Specification

Title: Polishing Concrete
Specification No.: CSDA-PC-113
Effective Date: Jun 5, 2008
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1. Codes, Standards & Definitions

1.1 The polishing contractor shall adhere to all applicable safety guidelines in accordance with Federal, State and local ordinances.

1.2 ASTM C779 – Standard Test Method for Abrasion Resistance of Horizontal Concrete Surfaces

1.3 ASTM F609 – Standard Test Method for Using a Horizontal Pull Slipmeter (HPS)

1.4 CSDA-ST-115 – Measuring Surface Texture

1.5 Definitions

- 1.5.1 Owner – Legal owner of the slab surface being polished
- 1.5.2 Contracting agency – The Contractor hired directly or indirectly by the owner that is sub-letting the polishing requirements to a polishing contractor.
- 1.5.3 Polishing contractor – The contractor hired to perform the actual polishing operation and is thoroughly trained with the equipment, accessories and chemicals used to perform the work.
- 1.5.4 Surface prep – The work needed to get the slab prepared for the polishing steps.
- 1.5.5 Densifier – clear colorless liquid that has a chemical formulation to penetrate the concrete slab surface to create a synergistic breathable skin in the concrete surface that will increase the hardness, abrasion resistance and 'dust-proofing' qualities.
- 1.5.6 Grinding Methods:
  - 1.5.6.1 Wet Grind – A polishing or grinding step that is performed using water as a coolant. A slurry is created from the water and the grinding debris.
  - 1.5.6.2 Dry Grind - A polishing or grinding step that is performed dry using diamond tools made for dry grinding. The dust is collected using a vacuum and a HEPA equivalent or greater filtering system which collects the dry debris for proper disposal.
- 1.5.7 Accessory Bond:
  - 1.5.7.1 Brazed Diamond – The diamond grit is directly adhered to a tooling plate and does not use any matrix.
  - 1.5.7.2 Metal bond – The metallic matrix holding the diamonds. The properties of the matrix can be designed to alter the performance characteristics for a specific slab surface.
  - 1.5.7.3 Semimetal bond – A hybrid matrix consisting of resin and metals.
  - 1.5.7.4 Resin bond – A polymer and/or resin matrix holding the diamonds.

2. Prerequisites

2.1 Normal and customary equipment used on a polishing job include:

2.1.1 Grinder/polisher machine, either Rotary or Planetary, typically with an Electric Motor due to exhaust emissions in that most polished concrete floors are indoors.
2.1.2 Grinding and polishing accessories. These accessories are used in progressive quantum steps, from course grits to fine grits, and are appropriately sized so each step will remove scratches generated by the previous step. The steps start with a diamond grit size large enough to remove the specified amount of surface damage and inclusions in the concrete slab, and progress to a point where the scratches created by the accessory are no longer visible. Typically, the progression is 40 grit metal bond, 80 grit metal bond, 150 grit metal bond, 100 grit resin, 200 grit resin, 400 grit resin, 800 grit resin, and 1,500 grit resin.
2.1.3 Concrete densifier and the appropriate supplies and equipment to properly apply the densifier.
2.1.4 Equipment, such as a vacuum, to clean between each step and to control slurry and/or dust generated during the grinding/polishing steps. It is important to clean between each step to prevent debris in the dust or slurry to create additional scratches in the slab surface.
2.1.5 Equipment necessary to finish the edges and near obstructions or slab discontinuities.

2.2 It is the responsibility of the owner or contracting agency to have the area to be polished properly identified.

2.3 It is the responsibility of the owner or contracting agency to provide water and power for the polishing contractor.

2.4 It is recommended that a pre-job meeting be held with the owner or contracting agency to determine the following information relating to the overall job:
2.4.1 How are the edges to be finished? How close to the wall or vertical surfaces?
2.4.2 If the polished floor needs to go beyond 1,200 grit to a 3,000 grit level, that the proper slip tests will be preformed.
2.4.3 That all agree on the amount and level of surface prep before the polishing steps.
2.4.4 How are cracks, slab discolorations, oil saturation spots (that will inhibit the use of the densifier), non-uniform exposure of aggregate from the surface prep or early grinding steps are to be handled.

2.5 It is the responsibility of the polishing contractor to clean between each step. If the contractor is wet grinding, the slurry must be collected and properly contained.

2.6 It is the responsibility of the owner or contracting agency for providing proper, safe, and appropriate disposal of slurry.

2.7 Adequate safety provisions must be provided by the owner or contracting agency to protect the operator's work area.
2.7.1 The owner or contracting agency shall provide safe access to and from the work area.
2.7.2 Barricade, cones, warning tape or other devices used to keep unauthorized people out of the work area shall be provided by the owner or contracting agency.

3. Polishing Set-up Procedures

Except when the polishing contractor determines that any of the following steps do not apply to a particular work or that other steps are appropriate:

3.1 The polishing contractor's equipment must comply with all applicable OSHA standards.

3.2 Be certain that the proper type and amount of surface prep is done before the polishing of the slab surface begins.

3.3 The diamond grit progression for the job needs to be followed in order. If a step is missed, it is important to start on that step and continue forward in order. When changing from Metal bond to resin, it is important to keep the grit size the same or step back one step on the resin (i.e. from 200 grit metal to the next step as either 200 grit Resin bond or 100 grit Resin bond).

3.4 The machine size, weight and rotational speed, as well as, the slab conditions and properties, will influence the selection of accessories and densifier. Be certain to follow the recommendations of the manufacturer(s).

3.5 The densifier must be applied at a specific point in the polishing process per the chemical manufacture's instructions to maximize the effectiveness and performance.
- 3.5.1 The densifier should be delivered to the job site in unopened containers and properly labeled/identified with the product name, manufacturer and safety warnings.
- 3.5.2 Store the densifier properly per the manufacturer instructions. Keep the product from freezing.
- 3.5.3 Do not apply the product when the air and slab surface temperatures do not fall within the manufacturer recommendations.
- 3.5.4 The densifier might damage some surfaces including some aluminum and glass surfaces. Be certain to follow the manufacturer instructions.
- 3.5.5 Properly rinse and neutralize the chemicals used before moving to the next step in the process.

4. Polishing Operation

Except when the polishing contractor determines that any of the following steps do not apply to a particular work or that other steps are appropriate:

4.1. Do not operate the polishing machine in an unsafe manner. The surface conditions with wet slurry on a smooth surface can be very slippery during the polishing operation.