

The Evolution of tile

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Presentation Content

Part 1: Profiles: the solution to the “Evolution” of the tile industry

Part 2: Profiles: the solution for traditional movement joint assemblies

Narration: *Over the last several decades, the tile industry has had to evolve as a result of changes in manufacturing processes, installation methods, and even global climate standards requiring the development of a new product category: Installation Systems. Installation systems are “solutions” to challenges that tile installers encounter daily. The category includes products and systems that provide solutions to these installation challenges including such issues as substrate movement, lippage, water management, exterior systems and several others. This Internal Learning Module will explain why and how tile profiles have addressed installation challenges brought about as a result of: 1- the “Evolution” of tile installation methods and manufacturing processes and 2- the shortcomings of traditional movement joint assemblies.*

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Part 1- Profiles: the solution to the “Evolution” of manufacturing and installation methods

Narration: *To this day, the biggest change in the tile industry is related to installation method. For centuries (yes, centuries), ceramic and stone tile have predominantly been installed in a form of “thick-bed” or “mortar-bed”, which is a setting bed made of sand and cement that is approximately 1 ¼” to 2”. Today, and for the last 50 years, the predominant method of installation for tile is the “thin-set” method, which is a mortar-based adhesive applied to a substrate using certain sized trowels at approximately 3/32” in thickness.*

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Thick-set (mortar bed) versus thin-set

Thick-set

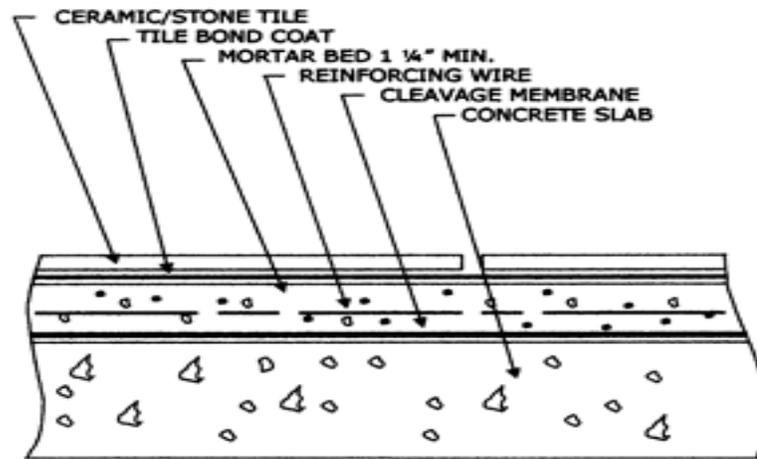
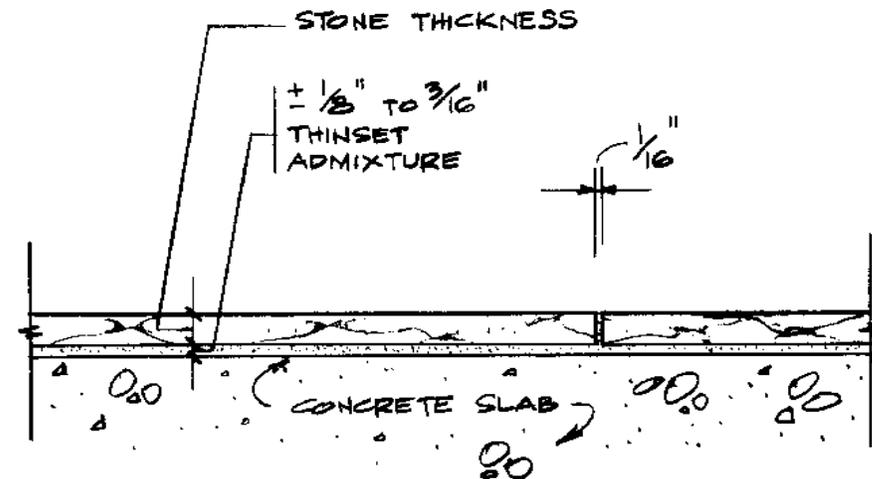


FIGURE F

Thin-set



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Thick-set (mortar bed) versus thin-set



Narration: *The benefits of thin-set application compared to thick-set, from a practical standpoint, are numerous: labor-saving, time-saving, less skill dependent, less load bearing, etc.. The thin-set method was developed in the mid-1960s and helped make tile and stone a more “attainable” luxury for the average consumer as it significantly reduced labor cost and time. It was an innovation that “opened” the market and tile consumption has grown as a result.*

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Thick-set (mortar bed)

