
Oakhurst Dairy – New Milk Cooler**SECTION 09671 - RESINOUS FLOORING****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
1. General-use epoxy-resin flooring.
- B. Related Sections include the following:
1. Division 3 Section "Cast-in-Place Concrete" for concrete substrates to receive resinous flooring.

1.3 QUALITY ASSURANCE

- A. Acceptance Sample:
1. A minimum one-foot square acceptance sample of the specified flooring system shall be prepared by the manufacturer's representative and submitted to the Owner prior to the bidding phase of the project. All bidders shall inspect the "acceptance sample" before submitting their bids. No contractor that has not seen his sample shall submit a bid.
 2. The installed flooring system shall duplicate the acceptance sample in thicknesses of each respective film layer, color, texture and degree of overall appearance and finish.
- B. The finished floor coating system shall be uniform in color, texture and appearance. All edges that terminate at walls, floor discontinuities, and other embedded items shall be sharp, uniform, and cosmetically acceptable with no thick or ragged edge. The Contractor shall work out an acceptable masking technique to ensure the acceptable finish of all edges.
- C. Surface preparation efforts shall be confirmed by conducting "bond tests" on prepared surfaces as specified by Paragraph 3.1. Consult with material manufacturer for specific procedure.
- D. Reference Standards
1. ACI 308 - Standard Practice for Curing Concrete
 2. ACI 302.1R-80 - Guide for Concrete Floor and Slab Construction
 3. United States Department of Agriculture Acceptance
- E. Contractor:
1. Knowles Industrial Services Corporation
295 New Portland Road
Gorham, ME 04038
(207) 854-1900

1.4 SUBMITTALS

- A. Acceptance Sample: The acceptance sample shall be a one foot square sample of the Degadur flooring system applied to hardboard or similar backing for rigidity and handling.

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- B. Manufacturer's Literature: Descriptive data and specific recommendations for initiating, mixing, application, and curing.
- C. Manufacturer's Material Safety Data Sheets (MSDS) for each respective product being used.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. All materials shall be delivered in original manufacturer's sealed containers, with all pertinent labels intact and legible.
- B. Store materials in protected area at a temperature between 35°F and 80°F.
- C. Follow all manufacturer's specific instructions and prudent safety practices for storage and handling.

1.6 JOB CONDITIONS

- A. The material, air and surface temperatures shall be in the range of 35°F to 85°F during application and cure.
- B. The relative humidity in the specific location of the application shall be less than 85 percent and the surface temperature shall be at least 5°F above the dew point.
- C. The surfaces to be coated shall have been prepared as specified in Section 3.2 "SURFACE PREPARATION".
- D. Protect all adjacent surfaces not to be coated with masking and covers.

PART 2 – PRODUCTS**2.1 APPROVED MANUFACTURER**

- A. Degadur North America, Inc., 173 Interstate Lane, Waterbury, CT 06705; (800) 477-4545. Distributed by Righter Corporation, 11 Upton Drive, Wilmington, MA 01887; (978) 988-0100 - is listed as a level of quality.

2.2 APPROVED MATERIALS

- A. Methyl Methacrylate Acrylic Quartz Flooring System with Microban®:
 - 1. Saturating Prime Coat: Degadur R41/I Component 100% Solids Low Viscosity Primer/Sealer
 - 2. Flash/Coat: Degadur R17 R.C. 100% Solids MMA Polymer Concrete
 - 3. Intermediate Coat: Degadur R61 SL MMA 100% Solids Self -Leveling Pigmented with Quartz Broadcast
 - 4. Topcoat: Degadur R71 with Microban® MMA 100% Solids Colorless Topcoat/Sealer. X2

2.3 PRODUCT REQUIREMENTS

- A. Degadur R41/I Low Viscosity Primer Topcoat Performance Criteria:
 - 1. Percentage Reactive Resin - 100%
 - 2. Water Absorption, ASTM D570, Wt. % less than 0.06
 - 3. Tensile Strength, ASTM D638, psi – 3,660
 - 4. Tensile Modulus, ASTM D638, psi – 2.1
 - 5. Coefficient of Thermal Expansion, ASTM D696, in./in./F-.000035
 - 6. Electrical Resistivity, ASTM D257
 - Volume Resistance, ohm-cm - 10₁₅
 - Surface Resistance, ohm - 10₁₂

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7. Water Vapor Transmission, DIN 53122, g/cm-hr-mm
Hg x 10⁻⁹ - 1.4
8. Chemical Resistance, ASTM D543
 - effect of weak acids - none
 - effect of strong acids - slight
 - effect of alkalies - none
 - effect of salt solutions - none
 - effect of gasoline, oil, grease - none
 - effect of sunlight, UV - none
9. Pot Life @ 68 °F, minutes - 10-15
10. Cure Time @ 68 °F, minutes - 30-45
11. Recoat Time @ 68 °F, minutes - 30-45
12. Multi-coat applications shall achieve a “solution-weld” chemical bond between each coat for a monolithic film characteristic.

