

SECTION 03 35 19

GRIND AND SEAL CONCRETE FLOORING

DTI GrindSeal System

PART 1 - GENERAL

1.1 SUMMARY

A. This Section covers mechanically ground concrete floors sealed with a penetrating sealer using the DTI GrindSeal System, finished to one of three specified grind levels:

1. Level GS-1 - Light Grind: removes surface laitance, light contamination, and minor surface irregularities; minimal aggregate exposure; retains the natural cream surface of the slab.
2. Level GS-2 - Medium Grind: uniform grind refining the surface and beginning fine aggregate (salt-and-pepper) exposure.
3. Level GS-3 - Full Grind: deeper cut producing greater fine and partial coarse aggregate exposure and removing more of the original surface.

B. The work includes surface grinding to the specified grind level, an optional DTI CD7 densifier pass where scheduled, application of DTI DeepSeal penetrating sealer, and an optional DTI Poly Guard polyaspartic topcoat where scheduled. The finished appearance is matte with a natural concrete look.

C. Joint filling, where scheduled, is specified in Section 03 35 16 and is companion work to this Section.

1.2 REFERENCES

A. ASTM C779 - Standard Test Method for Abrasion Resistance of Horizontal Concrete Surfaces.

B. ASTM E1155 - Standard Test Method for Determining F(F) Floor Flatness and F(L) Floor Levelness Numbers.

C. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.

D. ACI 117 - Specifications for Tolerances for Concrete Construction and Materials.

E. ACI 302.1R - Guide for Concrete Floor and Slab Construction.

1.3 DEFINITIONS

A. Grind Level: the depth and completeness of the mechanical grinding performed, which determines aggregate exposure and how much of the original surface is removed. Grind level is not a polish level; grinding under this Section does not include resin polishing steps.

B. Penetrating Sealer: a sealer that soaks into the concrete pores and reacts or bonds within the slab rather than forming a surface film, preserving the natural matte appearance of the concrete.

C. Aggregate Exposure: the degree of fine and coarse aggregate revealed by grinding. Exposure is a function of the existing slab and is not uniform across any floor; see 1.7.

1.4 SUBMITTALS

A. Product data for DTI DeepSeal penetrating sealer, and for DTI CD7 densifier and DTI Poly Guard topcoat where scheduled.

B. Installer qualifications: minimum five years of concrete grinding and sealing experience and a minimum of 25 completed grind and seal projects of similar size.

- C. Mock-up approval record (see 1.6).
- D. Maintenance and sealer re-application instructions for the finished floor.

1.5 QUALITY ASSURANCE

- A. Pre-installation conference with the Owner, General Contractor, and grinding contractor to confirm grind level, sealer selection, schedule, slab readiness, and power requirements.
- B. Slab condition: grind and seal follows the existing slab. Slabs with severe spalling, scaling, cracking, or surface deterioration shall be brought to the Owner's attention in writing before work begins, with repair options identified under 1.7.
- C. Electrical: grinding equipment may require 480V three-phase power. Confirm availability before mobilization; generator requirements, if any, shall be identified at the pre-installation conference.
- D. Environmental conditions: slab and ambient temperatures shall be within the sealer manufacturer's recommended range at application and until the sealer has dried. Cold slabs extend sealer dry times; schedule shall allow for extended drying where slab temperatures are low.

1.6 MOCK-UP

- A. Before production work, complete a mock-up of not less than 100 square feet in an area designated by the Owner, carried through the full specified sequence including densifier and topcoat where scheduled.
- B. The approved mock-up establishes the standard for aggregate exposure, appearance, and workmanship for the project. Production work shall match the approved mock-up.
- C. The mock-up may remain as part of the finished floor.

