

Drainage in EIFS & Stucco

Exterior Insulation and Finish System (EIFS) is an exterior wall cladding that utilizes rigid insulation boards on the exterior of the wall sheathing with a plaster appearance exterior skin. First, to make things complicated, there are two types of EIFS: PB systems and PM systems. The PB is the most widely used system and the PB refers to "polymer based". The PM is not as widely used and the PM refers to "polymer modified". Polymer scientist will continue to improve these formulas and the PB & PM will be improved in the future.

A PB EIFS façade consists of a base layer of expanded polystyrene (EPS) insulation board (similar to "bead board" foam) attached to the wall sheathing. Additional EPS boards can be cut and rasped, shaped, formed and then placed or "planted on" over the base layer of insulation boards to give the façade the desired architectural features. Next, a thin base coat (typically 1/16" to 3/32") is applied over the EPS boards, with a fiberglass reinforcing mesh fully embedded into the base coat. Finally, the finish coat, available in a wide variety of colors and textures, is applied over the base coat.

The PM system is different than the PB system. First, the insulation board used is often extruded polystyrene (which has a smoother finish and greater compressive strength than EPS) and the reinforcing mesh can vary between a heavy fiberglass and thin metal lath. The reinforcing mesh is mechanically attached (via screws and plates) to the insulation board and sheathing rather than being embedded in the wet base coat. Next, the base coat, ranging from 3/16" to 1/4" thick and containing higher cement content, is then applied over the mesh (similar to traditional stucco described below.) The finish coat is then applied over the base coat.

EIFS is available in two basic types: a barrier wall system or a wall drainage system. Barrier EIFS wall systems rely primarily on the base coat portion of the exterior skin to resist water penetration. Therefore, all other components of the exterior wall must either be barrier type systems or be properly sealed and flashed to prevent water from migrating behind the EIFS and into the underlying walls or interiors. Wall drainage systems rely on flashing or weeps to let water out of the system. These systems also need weather barriers applied behind the system. Wall drainage EIFS systems are similar to cavity walls; they are installed over a weather barrier behind the insulation that acts as a secondary drainage plane. The weather barrier must be properly flashed and coordinated with all other portions of the exterior wall to prevent water from migrating into the underlying walls or interiors.

Stucco is different because the advent of fiber-reinforced Portland cement, stucco systems today are very often two-coat systems (a base and finish coat, but often referred to in the industry as "one coat" stucco), rather than the three-coat systems of yesterday (a scratch, brown, and finish coat). The one-coat stucco system consists of a wire lath attached to the substrate over a weather resistive barrier. The stucco system has a tendency to crack so a weather resistive barrier is also important to these systems.

The problem with these systems seems to be poor or improper installation and the most likely place that this will appear will be the window and door openings. Water resistant barriers, flashings, and sealant, and how they are installed, become a very important factor in keeping water from entering the exterior cladding. Since the barrier system is much less forgiving than the drainage system, water intrusion issues are more likely to occur. HCI believes in drainage systems, the fact that by planning on water to enter the system and then allowing for water to exit is a much safer way than the barrier system.