General

## Summary

### Provide labour, materials, tools and equipment required to install complete resinous flooring system specified in this Section including surface preparation.

## RELATED requirements

### [Section 03 01 00 - Concrete Rehabilitation.]

### [Section 03 31 00 - Structural Concrete] [Section 03 33 00 - Cast-in-Place Concrete].

### [Section 03 35 00 - Concrete Finishing.]

### [Section 03 39 00 - Concrete Curing.]

### [Section 09 05 58 – Mechanical Preparation of Flooring Substrates]

## abbreviations and acronyms

### w.f.t.: Wet film thickness.

## REFERENCE Standards

### American Society for Testing and Materials ([ASTM](http://www.astm.org/))

### ASTM C579-01 (2012), Standard Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes.

### ASTM C580-02 (2012), Standard Test Method for Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing’s, and Polymer Concretes.

### ASTM D570-98 (2010) Standard Test Method for Water Absorption of Plastics.

### ASTM D635-10, Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.

### ASTM D638-10, Standard Test Method for Tensile Properties of Plastics.

#### ASTM D 695-10 Standard Test Method for Compressive Properties of Rigid Plastics.

### ASTM D2240- 05 (2010), Standard Test Method for Rubber Property -Durometer Hardness.

### ASTM D2369-10e1, Standard Test Method for Volatile Content of Coatings.

### ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.

### ASTM D4060-10, Standard Test Method for Abrasion Resistance of Organic Coatings by Taber Abraser.

### ASTM D4541-09e1, Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.

### ASTM F2170-11 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.

### ASTM F2659-10, Standard Guide for Preliminary Evaluation of Comparative Moisture Condition of Concrete, Gypsum Cement and Other Floor Slabs and Screeds Using a Non-Destructive Electronic Moisture Meter.

#### ASTM G21-13, Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.

### Canadian Standards Association ([CSA](http://www.csa.ca/))

### CSA A23.1-14/A23.2-14 Concrete Materials and Methods of Concrete Construction / Test Methods and Standard Practices for Concrete.

### International Concrete Repair Institute (IRCI)

#### ICRI Guideline No. 310.2R-2013, Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings and Polymer Overlays.

### Underwriters Laboratories of Canada (CAN/ULC)

#### CAN/ULC S102-10, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

## administrative requirements

### Pre-application Meeting:

#### Convene a pre-application meeting two (2) weeks before commencing the Work of this Section in accordance with [Section 01 31 19 – Project Meetings] [\_\_\_\_\_\_\_\_]. Require attendance of parties directly affecting Work of this Section, including Owner, Contractor, Consultant, Applicator, Manufacturer's technical representative and other Subcontractors affected by the Work of this Section to review the following:

##### Surface preparation.

##### Priming.

##### Application.

##### Curing and protection.

##### Coordination with other Work.

## SUBMITTALS

### Make Submittals in accordance with Section [01 33 00 - Submittal Procedures] [\_\_\_\_\_\_\_\_].

### Product Data: Submit manufacturer's Product data, including physical properties and appearance options including: standard colours, variable surface textures and surface sheen.

### MSDS: Submit Manufacturer’s Safety Data Sheet for each Product being used.

### Samples for Initial Selection: Submit manufacturer's colour charts showing the full range of colours available for each type of finish coat material indicated for Consultant’s initial selection.

### Samples for Verification: Submit samples of each colour and material being applied, with texture to simulate actual conditions, on representative samples of the actual substrate and as follows for Consultant’s verification:

#### Use representative colours when preparing samples for review; resubmit until required sheen, colour, and texture are achieved.

#### List of material and application for each coat of each sample; label each sample for location and application.

#### Submit samples on the following substrates for Consultant's review of colour and texture:

##### Hardboard: Provide two (2) 100 mm square samples for each colour and finish.

**SPECIFIER’S NOTE**: delete optional text in the following sentence if Mock-Up is required in 1.8.3 below.

#### Obtain written acceptance of Samples in writing from the Consultant before commencing Work of this Section. [Accepted Samples shall be the final standard of acceptance of the finish.]

