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Ardex Technical Note 4.4:

Specifying Tiling for Swimming Pools and Leisure Areas – Specifying Tile Adhesives

This technical note aims to provide guidance on the specification of tile adhesives in swimming pools and leisure areas. Backgrounds for tiling, tiles and the situations we place tiling in are constantly changing through a mix of new technology and fashion trends. Yet all these factors influence the choice of tile adhesive or grout and the specification.

Basic Adhesion Principles

There are three main types of ceramic tiling adhesives: dispersion, cement based and reaction resin. They develop adhesion in different ways.

Dispersion, otherwise called ready mixed/paste adhesives, are for wall use and found most commonly in the DIY/domestic tiling market. They need to dry to develop adhesion.

Cement based adhesives are commonly used in the contract market for both wall and floor tiling. These bagged adhesives when mixed with water will form a mortar, which sets and hardens.

Reaction resin adhesives, commonly referred to as epoxy (or Polyurethane) are generally 2 component systems which react together when mixed to gain adhesion. These are used in specialist areas.

This very basic principle is important, as considerations such as the body of the tile type, its level of water absorption, the tile size/ weight, the width of the grout joint, coupled with the porosity of the background or the end tiling situation, will affect your choice when specifying, especially for dispersion/paste products.

Pool Chemicals and Water Balance

Sulphate containing materials can affect cement-based materials, leading to cracking, expansion and loss of strength and bond. In addition, aggressive pool water conditions such as soft or acidic water can lead to cement based materials eroding. Both these factors can ultimately lead to failure.

One cannot rely on the tiling and grout to protect the background and adhesive bed from the aggressive effects of the pool water.

The TTA document “Design and Construction of Swimming Pools” provides further information on water balance.

Cement and the Importance of Water Balance

Soft, acidic water is “hungry” and will dissolve calcium based minerals. A natural solvent, water will dissolve certain things it comes into contact with, think sugar or salt. Soft water dissolves lime (calcium hydroxide) in much the same way as any water will dissolve sugar, that’s why soft and aggressive water are the water types which require greater consideration in a tiling specification.

Hard water is “full” of calcium salts and will deposit these in the form of scale if the pool water is not correctly balanced.

The ideal PH range for a pool is 7.2 to 7.8 under balanced water conditions.

Additional Considerations

In addition to the normal considerations when selecting an adhesive or grout, the following considerations are required when specifying for swimming pools.

- Quality of water supply.
- Pool water treatment chemicals – avoid sulfate containing chemicals.
- Pool water balance.
- Cleaning and maintenance chemicals – avoid sulfate containing and acid based chemicals.
- Pool design – eg. Water features, flumes, etc..
- Location of the tiling.

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Adhesive plays a Pivotal Role

Although not a visible part, the correct choice of adhesive and grout, and correct installation literally holds the overall project in place for years to come.

Apart from understanding the basic adhesion properties of tile adhesives, it's also important to be clear on the enhanced properties of the adhesives and grouts to suit given situations. Adhesives are firstly characterised by type, such as:

- C for Cementitious
- D for Dispersion
- R for Reaction Resin

Then by their additional properties:

- F denoting fast setting
- T denoting reduced slip
- E denoting extended open time
- S denoting deformable

Be it an adhesive or grout classification, a level 1 product has normal characteristics and a level 2 product has additional characteristics. A C1 adhesive will have a minimum tensile strength of 0.5N/mm², whereas a C2 will reach a minimum tensile strength of 1.0N/mm². In addition to this, there are also other properties such as enhanced slip, faster setting or longer open time.

So, for example, a C2TE S1 adhesive denotes a cementitious adhesive with additional properties, reduced slip and extended open time, which is deformable.

It's important to point out that S2 adhesives, due to the fact that they are highly deformable, are not recommended for heavily trafficked areas as stated in BS 5385.

ARDEX High Performance Fibre Reinforced Technology

Quality products will reach and be classified to the EN standards, however the classifications only provide a guideline level of performance.

ARDEX unique high performance fibre reinforced technology adhesives demonstrate considerable advances on the standards and provide exceptional real-life performance on site. These products have even higher adhesion performance and can be classified as C2FT(T)E(E) – S1 adhesive.

For example, whereas a standard open time would be 20 minutes, an extended open time would be referred to as 30 minutes under laboratory conditions. In real world site conditions this could be much less. ARDEX high performance fibre reinforced technology tile adhesives outperform this basic benchmark of 30 minutes with some having an open time of 60 minutes, double that's stated as "extended" in the classification.

ARDEX high performance fibre reinforced technology tile adhesives are easy to use and guaranteed to perform. They have been used on many prestigious projects and many difficult installations to date.

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