- *Floor Tile edges embedded in mortar layer or protected by marble threshold*



Narration: *Although the practical benefits of the thin-set method are numerous, there are some drawbacks. As shown above, tile edges were rarely exposed in the thick-set method. Generally, tile edges were embedded in mortar and/or marble thresholds were installed to hide and protect tile edges. In some cases, rooms where tile was usually installed (ie: bathrooms), the concrete slab was countersunk to allow the placement of the mortar bed and tile to be even with the adjacent flooring, hence no exposed tile edges. (note: there are also performance-related drawbacks to the thin-set method compared to thick-set which will be the focus of a future Internal Training Module)*

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Thin-set

- *Floor Tile edges exposed*

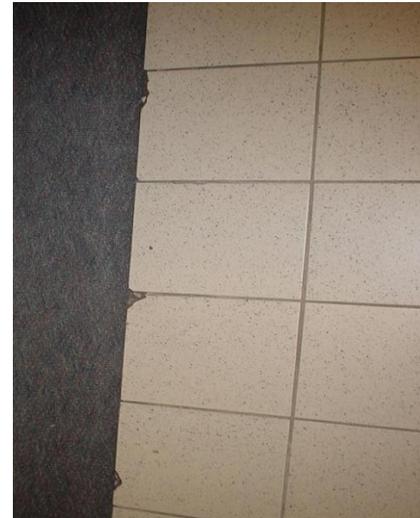


Narration: *One of the first issues encountered when the thin-set method became popular was exposed tile edges. As shown above, as the setting bed thickness for thin-set is less than 1/8", tile cannot be imbedded in the mortar layer as it had been in the thick-set method and, thus, tile edges are exposed.*

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Thin-set

- *Floor Tiles are subject to damage*



Narration: *Ceramic tile is very wear-resistant on the surface but brittle and fragile on the edges resulting in damage if left unprotected.*

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- The change from thick-set to thin creates a challenge in tile installation
- Tile edges are now exposed leading to damage
- Tile profiles have become the solution

Narration: *In summary, changes in tile installation methods, ie: the evolution from thick-set to thin-set, has created an installation challenge resolved by the integration of floor profiles.*

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Floor Tile profiles have become a standard



Narration: *The first product ever developed in the installation systems category was an “L” shaped metal profile designed to be installed with a floor tile to hide and protect the exposed edge. This innovation eliminated a very common call back experienced by tile setters at the time and has since become an installation standard for floor tile.*

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“L”



Sloped



Steps



“T”



Sloped to other



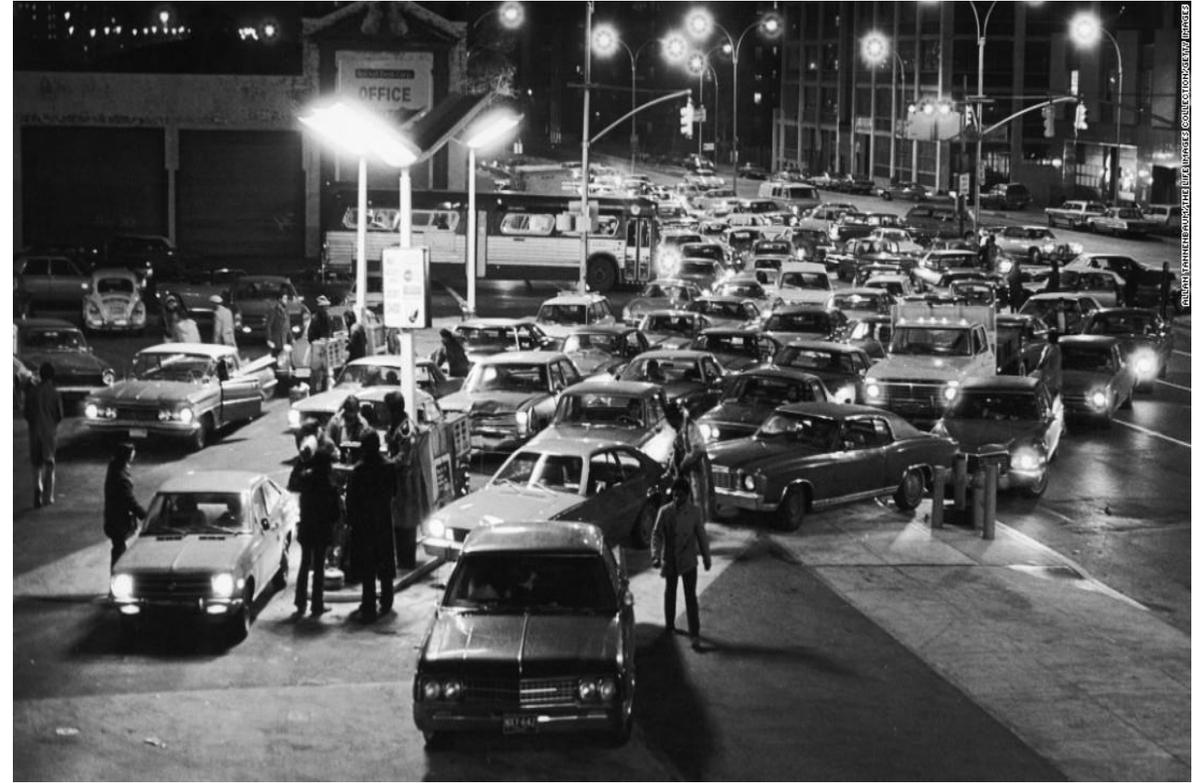
Narration: *Over time, additional floor profile types were added to address specific needs and multiple variations of size, shape, materials, colors, etc., addressing a myriad of floor conditions.*