1.7 DESIGN LIMITATIONS AND EXCLUSIONS

- A. Grind and seal does not hide slab defects. Existing patches, pour-backs, trenching repairs, staining, tire marks, paint, and discoloration that extend below the grind depth will remain visible in the finished floor. Grinding removes surface material only to the depth of the specified grind level.
- B. Color and exposure variation is inherent to ground concrete and is not a defect. Adjacent placements, pour-backs, and previously repaired areas will grind and accept sealer differently than the surrounding slab.
- C. Penetrating sealer is breathable and is not a moisture mitigation system. It does not stop moisture vapor transmission, hydrostatic pressure, or efflorescence, and it does not bridge cracks or joints.
- D. Penetrating sealer wears in traffic lanes. Forklift lanes, turning areas, dock traffic, and main travel aisles will lose sealer protection faster than the general floor. Plan re-application at intervals of 12 to 36 months in traffic lanes and 3 to 5 years in general areas, adjusted for actual traffic; see 3.7.
- E. Hidden conditions, including voids under the slab, delaminated surface layers, and unsound areas not visible before grinding, are excluded. Where sounding or grinding reveals voids or unsound concrete, stop work in that area and notify the Owner; repair is by separate agreement unless scheduled.
- F. Scope boundary: this Section is grind and seal only. Patching, coating removal beyond the specified grind level, joint filling, crack repair, and leveling are included only where scheduled. Field experience shows underscoped "seal only" work growing into grind, patch, and repair work after mobilization; the scheduled scope governs.
- G. Grind and seal versus polished concrete: grind and seal is the appropriate choice where a matte, natural concrete appearance is acceptable, where the floor will be re-evaluated or coated later, or where schedule and budget do not support the additional resin polishing steps of a full polish. Production planning rates for grind and seal are typically 41 to 45 square feet per man-hour, and a typical project duration is on the order of four working days depending on size and access; a full polish requires additional days of progressive

resin passes for a comparable area. Where a reflective finish, maximum surface hardness, or the lowest long-term maintenance profile is required, specify polished concrete under Section 03 35 00 instead.

H. New concrete and pour-backs shall cure a minimum of 28 days before grinding and sealing. Sealer applied to uncured concrete will not perform as specified.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Penetrating sealer: DTI DeepSeal, a penetrating silane/siloxane-class concrete sealer that soaks into the pores of the ground concrete, repels water and chloride intrusion, resists staining, and leaves no surface film, gloss, or color change. The sealed floor remains matte and breathable.

B. Densifier (where scheduled): DTI CD7, a reactive silicate-based concrete densifier and hardener that penetrates the slab, reacts with free lime to form additional cementitious material within the pores, and increases surface hardness, abrasion resistance, and dust resistance.

C. Topcoat (where scheduled): DTI Poly Guard, a polyaspartic topcoat applied in thin coats over the penetrating sealer system where a film-forming wear surface and a slight sheen increase are specified. Application of DTI Poly Guard changes the finish from fully matte to a low satin sheen and shall be confirmed at the mock-up.

D. Grinding abrasives: metal-bond diamond tooling in progressive grits (40, 80, 150) as required to reach the specified grind level.

E. Water: potable, for wet grinding and rinsing where used.

2.2 EQUIPMENT

A. Planetary or rotary grinding machines of sufficient head weight and power to achieve the specified grind level without skipping, fitted with vacuum dust collection operating at HEPA filtration where dry grinding is performed.

B. Edging equipment capable of carrying the same grind sequence to within 1/4 inch of walls, columns, and obstructions.

C. Sealer application equipment: low-pressure pump sprayers, microfiber applicators, or rollers as recommended by the sealer manufacturer for uniform coverage without puddling.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify the slab is cured a minimum of 28 days, and identify curing compounds, sealers, coatings, adhesives, oils, and other surface contamination requiring removal under 3.2.

B. Sound the slab in representative areas to identify voids, delamination, or unsound surface concrete. Mark and report suspect areas to the Owner before grinding; see 1.7E.

C. Document existing cracks, spalls, patches, pour-backs, staining, and slab defects photographically before starting. Defects not documented are presumed to have been caused by the work of this Section.

D. Verify slab dryness before sealer application. Where in-situ relative humidity exceeds 85 percent per ASTM F2170, or where the slab is visibly damp, notify the Owner and delay sealer application until the slab dries.

3.2 PREPARATION

- A. Remove existing coatings, mastics, curing compounds, and surface contamination by mechanical grinding as part of the specified grind sequence. Chemical stripping alone is not acceptable. Removal beyond the depth of the specified grind level is included only where scheduled; see 1.7F.
- B. Protect adjacent surfaces, walls, storefronts, racking, and equipment from dust and slurry. Maintain dust control for the duration of the work.

