

Pre-applied fully bonded waterproofing system Zemseal®

FAQ

Additional waterproofing measures are usually required to meet all the structural and physical requirements of waterproof structures.

In case of high utilization requirements, the use of a pre-applied fully bonded waterproofing system that prevents back-tracking has proven its worth. Our Zemseal® pre-applied fully bonded waterproofing system envelops the water-impacted structural elements and forms a closed, integral exterior waterproofing system. MAX FRANK Zemseal® pre-applied fully bonded waterproofing technology combines mechanical and adhesive bonding (dual-bond technology).

Advantages

- Dual-bond technology: mechanical and adhesive bond
- proven back-tracking prevention
- Excellent crack-bridging
- High material efficiency (only 50 mm butt overlap)
- Suitable for high pressure cleaning
- Easy handling due to low roll weight
- Effective diffusion barrier-protection against radon gas
- European Technical Assessment (ETA)
- General test certificate from building authorities (abP)

What evidence is available for your system?

- AbP as strip sealing and for transitions on waterproof concrete
- ETA with CE marking
- CE marking according to DIN13967

Can a PFWS (Pre-applied fully bonded waterproofing system) be used as a stand-alone waterproofing solution?

No, Zemseal® PFWS can only be used in combination with a waterproof concrete structure with appropriate joint sealing.

Does a PFWS have a negative effect on fire protection?

No, Zemseal® PFWS does not represent an additional fire load.

What crack widths can be bridged?

Zemseal® PFWS can bridge cracks up to a maximum of 2 mm.

Who is allowed to install a PFWS?

Zemseal® PFWS may be used by anyone who has been trained or certified by the manufacturer.

What is the processing temperature range?

0°C - 50°C, under certain boundary conditions processing at -10 °C - 0°C is also possible.

Is it allowed to staple a PFWS to the formwork?

The Zemseal® PFWS may be stapled to the formwork outside the area to be concreted.

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What must be observed in the event of damage to a PFWS?

Damaged and defective areas must be repaired with system-compliant Zemseal® adhesive tape before concreting.

What influence does pollution have on the PFWS?

Heavy soiling must be avoided or removed accordingly, as it can lead to bond failures between the fresh concrete and the bond layer. Heavy pollution affects the back-tracking effect of the membrane and the functionality can no longer be guaranteed.

How can I clean the PFWS again if it gets dirty?

The Zemseal® PFWS can be cleaned with a water hose or a high-pressure cleaner (recommendation: up to 170 bar, flat jet nozzle, 20 cm distance). The excess water must be removed with a wet-dry vacuum cleaner.

What substrate is required for installation under the floor slab?

The substrate can be executed as a levelled or smoothed clean layer and must be level and free of loose parts. It is also possible to lay the Zemseal® PFWS on a pressure-stable thermal insulation, taking care that there are no height offsets between the insulation boards.

What stripping times must be observed with the Zemseal® PFWS?

The stripping times depend on the cement used and the ambient conditions.

When using customary cements, we recommend a stripping time of at least 48 hours.

At temperatures < 5° C, the stripping time may be increased.

Note: In case of doubt, we recommend performing a peel test before stripping the formwork (this applies especially when using slow-setting concretes).

What is dual-bond technology?

Dual-bond technology describes the bond between Zemseal® and the concrete. Two types of bonding are formed, which prevent water from running behind the fresh concrete bond film.

Mechanical bond:

A very good mechanical bond is formed between the geotextile fleece and the concrete. The fine particles of the fresh concrete penetrate the fleece due to the vibration energy during compaction. As a result, after the concrete has hardened, a non-tracking bond is formed with the composite layer.

Adhesive bond:

The nonwoven geotextile is impregnated with an adhesion promoter (acrylate copolymer) during the manufacturing process, which improves the adhesion of the concrete to the fibers.

What is the difference between PP and PE-LD / PE-HD?

PE-LD (LDPE) = low density polyethylene and PE-HD (HDPE) = high density polyethylene.

In polymers, the density (crystallinity) determines the processing properties and the quality of the subsequent film. PE-HD is more stable, tear-resistant, scratch-resistant and wear-resistant than PE-LD, but also significantly stiffer and more brittle.

