

Make sure things “pan out”

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“We are very aware of the various prefabricated foam trays and pans available for shower pan waterproofing, and they are not created equal. Strength and durability of the tile substrate is paramount in our selection process.”

– Michael Lee, Senior Associate, CDC Consultants

Back in the 1940s, when Ray McIntire of Dow Chemical was laboring to create flexible electrical insulation, he could not have foreseen that his efforts would someday evolve into routine tile-setting practices such as prefabricated foam shower pans and other shower waterproofing elements. McIntire’s experiment involved gases directed into heated polystyrene – and a “happy accident” resulted: a product that was 95% air! This product became best known for use in disposable cups, coolers, and packing materials: “Styrofoam” was the end result.

From these humble beginnings, Styrofoam™ (aka EPS or expanded polystyrene foam) is now used extensively in construction, from road building to home building. In the late ‘90s a U.S.-based company and another in Europe start-

ed to explore ways in which EPS foam might be used as part of the shower pan waterproofing system.

The practice of using EPS foam as a substrate for tile and stone which functions as a suitable foundation for a shower pan, has grown to become a legitimate alternative (not replacement), to conventional dry-pack mortar substrates. Product offerings



One of the first EPS foam pre-pitch products introduced was designed to replace dry-pack mortar slope to drain beneath a loose-laid shower pan.

have increased as more vendors offer EPS foam shower pans and trays as part of their waterproofing solutions. Their growing use in a variety of residential and commercial applications is driving the demand for a method in which established norms of performance can be determined, (good, better, best), amongst the various offerings.

One of the earliest offerings focused on creating the required “pre-pitch” beneath loose-laid shower pan. EPS foam was pre-fabricated to create the sloping 1/4” per foot template, and when glued to a laminated/corrugated “shell,” it replaced the traditional dry-pack, pre-pitched mortar bed. The EPS foam pre-pitches were typically offered in a variety of popular shower pan dimensions. A shower pan was loose-laid over the foam template pre-pitch, and a mortar bed was then installed over the shower pan.

Prefab molded EPS trays: scrutinizing performance

By 2002, the next step in the foam shower pan evolution came from Europe, in the form of a molded EPS sloped shower tray onto which a sheet membrane would be directly bonded. Thinsset was used to bond both the tray to substrate, and sheet membrane to the foam tray.

As acceptance and popularity of this European offering grew,

a number of similar, competitive products were introduced, in some cases offering a significant difference: a waterproof “skin” or membrane, already bonded or adhered to the foam tray by the manufacturer, which eliminated the need for the installer to apply a waterproof membrane. The shower walls still need to be waterproofed according to industry standards.

XPS (extruded polystyrene) has also been introduced as a material solution, with a cementitious/fiber mesh exterior coating on the foam surface. This coating adds a higher compressive strength value to the waterproofing attributes of the foam core.

Initially, the majority of these products found acceptance and success in the residential, remodeling, and custom home market. These lightweight, prefabricated foam trays/pans reduced installation time, and promised more consistent end results, with regard



The use of XPS foam provides a foam tray with waterproof foam core. An external skin of cementitious/fiber mesh increases compressive strength.

to slope to drain.

As the ranks of competitors offering these products increased, and scrutiny with regard to product durability and performance intensified, the need for a more codified system of evaluating the products grew.

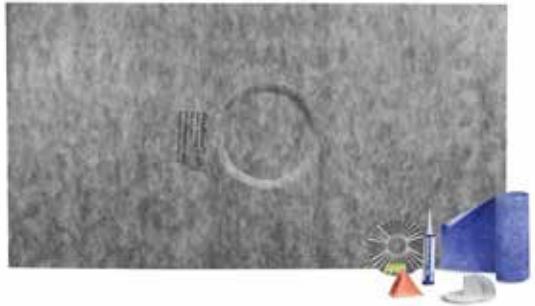
Part of this increased scrutiny was also due to heightened marketing and sales efforts for these products on commercial projects such as hotel showers where architectural and design professionals raised concerns about durability, point loading, compression, etc. Currently, there are no ANSI standards, or TCNA installation methods that address the needs of a contractor or architect seeking to ascertain performance variables amongst various foam tray offerings.

