



Technical Notes

PORTLAND CEMENT PLASTER (STUCCO) OVERVIEW

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Stucco is the common term for Portland cement plaster, a wall coating that has been used for centuries on buildings world-wide. Stucco provides a durable, long-lasting, non-combustible, weather-resistant, low-maintenance finish. Used alone, or in combination with other traditional building materials such as stone, brick, or wood, it provides long-term value and offers design versatility in colors and textures. There are two application methods currently used for concrete stucco installation:

THREE-COAT STUCCO is the traditional installation method. Also called a hard-coat system, this system begins with a base or “scratch” coat of Portland cement-based mortar applied at between $\frac{3}{8}$ – $\frac{1}{2}$ in. (9.5–13 mm) thickness over expanded metal lath or galvanized stucco netting that has been secured to the exterior sheathing with a moisture protection barrier between the lath and sheathing. Next, a “brown” coat of mortar of approximately $\frac{3}{8}$ in. is applied over the “scratch” coat. These two base coats are hand-applied or machine sprayed (pump grade). The third coat, the finish coat, is often pigmented for color and applied by smooth trowel, hand-textured, floated to a sand finish, or sprayed. The three-coat stucco system total thickness is approximately $\frac{7}{8}$ in. (22 mm), and weighs 10–12 lb. per sq. ft. (4.5–5.4 m²).

ONE-COAT or TWO-COAT STUCCO is a popular variation of the traditional three-coat system. The name “one-coat” is misleading, as two coats of stucco plaster are used, beginning with a base coat applied between $\frac{3}{8}$ – $\frac{1}{2}$ in. (9.5–13 mm) thickness over an approved substrate such as plywood, Oriented Strand Board (OSB), fiberboard, exterior grade gypsum sheathing, or expanded polystyrene (EPS) insulation tongue and groove board. This system often uses a base coat that is sprayed on. All moisture barrier and wire fabric or metal lath building standards apply to the one/two-coat stucco system. The same finish coat options of color, texture, and design as the three-coat system are used. The total thickness is approximately $\frac{3}{8}$ – $\frac{1}{2}$ in. (9.5–13 mm) and weight is 4–6 lb. per sq. ft. (2–3 kg m²). All one/two-coat formulations must be ICC (International Code Council) code compliant for IBC (International Building Code®) and IRC (International Residential Building Code®) by meeting specific structural, durability, fire-resistance, and weather protection standards.

EIFS—Exterior Insulation and Finish Systems, also called synthetic stucco, is an exterior wall system sometimes confused with stucco systems. EIFS consists of a foam insulation board covered with a special synthetic finish. It is more commonly used on large commercial projects.

All Portland cement plaster (stucco) products and installation methods follow these standards set by The American Society for Testing and Materials (ASTM):

- ASTM C 926-06, Standard Specification for Application of Portland Cement-Based Plaster
- ASTM C 979, Specification for Pigments for Integrally Colored Concrete
- ASTM C 1063-03 Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster
- ASTM C 847-04 Standard Specification for Metal Lath
- ASTM C 1032-06 Standard Specification for Woven Wire Plaster Base
- ASTM C 897-05 Standard Specification for Job-Mixed Portland Cement Plasters
- ASTM C 144-04, Standard Specification for Aggregate for Masonry Mortar



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The quality of stucco is improved by using a pre-blended engineered mix over a traditional field-mixed source. Pre-blended mixes are designed for workability, long-term durability, adhesion, and reduced shrinkage. TCC Materials offers a choice of three aggregate blends in their three-coat scratch and brown pre-blended products and are selected per architectural specification or contractor preference. The fine blend uses mason sand (ASTM C 144); the medium blend is a mix of 70% fine mason sand (ASTM C 144) with 30% coarse sand (ASTM C 33); and the course blend is 50% fine (ASTM C 144) with 50% coarse sand (ASTM C 33). The medium blend meets ASTM C 897, most commonly specified by architects. Each mix design is also offered with reinforcing fibers or without fiber.

TCC offers two options for one/two-coat installations including a fiber base coat and a pump grade base coat. Both versions meet ASTM C926.

TCC Materials finish coat stucco products meet ASTM C 926 requirements and can be colored for use as the pigmented, aesthetically pleasing, finish coat of a stucco system.

All stucco application systems require expansion and control joints to properly allow for movement in any stucco wall system. Always read and follow product installation instructions for each product. As with all Portland cement-based products, proper water curing is important. These stucco products can generally be applied when ambient temperatures range from 40°-100°F (4°-37°C).

For product information visit tccmaterials.com.