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Q: How did the oil crisis of the 1970s change the tile industry?

Narration: *The first section discussed the “Evolution” of tile installation methods that led to the development of edge protection profiles for floors. The following section will discuss how significant changes in tile production methods has had an even greater impact on the need for profile solutions. That being said, as stated above, few people know that the worldwide oil crisis in the early 1970s was the catalyst that changed tile manufacturing.*



Narration: *In 1973, the Organization of Arab Petroleum Exporting Countries (OAPEC), created an oil embargo on the US and many European countries causing the cost of a barrel of oil to increase 4-fold, from \$3 to \$12 within a 3-month period. How did this relate to the tile industry?*

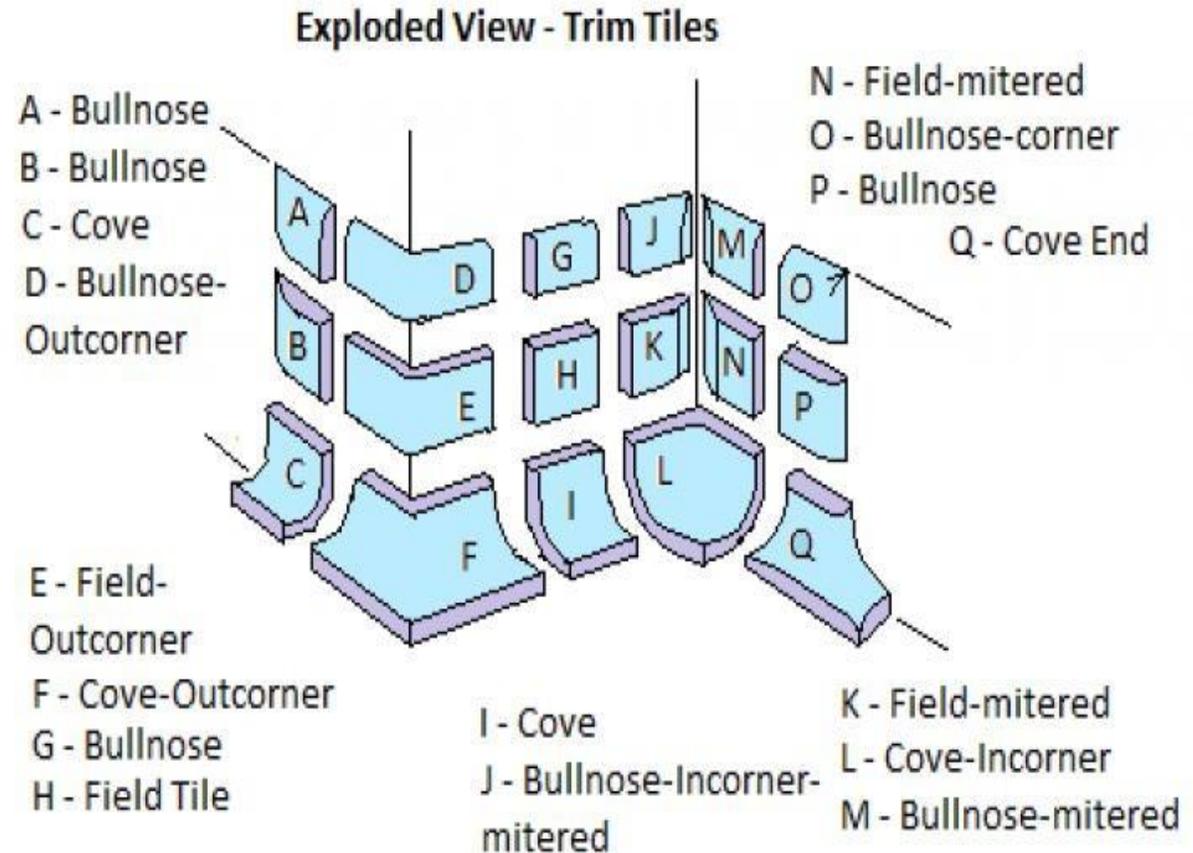
Tile is “baked”



