

# SECTION 03 35 29

## SEALED CONCRETE

### DTI ClearSeal System

#### PART 1 - GENERAL

##### 1.1 SUMMARY

A. This Section covers the cleaning, preparation, and sealing of existing concrete floors with the DTI ClearSeal Sealed Concrete System, in one of two sealer classes as scheduled:

1. Penetrating sealer: DTI DeepSeal, a silane and siloxane water repellent or densifying sealer class that penetrates the slab, leaves no surface film, and preserves the natural matte appearance of the concrete. Where a densifier is scheduled in place of or ahead of the water repellent, DTI CD7 densifier shall be used.
2. Film-forming sealer: DTI ClearSeal, an acrylic class clear sealer that forms a thin wear surface and adds sheen, or DTI Poly Guard, a polyaspartic class clear sealer, where a harder, faster curing, and more chemical resistant film is scheduled.

B. The work includes cleaning and degreasing, light mechanical surface preparation where scheduled, sealer application in the specified number of coats, and turnover with maintenance instructions.

C. This Section covers seal-only scopes applied to existing slabs that are already prepared or that require only the light preparation described in Part 3. Where the scope includes grinding the slab before sealing, that work is covered under Section 03 35 19, Grind and Seal. The two sections are not interchangeable; the scheduled section governs.

##### 1.2 REFERENCES

- A. ASTM D4258 - Standard Practice for Surface Cleaning Concrete for Coating.
- B. ASTM D4259 - Standard Practice for Abrading Concrete.
- C. ASTM D4263 - Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
- D. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
- E. ICRI Guideline 310.2R - Selecting and Specifying Concrete Surface Preparation, including Concrete Surface Profile (CSP) designations.
- F. ACI 302.1R - Guide for Concrete Floor and Slab Construction.

##### 1.3 DEFINITIONS

A. Penetrating sealer: a sealer that soaks into the concrete pore structure and reacts or deposits within it, changing the surface chemistry without building a measurable film on top of the slab.

B. Film-forming sealer: a sealer that dries or cures into a continuous thin film on the surface, providing sheen, darkening, and a sacrificial wear layer.

C. CSP: Concrete Surface Profile per ICRI 310.2R. This Section, where mechanical preparation is scheduled, is limited to CSP-1 to CSP-2, a light profile comparable to an acid etch through a light shot blast or scarifier pass.

##### 1.4 SUBMITTALS

- A. Product data for the scheduled sealer class (DTI DeepSeal, DTI CD7, DTI ClearSeal, or DTI Poly Guard), including the manufacturer's stated coverage rates, moisture and temperature limits, and cure times.
- B. Installer qualifications: minimum five years of concrete sealing experience and completed sealed concrete projects of similar size.
- C. Test area approval record (see 1.6).
- D. Maintenance and re-application instructions for the finished floor.

## **1.5 QUALITY ASSURANCE**

- A. Pre-installation conference with the Owner, General Contractor, and sealing contractor to confirm sealer class, sheen expectations, preparation level, coverage rates, application and cure windows, traffic return times, and any areas to be excluded or masked.
- B. Moisture condition: film-forming sealers shall not be applied over slabs with active moisture vapor problems. Where in-situ relative humidity exceeds the sealer manufacturer's limit per ASTM F2170, or a plastic sheet test per ASTM D4263 shows condensation, notify the Owner before proceeding. Sealing a vapor-active slab traps moisture under the film and causes whitening, blistering, and peeling that cannot be warranted.
- C. New concrete and pour-backs shall cure a minimum of 28 days before sealing, and shall be free of curing compounds incompatible with the scheduled sealer.

## **1.6 TEST AREA**

- A. Before production work, seal a test area of not less than 100 square feet in a location designated by the Owner, using the full specified preparation, sealer, and coat count.
- B. The approved test area establishes the standard for appearance, sheen, darkening, and coverage rate for the project. Penetrating sealers darken and enrich the slab slightly and unevenly; the test area, not a sample board, is the governing standard.
- C. The test area may remain as part of the finished floor.

