

SECTION 09 67 26

URETHANE CEMENT FLOORING

DTI CureCrete System

PART 1 - GENERAL

1.1 SUMMARY

A. This Section covers trowel-applied and self-leveling urethane cement flooring using the DTI CureCrete Urethane Cement System, installed at one of the following thicknesses as scheduled:

1. Standard Duty - 3/16 inch: for commercial kitchens, food preparation areas, restrooms, locker rooms, and light to medium production areas subject to regular washdown.
2. Heavy Duty - 1/4 inch: for food and beverage processing areas, meat and dairy rooms, breweries, and production floors subject to hot washdown, impact, and heavy wheeled traffic.
3. Extreme Thermal Shock - 3/8 inch: for areas subject to steam cleaning, direct hot discharge, freezer-to-washdown temperature swings, and the most severe thermal cycling.

B. The work includes substrate preparation, moisture testing, optional moisture vapor barrier primer, installation of the DTI CureCrete body at the scheduled thickness, broadcast aggregate where specified, integral DTI CureCove cove base, grout and seal coats, and two coats of DTI Poly Guard polyaspartic topcoat where scheduled.

C. Urethane cement is a resinous flooring system and is related to the work of Section 09 67 23, Resinous Flooring. Where the Drawings designate the DTI CureCrete System, this Section governs.

1.2 REFERENCES

A. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

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

C. ASTM C579 - Standard Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes.

D. ASTM C307 - Standard Test Method for Tensile Strength of Chemical-Resistant Mortar, Grouts, and Monolithic Surfacing.

E. ANSI A326.3 - Test Method for Measuring Dynamic Coefficient of Friction of Hard Surface Flooring Materials.

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

1.3 DEFINITIONS

A. System Thickness: the total cured thickness of the urethane cement body, not including primer, cove, or topcoat, measured at the scheduled duty level.

B. Integral Cove: cove base formed from the same urethane cement material family as the floor body, installed monolithically with the floor, with a cove radius at the floor-to-wall transition, per 3.6.

C. Thermal Shock: rapid temperature change at the floor surface caused by hot washdown, steam, or discharge of heated liquids onto a cold floor, or cold liquid onto a heated floor.

1.4 SUBMITTALS

- A. Product data for the DTI CureCrete Urethane Cement System, including DTI CureCrete body, DTI CureCove, DTI VaporBlock moisture vapor barrier primer where scheduled, and DTI Poly Guard topcoat where scheduled.
- B. Installer qualifications: minimum five years of urethane cement and resinous flooring experience and a minimum of 15 completed urethane cement projects of similar size and use.
- C. Moisture test plan and results per 1.5 and 3.1.
- D. Drain survey and slope verification record per 1.5.
- E. Mock-up approval record (see 1.6).
- F. Maintenance instructions for the finished floor, including cleaning chemistry limitations.

1.5 QUALITY ASSURANCE

- A. Pre-installation conference with the Owner, General Contractor, and flooring contractor to confirm scheduled thickness, cove height, drain locations and elevations, slope responsibility, shutdown or phasing plan, ambient and substrate temperatures, and moisture test results before any material is ordered.
- B. Moisture testing: test the slab per ASTM F2170 (in-situ relative humidity) and ASTM F1869 (moisture vapor emission rate) at the frequency required by the system manufacturer. Where moisture vapor emission exceeds 3 lbs per 1,000 square feet per 24 hours, or in-situ relative humidity exceeds the system limit, install DTI VaporBlock moisture vapor barrier primer under 3.4 before placing the body. Do not proceed on test results supplied by others without verification.
- C. Drain survey: before installation, survey every floor drain, trench drain, and cleanout in the work area, recording rim elevations relative to the surrounding slab. Identify in writing any drain set above or below the plane required for drainage at the scheduled system thickness. Discrepancies are the responsibility of the party who set the drains; see 1.7.
- D. Temperature: substrate temperature shall be a minimum of 60 F and rising at the time of installation and shall remain within the system manufacturer's limits through initial cure. Ambient conditions shall be maintained so that the substrate stays at least 5 F above the dew point. Work on colder slabs shall not proceed; provide heating or reschedule.
- E. Coverage verification: before mobilization, verify material quantities against the scheduled area, thickness, and cove linear footage using the system manufacturer's published per-kit coverage at the scheduled thickness. Kit coverage at greater thicknesses is substantially lower than at thin builds; shortages caused by under-ordering against the scheduled thickness are the flooring contractor's responsibility to prevent by this verification.