Narration: *Ceramic tile is essentially “cooked” earth. “Kilns” are large ovens that “cook” tile during the production process. Up until the early ‘70s, tile production methods utilized the “double-fired” (bi-cottura) process, which means the “bisc” of the tile (the backing) was fired first then removed from the kiln so that the glaze (surface coloring or design) would be applied and then the tile was cooked again, hence the term “double-fired”.*

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Typical Double Fired tile

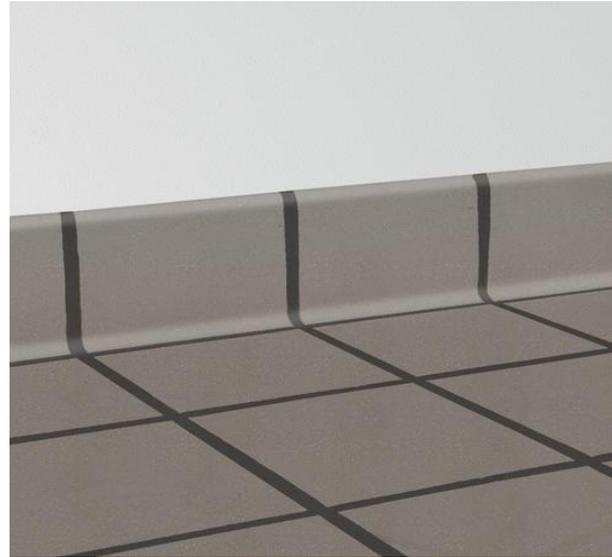


Narration: *The “double-fired” process allowed tile manufacturers to produce a multitude of specialty trim pieces. These pieces included cove base tile, bullnose tile, step tread tile and other variations . However, in this process tile passes through the kiln twice, thus requiring double the energy. Since, at the time, oil was the common energy source, the oil embargo imposed on tile producing countries meant that their energy costs had essential quadrupled and, therefore, new and more energy-efficient production methods had to be found, hence the development of the “single-fired” (monocottura) manufacturing process.*

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Typical trim tiles, such as bullnose, cove base and step treads, are very hard to find, expensive and often do not match



Narration: *The "single-fired" tile manufacturing process eliminates having to re-cook tile. As opposed to cooking the bisc and the glaze in two separate steps, the glaze is applied to the bisc and the tile is fired once, thus saving half the energy cost. This new process had many benefits over and above the energy savings such as the ability to make larger and more vitreous tile. However, this process does not allow the production of specialty trim tile. Therefore, cove base, bull nose, step tread and other tile trim pieces that were commonly available are now hard to find or not available.*

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As a result, installations are done incorrectly and/or fail to achieve their aesthetic and functional objectives



Narration: *The inability to produce trim pieces in the newly adopted “single-fired” tile manufacturing process led to installations that were inadequate. If available, shading variations between field and trim tile is common as shown in the image on the left above. Installations where trim tile is not available results in exposing the bisc of the tile, as shown in the image on the right side, which, technically, is deemed unacceptable by tile industry installation standards (the bisc of a tile should never be visible).*

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- The “single-fired” tile manufacturing process created a need for a solution to address exposed tile edges
- Traditional ceramic trim pieces that are available are hard to find, expensive and often do not adequately match the field tile
- Tile profiles have become the solution

Narration: *In summary, changes in tile manufacturing methods, ie: the evolution from “double-fired” to “single-fired”, has created an installation challenge resolved by the integration of profiles.*

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Tile profiles have become a standard



Narration: *Tile profiles for both floor and wall applications have become a standard installation practice. Today, ALL tiles can be used in ANY application as any and all trim requirements can be addressed with a multitude of profile options.*

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Bull Nose



Cove Base



Steptread



Narration: *Tile profiles are available to address all traditional trim requirements in hundreds of colors, sizes and materials.*

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Square Profiles



Baseboard Profiles



Pedestal Profiles



Narration: *...and, Profilitec offers many, many more options available to address a multitude of conditions that traditional ceramic trim pieces simply cannot address.*

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Profilitec: The industry's most advanced Profiles

1. Longer

(8'10" vs 8'2") to better adapt to North American construction standards



Narration: *Profilitec profiles are engineered to be the most advanced in the category. Some of these improvements over standard profiles will be outlined here and in the next few slides. First, standard profiles are typically 8' in length. However, because construction standards have increased floor to ceiling heights of most buildings to 9' from 8', standard profiles fall short in length requiring cut pieces as shown in the picture on the right. A 9' ceiling has a nominal height of aprox. 8'6" to 8'8", therefore, Profilitec's 8'10" length allows the installer to use 1 profile without a seam in almost every floor-to-ceiling application.*

