

DAMAGE WHEN TILING SWIMMING POOLS AND ITS AVOIDANCE

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SUMMARY

Waterproofing of swimming pools and the subsequent laying of tiles or mosaic stones make high demands of the materials used and the way they are processed. Sustained swimming enjoyment can only be ensured in combination with a functional water treatment system.

Professional waterproofing – a basic requirement

Before waterproofing is commenced, the pool shell needs to be checked for suitability. It needs to be even and free of fractures. The concrete needs to harden for at least 3 months so that it has undergone most of the inherent shrinkage to avoid any excessive tension in the tile surface.

Whilst the surfaces, i.e. the walls and the floor, are relatively easy to seal, expert know-how is required when it comes to the insertion of lights, inflow jets, drains etc. Often installations with flanges made of polyethylene (PE) or polypropylene (PP) are used. These adhesion-unfriendly materials do not allow a clean connection to the surface seal. Secure methods for waterproofing openings are illustrated.

The pool water influences the choice of tiling mortar and joint grout

Depending on the aggressiveness of the pool water, it is usually sufficient to use cement tiling materials otherwise sturdier, but much more expensive, epoxy-resin products need to be used. In particular, the potential lime aggressiveness of the water is often underestimated. Lime-aggressive water will leach lime from cement adhesives and grouting materials. As time passes, the cement structure disintegrates, the adhesive structure is destroyed and the joints are “dissolved”. Whether or not the water is capable of leaching lime depends on the water hardness (calcium content), the pH-value and the acid capacity. As these three factors also have a mutual effect on each other, the assessment can only be made using complex mathematical models.

The author presents the lime index method. Based on the empirical values for the pH, calcium content (mg/l) and acid capacity $KS_{4,3}$ (mmol/l), the lime index (KI) can be easily determined thus allowing the water to be classified as lime-solving or lime-precipitating. If the calculated KI is greater than 0, cement products can be used. If the KI is less than 0, the joint grouts, tiling mortar and waterproofing products need to be successively switched to epoxy-resin based products the greater the negative value of KI.

Mosaic – beautiful but prone to damage

Mesh-mounted mosaic is not suitable for use in permanently wet areas. Firstly, the mesh reduces the adhesion surface for the tiling mortar. Secondly, the mesh adhesive saponifies in contact with alkalinity and thirdly, is a nurturing ground for micro-organisms. When laying translucent mosaic, steps must be taken to ensure that tiling and grouting is carried out with great care. Otherwise the laying mortar will imbue inhomogeneously and brown marks will shine through translucent mosaic.

Pool head – it’s all down to the details

Modern pools are designed with a raised water level, which means that the water surface is at the same height as the tiles of the pool surrounds. Based on the principle of communicating pipes, the water would pass below the pool head and infiltrate the mortar bed of the ceramic surface of the pool surrounds. This needs to be prevented by blocking the outer edge of the pool head by an anti-capillary filling, as otherwise the result may be scum on the pool surrounds or loss of water.

Fully functional water treatment – an absolute must

It cannot be repeated often enough – a fully functional water treatment system is imperative for sustained swimming enjoyment. If pool circulation, pool cleaning, the use of chemicals etc. are not performed continuously and monitored, the pool will quickly be overtaken by micro-organisms. The author looks at the most important parameters and their importance for water hygiene.