

Crack Policy

Stucco is widely used all over the world as an exterior cladding because of its aesthetic appeal, durability, fire resistance, design flexibility, low cost and ease of maintenance. Stucco is by nature hard and strong, but it is relatively thin and brittle and will crack when subjected to stresses that exceed its tensile strength.

There are two fundamental types of stresses that cause stucco cracks-internal and external. Internal stresses are due to the natural curing and drying process of stucco. Stucco shrinks as it hardens and gains strength. This shrinkage, when restrained may create hairline cracks.

External stresses are due to the transfer of outside forces into the stucco assembly. Common examples are at the corners of windows and doors. These stresses can cause movement within the stucco, which can result in wider cracks than internally generated cracks. The following are common but not exclusive, sources of external stresses that may lead to cracking:

- **Movement of framing and sheathing:** Lumber and wood-based sheathing are subjected to dimensional variations associated with the loss or gain of moisture. Cold formed metal framing is subjected to dimensional variations due to thermal expansion and contraction.
- **Improperly applied wood-based sheathing:** Wood-based sheathing not properly gapped can swell and put pressure on the stucco.
- **Soil movement:** Seismic events, settlement, and expansion of soil under the building can cause movement of the foundation.
- **Loads on buildings:** Live loads (i.e. traffic, furniture and occupants) and dead loads (i.e. roof tiles).
- **Wind:** Wind can place pressure on stucco wall panels.
- **Construction process:** Today's construction jobsites subject stucco to stresses from workers, vehicles, vibration, and other forms of abuse. To ensure full satisfaction with the stucco assembly, reasonable expectations should be established with respect to cracking prior to selection of the stucco assembly and plastering contractor. The building owner should expect hairline cracks and diagonal cracks emanating from the corners of windows and doors.

By following industry best practices, the potential for cracking can be reduced (but not eliminated). Some of these best practices apply to the designer of the building, and others are under the builder's or plastering contractor's control. They include:

- Incorporate control joints in accordance with ASTM C 1063 guideline. Wherever dissimilar materials meet and every 100-150 square feet, control joints should be used to separate the panels. The moisture barrier should be installed continuously behind the joint.
- Heavier textures can make normal cracking less conspicuous.
- Properly installed moisture barriers, integrated with flashing, are critical to minimize moisture penetration.

- The builder should ensure that framing is straight and true and will not subject the stucco assembly to undue stress or excessive thickness variation.
- Use good quality aggregate, stucco, lath, moisture barrier, and trim materials per ASTM standards.
- Install wood-based sheathing according to APA industry guidelines.
- Load roofs prior to application of scratch and brown coats.
- Install drywall prior to application of finish coat.
- Ensure proper curing per manufacturer or code requirements.
- Builders should test soils and ensure proper compaction/fill to minimize foundation movement.
- Keep framing dry, properly seal junctions of dissimilar materials (e.g. common joints, windows, doors, vents, pipes).

When cracks occur, the building owner, builder, plastering contractor, and any subject matter experts involved will make a joint decision on the proper course of action. Each crack should be analyzed on a crack-by-crack basis, to determine probable cause, whether or not repair is required, and if so, how repair should be accomplished. The evaluation should consider the potential for water penetration, aesthetics, whether the crack is still active, and all other appropriate considerations. This analysis should also determine the cost of repairs and who is going to absorb the expense. In general, all cracks should be fixed if they are wide enough to permit water to enter through the exterior cladding system. Industry practice is to repair any cracks that exceed 1/16" in width, although jobsite circumstances may suggest deviations from the normal practice.

The simplest crack repair method is to use the same material as the color coat. Once the crack has been filled, fog coat may be used to even out the color around the repaired area. Other common repair methods may be better suited to active cracks. Consult the stucco finish manufacturer or contractor for recommended repair methods.