## closeout submittals

### Make Closeout Submittals in accordance with Section [01 78 00 – Closeout Submittals] [01 78 23 – Operation and Maintenance Data] [\_\_\_\_\_\_\_\_].

### Operations and Maintenance Data: Submit manufacturer's printed maintenance instructions for repair, cleaning and maintenance procedures; include name of original installer and contact information.

## QUALITY ASSURANCE

### Manufacturer Qualifications:

#### Manufacturer shall be certified under ISO 9001. All liquid materials, including primers, resins, curing agents, finish coats, and sealants are manufactured and tested under an ISO 9001 registered quality system.

### Applicator Qualifications:

#### Applicators: Use experienced applicators having a record of successful in-service resinous flooring system applications similar in material and extent to those specified in this Section and as follows:

##### Applicators must have completed flooring manufacturer’s training program for Products specified.

##### Applicators must be licensed, certified or approved in writing by the flooring manufacturer for the Products specified.

#### Applicator Experience: Minimum 5 years’ experience in the application of the type of system specified. Applicator shall submit a list of five (5) projects of similar size, scope and complexity.

### Mock-Up:

#### Construct one 10 sq.m. (100 sq.ft.) mock-up of each type and colour of resinous flooring in location acceptable to Consultant to demonstrate quality of finished system, complying with manufacturer's installation instructions and requirements of this Section [in accordance with Section 01 45 00 – Quality Control].

#### Arrange for Consultant’s review and acceptance, obtain written acceptance before proceeding with Work.

#### Upon acceptance, mock-up shall serve as a minimum standard of quality for the balance of the Work of this Section. Mock-up shall be left in place for the duration of the Work.

## DELIVERY, STORAGE AND HANDLING

### Delivery:

#### Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name, manufacturer, batch or lot number and date of manufacture.

#### Material should be delivered to job site and checked for completeness and shipping damage prior to job start.

### Storage:

#### Store materials in accordance with manufacturer’s written instructions.

#### Keep containers sealed until ready for use. Material should be stored in a dry, enclosed, protected area from the elements.

#### Do not subject material to excessive heat or freezing.

#### Shelf life: Established based on manufacturer’s written recommendation for each material being used.

### Handling:

#### Protect materials during handling and application to prevent damage or contamination.

#### Condition materials for use accordingly to manufacturer’s written instructions prior to application.

#### Record material lot numbers and quantities delivered to jobsite/storage.

## SITE CONDITIONS

### Do not install the Work of this Section outside of the following environmental ranges without Manufacturers’ written acceptance:

**SPECIFIER’S NOTE:** Dew Point: Beware of condensation! The substrate must be at least 3˚C (5˚F) above the measured Dew Point to reduce the risk of condensation, which may lead to adhesion failure or “blushing” on the floor finish. Be aware that the substrate temperature may be lower than the ambient temperature.

#### Material Temperature: Precondition material for at least 24 hours between 18°C and 30°C (65°F and 86°F).

#### Ambient and Substrate Temperature: Minimum/Maximum 10˚/30˚C (50˚/86˚F).

#### Substrate temperature must be at least 3˚C (5˚F) above measured Dew Point.

#### Mixing and Application attempted at Material, Ambient and/or Substrate Temperature conditions less than 18˚C (65˚F) will result in a decrease in Product workability and slower cure rates.

#### Relative Ambient Humidity: maximum ambient humidity 85% (during application and curing).

#### Measure and confirm acceptable test results for Ambient Relative Humidity, Ambient and Surface Temperature and Dew Point.

### Substrate Moisture:

#### Moisture content of concrete substrate must be ≤ 4% by mass as measured with a Tramex® CME/CMExpert type concrete moisture meter.

#### Additionally, internal concrete relative humidity tests may be conducted as per ASTM F2170 and values must be ≤ 85%.

#### If moisture content of concrete substrate is higher than 4% by mass and / or if relative humidity test results exceed readings of 85% RH, Consultant will instruct on addition of moisture mitigation systems or moisture tolerant primers.

