SIKA SPECIFICATION NOTE: This guide specification is provided in CSI Format for use by design professionals for individual construction projects. Modify the text based on your project requirements, and delete products not required. Questions? Call 800-933-SIKA.

SIKA SPECIFICATION NOTE: This guide specification includes test methods, materials and installation procedures for Sikalastic Hot Fluid Applied Polyurea Protected Roofing/Waterproofing Membrane System or as an Exposed Roofing/Waterproofing Membrane System. Sikalastic is a fully bonded, elastomeric waterproofing membrane designed for use over most common construction surfaces including concrete, plywood sheathing, metal substrates and/or modified bitumen roofing membranes.

SECTION 07 55 56

FLUID-APPLIED PROTECTED MEMBRANE ROOFING/Waterproofing

OR

Section 07 56 00

FLUID-APPLIED MEMBRANE ROOFING/Waterproofing

# GENERAL

* + - 1. RELATED DOCUMENTS
				1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
			2. SUMMARY
				1. Provide a protected hot-fluid-applied polyurea roofing/waterproofing system on structural concrete, plywood sheathing, metal or other approved substrates.

Work includes substrate preparation.

Work includes bridging and sealing air leakage and water intrusion pathways and gaps including connections of the walls to the roof air barrier, and penetrations of the building envelope including piping, conduit, ducts and similar items.

* + - * 1. Related Work: The following items are not included in this Section and are specified under the designated Sections:

Section 03 30 00 – CAST-IN-PLACE CONCRETE.

Section 06 16 00 – SHEATHING.

Section 07 60 00 – FLASHING AND SHEET METAL.

Section 07 92 13 – ELASTOMERIC JOINT SEALANTS

Section 21 14 25 – ROOF DRAINS.

##### C. The system includes a primer on the concrete substrate followed by high quality spray applied polyurea waterproofing membrane with a UV stable, polyaspartic coat. The system can be used in inverted or exposed conditions.

1.3 PERFORMANCE REQUIREMENTS

A. Cold fluid applied polyurea roofing/waterproofing system is intended to perform as a continuous barrier against liquid water and to flash or discharge to the exterior incidental water. Membrane system is intended to be left exposed or receive an overburden of insulation and ballast or concrete pavers and shall accommodate movements of building materials as required with accessory sealant materials at locations such as: changes in substrate, perimeter conditions and penetrations.

B. Installed roofing/waterproofing membrane system shall not permit the passage of water and will withstand the design pressures calculated in accordance with the most current revision of ASCE 7.

C. Manufacturer shall provide all primary roofing/waterproofing materials that are physically and chemically compatible when installed in accordance with manufacturers current application requirements.

1.4 SUBMITTALS

A. Submittals: Comply with project requirements for submittals as specified in Division 01.

B. Product Data: For each product.

C. Shop Drawings: Manufacturer’s standard details and shop drawings for the specified system.

D. Installer’s Authorization: Installer shall provide written documentation from the manufacturer of their authorization to install the system, and eligibility to obtain the warranty specified in this section.

E. Manufacturer’ Certification: Certification showing full time quality control of production facilities and that each batch of material is tested to ensure conformance with the manufacturer's published physical properties.

F. VOC Certification: Manufacturer’s certification that all roofing/waterproofing system products meet current Volatile Organic Compound (VOC) regulations as established by the State in which they are being installed; and stating total VOC content, in grams per liter, for all system components (i.e. primers, adhesives, coatings, etc.).

##  QUALITY ASSURANCE

##### Manufacturer qualifications:

The manufacturer of the specified product shall be ISO 9001:2008 & ISO 14001 certified and have in existence a recognized ongoing quality assurance program, independently audited on a regular basis.

##### Contractor qualifications:

###### The two-component rapid curing polyurea membrane and primer from the same manufacturer to ensure compatibility, can only be applied by a Specialist Applicator, qualified in the field of specialist coatings.

1. The specialist applicator must be fully familiar with the operation of the required heated, high pressure, plural component spray equipment, and have a successful track record of 5 years or more, or at least 10 proven references that can be inspected for due diligence purposes.
2. The Specialist Applicator shall maintain qualified personnel experienced in spraying hot spray polyurea and having a complete understanding of the spray equipment with diagnostic problem solving.
3. The contractor should always submit a pre-qualification and apply an on-site mockup to prove their competency prior to starting work on site.
4. The contractor should have enough equipment to carry out the contract, with backup equipment in case of any unexpected break downs.