B. R17 P.C. Requirements

1. Percent Reactive Resin - 100%
2. Water Absorption, ASTM 570, Wt. % - 0.02
3. Tensile Strength, ASTM D638-1,200
4. Coefficient of Thermal Expansion, ASTM 531 – 18
5. Compressive Modules (PSI X 10⁶), ASTM 469 – 1.2
6. Compressive Strength, ASTM C109-9000
7. Flexural Strength, ASTM 790-2800
8. Abrasion Resistance (Grams), ASTM 501-3.5
9. Pot Life – 10-15 minutes
10. Cure Time – 45 minutes

C. Degadur R61 Self -Leveling Resin System Performance Criteria:

1. Percent Reactive Resin - 100%
2. Water Absorption, ASTM D570, Wt. % - 0.04
3. Tensile Strength, ASTM D638, psi – 1,450
4. Tensile Modulus, ASTM D638, psi – 4.4x10⁴
5. Coefficient of Thermal Expansion, ASTM D696, in./in./F - 3.9
6. Electrical Resistivity, ASTM D257

Volume Resistance, ohm-cm - 10₁₅

Surface Resistance, ohm - 10₁₂

7. Water Vapor Transmission, DIN 53122, g/cm-hr/mm
Hg x 10⁻⁹ 1.43
8. Chemical Resistance, ASTM D543
 - effect of weak acids - none
 - effect of strong acids - slight
 - effect of alkalies - none
 - effect of salt solutions - none
 - effect of gasoline, oil, grease - none
 - effect of sunlight, UV - none
9. Pot Life @ 68 degrees F, minutes - 10-15
10. Cure Time @ 68 degrees, minutes - 30-45
11. Recoat Time @ 68 degrees F, minutes - 30-45

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12. Multi-coat applications shall achieve a “solution-weld” chemical bond between each coat for a monolithic film characteristic.

D. Degadur R71 with Microban® Colorless Topcoat Performance Criteria:

1. Percent Reactive Resin - 100%
2. Water Absorption, ASTM D570, Wt. % - 0.05
3. Tensile Strength, ASTM D638, psi – 3555
4. Tensile Modulus, ASTM D638, psi - 210,000
5. Coefficient of Thermal Expansion, ASTM D696, in./in./F - .000035
6. Electrical Resistivity, ASTM D257
7. Water Vapor Transmission, DIN 53122, g/cm-hr-mm
Hg x 10⁻⁹ -1.4
8. Chemical Resistance, ASTM D543.

Effect of weak acids	-	none
effect of strong acids	-	slight
effect of alkalies	-	none
effect of salt solutions	-	none
effect of gasoline, oil, grease	-	none
effect of sunlight, UV	-	none
9. Pot Life @ 68, F, minutes - 10-15
10. Cure Time @ 68, F, minutes - 30-45
11. Recoat time @ 68F, minutes - 30-45
12. Multi coat applications shall achieve a “solution-weld” chemical bond between each coat for a monolithic film characteristic.

2.4 MATERIAL PREPARATION

- A. Initiate and mix all material in strict accordance with the manufacturer’s specific instructions and procedures for the respective material being used.
- B. Pot life and cure times are very short; initiate and mix only enough product to satisfy immediate application requirements.

PART 3 - EXECUTION**3.1 PREWORK INSPECTION**

- A. Examine all surfaces to be coated with these materials and report any conditions that adversely affect the appearance or performance of the coating systems and which cannot be put into acceptable condition by the preparatory work specified in Paragraph 3.2.
- B. Do not proceed with surface preparation and application until the surface is acceptable.
- C. Ensure that floor drains, proximate equipment and any other items sensitive to dust and contamination are properly and adequately masked and protected.

3.2 SURFACE PREPARATION

- A. General:
 1. Initially, dislodge dirt, mortar spatter and other dry surface accumulations and contamination by scraping or brushing, sweeping, vacuuming or compressed air blow-down.
 2. Surfaces that are heavily contaminated with petroleum or other process products shall be cleaned with the appropriate degreaser, detergent or other effective cleaner/surfactant followed by thoroughly rinsing with fresh water to remove the

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accumulation prior to mechanical cleaning efforts. Mechanical cleaning will not remove such deposits, but only drive them deeper.