## **1.7 DESIGN LIMITATIONS AND EXCLUSIONS**

- A. Sealed concrete is a maintenance system, not a permanent coating. Every sealer class in this Section wears, weathers, or depletes in traffic and requires periodic re-application on the intervals stated in 3.7. Budget and maintenance planning shall assume renewal, not permanence.
- B. Sealers do not hide slab defects. Cracks, joints, stains, patching, pour-backs, trowel marks, and color variation remain visible through both sealer classes, and film-forming sealers may accentuate them by darkening the slab. Cosmetic correction of the slab is outside this Section.
- C. Penetrating sealers provide no sheen, no wear film, and only limited stain resistance. They reduce water absorption and dusting; they do not make the slab stain-proof, oil-proof, or glossy.
- D. Film-forming acrylic class sealers (DTI ClearSeal) will mark under hot tires (hot tire pickup), soften or discolor on contact with fuels, solvents, and many chemicals, and wear through in turning and braking lanes ahead of the balance of the floor. Where hot tire traffic or chemical exposure governs, schedule the polyaspartic class (DTI Poly Guard) instead.
- E. Film-forming sealers reduce slip resistance when wet. In wet areas, exterior entries, ramps, and washdown zones, an anti-slip additive shall be scheduled within the film-forming coats, or a penetrating sealer shall be used so the natural concrete texture is preserved.
- F. Sealers do not bridge moving cracks or joints, do not stop moisture vapor transmission unless

specifically rated to do so, and do not substitute for a moisture mitigation system. Moving or structural cracks shall be reported to the Owner and are excluded from this Section.

G. Previously sealed or coated slabs may reject or react with new sealer. Compatibility shall be confirmed in the test area; removal of incompatible existing material, where required, is covered under the preparation provisions of the scheduled section and may change the applicable section for the work.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

A. Penetrating water repellent: DTI DeepSeal, a silane and siloxane blend water repellent that penetrates the pore structure, bonds chemically within the slab, and reduces water and chloride absorption while leaving the surface appearance natural and matte, with no film and no change to surface texture.

B. Densifier option: DTI CD7, a reactive silicate-based densifier and hardener for use where dusting control and surface hardening, rather than water repellency alone, are scheduled. DTI CD7 may be applied as the penetrating treatment by itself or under a scheduled film-forming sealer where approved by the sealer manufacturer.

C. Film-forming acrylic sealer: DTI ClearSeal, a solvent or water based acrylic class clear sealer that forms a thin protective film, enriches and darkens the concrete, and is available in matte through gloss sheen as scheduled. Sacrificial and renewable by design.

D. Film-forming polyaspartic sealer: DTI Poly Guard, a polyaspartic class clear sealer with higher hardness, abrasion resistance, chemical resistance, and UV stability than the acrylic class, and with faster return to service. Use where acrylic class limitations in 1.7 govern.

E. Anti-slip additive: fine graded aggregate or polymer grit additive, compatible with the scheduled film-forming sealer, broadcast or blended into the final coat where scheduled to maintain wet slip resistance.

F. Cleaners and degreasers: pH neutral to alkaline detergents and degreasers compatible with the scheduled sealer and with the facility's discharge requirements.

G. Water: potable, for rinsing and wet preparation methods where used.

### **2.2 EQUIPMENT**

A. Auto-scrubber or swing machine with pads and brushes appropriate to the slab condition, and wet vacuum recovery, for cleaning and rinse water control.

B. Light mechanical preparation equipment where scheduled: shot blaster, scarifier, or diamond grinder fitted with tooling capable of producing CSP-1 to CSP-2 only, with vacuum dust collection at HEPA filtration where dry methods are performed.

