SANITARY SEALING MANUAL

Wolf Group

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What is sanitary sealing?

The purpose of sanitary sealing is to give sanitary rooms an esthetical and long-lasting appearance. During their lifetime, joints in the sanitary areas face a lot of adverse conditions- from excess moisture to contact with different chemicals. Therefore, it is important to use suitable sealants which maintain their mechanical and visual properties during their lifetime.

This manual gives instructions for sealing sanitary areas in the interior of buildings exposed to non-pressurized water, it means sanitary joints in bathrooms, toilets, showers and domestic kitchens.

Choosing the correct sanitary sealant

Nowadays, there are many different types of sealants available, e.g. neutral silicones, acetoxy silicones, PU-sealants, hybrids, etc.

Each type of sealant has its advantages and disadvantages, which should be considered before using it. For sanitary sealing, mostly acetoxy or neutral silicones are being used, due to their favorable characteristics in these particular applications. However, it is not excluded that other types of sealants are being used in sanitary joints.

Some of the important things to consider while choosing the sanitary sealant are:

» **Sealant adhesion to substrates.** Before the application, it should be made sure whether the sealant has a sufficient adhesion with the required surfaces.

» **Sealant compatibility with contact materials.** Sealant might not always be compatible with the surface material, even though the adhesion with this material is good. For example, acetoxy silicones shouldn't be used with uncovered metals due to the risk of corrosion, when using sealants in contact with natural stone (marble, granite), it should be ensured that they wouldn't cause the "staining" of those surfaces, etc.

» **Sealant's resistance to water and humidity.** It is obvious, that in sanitary rooms the joints are often in contact with high air humidity and even direct water (hot and cold). Therefore, sealant needs to maintain its shape, esthetic look and characteristics in these conditions.

» **Sealant's resistance to mildew and fungi.** In sanitary application, it is extremely important that the sealant would contain fungicides to provide longer protection against mildew and fungi.

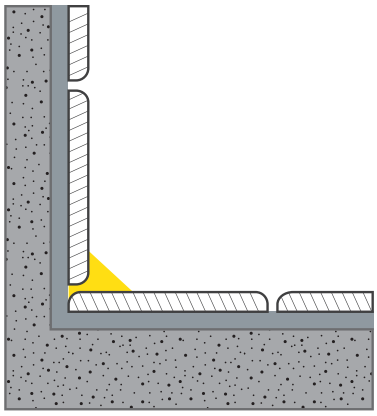
» **Sealant movement capability.** When sealing joints with greater deformations (joints between the wall and floating floor, joint between wall and bathtub) it is important to use sealants with higher movement capability.

» **Sealant's cleanliness.** In sanitary rooms, the sealant surface will be in contact with different chemicals such as cleanser, soap, shampoo, etc. It is extremely important, that sealed joints should be easy to clean to ensure their longevity and appearance. The surface of the sealant can't be too soft, otherwise it might be scratched during the cleaning process.

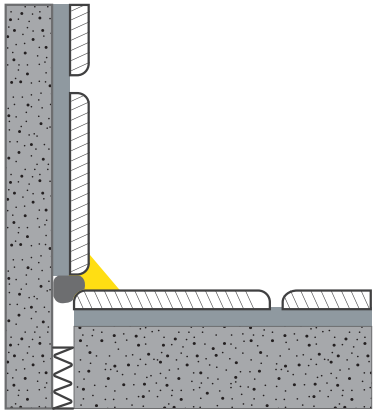
» **Health and environmental safety.** In terms of health and environmental safety, it is important that the sealant wouldn't contain any hazardous compounds and the total emission of volatile organic compounds (VOC) would be as low as possible.

Joint design

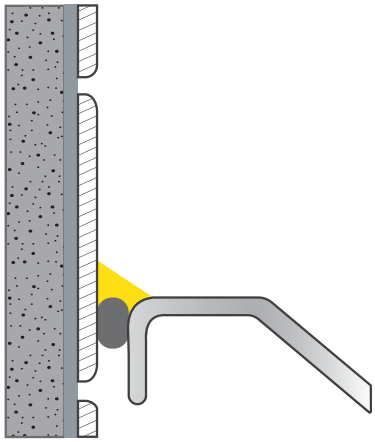
Correctly designed and executed joints help to guarantee sealant's longevity and required properties during the service life. The following pictures illustrate some of the main joint types in sanitary rooms.



Fillet joints are being used for practically immovable connections (inner corners of walls, the connections of sinks and toilets). The triangular shape of the sealant helps to avoid the water accumulation on sealant's surface.



When sealing joints with greater deformations (e.g. joints between the wall and floating floor), suitable backing material, such as closed cell PE backer rod, should be used to avoid three-sided adhesion and give the sealant the correct form.



Before sealing the joint between the wall and bathtub, the bath should be supported correctly to avoid unwanted movements during exploitation. With wider joints, backer rod should be used.

Sealant consumption

Sealant consumption depends on the joint size, shape and the installer's skill. When calculating the total consumption of sealant, the material losses should be taken into the consideration.