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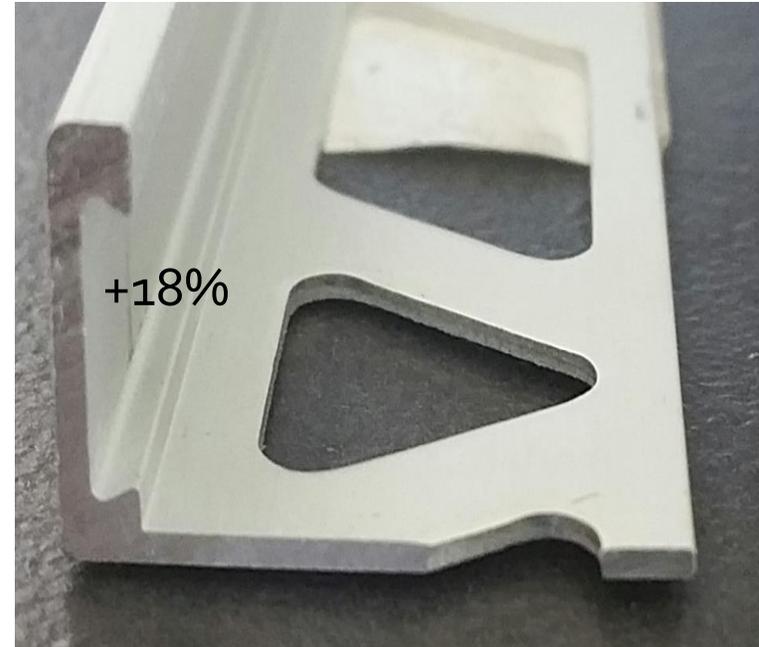
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Profilitec: The industry's most advanced Profiles

2. Thicker

Thicker gauging of all profiles, ranging from 28% to 50% compared to standard



Narration: *Profilitec profiles are manufactured using thicker gauges (ranging from 28% up to 50% thicker) on the vertical walls creating better point load and impact resistance. Basically, a stronger profile.*

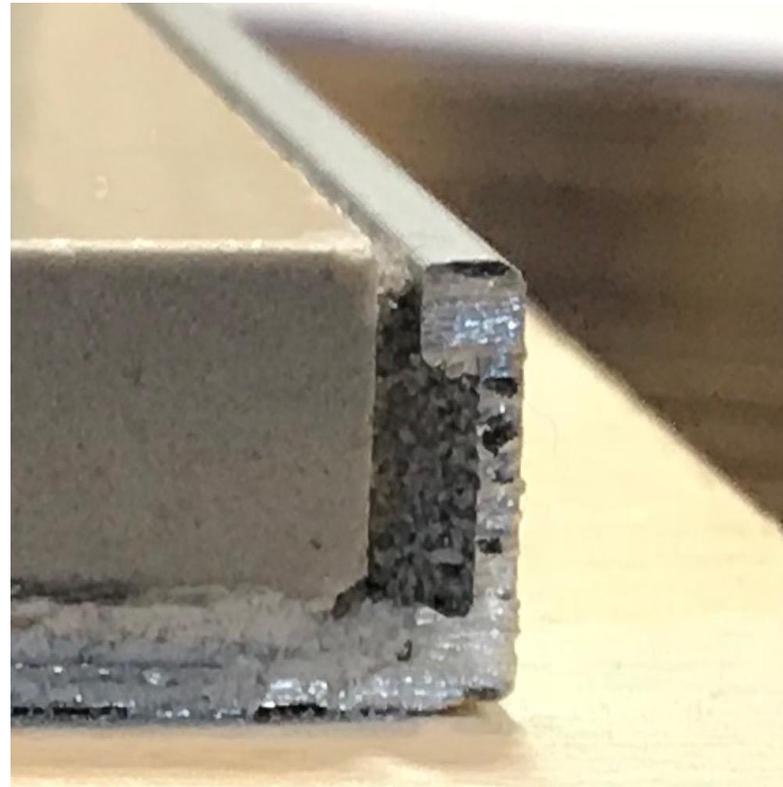
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Profilitec: The industry's most advanced Profiles

3. Patented "Grout Lock"

Allows grout to be mechanically "locked-in" and provide full protection of the tile's edge