C. Application equipment: low-pressure pump sprayer with fan tip for penetrating sealers, and sprayer, microfiber applicator, or short-nap roller for film-forming sealers, sized to maintain a wet edge at the manufacturer's coverage rate.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

A. Verify the slab is cured a minimum of 28 days and identify existing sealers, coatings, curing compounds, adhesives, oils, and other contamination, or identify areas requiring their removal.

- B. Perform moisture checks appropriate to the scheduled class: plastic sheet test per ASTM D4263 for film-forming work, and in-situ relative humidity per ASTM F2170 where readings are specified. Record results and report conditions above the manufacturer's limits before proceeding.
- C. Document existing cracks, stains, patching, and slab defects photographically before starting. Defects not documented are presumed to have been caused by the work of this Section.
- D. Verify drains, joints, and adjacent finishes are identified for masking or protection.

### **3.2 PREPARATION**

- A. Cleaning: sweep and vacuum the full area. Scrub with detergent or degreaser solution appropriate to the contamination present, including tire marks, oil spots, and food or process soiling in service and production areas. Rinse and recover all rinse water; do not allow dirty rinse water to dry back onto the slab.
- B. Stubborn contamination: oil saturated spots, paint, and adhesive residue that survive scrubbing shall receive spot degreasing or light mechanical removal. Spots that cannot be cleaned to a sound, absorbent surface shall be reported to the Owner; film-forming sealer over contaminated concrete will fail at those spots.
- C. Light mechanical preparation, where scheduled: abrade the surface to CSP-1 to CSP-2 per ASTM D4259 methods to remove laitance, weak surface material, and incompatible curing compounds, and to give film-forming sealers a uniform anchor profile. Vacuum all dust after abrading. Mechanical preparation under this Section is a light surface treatment only; it does not include the grinding sequence of Section 03 35 19.
- D. Final condition: the slab shall be clean, sound, and uniformly absorbent, verified by a water drop test showing even absorption without beading in areas scheduled for penetrating sealer. Allow the slab to dry to the manufacturer's stated condition before application. Cold slabs extend drying materially; do not compress the drying window to meet schedule.

### **3.3 APPLICATION CONDITIONS**

- A. Ambient and substrate temperature: apply only when surface and air temperatures are within the manufacturer's limits, typically not below 50 degrees F and not above 90 degrees F, and expected to remain within limits through initial cure. Do not apply to slabs heated by direct sun beyond the manufacturer's limit.
- B. Moisture: the surface shall be dry to the manufacturer's stated condition, with no standing water, no visible damp spots, and slab moisture within the limits verified in 3.1. Penetrating sealers require dry pores to absorb; film-forming sealers require a dry surface to bond.
- C. Weather and environment: for exterior work, do not apply where rain is expected before the sealer has cured per the manufacturer's instructions. Protect the work area from overspray, wind-blown debris, and traffic for the full application and cure period.
- D. Ventilation: provide ventilation appropriate to the sealer class in enclosed areas and comply with the facility's requirements for occupied operations.

### **3.4 PENETRATING SEALER APPLICATION (DTI DeepSeal and DTI CD7)**

- A. Apply DTI DeepSeal by low-pressure spray in a flood coat at the manufacturer's coverage rate, typically 150 to 300 square feet per gallon per coat depending on slab porosity, confirmed by the test area. Work the material across the surface with a broom or applicator where needed to keep all areas wet and absorbing for the full dwell time, and redistribute material from puddled areas to dry areas.
- B. Coat count: one coat is typical on dense, hard-troweled slabs. A second coat, applied wet on wet or after

the first has absorbed per the manufacturer's instructions, is typical on porous, broomed, or weathered concrete. Do not allow excess material to dry on the surface; remove residue before it hardens into a visible film or gloss spot, which defeats the penetrating function.

C. Densifier option: where DTI CD7 is scheduled, apply liberally to saturation, keep the surface wet for the full dwell time, then remove or rinse residue per the manufacturer's instructions. Where both are scheduled, DTI CD7 is applied first and allowed to cure before DTI DeepSeal, where approved by both manufacturers.