3. All concrete floor surfaces shall be visibly dry, especially in cracks and other deep surface discontinuities, prior to commencing mechanical cleaning and preparation.
4. All prior coatings to concrete are to be removed by mechanical means, i.e.: grind, chip or scarify. Chemical strippers are not to be permitted.

B. Mechanical Surface Preparation and Cleaning:

1. All accessible concrete floor surfaces shall be mechanically cleaned using a "Blast-Trac" method or approved equivalent. All surface and embedded accumulations of paint, toppings, hardened concrete layers, laitance, power trowel finishes and other similar surface characteristics shall be removed leaving a bare concrete surface having a minimum profile of 30 mils and exposing the upper facades of concrete aggregate.
2. Floor areas that are inaccessible to the cleaning machine shall be mechanically abraded to the same specified degree of cleanliness, soundness and profile using vertical disc scarifiers, starwheel scarifiers, grinders, needle guns or other suitably effective equipment.
3. Cracks in the floor 3/16" and smaller, shall be routed out to a minimum of 1/2" V-groove of sound concrete and filled with R68 Flexible Resin System. Cracks in the floor 3/16" and wider, shall be routed out to a minimum 3/4" deep V-groove of sound concrete and filled with R17 polymer mortar. Other significant surface discontinuities such as holes, pits, depressions and exposed aggregate areas (from chemical attack or erosion) shall be filled with similar material as recommended by the MMA material manufacturer to within 1/8" of surrounding grade level.
4. Allow the surface to dry or force dry with heat and circulating air to ensure that all surfaces, especially discontinuities, are visibly dry.
5. Conduct bond tests on a representative sampling of surface areas and surface characteristics, especially those areas that had penetrating accumulations of petroleum products or other chemical contamination. Successful bond tests indicate proper and adequate cleanliness, soundness, profile and dryness. If bond test do not break 100% concrete, repeat surface preparation efforts until successful bond tests have been achieved. Consult with manufacturer if problems persist. Do not apply floor coating system over concrete surfaces where bond tests have failed.

3.3 APPLICATION**A. Floor**

1. This application shall consist of applying the Primer/Intermediate/Sealer, allowing time for cure, and then applying the topcoats in the sequence and film thicknesses as specified herein below and in Paragraph 3.6.
2. Open only the containers of components to be used in each specific application. Refer to manufacturer's data sheets for pot life/temperature relationship to determine size of batches to mix.
3. Measure, add and mix the initiator into the resin in the proportions recommended by the material manufacturer.
4. Pour the mixture onto the floor surface and roll the material out to form a uniform, continuous film, ensuring that all crevices, cracks and other surface discontinuities have been saturated and coated. Do not leave any "puddles" roll out all such accumulations. Work quickly, but deliberately; the pot-life is short.
5. Allow the primer/sealer coat to cure.

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6. Flash/Coat use R17 P.C. can be extended with washed, dried, rounded stone. Apply at desired depth necessary, minimum depth to be 1/4". All polymer concrete must be reprimed.
7. Size the batches, open, mix and apply the Intermediate SL Coat with Pigment and Broadcast Color Quartz to 100% of the surface, ensuring formation of a continuous, uniform film in the thickness as specified below in Paragraph 3.6.
8. After Quartz has been applied and coating cured, sweep and vacuum excess quartz.
9. After full cure of flooring, apply two flood coats of colorless topcoat at 100 sq. ft. per gallon.

3.4 INSPECTION

- A. Request acceptance of the prime/sealer coat before application of the topcoat commences.
- B. All work that is not acceptable to the Architect, Engineer or Owner must be corrected before consideration of final acceptance.

3.5 CLEAN-UP

- A. Remove any material spatters and other material that is not where it should be. Remove masking and covers, taking care not to contaminate surrounding area.
- B. Repair any damage that should arise from either the application effort or from the clean-up effort.

3.6 COATING SCHEDULE

- A. Primer/Sealer Coat: R41/I 100% Solids MMA Low Viscosity
Primer/Sealer - Saturation at 100 sq. ft. per gallon.
- B. Flash/Coat: MMA R17 P.C. minimum depth 1/4"
- C. Intermediate Coat: R61 MMA Self Leveling pigmented 1/8" with Acrylic Quartz 100% of surface covered.
- D. Topcoat: R71 with Microban® MMA Colorless Topcoat/Sealer at 100 sq. ft. per gallon x 2.

END OF SECTION 09671