Narration: *Perhaps the most important engineering aspect of Profilitec profiles is the patented "grout lock" design. To effectively perform their function, floor profiles MUST be spaced approximately 1/8" from the tile's edge and filled with grout. Profiles that are applied to the edge of the tile without this space will do very little to protect against both impact and point load. It is the combination of profile and grout that protects the tile. Profilitec profiles are designed to allow grout to completely fill the cavity, thus allowing maximum protection, and solidly held in place mechanically via the design of the patented dovetail "grout lock" (picture on left). By contrast, some profiles have an integrated grout spacer (picture on right). This design helps automatically space the profile from the tile, however, it prevents grout from completely filling the cavity which significantly reduces edge protection capabilities. Also, due to the small area created by the integrated spacer, grout does not effectively hold in place and tends to crumble.*

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Profilitec: The industry's most advanced Profiles

4. "Blister-wrapped"

Pre-wrapped to minimize scratching
and other damage



Narration: *As an additional feature, all Profilitec profiles in which the finish may be sensitive to scratching, are "blister-wrapped". This is a plastic film that is shrink wrapped on to the profile immediately after production. Profiles are handled through multiple points (Manufacturer to distributor. Distributor to dealer. Dealer to contractor. Contractor to jobsite, etc.) as well as being subjected to many damage-inflicting conditions on jobsites causing scratches or other issues prior to installation. This protective plastic wrapping prevents a significant amount of potential problems and has proven to be a very well appreciated benefit to the installer.*

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Part 1 Summary

- The “evolution” within the tile industry has created a new category: “Installation Systems”
- Profiles, which are a component of the “Installation Systems” category, have now become a standard and necessary installation practice in the tile industry
- Profilitec has the most complete, advanced and up-to-date line of profiles for tile and flooring in general

Narration: *Part 1 of this Internal Learning Module has as its primary purpose to explain how and why profiles have now become a standard in the tile industry and the advancements Profilitec brings to the category. The following section will focus on profiles being a solution to another segment of the tile trade: Movement Joints.*

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Part 2- Profiles: the solution for traditional movement joint assemblies

Narration: *One of the most ignored facts in the tile industry is that ceramic, porcelain and stone tile assemblies expand and contract. This is a reality that is often not addressed, or addressed inadequately. There are specific industry guidelines that provide details as to why, where and how movement joints are to be integrated in to tile assemblies. This segment will first define movement joints including a definition of the various terms; will outline the current industry guidelines as to the location and construction of these joints; explain how and why pre-fabricated movement profiles are a better option; and finally, a overview of Profilitec's offering, the most complete in the category.*

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Movement Joint Definition

- A “movement joint” is:
“The intentional interruption in the ceramic tile or stone surface to allow for movement and to prevent damages”



Narration: *As outlined above, in the tile trade, a movement joint is actually a “weakened” zone to which forces can be directed. In physics, forces or stresses will generally direct themselves to the weakest point. Much like the old saying: “a chain will break at the weakest link”, movement joints are essentially an intentional weak link. However, because these “weak points” are soft and flexible, damage inflicted by the forces of nature are managed or “controlled”.*

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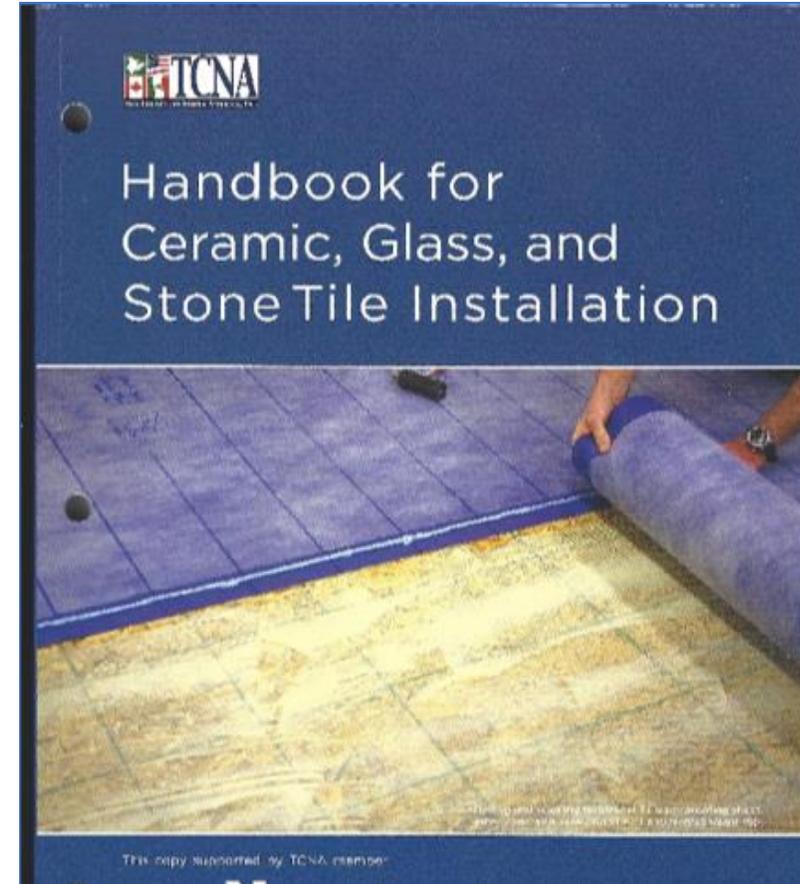
- Tile has an expansion rate of approximately 0.01" in 6' when temperature change is 100 degrees Fahrenheit