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, including the scheduled thickness, broadcast and topcoat where scheduled, a section of integral cove, and one termination at a drain, threshold, or joint.
- B. The approved mock-up establishes the standard for texture, slip resistance, cove profile, color variation, 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. Slope to drain: this Section installs a substantially uniform-thickness system that follows the contours of

the existing slab. Slope to drain is by others unless expressly scheduled as part of this Section. Where the existing slab is flat, reversed, or pitched away from drains, the finished floor will drain the same way the slab drains; ponding caused by slab or drain elevation is not a defect of this work. Correction of slab slope, where scheduled, is performed before system installation and is verified at the drain survey under 1.5.

B. Existing overlays and coatings: existing toppings, overlays, and coatings of unknown bond are excluded from warranty until removed or proven bonded by testing. Hidden unbonded overlays discovered during preparation shall be removed; removal beyond the scheduled preparation is additional work.

C. Water during installation: the system cannot be installed over standing water, active leaks, or a slab being wetted by cooler sprayers, freezer melt, process discharge, or leaking piping. The Owner or General Contractor shall deliver the area dry and keep it dry through initial cure; see 3.1.

D. Concrete age and condition: new concrete shall cure a minimum of 28 days before installation. This Section does not include structural slab repair, joint rebuilding, or correction of slab cracking that is live or moving.

E. Color and texture variation: urethane cement is a trowel-finished cementitious system. Variation in color, trowel pattern, and broadcast density is inherent, increases with area and with phased work, and is not a defect. Phased areas installed on different days will show a visible transition at phase lines.

F. Chemical exposure: resistance is framed by exposure class in 2.1. Continuous immersion, concentrated oxidizers, and chemicals outside the submitted resistance data are excluded unless confirmed in writing.

PART 2 - PRODUCTS

2.1 MATERIALS AND PERFORMANCE REQUIREMENTS

A. System: DTI CureCrete Urethane Cement System, a seamless, water-based polyurethane cement flooring system consisting of primer where required, a trowel-applied or self-leveling urethane cement body, optional broadcast aggregate, grout and seal coats, and topcoat where scheduled, all from the same system family and fully compatible.

B. Body: DTI CureCrete, a three-component polyurethane cement mortar (resin, hardener, and graded cementitious aggregate filler) that cures by chemical reaction independent of slab dryness once placed within the moisture limits of 1.5, and that bonds tenaciously to properly prepared concrete.

1. Compressive strength: not less than 7,000 psi at 28 days when tested per ASTM C579.
2. Tensile strength: not less than 600 psi when tested per ASTM C307.
3. Bond strength: exceeds the tensile strength of the concrete substrate; failure in adhesion testing shall occur in the concrete, not at the bond line, on a properly prepared substrate.
4. Thermal shock resistance: the system at the 3/8 inch thickness shall withstand repeated thermal cycling across a service temperature range of minus 40 F to 248 F (minus 40 C to 120 C) without cracking, delamination, or loss of bond. At lesser thicknesses the service range narrows per the manufacturer's published data; the scheduled thickness shall be selected for the thermal exposure of the area.
5. Thermal compatibility: coefficient of thermal expansion similar to concrete, so the system expands and contracts with the slab rather than against it.
6. Chemical resistance: resistant, per the manufacturer's published resistance data, to the exposure classes typical of food and beverage facilities, including organic acids (lactic, acetic, and citric), sugars, animal fats and blood, alkaline sanitation chemicals and detergents at use dilution, and common solvents. Submit resistance data for the specific chemicals of the facility where scheduled.

7. Impact and abrasion: suitable for steel-wheeled and loaded pallet traffic at the Heavy Duty and Extreme thicknesses.

C. Cove material: DTI CureCove, a thixotropic urethane cement cove mortar from the same system family, formulated to hold a vertical face and a formed cove radius without slumping.

D. Moisture vapor barrier primer: DTI VaporBlock, a two-component epoxy moisture mitigation primer applied where required by 1.5, compatible with and approved by the system manufacturer as the primer under the DTI CureCrete body at the measured moisture condition.

E. Topcoat: DTI Poly Guard, a two-component polyaspartic topcoat providing UV stability, abrasion resistance, and a cleanable sealed surface. Where scheduled, apply in two coats. Polyaspartic topcoat is an option for light and color stability and cleanability; where not scheduled, the grout and seal coats of the system form the wearing surface.

F. Broadcast aggregate: kiln-dried silica sand or colored quartz aggregate, graded for broadcast into the wet body to refusal, providing texture and slip resistance per 2.2.

G. Joint sealant and backer: elastomeric sealant compatible with the system for use at terminations, drains, and moving joints per 3.7.

H. Repair material: additional DTI CureCrete and DTI CureCove material of the same batch family retained for patching and phase-line tie-ins.