### Supply temporary utilities, including power, water, temporary ventilation and lighting for use by applicator.

### Maintain constant ambient room temperature for 48 hours before, during and after installation or until cured. Minimum temperature of 10°C (50°F) and maximum temperature of 30°C (85°F). Do not apply Product while ambient and substrate temperatures are rising.

### Erect suitable barriers and post legible signs at points of entry to prevent traffic and trades from entering the work area during application and curing period of the floor.

### Ensure adequate ventilation and air flow.

## WARRANTY

### Submit Warranty information in accordance with Section [01 77 00 – Closeout Procedures] [\_\_\_\_\_\_\_\_].

### Submit Applicator’s written warranty, signed and issued in the name of Owner warranting the Work of this Section against defects in materials and workmanship for a period of one (1) year from the date of Substantial Performance of the Work.

# Products

## MANUFACTURER

### Basis-of-Design Manufacturer: Sika Canada Inc. 601 Delmar Avenue, Pointe-Claire, Quebec, H9R 4A9 Phone (514) 697-2610, Fax (514) 697-3087 <http://www.sika.ca>.

### Substitutions: Consultant may consider additional manufacturers having similar Products to Basis-of-Design Manufacturer listed above during the construction period, provided they meet the performance and aesthetic requirements established by the named Products. Submit requests for substitution in accordance with [Section 01 25 00 – Substitution Procedures] [\_\_\_\_\_\_\_\_] before starting any Work of this Section:

## SYSTEM

### Resinous Flooring System: heavy-duty trowel applied epoxy underlayment and double broadcast and sealed decorative epoxy floor, composed of multi-coloured quartz aggregates finished with transparent top coats and as follows:

#### Compressive Strength: 91 MPa (13,198 psi) at 28 days in accordance with ASTM C579.

#### Flexural Strength: 28 MPa (4,061 psi) at 28 days in accordance with ASTM C580.

#### Hardness: 85 Shore D at 7 days in accordance with ASTM D2240.

#### VOC Content: ≤ 25 g/L in accordance with ASTM D2369.

#### Pull-off Strength: > 2 MPa (>290 psi) with substrate failure in accordance with ASTM D4541.

#### Flammability: Self-extinguishing in accordance with ASTM D635.

#### System Thickness: minimum 5 mm

#### Basis-of-Design System: Sika Canada Inc., Sikafloor® Quartzite® HDB System.

## componentS

### Primer, Mortar and Broadcast Coats: two component, clear, high solids, low odour, low VOC, high gloss epoxy finish:

#### Applied Thickness:

##### Prime Coat: 254 µm (10 mils) w.f.t.

##### Mortar: 3 mm (1/8”)

##### 1st Broadcast Coat: 381 µm (15 mils) w.f.t.

##### 2nd Broadcast Coat: 508 µm (20 mils) w.f.t.

#### Compressive Strength: 41 MPa (5,946 psi) in accordance with ASTM D695.

#### Tensile Strength: 36 MPa (5,221 psi) in accordance with ASTM D638.

#### Pull-off Strength: > 1.7 MPa (246 psi) (substrate failure)in accordance with ASTM D4541.

#### Hardness: 83 Shore D in accordance with ASTM D2240.

#### VOC Content: 20 g/L in accordance with ASTM D2369.

#### Basis-of-Design Product: Sika Canada Inc., Sikafloor® 156.

### High Strength Trowel Mortar Aggregate: in clear epoxy resin matrix.

#### Basis-of-Design Product: Sika Canada Inc., Sika® Aggregate PT

### Decorative Broadcast Quartz Aggregates: finished with transparent top coats.

#### Basis-of-Design Product: Sika Canada Inc., Sikafloor® Broadcast Quartz Aggregate.

**SPECIFIER’S NOTE**: Final surface texture and glossy appearance of the finished floor is highly dependent upon the specified application rate of the Sikafloor 2002 top coat. Application at 10 mils will produce a medium texture with good gloss; application at 20 mils will produce a fine texture with high gloss appearance.