Narration: *As expressed above, although 0.01" may seem very small, it's actually relatively significant, and a 100 degree temperature change may seem extreme, but it's more common than you would expect. An an example, an exterior tile surface that is subjected to the sun's rays in Arizona can heat up to over 150 degrees Fahrenheit. A room with a large bay window can also heat up the surface of an interior tile floor significantly. To make matters worse, imagine if it suddenly rains on that tile surface in Arizona. The thermal shock could be enough to completely shear the tile off the substrate.*

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- The Tile Council of North America (TCNA) has specific guidelines for the placement of movement joints under method EJ171



Narration: *Because of these movement dynamics, the tile industry has developed a series of guidelines to assist architects, designers, contractors, installers and others on the placement of movement joints within a tile's surface.*

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TCNA Method EJ171 Movement Joint Guidelines: *the basics*

1. *Interior, maximum 25' in each direction*
2. *Exterior, 8' to 12' in each direction*
3. *Interior tilework exposed to direct sunlight or moisture, maximum 12' each direction*
4. *Perimeters, perimeter walls, dissimilar floor finishes, curbs, columns, pipes, ceilings, etc.*
5. *All inside corners*

Narration: *The above list contains “basic” movement joint requirements for typical tile floors. They indicate where a “movement joint” or “soft joint” is to be located within the installation. Movement joints are required at more frequent intervals for exterior applications compared to interior, because, of course, temperatures are more extreme. Nonetheless, interior surfaces exposed to direct sunlight must be treated like exteriors because, as stated in the previous slide, direct sunlight can significantly heat up that floor. Points 4 and 5 basically tell you that ALL inside corners, whether they be floor to wall or wall to wall transitions MUST be a soft joint because changes in plain or the direction of a surface (ie: floor to wall) is always a “weakened” zone or “stress point” and must be treated as such.*

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Types of “Movement Joints”

Control Joint



Expansion Joint



Cold Joint



Isolation Joint



Narration: *The term “movement joint” or “soft joint” are general terms relating to movement zones. Some specific terms, as pictured above, are defined as follows: Control joint: a saw cut in a freshly poured concrete slab. Expansion joint: generally, a large movement zone between two separate structures (ex: two buildings). Cold joint: a joint created by two separate concrete pours. Isolation joint: wall and floor are two separate and independent structures. Another important guideline for the placement of movement joints states that all joints in the structure must be followed through to the tile layer and the width of the movement joint at the tile surface MUST be as wide or wider than the joint in the structure, therefore, knowing the type of movement joint you are addressing will better enable you to determine your needs.*

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Movement Joints: *two methods*

Sealant-Applied (injected)



Pre-Fabricated



Narration: *There are currently two industry-allowed methods for the implementation of movement joints on a project: Sealant-Applied and Pre-Fabricated profiles. Sealant applied, as pictured above, involves the injection of a flexible elastomeric sealant in to an open grout joint where movement is to occur and installed AFTER tile installation. Pre-fabricated movement joint profiles have a flexible movement zone and are installed DURING tile installation. Both are acceptable methods outlined in the TCNA handbook. However, at Profilitec, we firmly believe that pre-fabricated profiles are the better solution.*

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Movement Joints: comparative analysis

Sealant-Applied (injected)

- Applied as a second step
- Must eventually be replaced
- Diminishing elasticity
- No edge protection
- Significantly higher overall cost

Pre-Fabricated

- Applied during tile installation
- Permanent solution
- Constant elasticity
- Edge protection
- Single-step process, much more cost effective

Narration: *As the comparison shows above, the benefits of Pre-Fabricated movement joints far outweigh the sealant-applied option. In short, sealant-applied is a temporary solution that provides no edge-protection and because it is an added step compared to pre-fabricated movement joints, it is also a more costly proposition. As such, pre-fabricated movement joints have become a standard in the tile industry.*

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Movement Joints: *Sealant-applied*

