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CTIOA FIELD REPORT 2004-3-14

SUBJECT: GROUT – THE EFFECTS OF TRADE ABUSE

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OBJECTIVE:

The objective of this report is shed some light on the effects on Grout of Trade Abuse in its many facets. It is based on over 1000 inspections relating to the performance of and/or installation of grout. For the purpose of this report, we will concentrate on the most popular grouts, which are Sanded and Non Sanded versions of cementitious grout.

WHAT IS GROUT?

Let's understand what grout is. It is pigmented concrete with very small aggregate. In other words, instead of rocks for aggregate, it has sand.

Some grouts have latex (polymers) to modify their actions or reactions to certain conditions. For example, grout that is not latex (polymer) modified may not properly adhere to some porcelain tile. Equally, highly absorptive tile pose a different problem that the modifiers can, in some cases, mitigate. Modifiers in grout may also work to help grout adhere where silicates or curing compounds have been used on the slab.

Grout is absorptive. It will absorb approximately 15-17% of its weight in water, or cleaning agents, or dirty mop water with drywall dust in it, or cleaning compound residue, etc.

Finally, grout is subject to its environment. The dirtier the environment, the more likely the grout will succumb to the dirt. For example, normal trade dusts are in suspension in a house, even after it is finished, for about 21 days. But during the construction process, they are far more rampant. As such, they tend to settle on freshly floated grout and cause it to have a whitish appearance and, if not removed regularly, these dusts can find their way into the grout on a more permanent basis.

In addition, slabs that are in excess of eight pounds of moisture when the tile and grout are installed can impact grout color and cure. The expression of excessive moisture once tile is installed is only through the grout joints. The moisture must migrate out of the slab, and it does so through grout joints. This can lead to alkali migration and the result of this phenomenon is white looking material topically on the grout joint.

TOLERANCE STACK

Grout has limitations, like any other product. For example, it should not be installed when the temperature is below 40 degrees...not just the ambient air, but also the substrate.

Grout should not be installed the same day or day after the tile is set, yet this is often demanded. Why should the time between setting tile and grouting be at least 72 hours? The over moist slab notwithstanding, the thin set is still profusely emitting its moisture somewhere during the initial cure of 72 hours. That somewhere is up through the grout once it is in the joint. Thin set can have minerals in it that surface on the grout as the thin set reaches its initial cure. (The other reason for waiting is to prevent the potential for bond loss between the tile and the substrate, however this is another complete subject.)

High slab moisture can equally cause alkalis to wind up on top of the grout...resilient flooring people limit installation to under 3 pounds if I recall correctly. Grout and tile should be limited as well, but rarely are. We would suggest 8 pounds as a maximum. Now, this will not always impact bond between the substrate and the thin set, but it can impact cure and color consistency of the grout.

The issue here is simple, is it a product or installation issue when it is too cold or hot, when there is too much moisture in the slab or the thin set must finish its cure through the grout? The answer is no! It amounts to tolerance stack against which no one can fully engineer the product to cope.

TRADE DUSTS/DEBRIS/ABUSE

In over 1000 inspections for various issues surrounding grout, there is one

constant, which is trade dusts/debris/abuse. In almost 100% of the grout issues, trade abuse of some type has contributed to grout color and consistency issues at least in some degree, if not the absolute total cause.

Trade abuse runs the gambit...it includes other trades such as painters, electricians, plumbers and drywallers, but equally, it includes the cleaning crews and others that have occasion to enter the home.

The most common are:

1. **Paint Spatters and Droppings:** The painter tends to drop paint throughout the house, usually during touch up, and it often makes its way onto the grout joint. A painter may then take wet a rag and wipe the dropping off. The result, they impregnate the grout with paint and it cannot be removed. Caulk can have the same effect.
2. **Drywaller Dust and Debris:** The dusts they create are in suspension, settle and become visible for quite some time after they complete their tasks...21 days minimum after all work is completed in the house. Repairs often occur after the tile is completed, and these repairs fill the air with dust and debris. Since these dusts are in suspension, they settle on freshly installed grout that is wet, and in some cases, the grout actually wicks the dusts into itself.
3. **Plumbing Leaks:** Plumbing leaks affect the color of grout. More water can cause the grout to be darker than the areas where there is no leakage and thus excessive water. This cannot be anticipated in product manufacture nor can it be rectified by installation technique.
4. **Repairs after Installation:** After the tile and grout are in, some repairs are required. For example, there is a new switch that needs to be installed, or a shelf, or a drywall repair. In house after house, these repairs are done without using a drop cloth to catch the debris, or a vacuum to pick up the debris that is created. I've actually asked these trades people why they don't use a drop cloth and their remarks suggests what they erroneously believe about tile and grout. Tile, in most people's mind is impervious, and in fact it is. Grout, on the other hand, is not.
5. **Normal Site Dirt:** Most houses have a lot that has dirt all around it, at least before it is landscaped. This dirt is blown into the house by the wind. Then, trades people walk through the dirt, and track it into the house. After a few people move through the house, the dirt accumulates and is often actually ground into the grout. Once there, it requires special cleaning to get it out or there will be some impact on the grout appearance.

