

Product and Systems Technology

Sun-Faded IMPERIAL® Gypsum Base

PM4

IMPERIAL® gypsum base is manufactured with stringent physical characteristics that provide a controlled absorptive surface for superior application and finishing properties, including bond, for designs intended for long-lasting performance.

The face paper of the base is a multi-ply sheet manufactured from waste paper composed mainly of cellulose (fibrous portion) and hemicellulose (binder portion). A blue dye, added to the face layer of the paper, provides product identification and acts as an indicator to alert the plasterer that a chemical change has occurred in the face paper. This change is detrimental to the application of *any* lime-containing veneer plasters such as DIAMOND® veneer finish. **Note:** Non-lime-containing products, such as IMPERIAL® veneer finish and IMPERIAL® and DIAMOND® veneer basecoat products are not affected by this condition.

Normally, the gypsum base is installed and the veneer plaster applied without any change in the chemical characteristic of the face paper. Under certain conditions, however, the face of the gypsum base may become exposed directly or indirectly to ultraviolet light (sunlight) for prolonged or intense periods of time. Under these conditions, a general fading of the blue color will occur. Color will range from gray to a yellowish tint, depending on the degree of exposure and length of exposed aging time.

The fading color is a visual indication that a chemical change has occurred in the face paper fibers (cellulose) and binder (hemicellulose). The reaction that takes place under these circumstances is one of accelerated aging, or what is chemically termed *photodegradation*.

In this process, both the cellulose and hemicellulose degrade to organic acids. The degradation requires several intermediate reactions: First, forming starches and sugars, then organic acids. Since this process is gradual, the greater the exposure to ultraviolet light, the higher the concentration of organic acids. A common illustration of this phenomenon occurs when newspaper is stored. It becomes yellowish and brittle with age, especially when not protected from sunlight.

Keeping this process in mind, let's examine why certain types of veneer plasters experience loss of bond (delamination) at the plaster-gypsum base interface, although the plaster surface appears hard and sound.

Veneer plaster can be formulated in two distinct types: Those which are essentially gypsum plaster (calcium sulfate hemihydrate), and those which are a blend of gypsum and lime (calcium-magnesium-hydroxide) or other alkaline materials. Each of these types will be affected differently by the organic acids formed by the reaction of ultraviolet light and the gypsum base face paper. With nonalkaline formulations (i.e., IMPERIAL veneer finish and IMPERIAL and DIAMOND veneer basecoat) organic acids act as mild accelerators and create no adverse physical changes in the plaster or in its bond to the gypsum base. However, these same acids, when combined with an alkaline material such as lime, form a potent retarder. Formulations based on gypsum and lime or other alkaline materials (such as DIAMOND veneer finish) are susceptible to this reaction when applied to a sun-faded base.

(Note: All lime-containing products are identified on the packaging by a statement that the product contains lime.) The high concentration of acids at the plaster-gypsum base interface, and the sufficient availability of alkali in the plaster formulation inhibits setting so that an unset layer of material is formed at the interface whereas the rest of the plaster sets normally. The unset (unhydrated) plaster or finish has no internal strength. Therefore, when an outside force is exerted, such as bowing, vibration, impact, etc., the plaster finish separates (delaminates) from the gypsum base surface, resulting in the observed delamination of the finished plaster surface from the plaster base surface.

When fading of the gypsum base surface occurs, it is recommended that the surface be sprayed with a solution of alum (approximately three pounds per gal. of clean water) prior to application of an *alkaline veneer plaster*, like DIAMOND veneer finish. An alternate corrective method is to apply a good-quality plaster bonding agent, such as USG™ plaster bonder, in accordance with the product directions, to ensure good veneer plaster bond to the faded gypsum base surface.

When using lime-containing veneer plaster, caution should be exercised in selecting the correct remedial action. **The use of a bonding agent will ensure bond but eliminate the suction required for single-coat veneer finishing, resulting in more difficult finishing properties. The use of a basecoat is recommended in this situation.** On the other hand, the use of an alum solution will not reduce suction, so that it allows the use of a single-coat finish; but it accelerates set time, thus limiting the working time available.

IMPERIAL veneer finish and IMPERIAL or DIAMOND veneer basecoat can be applied to faded IMPERIAL gypsum base without an alum solution or a plaster bonding agent, since no alkali is present. Neither formulation contains alkali (lime) to react with the faded base to cause retardation and loss of bond.

Trademarks

The following trademarks used herein are owned by United States Gypsum Company: DURABOND, IMPERIAL, USG, USG in stylized letters.

Note

Products described here may not be available in all geographic markets. Consult your U.S. Gypsum Company sales office or representative for information.

Warning

Store all IMPERIAL gypsum base flat. Panels are heavy and can fall over, causing serious injury or death. Do not move unless authorized.

Notice

We shall not be liable for incidental and consequential damages, directly or indirectly sustained, nor for any loss caused by application of these goods not in accordance with current printed instructions or for other than the intended use. Our liability is expressly limited to replacement of defective goods. Any claim shall be deemed waived unless made in writing to us within thirty (30) days from date it was or reasonably should have been discovered.

Safety First!

Follow good safety and industrial hygiene practices during handling and installing products and systems. Take necessary precautions and wear the appropriate personal protective equipment as needed. Read material safety data sheets and related literature on products before specification and/or installation.

