Semi-Rigid Floor Joint Filler Installation Timing

Joint Filling New Concrete Floors

The function of a semi-rigid joint filler is to protect joint edges from damage caused by hard wheeled traffic. To provide optimum protection the filler should span the entire joint width and be directly up against the edge. Easier said than done.

All concrete is placed with more water than is necessary to activate (hydrate) the cement. This excess water gradually leaves the slab via evaporation through the slab's surface. But as the moisture leaves, it causes the concrete to shrink in linear dimension. As the concrete panels shrink, the joints between the panels widen. It is not unusual for a 1/8" (3 mm) wide joint to eventually open to 3/16" (5 mm) - 1/4" (6 mm) or more.

A rule of thumb is that typical concrete shrinks at the following rates of total expected shrinkage:

First 30 days..... Approx. 20-30%
Next 335 days..... Approx. 50-60%

One year total..... Approx. 70-90%

In other words, joints are opening even as the filler is installed, and continue to widen well after the filler is in place. It's not unusual to fill one day, and find filler separation the next morning. This widening causes fillers to separate adhesively or cohesively as the widening exceeds the filler's expansion capability. *(Refer to Technical Bulletin T11 for complete details on the causes and corrections of joint filler separation.)*

In addition to moisture loss shrinkage, slabs can also shrink as a result of temperature and humidity changes. The best example of this is what happens in refrigerated areas. Cold temperatures cause slab panels to contract dimensionally. The refrigeration process also reduces moisture in the air and accelerates the evaporation process. In a freezer, it is not uncommon to see a 1/8" (3 mm) joint open to 3/8" (9.5 mm) or more.

It is impractical to defer joint filling until all of the slab shrinkage has taken place. The best strategy is to defer filling until the joints are nearer their ultimate width.

Recommendations

1. Typical New Industrial Slabs

ACI and PCA both recommend delaying of filling for 60-90 days after slab placement, with the added proviso

Recommendations *(continued)*

longer if possible. This is best recommended for buildings that will not be temperature controlled. If the building will be temperature controlled, defer filling until that time. Once controls are in place the slab and the joints will begin to stabilize.

2. Refrigerated Areas

Always defer filling joints in refrigerated areas until the rooms have been brought down to their ultimate operating temperature and stabilized there. ACI floor committees suggest allowing 5 days at ultimate temperature for coolers and 14 days for freezers before filling. (Refer to Technical Bulletin T6 for additional information).

3. Retail Stores

The typical retail store is constructed so rapidly that filler deferral is almost impossible. If joints are filled early, the filler separation will be more significant. The best approach is to shorten the spacing between joints, thus reducing the amount of separation at each joint.

Filling Of Older Floors

Sometimes joints are not filled until the floors are 6-18 months old. An example would be spec buildings, where joints may not be filled until a tenant has been found. In this situation, the primary concern is not initial slab shrinkage but seasonal conditions. Slabs can expand with higher temperatures and humidity, and shrink with lower temps and humidity. If you fill in the summer, joints will be at their tightest. When cold weather arrives the joints will likely open and filler separation will develop. If you fill in the dead of winter, when joints are at their widest, you may find that summer's heat and humidity have expanded the slabs and caused the filler to be compressed and extruded. If possible, always fill joints in mature slabs during mid-temperature months (March thru May, September thru October). Or, if the facility will be temperature controlled, wait until the HVAC has been turned on for several weeks. (See T*echnical Bulletins T13 and T14* for further recommendations).

Minimum Waiting Time Before Filling

While deferring filling as long as possible is preferable, we recognize that individual project circumstances sometimes require joint filling operations to be performed very early in the slab curing process. Per ACI/PCA guidelines, we recommend the absolute minimum time to allow before filling should be 28 days to ensure filler to joint wall adhesion is not compromised due to moisture.

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