazardous according to Regulation (EG) Nr. 1272/2008 (CLP).

It is therefore necessary, before beginning processing, to become familiar with the precautions and safety advice as indicated in the material safety data sheet.

Packaging:

TRACKFIX SIL
Component A 27 kg- Plastic canister

TRACKFIX SIL
Component B 22,5 kg- Plastic canister

Bigger packaging on request.

Storage:

Shelf life at least 12 month in original packaging when stored in dry conditions between 15 - 25°C, protected from heat, frost and direct sunlight.

After the expiration the use of the product is generally not recommended, unless an approval has been provided by TPH. This approval can only be obtained by the quality assurance department of TPH releasing the material after verification of main properties being within specification.

Disposal:

Small quantities of cured product residues can be disposed of as normal domestic waste. Dispose of not cured product components must be effected in accordance with the corresponding local regulations. For further information please refer to the material safety data sheets.

Test certificates:

TRACKFIX SIL - Investigation of the elution behaviour of a silicate-based injection resin; MFPA Leipzig 2012

TRACKFIX SIL - Investigation of the resistance of a silicate-based injection resin to freeze-thaw cycle; MFPA Leipzig 2012

Investigation according to TrinkwV 2012 and coating guideline; görtler analytical services gmbh Vaterstetten 2019

Determination of the compressive strength of ballast cubes bonded with *TRACKFIX PUR*, *TRACKFIX POX* and *TRACKFIX SIL*, TU Munich 2019

Approval for operational testing of the two-component injection resin *TRACKFIX SIL* for ballast bonding; Eisenbahn-Bundesamt 2020

TRACKFIX POX, *TRACKFIX SIL*, *TRACKFIX PUR* - Reaction to fire test of floor coverings; MFPA Leipzig 2023

TRACKFIX POX, *TRACKFIX SIL*, *TRACKFIX PUR* – Determination of heat of combustion according to DIN ISO 1716:2010-11; MFPA Leipzig 2023

Legal:

The correct and thus successful application of our products is not subject to our control. A guarantee can be issued for the quality of our products within the framework of our sales and supply conditions, however not for successful processing. All data and specifications in this specification sheet are based on the present state of the art and the right to changes and adaptations for the sake of development remains explicitly reserved. The consumption specifications designated by us can be only average empirical values, where deviations are possible on an individual basis and therefore cannot be excluded by us.

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