

# Product and Systems Technology

## Mixing Veneer Plaster and Equipment

### PM9

Proper mixing will produce veneer plasters that provide excellent spread, ease of application and maximum coverage.

Veneer basecoat and finishes will produce maximum performance and workability only when the correct mixing equipment is used and directions are carefully followed. When short-cuts and haphazard approaches are used, wide variations typically occur in product performance.

Proper equipment consists of a smooth-sided container strong enough to withstand impact and a cage-type mixer paddle driven by a heavy-duty, 1/2" electric drill with a no-load rating of 900 to 1000 rpm.

Soft-plastic mixing containers are not recommended since the plastic shavings may contaminate the mortar. A propeller-type paddle causes splattering and poor mixing action and can result in the rupture of a plastic or metal container.

The best mixing containers are 16 or 30-gal. metal or heavy-duty plastic drum-type vessels with sufficient diameter and height for easy handling. If commercially available containers cannot be found, a reconditioned grease drum will serve as a suitable substitute. Handles may be added by welding steel bars to the sides.

Conventional plaster mixers are not recommended because their slow folding action will not thoroughly disperse veneer plasters in the recommended mixing time. This results in erratic set and poor application and finishing properties. Veneer products do not contain large amounts of aggregate for which conventional plaster mixers are designed, so when using veneer plasters these mixers are more difficult to maintain and keep clean.

A cage-type mixing paddle is recommended to draw plasters into and through the paddle blades. By its high-shear action, it rapidly disperses and blends the ingredients in the mixing water without splattering. Operated at correct speed, the cage-type paddle thoroughly mixes in minimum time without introducing excess air. The resultant mix has high plasticity and workability.

Optimum mixing time for veneer plasters is 3 to 4 minutes. Mixing time should never be less than 2 minutes nor longer than 5 minutes. A short mixing time will be insufficient to wet the plaster, causing lumps, variation in setting time and poor workability. On the other hand, a long mixing time shortens setting time, which reduces working time for applying the material. Excessive mixing may cause a quick set, since in addition to the extra time used for mixing, the excess agitation will also accelerate the setting reaction, thus reducing the overall set time.

Plaster mixing should be timed so that each batch will be used when it is completed. If the mix is allowed to stand for 20 or 30 minutes before being used, the delay reduces available working time for application. This wait can also lead to retempering which results in a weak, soft, unacceptable finish surface.

Following are the USG recommendations for properly mixing veneer plasters.

For the first batch, add all but 1 to 2 quarts of the required water to the mixing container; then with the mixer operating, slowly add the required amount of plaster. Mix for 1 to 2 minutes until the plaster is wet; then add up to 1 to 2 quarts of retained water to obtain the consistency desired. Mix at full speed for 1 to 2 minutes more. The following batches can be mixed by adding the total amount of water used to obtain the desired consistency of the first batch at the start of mixing.

When veneer plaster is job-aggregated, the mixing sequence is similar. Add required water to the mixing container, retaining 1 to 2 quarts of water to the side. Add the plaster while running the mixer. Mix at high speed for 1 to 2 minutes to thoroughly wet the plaster. With the mixer continuing to operate, add the aggregate and up to 1 to 2 quarts of retained water to obtain the desired consistency. **Note:** It may not be necessary to adjust the initial amount of water recommended on the bag when veneer plasters have sand added at the jobsite.

Job addition of aggregates to any plaster mix tends to accelerate the setting time and slightly reduces the finish strength of the wall surface. Under normal conditions, addition of retarders is not required. In cases where aggregate addition has reduced the setting time below acceptable application and finishing time, use of retarder is acceptable. (See PM7, "Job Use of Retarder in Plaster.") Exercise caution in the use of retarder; too long a setting time may result in cracking, dry-out and a weak, soft plaster finish.

Care should be taken during the mixing operation to prevent contaminants from entering the mix. Dirty mixing water that has been used to clean tools will accelerate setting time, so only clean, potable water should be used for mixing.

Mixing equipment should be cleaned after every batch is mixed. This prevents set plaster from being introduced into the mix and accelerating the set.

Use moderate temperature mixing water to ensure consistent setting time. Extremely hot or cold water can cause noticeable variation in setting time. Tools that are not properly maintained may introduce rust into the mix resulting in color variations, surface stains and accelerated setting times.

Aggregates used should meet specifications for proper size gradation, weight and impurities as outlined in ASTM C35. Improperly sized aggregates will produce weak walls. Sand should be clean and free of dirt, clay and foreign matter that might affect setting time of the plaster.

Following above recommendations and bag directions is a good common-sense approach to obtain satisfactory results. Proper mixing of veneer plasters can eliminate job problems, ensure consistent job performance and result in a high-quality finish job.

U.S. Gypsum Company veneer plasters mix easily into a mortar of maximum workability with excellent results when recommended mixing equipment is used and manufacturer's directions are carefully followed. Proper mix is the key to the optimal plasticity needed for ultimate ease of application, uniform quality performance, and high job productivity.

**Ensure Correct Mixing**



Mix USG plasters only with a cage-type paddle mixer driven by a heavy-duty 900 to 1000 rpm 1/2" electric drill. When operated at recommended speeds, the paddle mixer draws the plaster into and through the blades, which by shear action evenly disperse and blend the plaster's ingredients in the mixing water. The resultant mix is an air-free mortar with high plasticity. To achieve these ideal plaster characteristics, mixing time should be not less than 2 minutes but not more than 5 minutes. Because of the superior results produced by the cage-type paddle mixer, the paddle is recommended for mixing U.S. Gypsum veneer plasters. Use of propeller-type paddles and conventional mortar mixers may not produce optimal results.

U.S. Gypsum neither manufactures nor sells cage-type paddle mixers. For recommended product information, see the following:

<b>Recommended Cage-Type Mixing Paddle and Equipment Source</b>	Available from: Quickspray, Inc. 2105 West Lakeshore Drive P.O. Box #327 Port Clinton, Ohio 43452 Phone: 419 732.2611 or 2601	
	<b>Availability—Mixing Equipment</b>	<b>Mixing Units</b>
	<b>Part No.</b>	<b>Mixing Units</b>
	2080	16 gal. barrel (1 bag size)
	2081	30 gal. barrel (3 bag size)
	GBC-B15SH	15 gal. (1 bag size) smooth sides
	2029	Cage-type mixing paddles: 7-1/2"
	2028	Cage-type mixing paddles: 5"—not shown

**Recommended Container**



A smooth-sided mixing container, strong enough to withstand mixing paddle impacts that could cause gouging, produces the best results. Brittle containers should not be used. For suitable containers, see the table above.

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**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.



Manufactured by  
United States Gypsum Company  
550 West Adams Street  
Chicago, IL 60661

800 USG.4YOU (874-4968)  
usg.com

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