6. Paint on the Substrate- This goes to abuse. If the interior floor was as clean as the garage when the tile was ready to be installed, there would be no issue. However, paint on the floor, even when removed, can lessen the porosity of the slab and affect grout color because the substrate is not consistent. When that happens, one joint may cure differently than another. Not only can it affect grout cure, but it may also cause bond loss issues between the thin set and the substrate.
7. Improper Cleaning Agents and Procedures: Overly strong cleaning agents used before the grout is fully cured can lead to all sorts of things from Pigment extraction to soft grout. Let's deal with cleaning issues as another topic because while it is trade abuse at some point, improper grout care is a separate topic and represents a very large percentage of the problems that are encountered.

CLEANING ISSUES – IMPROPER CLEANERS AND CLEANING TECHNIQUE

1. Improper Cleaning Products

- a. Steam Cleaning Chemicals. The chemicals used are too strong for newly installed grout. These chemicals can extract pigments, often modify color, and is generally an incorrect procedure. Some grout companies void color warranty immediately if this procedure is used on grout.
- b. Petroleum Based Cleaners – These are absolutely unacceptable. They are similar in effect to the method used for some Saltillo installations called oiling. For example, if one were to use mineral spirits the result will be color issues with the grout. And, there have been multiple houses that have evidence of using just such cleaners prior to the homeowner taking possession.
- c. Lysol, Pinesol, Orange Cleaners, etc - These are equally unacceptable, as they tend to leave residue. The residue actually works to attract dirt rather than resist it.
- d. Dish Soap – Dawn and others are unacceptable due to chemical residue
- e. There are other improper cleaners that are discernable with site inspection. The point is, when foreign matter impregnates

grout, many times simple fixes are eliminated.

2. Improper Cleaning Techniques (Methods)

- a. Mopping the floor – Unacceptable. In principle, this would sound okay, but the problem is: the floor is not vacuumed first, the mop is always too wet, and the mop water is not changed or cleaned frequently enough. If the mop is too wet, water may puddle in the grout joint. If water puddles in the grout joint and then evaporates, the residue can turn the grout white.
- b. Steam – Far too aggressive for grout that is under a year old. There are a lot of reasons, but suffice it to say that it may cause significant damage to the grout. Some grout manufacturers void warranty on grout if it has been steam cleaned.
- c. There are other methods that have been expressed for cleaning grout which are far too numerous to mention. However, the following section indicates the safest and best way to clean.

PROPER CLEANING

Proper cleaning will resolve a good percentage of the grout related before the homeowner takes possession and even after. These are actually easier than methods currently in use, and are good for builder and homeowner.

1. First, vacuum the house regularly after the tile and grout are installed to remove trade dusts and debris. Certainly, vacuum the tile before any cleaning is attempted.
 - a. Make those who create dusts and dirt, vacuum before they leave. The house is clean after the tile is installed, and if it is kept that way by subsequent people entering the house, a good many trade debris issues will go away.
 - b. Make those who complete repairs with paint, caulk or other similar type products, protect the floor.
2. Then, use a damp Swiffer (not the squirting one) and run across the floor. This will pick up the dusts in the joint, and take the soil off the tile and the grout will not be impacted.

HYDRATION:

It is true that grout needs to be properly hydrated. Like any material where

cement is the primary ingredient. However, mopping is not the preferred method. It would work, however, with dirty water, dirty mops and dirt in suspension, it contaminates the grout. We would suggest a better method is simply to take a Utility Sprayer and fill it with Distilled water. Then, lay the water in/on the grout joint once or twice during the first week.

CONCLUSION:

We are not saying that installers don't mess up once in a while...neither are we saying that there won't be a genuine product issue here and there. But understand the statistics.

Most Powder manufacturers have outstanding QC. Less than .01% of their product is off spec. Secondly, the products are engineered by most powder folk to withstand some installation variation or tolerance incompatibility.

In reality, only a relatively small percentage of the installations I have inspected are clear-cut installation error. The reality is that installation error may occur, but trade dusts and debris are strong contributors. Without the trade dusts and debris, much of the installation issues would not be noticed.

Finally, this field report is designed to be a point of reference. Trade debris in its many forms is causing builders problems that need not occur. In fact, about 90% of the complaints that I have inspected have trade abuse or debris issues as one primary cause. That would mean that if Trade Abuse were contained, JD Power Satisfaction ratings for major builders would go up significantly.