D. Cure and traffic return: protect from water and traffic until cured. Typical return is foot traffic in 2 to 4 hours and vehicle traffic in 24 to 72 hours, per the manufacturer's instructions for the actual slab and conditions. Water repellency develops over the first several days of cure; do not judge performance on the first day.

### **3.5 FILM-FORMING SEALER APPLICATION (DTI ClearSeal and DTI Poly Guard)**

A. Apply in thin, uniform coats at the manufacturer's coverage rate, typically 250 to 350 square feet per gallon per coat for the acrylic class and 150 to 250 square feet per gallon per coat for the polyaspartic class, confirmed by the test area. Thin coats are mandatory; heavy single coats trap solvent or moisture, dry white or hazy, and wear unevenly.

B. Coat count: two coats typical for both classes. Allow the first coat to dry or cure to the manufacturer's recoat window before the second coat. Where the window is missed, prepare the surface per the manufacturer's instructions before recoating; do not coat over a cured film that will not accept the next coat.

C. Anti-slip additive, where scheduled, shall be blended into or broadcast into the final coat at the manufacturer's rate and distributed evenly. Additive concentrates in roller laps and low spots show as visible texture variation; maintain a wet edge and consistent technique across each placement.

D. Cure and traffic return: typical return for the acrylic class is foot traffic in 4 to 8 hours, light traffic at 24 hours, and full cure in 3 to 7 days; the polyaspartic class typically returns to foot traffic in 2 to 4 hours and full service within 24 hours. All returns are per the manufacturer's instructions for actual conditions. Protect fresh film from water, condensation, and tire traffic for the full cure period; early tire traffic on acrylic class film causes permanent marking.

### **3.6 FIELD QUALITY CONTROL**

A. Coverage verification: track material usage against area sealed. Consumption materially below the manufacturer's rate indicates over-spreading and thin protection; consumption materially above indicates over-application and film defects. Reconcile at the test area rate before production proceeds.

B. Penetrating sealer verification: after cure, perform a water absorption check in several locations. Treated areas shall shed and bead water noticeably longer than an untreated reference area, with no visible film, gloss, or color change beyond the test area standard.

C. Film-forming sealer verification: inspect for uniform sheen and darkening against the test area, and for defects including whitening, blistering, fisheyes, lap lines, and missed areas. Defective areas shall be removed or corrected per the manufacturer's instructions and recoated; cosmetic defects in film-forming sealer cannot be blended out by additional unplanned coats.

D. Slip resistance: where anti-slip additive is scheduled, verify the finished surface in wet condition against the Owner's use requirements by test where specified.

### **3.7 PROTECTION, TURNOVER, AND MAINTENANCE**

A. Protect the finished floor from construction traffic, staining materials, and standing water until turnover and full cure.

B. Turnover cleaning: vacuum and damp mop with a neutral pH cleaner. Do not apply waxes or incompatible topical products over the sealer.

C. Deliver maintenance and re-application instructions, including the following typical renewal intervals for planning, adjusted to actual traffic and exposure:

1. Penetrating water repellent (DTI DeepSeal): re-apply every 3 to 5 years in exterior and high exposure areas; interior low traffic areas may extend beyond this range. Loss of water beading is the renewal signal.
2. Densifier (DTI CD7): the densification reaction is permanent and does not require re-application; surface protection, where scheduled over it, renews on the interval of the scheduled surface treatment.
3. Film-forming acrylic (DTI ClearSeal): re-apply every 1 to 3 years, sooner in turning lanes, entries, and washdown areas where wear concentrates. Renew by cleaning, light preparation, and a fresh coat per the manufacturer's instructions.
4. Film-forming polyaspartic (DTI Poly Guard): re-apply every 3 to 5 years under typical commercial traffic, per condition inspection.

D. Renewal work under later contracts generally follows this same Section, provided the existing sealer is sound and compatible; failed or incompatible film shall be removed before renewal.

**END OF SECTION 03 35 29**