GROUTING GUIDELINES & APPLICATION INFORMATION

The following instructions pertain to the general installation procedures for grouts manufactured by Specco Industries Inc.. Contractors or engineers should refer to the technical data sheet for the specific grout being used for additional suggestions and to help promote successful installations.

Grout Description: Nonshrink grouts are generally intended to provide full bearing under a baseplate which assures total support of the ultimate load. Unlike traditional concrete, cementitious grouts are specifically formulated to expand rather than shrink as they cure. Three types of expansion mechanisms are recognized by ASTM C-1107 specifications currently.

Grout Classification:
Type A - Pre-hardening expansion, where the grout expands prior to taking final set. This usually requires a gaseous expansion mechanism.
Type B - Post-hardening expansion, where the grout expansion occurs following the final set. The expansion mechanism is derived from a chemical reaction of the mix components.
Type C - Post-hardening expansion, where both gas forming and chemical expansion mechanisms are used in combination.

Note - In order to meet the ASTM C-1107 specifications, each grout is tested at three different consistencies: plastic, flowable, and fluid. Each grout is also run at three different temperature ranges: below 50°F, 70°F, and 90°F. Each fluidity and temperature combination is tested freshly mixed and after being held for 30 minutes. Controlled, positive expansion at all the different conditions is required for the grout to comply with the specification.

General Guidelines: Careful preparation is necessary for successful grouting operations. All grouting should be done using established procedures and recommendations of ACI for placing and curing concrete.

Temperature Restrictions: Grouts generally work best at 50-80°F. In order to follow standard grouting procedures, temperatures of the foundation, plates, mixing water and grout should be between 45 -90°F. Cold weather retards strength gain and set time. Hot weather accelerates setting time and can cause premature drying of the grout. Heating or cooling methods need to be provided to compensate for extremes in ambient temperatures which will result in variations in cure time and strength gain. When grouting at higher temperatures, use cool water, shade the area to be grouted, and protect the placed grout from direct sunlight for at least 48 hours by covering with wet burlap. When grouting at low temperatures, raise the temperature of the foundation by using steam, infrared heat, or radiant heat systems. Use warm mixing water and cover the grout to retain warmth. Do not apply heat directly to the grout after its initial placement. Do not add any accelerators to the mixed grout, only use warm, potable water.

Grout Consistency: The general rule is the less water added to a bag of grout, the stiffer the mix, and the corresponding higher compressive strength obtained. Grout mixed in a plastic consistency is suitable for smaller baseplates such as for columns or precast panels. Flowable grout can be used for small to medium size machine baseplates. Larger baseplates or intricate anchoring designed may require a fluid grout to ensure adequate filling of all voids.

Surface Preparation: Surfaces to be grouted should be clean and free from rust, grease or oil. All surfaces should be roughened to remove laitance and expose sound concrete. When dynamic, shear, or tensile forces are anticipated, concrete surfaces should be chipped, with a chisel point hammer to a roughness of +/- 3/8 inch. Saturate the area to be grouted with water typically 24 hours prior to grouting (8 hours minimum) until it is uniformly damp, and remove any excess water from the foundation or bolt holes just before placing the grout. Bolt holes should be grouted before the major portion of the grout is placed.
Forming: After determining the method of grout placement, a strong, properly braced and oiled form needs to be constructed with proper relief openings. Cement based grouts must be confined to attain their optimum compressive strength. Most grout projects require placement under a steel baseplate. Forms are built around the perimeter of the baseplate extending up one inch higher than the highest grout point. Forms should be liquid tight and nonabsorbent, and allow for venting at the top to avoid entrapment of air. Seal form edges with grout, putty, tape or caulking compounds to prevent the grout from leaking out the bottom. Use a light coat of form release on the forms to allow easy removal. Do not have close fitting forms. There should be a one inch horizontal clearance and a 1 inch vertical clearance for height above the bottom of the baseplate. Expansion joints may be needed for both indoor or outdoor installations. Depending on the size of the baseplate and the selected method of placement, one end of the form can be constructed as a headbox. The headbox is recommended for moderately sized equipment and should be sloped at 45 degrees to enhance grout placement.

Mixing: When planning any grout project, evaluate the batch size and the total cubic foot requirements. Single bag batches may be mixed efficiently with a power drill and jiffy (paddle) mixer using a 5 gallon pail. Paddle type mortar mixers can be used for batches requiring more than 2 bags. Concrete mixers are not acceptable substitutions and do not generally provide adequate mixing. Mortar mixers are rated by cubic foot capacity a two cubic foot mixer can typically handle a four 50 lb. bag batch. Larger projects are best applied using a continuous mixer/grout pump assembly where the hose can be positioned under large baseplates eliminating the possibility of a cold joint or air pocket. Always prewet all mixing equipment and hoses prior to batching to prevent clogging and to allow even grout flow. Add the appropriate amount of clean, potable water for the batch size and then add the dry grout. Mix for a minimum of 3-5 minutes. The flow of the grout should be checked (for fluid grouts use a flow cone) and care should be taken to ensure the grout will not “bleed” with the amount of water that has been added. Do not mix more grout than can be placed within the pre-established working time. Do not retemper the grout by adding water and remixing if it starts to stiffen. Do not add any cements or sand to the grout which can change the grouts characteristics. Add approximately 12 pounds of washed 3/8 inch pea gravel to each 50 lbs of grout for application depths from 2 to 5 inches, and up to 25 lbs pea gravel per 50 lbs grout for applications over 5 inches.

Placement: The mixed flowable or fluid grout should be transported by wheel barrow, buckets or pump to the headbox and placed immediately. The transporting distance should be as short as possible. Grout should always be placed from only one side of the equipment to prevent entrapment of air or water beneath the equipment. Once started, the flow of the grout should not be interrupted or halted until the total space beneath the baseplate has been filled. Metal strapping or thin rods can be helpful in removing air pockets and in assisting in the movement of the grout into anchor holes, or behind other obstructions. Never use a concrete vibrator when working with non shrink grouts. Excess movement or vibration can cause grout segregation and resulting loss of strength. Flow must continue until the grout is visible at all critical vent holes as well as around the baseplate. Note- Dry pack grouts do not use the headbox and are placed by ramming device with repeated blows until the void is full.

Form Removal & Curing: Immediately after placement and as soon as the sheen of water disappears and the grout has begun to stiffen, trim the surfaces with a trowel and cover the exposed grout with clean wet burlap or rags for up to 24 hours, and then follow with a suitable waterbased curing and sealing compound such as Specco Envirocure 1315 to prevent additional water loss. The grout should have achieved initial set (test by checking penetration with a pointed masons trowel), prior to removing the grout forms or cutting back excessive grout. The grout shoulder edges can be cut back and finished at 45 degrees angles from the plates to help displace stress loads at the edges. Additional precautions: Do not use grouts in unconfined, “topping” applications. Keep grout applications from freezing until they reach a minimum strength of 4000 psi.

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