Estimated consumption of sealant in linear meters per 300 ml cartridge (without material losses) for fillet joints with triangular shape:

Joint width / Joint depth	3 mm	4 mm	5 mm	6 mm
3 mm	66,7			
4 mm		37,5		
5 mm			24,0	
6 mm				16,7

Recommended joint sizes.

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Sealing of the joints

To achieve the required results and longevity of sanitary joints, it is important to follow the general installing requirements described in this manual. Before sealing, it must be ensured that the main volume reduction of the construction elements has been completed and the equilibrium moisture content has been achieved. Since sealants may be applied in many different conditions, additional installation procedures may be required, in addition to the general rules.

Conditions while sealing

For the best performance, sanitary sealant should be applied when the ambient air temperature and the temperature of the substrates is similar to normal room temperature, usually between +15 °C to +25 °C.

Frequently, different types of silicone sealants are being used for sanitary applications. It must be considered that the curing speed of silicone sealants depends on the atmospheric humidity. With higher temperatures and humidity, the sealant cures faster compared to lower temperatures and humidity. During curing process certain by-products diffuse out of silicone and therefore a sufficient ventilation is needed, when using the silicone indoors.

Cleaning

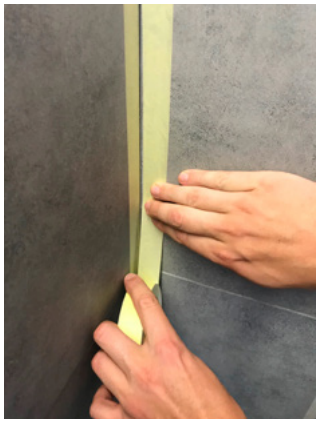
Before sealing, it must be ensured that the joint surfaces are clean, smooth, dry and strong enough. If needed, the porous surfaces should be cleaned with an abrasive material and after that all the loose particles should be removed. Non-porous surfaces should be cleaned with solvent and a clean, non-fluffy cotton cloth. Solvent rests should be removed before evaporating with a clean cloth.

Installing backing material (*if needed)

For wider and movable joints, the backer rod should be used. The purpose of the backer rod is to ensure correct joint thickness, avoid three-sided adhesion and give the sealant a correct form. Depending on the specific situation, either closed cell or open cell backing material is being used.

Backer rod is installed, taking into consideration that it gives the joint sealant the correct depth and shape. When installing the closed cell backer rod, it must be ensured that the surface of the backing material wouldn't be damaged, since it may result in a disadvantageous adhesion and the releasing gases may harm the sealant (bubbling). The diameter of the backer rod should be approximately 25% larger than the joint width.

Installing masking tapes



If necessary, the adjacent surfaces of the joint should be protected to avoid staining. Usually masking tape is being used for this.

Sealing

After cleaning, and backing material installation (if needed), the sealant can be applied.

Apply sealant evenly and smoothly in the joint with a suitable silicone gun. Make sure that there wouldn't stay any airgaps between the sealant and the backer rod nor the sealant and substrate surface.

Tooling

After installing the sealant to the joint, it should be tooled and smoothened to give the joint a clean and esthetical appearance. Usually, special tools and spatulas can be used for this.

All the excessive sealant should be removed, and surface of the sealant smoothened.

Removing masking tapes

Protective masking tapes should be removed immediately after tooling, before the sealant's skin is formed. Removing the tapes should be done carefully, so that the finished joint surfaces are not being damaged.

Finishing

To achieve the best result, the sealant surface should be finished gently with a damp finger that has been soaked in soapy water. It is extremely important that all the tooling and smoothing would be done, before the sealant forms the skin.

Maintenance

Damages of the joint

The condition of sanitary joints should be monitored and evaluated on a regular basis and, if necessary, the damages should be eliminated.

The main damages of sanitary joints are the sealant mold, adhesion loss from the substrate or cohesive failure of the sealant, sealant discoloration and ageing. Joint failures can cause water and moisture damages, surface finishing damages, as well as the spread of mold and bacteria.

Common mistakes that may cause joint damages:

» Incorrectly selected sealant or other materials (e.g. sealant with a low movement capability is used in joints with high deformation).
» Incorrectly designed and/or built surfaces (e.g. floors with incorrect slopes).
» Excess moisture of joints.
» Deposition of organic waste and dirt on the sealant surface (soaps, shampoos, household chemicals, etc.).
» Poor ventilation and heating in sanitary room.
» Poorly executed sealing.
» The ageing of the sealant.

Maintenance and repair

Regular cleaning, disinfection and drying of sealant joints are extremely important to ensure the long-term durability of sanitary joints. Sufficient ventilation and heating must be provided in sanitary facilities in order not to create a favorable surface for mold growth or spread.

As soon as the mold is noticed on the sealant surface, it should be cleaned with a suitable detergent. If the mold has already spread to the deeper layers of the sealant, the damaged sealant must be completely removed and replaced. The sealant should also be replaced if its adhesive or cohesive failure is detected.

The old sealant is mechanically removed with a suitable tool (scraper, knife, etc.), then suitable silicone remover is used to make it more convenient to remove silicone residues. If the mold has spread to the surfaces under old sealant, it should be removed. Otherwise, new mold may start to grow quickly again, because the mold spores are still present underneath the new sealant. The new sealant will be applied to the joint, taking into account all the instructions described in this manual.

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