Product and Systems Technology

Application Directions for DIAMOND® Veneer Finish in Electric Cable Heat Systems

PM16

A. Mixing job-sanded DIAMOND Veneer Finish For Hand Application

Do not hand-mix. Best results are obtained by using a heavy-duty drill with a no-load rating of 900 to 1000 rpm. These types of mixers in combination with a cage-type mixing paddle will ensure complete mixing in less time. Slower operating drills will adversely affect the setting properties of the plaster.

Since this material will set in approximately one hour, mixing and application must be coordinated so that you don't mix more material than can be applied in 30 minutes. Do not retemper. Place approximately 12 to 15 quarts of water in a 12- to 15-gallon smooth-sided metal container, about 14" in diameter and, with mixer operating, slowly add one bag of plaster. For the fill coat, add up to one part (50 lbs. or 22.7 kg) but not less than one half part (25 lbs. or 11.3 kg) of clean, sharp, fine silica sand per 50 lb. (22.7 kg) bag of plaster. Mix for a minimum of two minutes to disperse all lumps completely, but do not mix longer than five minutes. Mixing equipment and tools must be kept clean to prevent acceleration from set plaster or other contaminants. When DIAMOND veneer finish is job-aggregated, one teaspoon of USG™ retarder for lime containing plasters should be added for each bag of finish plaster to compensate for the acceleration caused by the addition of sand, and thus allow sufficient working time.

B. Application of plaster to IMPERIAL® Gypsum Base

Apply job-sanded DIAMOND veneer finish to a total thickness of 1/4" in two coats over IMPERIAL® gypsum base. Apply a fill coat of the plaster parallel to the direction of the cable and of sufficient thickness to completely cover the cable. Do not use the cables as a screed. Level this fill coat with a trowel, rod or darby to fill any low spots or to remove any high ridges. The fill coat should be "toothed" and left rough to provide a key for the finish coat by the use of a separate darby or by lightly brooming prior to set. The average thickness of the fill coat should be 3/16". After the fill coat has set and developed sufficient suction, a finishing coat of job-sanded DIAMOND veneer finish should be applied to a total thickness of 1/4". Note that in good drying weather sufficient suction will be developed about two hours after the fill coat has set; however, in damp and/or cold weather the time interval might possibly extend overnight, unless good supplementary heat and ventilation are provided.

Apply the finish coat of job-sanded DIAMOND veneer finish to a thickness of between 1/16" minimum and 3/32" maximum. Scratch in a tight, thin coat over the entire area, immediately doubling back to the full thickness. Fill all voids and imperfections. It is advisable to scratch and double back with the same mix of DIAMOND veneer finish. When the surface has become firm, holding the trowel flat, final-trowel using water sparingly. Do not overtrowel. Best results require you to plan the plastering of an area to permit continuous application of an entire ceiling. Always work to a wet edge. Avoid dry joinings.

C. Direct application of plaster to monolithic concrete

1. Plaster bonding agents—USG™ plaster bonder is applied in accordance with the instructions on the package. It is used prior to the application of DIAMOND veneer finish directly to monolithic concrete.
2. Surface preparation—The concrete surface must be structurally sound and clean, free of dirt, dust, grease, wax, oil or other unsound conditions. All metal components in the concrete surface shall be coated to prevent rusting in the plaster. Form ridges must be removed. The surface must be reasonably uniform and level. Locate ceiling areas which, due to unevenness, require filling prior to installing electric cable and plastering. After leveling and filling voids, treat the entire surface with USG plaster bonder. Then apply DIAMOND veneer finish (fill coat mix) as a leveling coat, and allow to set.
3. Application of plaster—CAUTION: The temperature of a concrete ceiling with bonding agent and cable applied must be above 32 °F (0 °C) before plastering is started. With the air temperature above 55 °F (13 °C), apply job-sanded DIAMOND veneer finish to a total thickness of 3/8" in two coats over the level surface. Apply a fill coat of the plaster parallel to the direction of the cable and of sufficient thickness to completely cover the cable. Do not use the cables as a screed. Level this fill coat with a trowel, rod or darby to fill any low spots or to remove any high ridges. The fill coat should be "toothed" and left rough to provide a key for the finish coat by the use of a separate darby or by lightly brooming prior to set. The average thickness of the fill coat should be 5/16". After the fill coat has developed sufficient suction, a finishing coat of job-sanded DIAMOND veneer finish should be applied to a total thickness of 3/8" over a level base. Note that in good drying weather sufficient suction will be developed about two hours after the fill coat has set; however, in damp and/or cold weather the time interval might possibly extend overnight, unless good supplementary heat and ventilation are provided.

