Cathedral Stone® Products, Inc.
The leader in scientific masonry restoration

Hot and Cold Weather Protection for Jahn Mortars

Working in extreme weather conditions

The Jahn application instructions give a working range of 40° to 90°, and state that repairs must be protected from extreme heat, freezing, excessive wind, direct sunlight and rain. It is possible to work above and below that range, as well as during the other conditions, but precautions must be taken. Contractors that are working in hot and cold weather should always follow the local building codes regarding material protection, heating of materials, use of frozen materials and protection of completed work.

Hot weather protection

1- Install tarps or other suitable protection to keep the direct sun off the repairs during and after installation. The protection should be erected early in the morning to prevent heat build up in the substrate.

2- All areas to be patched should be pre-dampened repeatedly to prepare the substrate. This reduces the possibility of the substrate wicking the moisture out of the repair mortar, preventing adhesion.

3- Begin curing the repairs sooner and more frequently, sometimes as soon as 30 minutes after completion. The rule of thumb is that the new repair should be dry enough not to run (damage the finish) when water is misted on it. The frequency of dampening can be every hour or two until quitting time. It is not necessary to provide dampening overnight, unless they are applied on Friday afternoon, and no work is being done on Saturday. Curing should be resumed on Monday.

4- Patches applied on Friday, must be dampened and covered with plastic, to keep the moisture in over the weekend. On Monday uncover and start the curing process again.

5- Fresh patches must be dampened at least twice on the day they are applied. Continue to dampen for at least 72 hours.

6- Repairs should be protected from rain for a minimum of four hours.

Cold Weather Protection

1- Keep Jahn mortars in a dry and heated area at a minimum of 40°.
2- The ambient temperature of the substrate must be 40° or higher before any patching starts.
3- The working low for Jahn mortars is 40°; if temperatures drop below 40°, provide an enclosure (see protection below) and heat to maintain the 40° temperatures for 48 hrs after installation. Mortar, that freezes, is not as weather-resistant or as watertight as mortar that has not frozen. Furthermore, significant reductions in compressive and bond strength may occur.
4- The temperatures in the heated enclosures and substrate should be monitored and recorded at regular intervals, especially when the temperatures drop below freezing.
5- Follow the recommended mixing instructions for Jahn mortars. Excessive water can cause loss of bond between the mortar and the substrate. Too much water will also affect the color of the mortar, usually drying lighter in color.

6- **Do not** use any Accelerators or Antifreeze with Jahn mortars! Accelerators are admixtures used to speed the setting time of mortar. Antifreeze significantly reduces the mortar compressive and bond strengths. (Any changes to the Jahn mortar formulation will eliminate the warranty of the material)
7- Heated water maybe used for mixing during cold weather. The water should not exceed 160 F to avoid premature hydration.

Protection

Heated enclosures should be provided at temperatures below freezing. There are several different methods for complete and partial enclosures of buildings. Large tents, temporary wood structures covered with clear plastic, and shelters built of prefabricated panels covered with clear plastic sheets are examples of complete enclosures. Partial enclosures often consist of enclosed swinging scaffolds, which may be moved from floor to floor when necessary. Scaffold enclosures are used mostly. Tubular scaffold is covered with a tarpaulin or polyethylene.

Once the enclosure is complete it is important to heat before patching starts. If the substrate is frozen, it might take 1 to 2 days before the ambient temperature of the substrate is above freezing. Heat will rise to the top of the enclosure; make sure any repaired areas at ground level don't freeze.

When using an insulated blanket over repaired areas, leave an air space between the substrate and the blanket (6") to allow airflow.

Color Issues

There are variables that can affect the color of mortar. Color is affected by hot/cold temperatures, excessive water, wind, and humidity.

1- Excessive water in the mix dilutes pigments and cements causing the mortar to lighten in color.
2- High humidity can cause mortar to lighten; this is usually a surface condition.
3- Rain will also lighten mortar color if allowed to come in contact with mortar that hasn't set.
4- Cold weather can cause the mortar to lighten. Ice crystals can form in the mortar when patching, when thawed or heated; excessive water will dilute the cements or pigments.
5- In cooler weather mortar has a longer cure time. The patches will stay darker for a longer period of time; eventually the mortar will lighten to the proper color. The amount of time it takes the mortar to set depends on temperatures. Sometimes this could take 1 to 2 months.
6- Hot weather can cause the mortar to bake or dry out rapidly, usually causing the mortar to dry darker. Wind will also dry mortar too rapidly.
7- Finishing or tooling the mortar at different times during drying will also cause color variations in the mortar. Tooling the joints too wet will bring water to the surface causing the mortar to lighten. Allowing the mortar to set or tooling the mortar joint when it is dry usually results in a darker joint.
8- Mortar will also dry different colors from one day to the next, depending on weather conditions. One day it can be 90° and sunny, the next day it can be damp, 65° and overcast. The temperature range greatly influences the drying time or hydration of mortars, which in turn affect the final color the mortar.

There are many variables that can affect the color of all mortars. It is very important to be consistent mixing, finishing and curing the mortar. Always be aware of the weather conditions when working with colored mortars and provide protection when necessary.