the misunderstood JOINT

by National Applied Construction Products, Inc.
800-633-4622 • nacproducts.com

No, this is not an article promoting legalized marijuana use.

It is an attempt to clear the air about industry terms for substrate joints. Just as we have different dialects throughout the United States, we also use construction terms in different ways. If you are with me so far but start to find this information too basic, start skimming now. But, stop where words are in italics - there still may be a lesson here even for the seasoned constructor.

Concrete shrinks as it cures. (There are only two types of concrete in my book, the one that has cracked and the one that will.) We attempt to control cracks caused by the curing/shrinking process by limiting the size of the slab. This can be accomplished in several ways.

One, the concrete is laid in two or more separate, smaller pours. After an initial cure of the first slab, the forms are removed and a second pour is made which either butts up against or is connected to the first by rebar. The joint between the first pour and the second or succeeding pours is called a 'cold joint'. There is very little to no interaction between the slab that has already begun the curing process and the newly poured slab. Thus, the joint is 'cold'. Both slabs shrink on their own, pulling towards the center of the slab and the cold joints act as control joints.

The second method involves a continuous pour over a large area. The relief for the curing/shrinking slab is accommodated by 'saw-cut' joints. Using a concrete cutting blade, the contractor scores a line into the green concrete. Think of how a glass-cutting tool works. The glass cutter creates a weakness by scribing a line, and then the glass is tapped on one side, resulting in a clean break along that score. This is also the way that tile is cut and snapped. By saw-cutting into, but not through the slab, a weakness is predetermined and the concrete cracks through the slab at this controlled point.

So the term control joint can be described as a cold joint or a saw-cut joint. Other terms used synonymously are 'construction joint' and 'movement joint'.

There are more terms to understand. An isolation joint is usually the diamond or square shaped joint around the base of a column. This isolates the movement of the slab connected to the column from the field or larger slab. Why? The columns and additional floors that may be connected to them bear weight. Floors have ranging live and dead loads and the roof may have the weight of a heavy rainfall, snow accumulation or wind pressure exerted on it. When the roof or upper floors move, so must the columns. The isolation joint at the column's base allows the column to move up and down, vertically, without damaging the surrounding slab. That is why we see a diamond shaped joint cut in the tile around the base of a column that is filled with a soft joint material. The tile has been cut through directly above the isolation joint in the substrate below. The cut in the tile is filled with a 'soft' joint material. This allows the column to move vertically without damaging the tile pattern.

Here's the tricky part, so let's clear the smoky air: The term expansion joint was once used only for the large, never-meant-to-be-tiled-over joint that connected two separate buildings or independent structures. A true expansion joint is meant to move vertically and horizontally. This joint was engineered to move more than 3/8″ laterally while allowing for vertical shift. Typically, you will see expansion joints covered with a wide metal plate (6″ – 12″) or filled with a rubber preformed material to make a smooth transition. Think of the rubber or 'zipper' joint that connects a bridge to the road surface. We know that a bridge will rise and fall with the live loads of trucks, buses and cars passing over it. The "Bridge Freezes Before Road Surface" signs tell us that the bridge is subject to different temperature extremes than the road and thus to different expansion and contraction rates. You will see (or feel) this joint under your tires at both sides of a bridge. Just as the bridge must move separately from the road surfaces, so must some buildings move independent of connecting structures. They are engineered this way to prevent damage to both structures. The true expansion joint accommodates both vertical and horizontal shear.

Tile can be installed over various types of control joints, such as cold joints, saw-cut, construction and movement joints if an anti-fracture/crack suppression membrane has been used that will handle the lateral movement. An anti-fracture/crack suppression product that handles up to 3/8″ lateral movement is best. Tile can be placed over an expansion joint if that term is being used in place of one of the other terms listed. Tile can never be installed over a true expansion joint that is meant to allow vertical movement. Tile can be installed over an isolation joint if the tile is cut through to match the joint in the substrate. Check with the architect or engineer to determine the type of joint.

Follow manufacturer's directions for full floor coverage on membranes that allow for the relocation of soft joints in the tile pattern. Some anti-fracture/ crack suppression membranes allow aesthetic placement and minimal number of soft joints in the tile pattern.

If a strip application over control joints is the minimum 'safety net' prescribed in the construction documents, the soft joint in the tile will need to be located as close to the substrate joint as is feasible, but still over the width of the membrane.

This is not the discussion I would have had with you about 'joints' in the '60's, but times and priorities change.

Know the terms. Ask if you are not sure. Follow TCA guidelines on page 79-80 of the *2008 TCA Handbook* for soft joint requirements.

This article was published in the February 2004 issue of *TileLetter*, the official publication of the National Tile Contractors Association. www.tileletter.com