2.2 SLIP RESISTANCE OPTIONS

A. The finished slip resistance is set by the broadcast and seal schedule and shall be selected at the mock-up for the use of each area:

1. Smooth seal: no broadcast, sealed surface for dry areas and corridors where wheeled traffic predominates. Lowest slip resistance of the options; not for wet production areas.
2. Light broadcast: fine aggregate broadcast, sealed, for commercial kitchens and washdown-adjacent areas.
3. Full broadcast to refusal: coarse aggregate broadcast into the wet body to refusal, grouted and sealed, for wet processing areas, cooler and freezer thresholds, and areas with fats and oils on the floor. Highest slip resistance and impact tolerance.

B. Verify performance per ANSI A326.3 where specified; the wet dynamic coefficient of friction target for wet areas is 0.42 or greater unless the Owner directs otherwise in writing.

2.3 EQUIPMENT

A. Mixing: forced-action or drum mixers dedicated to the system, with batch timing controlled so each mix is placed and finished within its working time. Do not re-temper, re-mix, or add water or resin beyond the manufacturer's batch design; soft or slow mixes result from batching errors and are cause for removal.

B. Application: hand trowels, pin rakes, gauge rakes, and spiked rollers sized to place the body at the scheduled thickness in a single lift.

C. Preparation equipment: shot blasters, diamond grinders, scarifiers as required by 3.2, with vacuum dust collection operating at HEPA filtration.

D. Temperature equipment: heaters, blankets, or cooling as required to hold the conditions of 1.5 and 3.3 for the full installation and initial cure period, including overnight.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify the slab is cured a minimum of 28 days and that moisture testing under 1.5 is complete and documented for the actual areas of work.
- B. Verify the area is dry and will remain dry: no standing water, no active leaks, cooler and freezer drainage controlled, process lines isolated, and washdown operations suspended in and above the work area. Do not start until the water sources are corrected; water reaching the slab during installation or initial cure causes bubbling, soft sections, and bond failure.
- C. Verify substrate temperature is a minimum of 60 F and rising, measured in the slab, not the air, at the coldest locations in the area including cooler and freezer thresholds.
- D. Perform the drain survey of 1.5 and confirm drain rim elevations against the scheduled system thickness in writing with the Owner or General Contractor before starting.
- E. Sound the slab and any existing overlay or coating for hollow and unbonded areas. Document existing cracks, spalls, patches, and defects photographically before starting. Defects not documented are presumed to have been caused by the work of this Section.

3.2 PREPARATION

- A. Remove existing coatings, toppings, mastics, curing compounds, oils, and unsound or unbonded material by mechanical means (shot blasting, diamond grinding, or scarifying) to sound concrete with the surface profile required by the system manufacturer, typically a heavy profile suitable for the scheduled thickness. Chemical stripping alone is not acceptable.
- B. Repair spalls and surface defects deeper than the scheduled system thickness with compatible repair material before body placement so the finished thickness is uniform.
- C. Cut keyways and termination slots at all free edges, thresholds, drains, and phase lines so the system terminates at full scheduled thickness, never feather-edged.
- D. Vacuum the prepared surface to dust-free condition and protect it from traffic, water, and contamination until priming. Re-clean any area wetted or contaminated after preparation.

3.3 ENVIRONMENTAL CONDITIONS

- A. Maintain substrate temperature at a minimum of 60 F from preparation through initial cure. Cold slabs slow and can stop the cure; provide supplemental heat in coolers, freezers, and unconditioned spaces as required, and verify cure by hardness before opening to traffic or recoating.
- B. Do not install during or immediately ahead of conditions that will wet the floor, including scheduled plant washdowns, defrost cycles discharging into the area, or uncorrected leaks.
- C. Control batch and material temperature per the manufacturer's limits; condition materials in the installation environment before use.

3.4 PRIMER AND MOISTURE VAPOR BARRIER

- A. Where moisture testing under 1.5 requires mitigation, apply DTI VaporBlock at the manufacturer's specified coverage for the measured condition, in the number of coats required, and allow it to cure within its recoat window before body placement.
- B. Where mitigation is not required, prime only as directed by the system manufacturer for the substrate condition; the urethane cement body is designed to bond to properly prepared concrete.
- C. Observe recoat windows strictly. If a primer or coat exceeds its recoat window, mechanically abrade and clean it before proceeding; missed recoat windows without abrasion are a known cause of intercoat

delamination.

3.5 BODY INSTALLATION

- A. Mix each batch exactly per the manufacturer's proportions and timing. Place, spread to the scheduled thickness, and finish in a continuous operation within the working time of the material. Discard batches that exceed working time; do not stretch coverage beyond the verified per-kit yield of 1.5 to gain area.
- B. Where broadcast is scheduled, broadcast aggregate into the wet body to refusal at the specified gradation, allow initial cure, then sweep and vacuum all loose aggregate before grout or seal coats.
- C. Apply grout coat and seal coat per the system build-up to lock in the broadcast, fill the texture to the approved mock-up standard, and produce a cleanable surface.
- D. Phase lines: where work is phased, terminate each phase at a keyway cut per 3.2, protect the edge, and tie in the next phase per the manufacturer's procedure. Expect a visible transition at phase lines per 1.7.
- E. Phased installation in operating plants: sequence the work so the facility retains access routes and production capacity agreed at the pre-installation conference. Each phase is a complete cycle of preparation, body, cove, and coats for its area, including cure time under 3.9 before that area returns to service. Protect adjacent operating areas from dust, odor, and traffic for the duration of each phase.