3.3 GRINDING SEQUENCE

- A. General: perform each step over the full floor area including edges before advancing to the next grit. Vacuum and inspect between steps. Do not skip steps; each grit removes the scratch pattern of the previous one.
- B. Metal-bond grinding by level:
 - 1. Level GS-1 - Light Grind: 150 grit metal bond pass, or an 80 grit pass followed by 150 grit where laitance and contamination require it. The intent is a clean, sound, uniform surface with minimal material removal.
 - 2. Level GS-2 - Medium Grind: 80 grit metal bond, followed by 150 grit metal bond to refine the pattern.
 - 3. Level GS-3 - Full Grind: 40 grit metal bond, followed by 80 grit and 150 grit metal bond passes.
- C. At each step, the floor shall show no visible scratch pattern or missed areas from the previous step before advancing.
- D. After the final metal pass, vacuum the floor thoroughly and inspect under raking light for swirl marks, missed areas, and remaining contamination. Re-grind deficient areas before sealing.

3.4 JOINTS, CRACKS, AND REPAIRS

- A. Joint filling, where scheduled, shall be performed under Section 03 35 16, sequenced after the initial grinding passes so filler finishes flush with the ground surface. Note that filler cannot be struck perfectly flush on uneven slabs; minor variation at joints on out-of-tolerance slabs is acceptable and is not a defect.
- B. Crack and spall repair, where scheduled, shall be performed under the applicable repair provisions: sawcut the perimeter a minimum of 1/2 inch deep where required to obtain a sound edge, remove unsound material, and fill with semi-rigid polyurea repair mortar, ground flush in sequence.
- C. Moving or structural cracks are excluded from cosmetic treatment and shall be reported to the Owner.

3.5 DENSIFIER AND SEALER APPLICATION

- A. Densifier (where scheduled): after the final grinding pass and thorough cleaning, apply DTI CD7 liberally to saturation per the manufacturer's instructions, keep the surface wet for the full dwell time, then allow to dry completely before sealing.
- B. Sealer: apply DTI DeepSeal penetrating sealer to a clean, dry, ground surface per the manufacturer's instructions, at the specified coverage rate, in a uniform wet coat without puddling, dry streaks, or missed areas.
- C. Apply a second sealer pass where the first pass absorbs unevenly or where the mock-up established two passes as the project standard.
- D. Cold slabs require extended drying. Do not apply sealer to a cold or damp slab on the assumption that standard dry times apply; verify the surface is dry and within the manufacturer's temperature range, and allow additional dry time where slab temperatures are low.
- E. Topcoat (where scheduled): after the penetrating sealer has dried per the manufacturer's instructions,

apply DTI Poly Guard in thin, uniform coats per the manufacturer's instructions. Observe the recoat window; where the window is missed, prepare the surface as the manufacturer directs before recoating.

F. Keep traffic off the sealed floor until the sealer, and topcoat where applied, has dried per the manufacturer's instructions.

3.6 FIELD QUALITY CONTROL

- A. Appearance verification: compare exposure, uniformity, and overall appearance against the approved mock-up. Areas visibly below the mock-up standard shall be re-ground or re-sealed.
- B. Absorption check: after the sealer has dried, perform a water drop test at a minimum of one location per 2,000 square feet. Water shall bead or darken the surface slowly and uniformly; rapid, uneven absorption indicates missed or thin coverage and shall be corrected with an additional pass.
- C. Slip resistance: the finished matte floor shall provide a coefficient of friction consistent with the Owner's use requirements; verify by test where specified.

3.7 PROTECTION AND TURNOVER

- A. Protect the finished floor from construction traffic, water ponding, and staining materials until turnover. Use breathable protective covering only where covering is required.
- B. Turnover cleaning: vacuum and damp mop with a neutral pH cleaner. Do not apply waxes or topical coatings over the sealed floor unless scheduled.
- C. Deliver maintenance and re-application instructions: routine neutral pH cleaning, and penetrating sealer re-application intervals based on traffic, typically 12 to 36 months in traffic lanes and 3 to 5 years in general areas. Re-application is a maintenance operation performed on the cleaned floor without re-grinding, except where wear or damage requires spot grinding.

END OF SECTION 03 35 19