### Top Coat: two component, high solids, low odour, low VOC, high strength, high gloss, clear epoxy resin formulated for improved resistance to clarity change over time:

#### Applied Thickness: [254 µm (10 mils)] [508 µm (20 mils)] w.f.t.

#### Compressive Strength: 70 MPa (10,521 p.s.i.) in accordance with ASTM C579.

#### Tensile Strength: 28 MPa (4,061 p.s.i.) in accordance with ASTM D638.

#### Flexural Strength: 83 MPa (12,038 p.s.i.) in accordance with ASTM C580.

#### VOC Content: ≤ 25 g/L in accordance with ASTM D2369.

#### Modulus of Elasticity: 1,287 MPa (186,663 p.s.i.) In accordance with ASTM C580.

#### Elongation: 4% in accordance with ASTM D638.

#### Hardness: 85 Shore D in accordance with ASTM D2240.

#### Resistance to Mold Growth: Rated 0 (no growth) in accordance with ASTM D3273.

#### Resistance to Fungi Growth: Rated 10 (highest resistance) in accordance with ASTM G21.

#### Flammability: Self-extinguishing in accordance with ASTM D635.

#### Basis-of-Design Product: Sika Canada Inc., Sikafloor® 2002

**SPECIFIER’S NOTE: (DELETE IF NOT SELECTED/REQUIRED)** Optional Top Coats listed below are suggested for this type of system. These are not the only optional top coats that can be used. Sika offers a wide range of UV-resistant, chemical resistant and various gloss level options for additional Top Coats. Contact your local Sikafloor Representative for additional information.

### [Matte Finish Top Coat: two component, low odour, VOC compliant, water-borne, non-yellowing acrylic-aliphatic polyurethane matte-finish top coat:

#### VOC Content: ≤ 70 g/L in accordance with ASTM D2369.

#### Abrasion Resistance: 0.067 g in accordance with ASTM D4060 (CS17/1000cycles/1000g).

#### Basis-of-Design Product: Sika Canada Inc., Sikafloor® 317.]

### [Semi-Gloss Top Coat: two component, low odour, VOC compliant, water-borne, non-yellowing acrylic-aliphatic polyurethane semi-gloss-finish top coat:

#### VOC Content: ≤ 35 g/L in accordance with ASTM D2369.

#### Abrasion Resistance: 0.073 g in accordance with ASTM D4060 (CS17/1000cycles/1000g).

#### Basis-of-Design Product: Sika Canada Inc., Sikafloor® 318.]

### [Chemical-Resistant Top Coat: two-component, clear, ultra violet light-resistant, non-yellowing, smooth aliphatic urethane top coat:

#### VOC Content: ≤ 240 g/L in accordance with ASTM D2369.

#### Abrasion Resistance: 0.082g loss in accordance with ASTM D4060 (CS17/1000cycles/1000g).

#### Pull-off Strength: >5.8 MPa (>840 p.s.i) in accordance with ASTM D4541.

#### Flame Spread Rating: 5 in accordance with CAN/ULC S102.

#### Smoke Developed Rating: 94 in accordance with CAN/ULC S102.

#### Basis-of-Design Product: Sika Canada Inc., Sikafloor® Duochem 942.]

## accessories

### Provide all cleaning agents, cleaning cloths, sanding materials, and clean-up materials required per manufacturer’s specifications.

# Execution

## EXAMINATION

### Examine surfaces to receive flooring system. Submit Notice in Writing to Consultant, Contractor, and Owner if surfaces are not acceptable. Do not begin surface preparation or application until unacceptable conditions have been corrected. Do not apply flooring system to substrate treatments for moisture, repair, or levelling not of the same manufacturer.

### Surface must be clean, sound and dry.

### Pre-Installation Testing:

#### Substrate moisture:

##### Measure and confirm acceptable conditions for Substrate Moisture Content, Ambient Relative Humidity, Ambient and Surface Temperature and Dew Point.

##### Confirm and record above values at least once every 3 hours during installation or more frequently whenever conditions change (e.g. Ambient Temperature rise/fall, Relative Humidity increase/decrease, etc.).

#### Concrete substrate to have a minimum compressive strength of 25 MPa (3,625 psi) at 28 days and a minimum of 1.5 MPa (218 psi) in tension at time of application.

