



**CERAMIC TILE INSTITUTE OF AMERICA, INC.**

*12061 Jefferson Blvd., Culver City, CA 90230-6219*

## **CTIOA Field Report 86-2-3 (R-96)**

**SUBJECT: UNDERSTANDING GROUT AND MORTAR ADDITIVES**

### **INTRODUCTION**

Materials used in the tile industry today are more complex than at any time in the past. There are tiles with every conceivable characteristic from color and surface texture to density and bisque design. Many of these tile are better installed with latex modified mortars and grouts. Before making that decision, however, one must understand the benefits and limitations of latex admixtures.

### **DISCUSSION**

A. What are latex admixtures?

1. The word latex refers generically to a group of polymer emulsions with very different characteristics.
2. Laticies have been in existence for many years, and have a history of use in the tile industry spanning at least 25 years.
3. The first group of latex polymers designed for use

with cement is PVA's or poly vinyl acetates. This group is broken into copolymer and homopolymer types. Copolymer resins are best for use as grout additives. They retain flexibility and are insensitive to water after fully cured. Vinyl acrylics are also copolymer resins which perform well as grout additives.

4. Styrene Butadiene Rubbers, or Acrete=, as it is referred to in the trade, were the second generation polymers. SBR latex is excellent as an additive for thin-set mortars. Typically, SBR latex is added to a factory prepared blend of sand and cement or when mixed with silica sand and cement, a bonding mortar in compliance with ANSI A118.4 is achieved. Most manufacturers do not recommend that SBR liquids be mixed with either dry-set mortars or grouts.
  
5. The latest group of polymer resins to gain popularity and acceptance are the acrylic resins. Acrylics are superior to the other types of laticies in many respects. Acrylics are designed to be mixed with dry-set mortars in lieu of water, and with grouts they are normally diluted. Check each manufacturers recommendations before use. Acrylics are extremely stable in the highly alkaline cement environment. Acrylics dry clear, are very resistant to UV (Ultra-violet rays from the sun) and completely unaffected by water once cured.

#### B. Non-latex admixtures

1. There are several other types of admixtures currently on the market which are not latex in composition.
  
2. One such product, which has been used for many years, is Anti-Hydro. Anti-Hydro is basically a cement accelerator and waterproofing agent.

3. Anti-Hydro is typically used as an additive to grout. Anti-hydro when diluted 7 - 1 with water will render a harder grout joint. Care should be exercised, however, when blending with some colored grouts since anti-hydro is an accelerator and may accentuate uneven drying conditions and thereby cause shading.

C. What do latex admixtures contribute to mortars and grouts?

1. Laticies play a key role in two major areas. Used with bonding mortars, a latex admixture adds an adhesive capability to the bond. Basically, thin-set mortars form tiny bonds as the cement penetrates the substrate and tile. If those surfaces are very dense, the bond strength is substantially reduced. Since latex will add adhesive properties, the shear strength of the mortar to a dense surface will improve.
2. The other major benefit comes in the form of increased water resistance. The addition of latex will reduce water absorption in mortars and grouts substantially. Tests have shown that a typical sanded grout will have approximately 10 - 20% water absorption. The addition of latex will reduce water absorption to a 3 - 5% range. The benefits of this characteristic are obvious. Reduced water absorption will allow easier maintenance, more freeze-thaw resistance and increased density.
3. Latex additives also prolong the hydration period. This will, of course, promote color uniformity in colored grouts as well as intensifying their color

D. Installation characteristics

1. Basically, thin-set mortars with latex additives do not perform much differently than dry-set mortars mixed with water. Laticies are, however, more prone to skinning when exposed to wind or heat. During application, care must be taken to monitor the condition of the latex mortar. If skinning occurs, it must be recombined or removed and replaced with fresh material.
  
2. In grouts, the acrylic additive will be somewhat more difficult to work with than standard grout. Care must be taken to remove the acrylic fiber from the tile surface. In some cases, a thin residue may be removed the following day using a nylon scrub pad. Under no circumstances, however, should a grout film be intentionally left on the tile surface. This film, if allowed to harden, will be very difficult to remove.
  
3. PVA or vinyl acrylic type additives are much easier to work with in grouts. They tend to be more water sensitive during cleanup and do not normally leave a film on the tile surface.
  
4. The one major limitation with latex additives is cure time. Generally, manufacturers of these products recommend a 14 to 28 day cure time before being exposed to a permanent water condition. For instance, if latex were used to bond tile in a pool, depending upon temperature, humidity, etc., a wait of 14 to 28 days before filling would be mandatory.

## **CONCLUSION**

- A. Generally, latex admixtures will increase the performance of mortars and grouts.

B. It is important to note that these products are not necessary in all cases. If increased performance is required, however, and latex is chosen, follow the manufacturer's directions explicitly.