

# Product and Systems Technology

## Veneer Plaster Joint Reinforcement Systems

### PM5

One of the most important factors for achieving truly monolithic-appearing surfaces with veneer plaster systems is correct treatment of the joints of the gypsum base. The finest veneer plastering technique cannot make up for improperly treated joints.

Joint deformation in veneer plaster assemblies is caused by internal stresses at the joints resulting from flexibility of the system and variations in drying conditions caused by daily or seasonal changes in temperature, humidity and air movement. The materials used in constructing the joint assembly will also affect joint performance due to the way they react to these changing environmental conditions.

Two methods of joint reinforcement are utilized in USG veneer plaster systems. Where normal drying conditions exist and the system framing provides high rigidity (i.e., wood framing and 16" o.c. spacing), a glass fiber tape reinforcement system is suitable and most expedient. However, where rapid drying conditions exist, a paper tape and setting-type joint compound system is recommended. Also, note that a paper tape and setting-type joint compound must also be used with any steel framing systems and with certain specific systems on 24" o.c. framing spacing.

### Drying Conditions

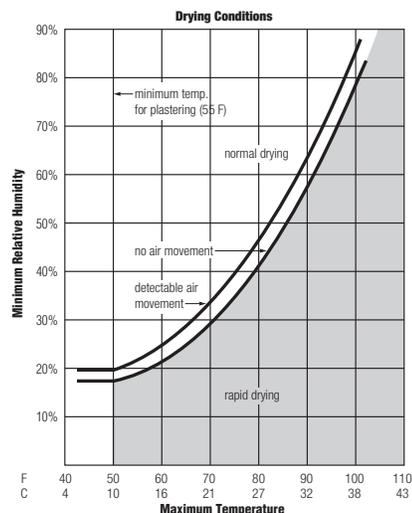
During normal drying conditions, IMPERIAL® glass-fiber mesh tape (Type S for staple application or Type P for adhesive application) is applied and preset with veneer plaster. This method provides a labor-saving, cost-efficient, trade-accepted, "expedient" method of joint reinforcement. The following graph will help identify the conditions for normal and rapid drying.

Note: For detailed information on normal and rapid drying conditions, refer to Plastering Materials Product and Systems Technology No. 10, "Environmental Factors—Plaster Application."

When building temperature and humidity conditions fall in the rapid-drying area of the graph, SHEETROCK® joint tape (paper tape) embedded with SHEETROCK® setting-type joint compound (DURABOND® or EASY SAND™) is recommended. This method is suitable for reinforcement under all drying conditions, but is less "expedient" due to the required setting and drying time required in multiple coat application of joint compound.

### System Rigidity

The rigidity (resistance to movement) of the total system must also be taken into account when determining which joint treatment method to use. In general, under normal drying conditions, systems which provide the greatest rigidity—wood framing, 16" o.c. framing spacing, multiple-layer gypsum base or two-coat veneer applications—will provide acceptable performance when the most "expedient" glass fiber tape reinforcement system is used. Less rigid systems utilizing steel framing, 24" o.c. framing spacing, single-layer 1/2" or 5/8" gypsum base and single-coat veneer applications require the optimum strength provided by SHEETROCK joint tape (paper tape) and DURABOND or EASY SAND joint compound under normal- and rapid-drying conditions.



## Joint Reinforcement Performance

To better understand the use of the different materials in these joint systems let's consider the physical properties of the materials.

In the case of paper tape, approximately 30 lb./lin. in. of tensile force (pulling apart) is required to break the tape with no measurable movement or elongation (no stretching). On the other hand, glass-fiber tape elongates (stretches like a rubber band) 0.03" before reaching maximum or breaking load of 70 lb./lin. in.

Research investigation has shown that hairline cracks or nail pops are visible at 0.01" of movement with veneer plaster system joints treated with glass-fiber tape. Actual load at that amount of movement is only 20 lb./lin. in. or about 30% less than the breaking load of paper tape (with no movement). As such, paper tape provides greater joint strength and is recommended where greater movement and shrinkage is anticipated.

The performance of glass-fiber tape is somewhat improved if the tape is prestressed or stretched slightly during its application and imbedment with the veneer plaster. The prestressing is accomplished with the presetting because as the veneer plaster sets, it expands and furnishes the movement necessary to stretch or prestress the tape, thus increasing its immediate resistance to load (tensile forces). The amount of expansion provided by the plaster is dependent on the rate at which the plaster sets. With rapid-drying conditions (see graph), the plaster expansion will be significantly reduced resulting in no tension (prestressing) in the glass-fiber tape, thus reducing its ability to control cracking.

## Paper Tape Application Techniques

The SHEETROCK joint tape and DURABOND or EASY SAND joint compound method is unaffected by rapid-drying conditions and achieves maximum joint strength (about 30 lb.) when dried. The setting-type compound is recommended, because once it is set, it remains stable, even when troweling the wet coat of veneer plaster over it. If a drying type of joint compound were used, it would be rewetted by the plaster application causing movement of the tape resulting in distortion of the finish surface and possible loss of joint strength.

Since SHEETROCK joint tape has a much lower absorption rate (take-up) and lower capacity than gypsum base face paper, shadowing will occur over the joint area if veneer plaster is applied directly over the tape. Therefore, a second or cover coat that completely hides the tape is required. This cover coat must be allowed to harden and dry before plaster application is started. The cover coat will provide a uniform, compatible absorption characteristic with respect to the field of the gypsum base. This eliminates the possible shadowing associated with less than adequate absorption encountered with exposed SHEETROCK joint tape.

In addition to shadowing, another defect that can occur if the cover coat is not provided is that of hollowed-out joints. Since the uncovered joint area will not provide as much absorption for take-up, the material directly over the joint will remain somewhat wetter than adjacent areas, and finish troweling will remove too much material.

## System Specifications

Specifying the proper veneer-plaster/joint system for the prevailing job conditions and installing it according to specifications is another essential step to achieving good systems performance.

For detailed specifications for joint treatment methods and installation for veneer plaster systems, refer to *Gypsum Construction Handbook* H17, Technical Folder SA920 and PM2, PM3 and PM4.

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