References

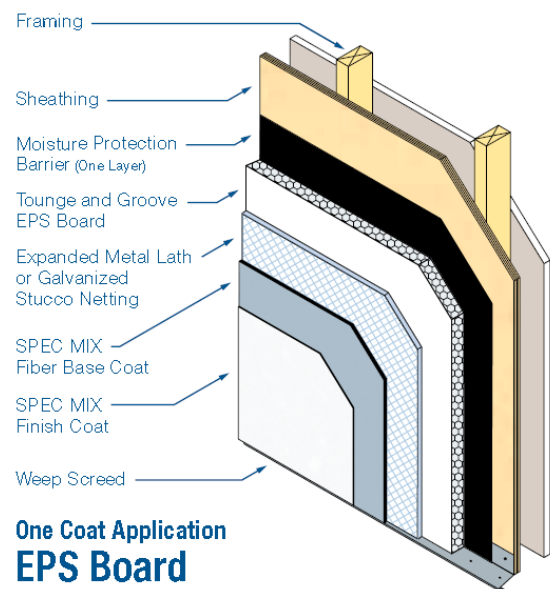
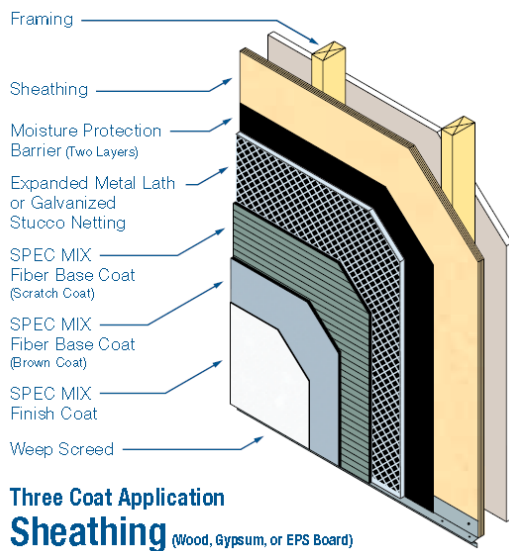
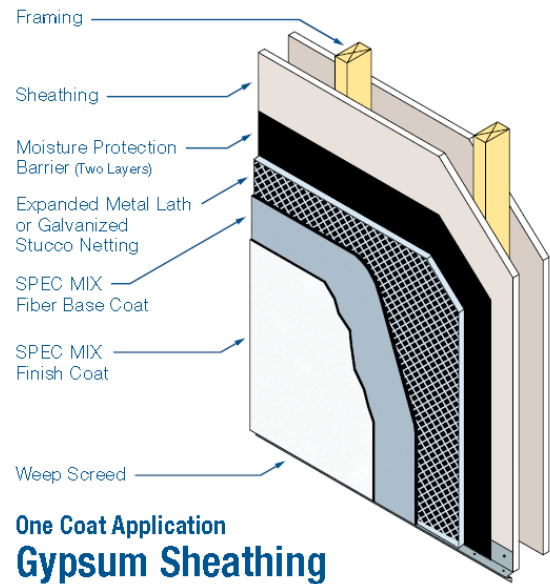
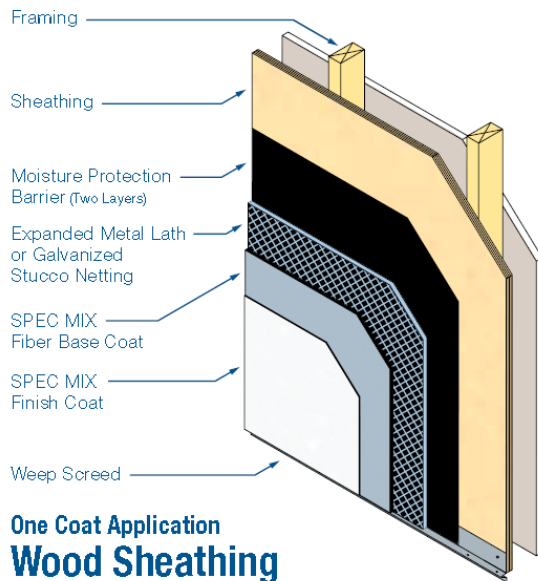
- Stucco Manufacturers Association (SMA)
- Portland Cement Association (PCA)
- Spec Mix

SYSTEM COMPARISONS		
Characteristics	Three-Coat Conventional Stucco	One/Two-Coat Stucco
Thickness	¾-1 in.	¾-½ in.
Weight per Square Foot	10-12 lb.	4.5-6 lb.
Common Assembly	Weather barrier Lath ¾-½ in. scratch coat ¾ in. brown coat A variety of finishes with top coat	Weather barrier CI (see below) Lath ¾-½ in. base coat A variety of finishes with top coat
Insulation—CI Continuous Foam Insulation	Typically not installed with CI but due to energy codes more CI is being used with three-coat stucco.	Typically use with 1 in. thick foam sheets (CI) wrapping the complete exterior. Installed between the weather barrier and the lath.
Finishes	Finish (top) coat can be any color or texture.	Finish (top) coat can be any color or texture.
Construction Types	Both for I-V rated buildings. Limitations apply based on fire ratings.	Both for I-V rated buildings. Limitations apply based on fire ratings.
Fire Ratings	One-hour, and two-hour rated walls when used in specific assemblies described by the International Building Code (IBC).	Most are one hour listed based on specific assemblies described in ICC reports.
LEED	LEED credits depend on locally sources materials.	LEED credits depend on locally sources materials.
Environmental	The use of recycled materials may also contribute to "green" attributes of the system. Long lasting, resists fungus, rot, and insects.	One/two-coat uses about half the materials and weight, requiring less mining, processing, transportation, and water for mixing and curing with a shorter construction schedule. The use of recycled materials may also contribute to "green" attributes of the system. Long lasting, resists fungus, rot, and insects. Improved energy efficiency R-value with CI foam insulation.

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Example Applications (courtesy of Spec Mix)



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