The primary concerns are focused on these products' ability to withstand point loading and compression forces that may occur during installation, as well as when the completed wet areas are put into service.

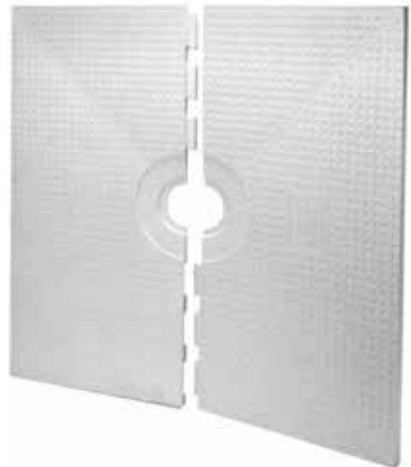
Michael Zafarano, Project Architect, Station Casinos, observed, "Many of the foam pans and trays we review appear to be suited for residential projects, and we question the resilience and compressive strength of some of these products. Our projects demand these types of products

will hold up in a demanding hospitality environment on a long term basis."

This growing awareness of the need to accurately identify the performance variables that may exist between different available products has not gone unnoticed by the industry. What's needed is a way to standardize and identify acceptable levels of performance



A number of manufacturers provided a waterproof surface or membrane affixed to the substrate. In some cases, more compression-resistant, lightweight alternatives to foam were offered.



2002 saw the advent of a molded foam tray/pan from Europe that provided a sloped substrate for the installation of a ANSI A118.10 bonded membrane.

amongst the numerous tray/pan offerings. This would help to erase skepticism that still lingers among some in the design and construction community.

Towards establishment of an ANSI standard

Maribel Campos, Director of Standards, ICC-ES PMG (International Code Council Evaluation Service for Plumbing Mechanical and Fuel Gas), in particular has been a driving force in her efforts to establish an ANSI standard for a “field fabricated tiling kit.” In her previous role at IAMPO (International Association of Mechanical and Plumbing Officials), and in her current position at ICC, she has worked with industry contacts to create an ANSI standard that includes prefabricated foam shower pans/trays as part of the system.

Campos’s efforts have their origin in IAMPO standard PS106, which has a number of test criteria and requirements. Perhaps one of the most critical and scrutinized portions of this standard focuses on the means and methods to evaluate and assign compressive strength and point loading characteristics of

these foam trays.

Campos’s efforts to develop an ANSI standard are now part of a committee review for a new ANSI standard for a field fabricated tiling kit. Elements of IAMPO PS106 are part of a proposed ANSI standard for these products.

As with any proposed ANSI standard, divergent, opinionated, and sometimes differing view-



Concerns about point loading and compression of EPS foam substrates has led to the introduction of reinforced/hybrid foam trays/pans.



A bonded membrane meeting ANSI 118.10 was designed to be used as the waterproofing for this molded EPS product from Europe.

points need to come into alignment. While this proposed ANSI standard is a work in progress that is still in committee, all agree there needs to be more work done to finalize standards and methods that ensure the right product for the job is installed the right way.

So, what to do in the meantime? The awareness that some of the foam pans and trays available may have compression/point loading issues, which could impact tile selection, is a good start. Your own survey of the products available might be required to vet the tray or pan that meets your needs: some

pans have the waterproofing built in, while others require you to tackle the task. There are also varying methods of pan or tray construction, with reinforced or multilayer systems offering higher compressive strength.

In most parts of the US the concept of an EPS or XPS foam shower pan or tray is viewed as yet another accepted installation method. Whether you are a staunch advocate of this product/method, or just contemplating the concept, it is beneficial to be aware of the issues, concerns, and innovative advances associated with this product in your installations.