Polypropylene has great similarities with PE-LD, it is characterized by high stability and is resistant to many chemicals. It is also physiologically safe and harmless to the environment in the recycling process.

However, polypropylene is harder and more heat resistant than PE-LD.

Which fresh concrete consistency may be used?

Consistency classes F3-F6.

Is there any evidence of the gas tightness of PFWS?

No, only for radon gas a radon resistance Z of $1,2 \times 10^8$ s/m has been determined.

What do I have to imagine by the term coefficient of friction?

The coefficient of friction gives a value at the first displacement in the shear joint between the sealing layer of the PFWS and the substrate. This value can then be taken into account in the structural design. Substrates can be insulation, a stripped cleanliness layer, a smoothed cleanliness layer, or a layer of PE film on a stripped or smoothed cleanliness layer.

Our coefficient of friction μ is between 0.4 - 0.8 (depending on the substrate), these are only empirical values and may **still have to be confirmed** by project-related tests!

Which spacers may be used?

Suitable spacers must be used for waterproofing structures.

Generally recommended are single and bar spacers made of fiber-reinforced concrete, e.g. type „Schlange N“ or Stremaform Spacer.

What must be considered when laying the spacers?

Spacers should be installed staggered and not in a line.

Depending on the substrate (e.g. thermal insulation), more spacers must be installed to prevent the spacers from being pressed into the substrate.

Is it permissible to install spacers over sheet joints?

Yes, with Zemseal® PFWS it is possible to install spacers over sheet joints.

Does the weight of the reinforcement have an effect on the PFWS?

No, the reinforcement counteracts displacements of the membrane due to thermal expansion and thereby relieves the sheet joints. For very high loads, it is recommended to select the membrane thickness according to its properties.

How long can a PFW membrane be stored?

The rolls should be stored horizontally in their original packaging, dry and protected from sunlight, snow, ice, water, excessive heat or heat sources. Storage temperature should be between +5°C and +30°C. Shelf life min. 24 months from date of manufacture.

How long may the composite layer (fleece) remain open after installation?

4 months (the composite layer must be protected from contamination).

How long may the sealing layer (PP side) remain open after installation (e.g. until the wall is filled)?

12 months.

Can reinforcement be reduced by using an PFWS?

Under certain circumstances and depending on the design principle, there may be potential for reducing the reinforcement required to limit the crack width. However, this must be determined in consultation with the responsible structural engineer. Moreover, the PFWS can be regarded as a preventive maintenance measure and thus contribute to cost savings. This point must also be agreed under private law and determined in coordination with those involved in the planning.

Are there systems that allow diffusion or positively influence drying of the concrete to the outside?

No, a study by the TH Nürnberg found out that there are no discernible differences between the systems.

Does the film need to be protected before filling?

Yes, it makes sense to protect the film before filling with a dimpled sheet with sliding layer, if no insulation was installed in advance.

How should I deal with waves and wrinkles?

Waves cannot be ruled out with PFWS because the sealing layer consists almost exclusively of plastic sheets. Plastics have a coefficient of thermal expansion, so changes in temperature also cause changes in length, which can lead to the formation of waves.

Wrinkle formation must be ruled out; if it does occur, it must be removed before concreting and the areas must be repaired accordingly.

What is the coefficient of linear expansion of the membrane?

Coefficient of linear expansion Zemseal® $\alpha = 84.0 \times 10^{-6}/K$ (average of all directions).

Difference bitumen compatibility / bitumen resistance?

There is no difference in the two terms. Two terms one test!

Is there a DGNB/LEED certification for pre-applied fully bonded waterproofing systems?

No, sustainability certifications such as DGNB or LEED ALWAYS refer to the life cycle of a building component or structure and never to a building product.

However, there are certificates for building products themselves that summarize the most important material characteristics and product data with regard to the respective certification model.

We provide these for DGNB and LEED via the "Building Material Scout" platform.

If you have any questions about installation, please also refer to the installation instructions at www.maxfrank.com.