Apply the finish coat of job-sanded DIAMOND veneer finish to a thickness of between 1/16" minimum and 3/32" maximum. Scratch in a tight, thin coat over the entire area, immediately doubling back to the full thickness. Fill all voids and imperfections. It is advisable to scratch and double back with the same mix of DIAMOND veneer finish. When the surface has become firm, holding the trowel flat, final trowel using water sparingly. Do not overtrowel. Best results require you to plan the plastering of an area to permit continuous application of an entire ceiling. Always work to a wet edge. Avoid dry joinings.

D. Structural relief

1. Perimeter relief—Perimeter relief is recommended for all DIAMOND veneer finish and IMPERIAL gypsum base ceilings. Note that the relief should accommodate both plaster and gypsum base, using back-to-back 3/4" ground casing beads (#66 square edge size with 1-1/4" short, solid flange). Attach the selected beads to the ceiling joist allowing a space sufficient to provide room for the finished wall thickness plus an additional 1/8". The 1/8" space will be retained after walls and ceilings are finished and will provide positive relief. Secure a flexible dust membrane behind the IMPERIAL gypsum base to seal the 1/8" space. Caulk may also be used to seal the 1/8" space.
2. Field relief—Large ceiling areas and ceilings having two or more separately controlled heating cables will require field relief.
   a. Break any ceiling areas exceeding 500 sq. ft. or with any single dimension exceeding 25 lin. ft. with a control joint. For standard 1/2" IMPERIAL gypsum base/1/4" DIAMOND veneer finish installations, use back-to-back 7/8" ground casing beads (#66 square edge size with 1-1/4" short, solid flange). Attach the beads to the ceiling joist. Secure a flexible dust membrane behind the IMPERIAL gypsum base to seal the space between the beads. Caulk may also be used to seal the 1/8" space.
   b. It is not recommended to have two or more separate heating cables, each controlled by a separate thermostat, on a continuous ceiling surface. When this practice is necessary, separate the areas with an expansion device or divide them with a header.

E. Painting

Prior to painting, the plaster should be fully dried, sound, clean and free of dust, grease or oil, and it should be sealed with a penetrating-type sealer. The cable must be de-energized for at least 6 hours prior to sealing and painting. Provide supplementary heat, if necessary, to maintain room conditions at the desired temperature (min. 55 °F or 13 °C) until the paint is dry. The cable may then be re-energized only after the paint is thoroughly dry. See PM15 “Surface Moisture.”

F. Precautions for energizing electrical heating cable system

1. The heating cable must not be energized until the plaster is thoroughly dry.
2. When the completed cable heat ceiling system and room temperature are at 55 °F (13 °C) or higher, elevate the thermostat to the desired temperature without incrementally spacing the thermostat settings.
3. When either or both the completed cable heat ceiling system and room temperature are below 55°F, the thermostatic elevations should be made in 5 °F increments per 24-hour period until the minimum temperature of 55 °F is attained.

Electric Cable Heat Ceilings

Plaster applied to	3/16" fill coat sanded 1:1(1)		5/16" fill coat sanded 1:1(1)		1/16" finish coat sanded 1:1/4(1)		1/16" finish coat sanded 1:1(1)	
	ft.²/ton	m²/ton(2)	ft.²/ton	m²/ton(2)	ft.²/ton	m²/ton(2)	ft.²/ton	m²/ton(2)
IMPERIAL gypsum base	1300	135	—	—	4500	460	3250	330
Monolithic concrete with plaster bonder	—	—	800	80	4500	460	3250	330

(1) Coverage based on one ton of aggregated mixture (combined weight of sand and DIAMOND veneer finish).
(2) Coverage rounded to nearest 5m² per metric ton.

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