3.6 INTEGRAL COVE BASE

- A. Install DTI CureCove integral cove base monolithically with the floor body at all walls, curbs, columns, and equipment pads in the work area, at a height of 4 inches minimum and 6 inches where scheduled, with a formed radius (typically 3/4 inch to 1 inch) at the floor-to-wall transition and a finished top edge termination.
- B. Cove height shall be confirmed at the pre-installation conference against wall conditions: where wall panels, FRP, or sheet goods terminate above the floor, the cove top edge shall meet a sound, sealed termination. Gaps behind wall panels admit water behind the system; seal or correct them before cove installation.
- C. Form cove before or with the body per the system sequence so floor and cove cure as one piece with no cold joint at the radius, the point of highest water exposure.
- D. At doorways and area limits, terminate cove per the Drawings and the approved mock-up.

3.7 TERMINATIONS, DRAINS, AND JOINTS

- A. Drains: finish the system to the drain rim at the surveyed elevation, keyed into the termination slot per 3.2, so the floor-to-drain transition is at full thickness and sealed. Do not build up material to create fall toward a drain unless slope correction is scheduled under 1.7.
- B. Thresholds and free edges: terminate at keyways at full thickness; install metal or sealant termination details where scheduled.
- C. Joints: saw-cut and re-establish working control and expansion joints through the system after cure and fill with compatible elastomeric sealant. Honor all moving joints; do not bridge them with the rigid body. Non-moving cracks may be treated with the body where the manufacturer permits.
- D. Penetrations and equipment feet: key and seal around all penetrations, posts, and equipment legs so no unsealed edge remains in wet areas.

3.8 TOPCOAT

- A. Where DTI Poly Guard is scheduled, apply two coats at the manufacturer's coverage rate after the seal coat has cured within its recoat window, abrading and cleaning between coats if the window is exceeded.

B. Maintain the temperature and dryness conditions of 3.3 through topcoat cure; topcoat applied to a cold or damp surface will not cure to full hardness or gloss.

3.9 CURING AND OPENING TO SERVICE

A. Cure times at 60 F to 75 F substrate temperature, to be extended at lower temperatures and verified by hardness:

1. Foot traffic: approximately 12 hours after placement.
2. Light wheeled traffic and equipment reset: 24 to 48 hours as directed by the manufacturer.
3. Full service, including washdown, chemical exposure, and thermal shock: full cure at approximately 4 to 5 days. Do not subject the floor to hot washdown, steam, or process discharge before full cure; early thermal shock can crack or debond a green system.

B. In phased work, no area returns to service before its own cure schedule is met, regardless of the state of adjacent phases.

C. Protect the curing floor from water, traffic, and contamination; barricade phase areas until released.

3.10 FIELD QUALITY CONTROL

A. Thickness: verify wet thickness during placement by gauge at a minimum of one location per 500 square feet and confirm the scheduled duty thickness is achieved, including at cove and drain terminations.

B. Compare texture, broadcast density, cove profile, and topcoat finish against the approved mock-up. Areas visibly below the mock-up standard shall be corrected.

C. Bond verification: perform pull-off or sounding checks where directed. Hollow areas shall be removed and patched per 3.11.

D. Drainage check: after full cure, flood-test or hose-test drainage at each drain where directed and record any ponding against the drain survey of 1.5. Ponding attributable to slab or drain elevation is documented under 1.7 and is not a workmanship defect.

3.11 PROTECTION, REPAIR, AND TURNOVER

A. Repairs and patches, where required, shall be cut back to sound, bonded material at full thickness with keyed edges, and refinished to match the surrounding texture as closely as the system permits; patches will remain visible as a difference in batch and texture.

B. Protect the finished floor from other trades, construction traffic, and staining materials until turnover.

C. Turnover cleaning: wash with a neutral or alkaline cleaner compatible with the system per the manufacturer's maintenance instructions. Do not use acid cleaners or unapproved solvents on the finished floor.

D. Deliver maintenance instructions: cleaning chemistry and dilution, squeegee and drainage practice, recoat and topcoat renewal intervals based on traffic, and the requirement to report drain, cove, and joint damage promptly, as these are the points where water first attacks the system.

END OF SECTION 09 67 26