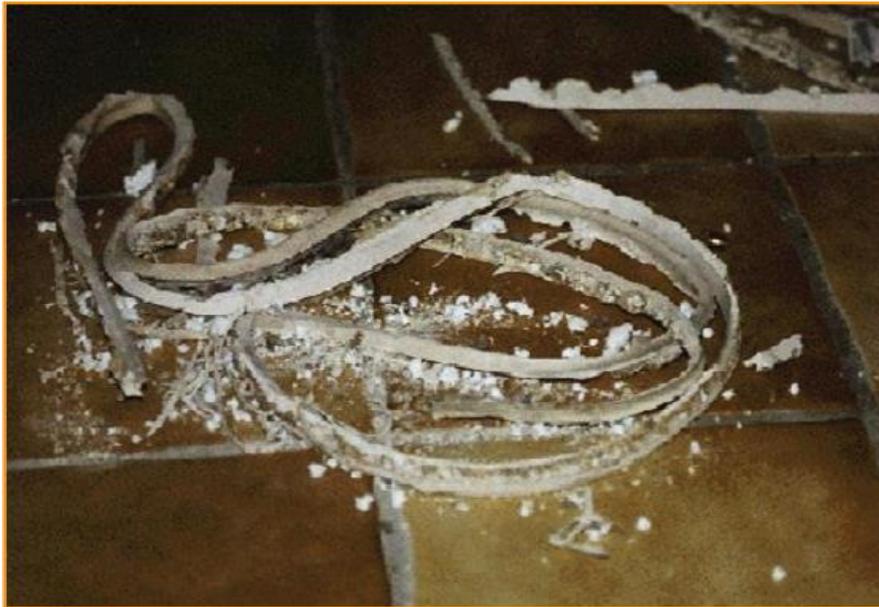


Narration: *Over time, sealant-applied movement joints harden, reduce their elasticity and tear away from the adjacent surfaces.*

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Movement Joints: *Sealant-applied*



Narration: *As shown above, sealant-applied joints eventually lose their elasticity and tear away from edges and are thus considered temporary. Therefore, they must be replaced after a given time. This is costly, time-consuming and impractical. Not to mention, they don't look very good.*

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Movement Joints: *Sealant-applied*



Narration: *Tiles abutting sealant-applied movement joints are vulnerable to point load and impact damages as they provide no protection to tile edges whatsoever.*

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Movement Joints: *Pre-Fabricated*

- Complete edge protection
- Constant elasticity
- 1-step installation process
- Permanent



Narration: *Pre-fabricated movement joints address all the shortcomings of sealant joints. They are permanent as the elasticity of the movement zone does not diminish, they provide basic to extreme edge protection, are available in a number of materials and widths to address all conditions and are installed during tile installation saving time and money.*

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Multiple Options for Multiple Conditions

Light Duty



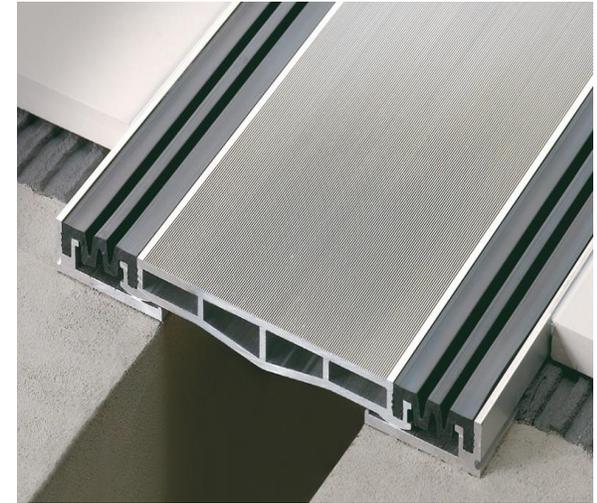
Heavy Duty



Construction



Surface Mounted



Narration: *Profilitec has the most complete and advanced array of movement joint options in the industry today. From commonly-used light duty movement profiles to heavy duty construction joint profiles, Profilitec has a solution for all conditions.*

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Part 2 Summary

- Movement joints are an important and often forgotten requirement for all tile installations
- Movement joint profiles are an important segment within the “Installation Systems” category.
- Pre-fabricated movement joint profiles address all shortcomings of traditional sealant-applied movement joints
- Profilitec has the most complete, advanced and up-to-date line of pre-fabricated movement joint profiles in the industry today

Narration: *As covered in this section, the TCNA guidelines for the integration of movement zones applies to EVERY installation, whether a small tiled entrance or a shopping mall. Whether centrally-located, or at the perimeters, every tile surface requires movement zones. Pre-fabricated movement joints are, by far, the best option and Profilitec has the widest range of pre-fabricated movement joints in the industry.*

Thank you



PRICE LIST USA-2019



Narration: *We hope you found this Internal Training Module to be helpful. Please note that all Profilitec products mentioned within this module are listed in the Profilitec Suggested Retail Price List shown above. We are always available to provide information to help you with your project.*