### Ensure concrete substrate conforms to the minimum requirements of the flooring manufacturer.

### Do not apply flooring system to sand-cement setting beds. Remove sand-cement beds to structural concrete substrate. Re-level/slope as required to achieve grade and/or drainage in accordance with manufacturer’s minimum requirements.

### Do not apply flooring system to asphaltic or bitumen membranes, soft wood, aluminum, copper or fiberglass reinforced polyester/vinyl ester composites.

### Apply to glazed or vitrified brick and tile, structural wood, and steel only with manufacturer’s written recommendation for proper surface preparation.

## SURFACE PREPARATION

### Prepare surface to receive flooring systems in accordance with manufacturer's written instructions.

### Remove dirt, oil, grease, wax, laitance, curing compounds, water-soluble concrete hardeners, and other surface contaminants.

### Remove sealers, finishes, and paints.

### All projections, rough spots, etc. should be removed and patched to achieve a level surface prior to the application.

### Remove unsound concrete by appropriate mechanical means.

### Concrete: Clean and prepare to achieve laitance-free and contaminant-free, open textured surface by shot blasting or equivalent mechanical means. Provide CSP level in accordance with ICRI Guideline No. 310-2R and manufacturer’s written recommendation.

### Chemical Surface Preparation: Chemical surface preparation (acid etching) is unacceptable and will void manufacturer’s warranty.

### Control Joints and Cracks: Repair and treat control joints and surface cracks utilizing manufacturer’s standard materials and installation details.

## APPLICATION

### Mix and apply material in accordance with manufacturer’s written installation instructions and procedures. Apply to manufacturer’s recommended coverage rates unless thicker coverage is specified in this Section.

### Follow manufacturer’s written recommendations on terminations and connections to walls, drains, doorways, columns and floor-to-floor transitions.

### Do not apply while ambient and substrate temperatures are rising.

### Apply resinous flooring with care to ensure that no laps, voids, or other marks or irregularities are visible. Apply to achieve appearance of uniform colour, sheen and texture; all within limitations of materials and areas concerned.

### Match colours and textures of Consultant accepted samples.

**SPECIFIER’S NOTE: (DELETE IF NOT SELECTED/REQUIRED)** Cove base height is normally 100 to 150 mm (4 to 6 in.) installed at a vertical thickness of 3 mm (1/8 in.). The most common radius is 25mm (1 in.); other common sizes available include 38 mm (1.5 in.) or 50 mm (2 in.). Base bead top strips are used as an optional levelling stop on the top of the epoxy cove base assembly. Cove bases can also be terminated flush with the wall into a preformed or cut groove. Contact your local Sikafloor Representative for additional information.

### [Install cove base [100 mm (4”)] [125 mm (5”)] [150 mm (6”)] [\_\_\_\_\_\_\_\_] high with [25 mm (1”)] [38 mm (1.5”)] [50 mm (2”)] radius in accordance with manufacturer’s written instructions. Install cove base with a minimum 3 mm (1/8”) thickness.]

### [Install L type white alloy or zinc base bead top strips at specified heights straight and level.]

## CLEAN UP

### Dispose of all waste from resinous flooring system installation in accordance with environmental legislation applicable to the Place of the Work and requirements of all authorities having jurisdiction.

### Dispose of empty containers at an approved waste handling facility for recycling or disposal.

## PROTECTION

### Protect finished floor from damage by subsequent trades.

### Protect freshly applied Products from dampness, condensation and water for at least seventy-two (72) hours.

### Monitor air flow and changes in air flow. Protect against introduction of dust, debris, and particles, etc. that may result in surface imperfections and other defects.

### Follow manufacturer’s written recommendations with respect to cure, wait time and return to service.

END OF SECTION

*The information, and in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika’s current knowledge and experience of the products when properly stored, handled and applied under normal conditions, within their shelf life. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any recommendations, or from any other advice offered. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users should always refer to the most recent issue of the Product Data Sheet for the product concerned, copies of which will be supplied on request or can be accessed in the Internet under www.sika.ca.*