NATIONAL PLASTERERS COUNCIL

Is my Pool Supposed to be "Waterproof" or "Watertight"?

based on **Technical Bulletin #7: "Waterproof" vs. "Watertight"**

Because your pool holds water you may think it is waterproof, but "watertight" and "waterproof" are two entirely different standards, and you should be aware of what each term represents and how they are different.

The National Plasterers Council (NPC) notes that when a pool's structure is built properly, it is designed to be watertight (to hold water). And during the installation of the decorative interior finish, the plumbing, lights, and other penetrations through the structure are also sealed, and made watertight. Together, the pool structure and the subsequent sealing around penetrations make your pool *watertight*. This means that water should not penetrate through the pool structure; however, it is not *waterproof.* Waterproof means that not even water vapor can pass through a material, like a raincoat for example. Most swimming pools allow moisture and water vapor to permeate the pool structure without causing structural harm. But again, if the shotcrete or concrete structure and the sealing of penetrations are done correctly and to industry standards, your pool should be watertight.

Ensure your Pool is Watertight

Water should not leak thru the swimming pool structure, whether the structure is made of placed concrete or of shotcrete (shotcrete is a wet or dry concrete mixture that is applied, or "shot", at high velocity) and should not leak around penetrations through the swimming pool structure. Shotcrete is routinely engineered and placed to create a watertight swimming pool, which the industry generally agrees, requires the structure to have a minimum compression strength of 4000 psi.[1,2] However, special steps should be taken to ensure that plumbing, lights, and any other penetrations through the structure are sealed, because the concrete or shotcrete structure can develop small shrinkage cracks around these penetrations during and after installation as the cementitious material dries[3,4].

One method to seal around penetrations is for the plasterers to trowel continuously through to the final set of the interior finish coating (until the material is hard), which seals the interior finish around the penetrations. For finishes where the troweling is discontinued prior to the final set, penetrations may require pre-sealing before applying the interior finish coating. It is common in some regions of the country to have "dig-outs" around penetrations in the concrete or shotcrete to make them easier to seal around.

Plumbing Penetrations with Fittings and Pre-Sealed

Some penetrations that require little or no adjustment before the interior finish is applied may not need dig-outs; but ultimately, sealing or plugging penetrations falls to whoever is assigned this responsibility.

To ensure your swimming pool shotcrete or concrete mix is watertight, the mix must have an adequate amount of cementitious material, a low water-to-cement ratio, a pozzolan or polymer modifier addition, or some combination of these.

Proper curing is required for all shotcrete and concrete pool structures to reduce the rate and size of shrinkage cracks near the surface and to increase the overall strength gain properties of your pool structure, which in turn makes it even more watertight. Even extending wet curing time from three days to seven days after the concrete or shotcrete is placed, can further reduce surface shrinkage cracks by 10 to 20 percent.[5] Ideally, the NPC recommends that moist curing (spraying with water) continue once a day thereafter for 28 days, and recommends "soaking" the concrete or shotcrete three to five times per day for the first seven days, depending on the climate in your area.[6] Soaking is usually done by spraying the shotcrete or concrete surface with a garden hose by the homeowner or whomever is assigned the responsibility.

Water from behind the structure prior to application of the interior finish coating.

Plumbing with fittings installed and pre-sealed.

Interior Finish Helps "Seal" the Deal

Proper interior finishing is the other key to a watertight pool. The interior surface finish of your pool must be placed and finished properly to ensure the pool is watertight. There should be no areas that allow water to pass freely through the finish coating, such as open cracks, holes or gaps at the tile line, rocks or at other transition areas. Pool plaster should be finished to provide a tight seal around all plumbing and lighting fixtures, and around any other penetrations in the shotcrete structure.

"Waterproof" Offers a Different Level of Moisture Barrier

There are unique instances when swimming pools may be required to be waterproof.[7] In such cases, specialized pool design and engineering should be used that prevent even moisture or water vapor from permeating through the structure. Pools built on a shelf or pilasters, pilings, or grade beams; pools with negative edges; portions of pool or spas that are raised above ground, or wherever the outside or back side is visible, may require the pool to be waterproof.

Waterproofing manufacturers offer many types of waterproofing systems, from those that are added to the concrete or shotcrete mix or the interior finish mix, to separate coatings or membranes that are applied to the pool interior, or to spray-on applications that absorb into the concrete or shotcrete structure. Waterproofing is generally accomplished by 'enveloping' the entire structure up to the deck (behind perimeter tile) and on top of negative edge walls so that water inside the pool cannot get through, around, or behind the swimming pool structure. Waterproofing prevents any moisture from passing through the structure and causing damage or showing unsightly mineral salt deposits on visible outer areas of the pool structure.

When using waterproofing, water should not be allowed to gather or pond against the outside of the pool structure from rain, irrigation systems, high water tables, or areas where water cannot drain/escape from the immediate pool area. Back pressure from such water can cause flexing, stretching, or debonding of the waterproof membrane, bond coat, or interior finish causing the waterproofing to lose its effectiveness.

Except in such rare instances, homeowners should seek a swimming pool structure and interior finish that is watertight and keeps water from leaking out or harming your pool's structural integrity. A properly engineered and installed watertight pool will achieve the intended service life and enable your swimming pool to be the family center of outdoor fun and relaxation for years to come!

REFERENCES

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