##### On site testing shall be done to demonstrate the performance of the system and applicator to meet the requirements of this specification including:

* + - 1. Material gel / setting times.
			2. Adhesion to substrate in accordance with EN 13596 or ASTM D 7234.
			3. Holiday testing in accordance with ASTM D 4787 or NACE RP0188–88 Discontinuity (Holiday) Testing of Protective Coatings.
			4. Shore Hardness development in accordance with DIN 53 505 or ASTM D 2240.
			5. Thickness using metal plate with calipers or ultrasonic equipment

##### Materials should be installed in accordance with all safety and weather conditions required by the manufacturer or as modified by applicable rules and regulations of local, state and government authorities having jurisdiction. Consult Safety Data Sheets (SDS) for complete handling recommendations.

## DELIVERY, STORAGE, AND HANDLING

##### All materials must be delivered in original, unopened containers with the manufacturer's name, labels, product identification, and batch numbers. Damaged material must be removed from the site immediately.

##### Store all materials in a cool, dry, preferably air-conditioned environment, off the ground and protect from rain or excessive heat until ready for use.

##### Keep equipment that will be in contact with the product cool and away from direct sunlight.

## JOB CONDITIONS

##### Environmental Conditions: Do not apply material if it is raining or if such conditions appear to be imminent. The substrate temperature should be at least 5⁰F (3ºC) above dew point and rising.

##### Protection: Precautions should be taken to avoid damage to any surface near the work zone due to the spray application of the specified material.

##### Application in a controlled environment is highly recommended.

## SUBMITALS

##### Submit two copies of manufacturer's literature including but not limited to: Product Data Sheets (PDS), and appropriate Safety Data Sheets (SDS).

## WARRANTY

##### A project specific warranty for the performance of the specified product should be agreed and confirmed in writing from the specialist applicator, backed by the product manufacturer. This warranty should form part of the tender bid documents.

####  STANDARD REFERENCE:

|  |  |
| --- | --- |
| ASTM G 53-96 | Practice for Operating Light- and Water-Exposure Apparatus (Fluorescent UV-Condensation Type) for Exposure of Nonmetallic Materials |
| DIN EN 1062-7 | Paints and varnishes. Coating materials and coating systems for exterior masonry and concrete. Determination of crack bridging properties. |
| DIN EN 13501 | Fire classification of construction products and building elements. Classification using test data from reaction to fire tests. |
| DIN EN ISO 2811-1 | Paints and varnishes. Determination of density. Pyknometer method  |
| DIN 53 504 | Tensile strength |
| DIN 53 505 | Shore A Hardness |
| DIN 53 504 | Elongation at break |
| EU Regulation 2004/42 | VOC content |
| EN 1504-2:2004 | Surface protection product – Coatings. Against ingress, moisture control, physical resistance and increasing resistivity |
| EN 13501-5 | Fire classification of construction products and building elements. Classification using test data from reaction to fire tests. |
| DIN 53109(Taber Abraser Test) | Abrasion resistance  |

# PRODUCTS

### LIQUID APPLIED, ROOFING/WATERPROOFING SYSYTEM OVERVIEW

A 80 mil DFT (2.0 mm) thick, liquid-applied, roofing/waterproofing system by Sika or similar approved manufacturer consisting of:

##### **Sika Primer:** Sikalastic EP Primer/Sealer or Sika Concrete Primer Lo-VOC or Sikalastic GDC Primer

##### **Sikalastic®-835i:** A high performance, spray applied, polyurea waterproofing membrane.

##### **Sikalastic®-701SF:** A UV resistant, liquid polyaspartic top coat.

##### **All materials in the system must be from the same supplier/manufacturer.**

### LIQUID-APPLIED, ROOF WATERPROOFING PERFORMANCE SPECIFICATION

|  |  |  |
| --- | --- | --- |
| **Technical Data** | **Standard** | **Min requirement** |
| Minimum thickness  |  | ≥ 80 mils (1.9mm) total thickness |
| Minimum consumption  |  | Exposed roofs:Sikalastic®-835i: Approx 20 ft²/gal (1.8 kg/m2)Sikalastic®-701SF: Approx 160-130 ft²/gal (0.3 kg/m2).Non-exposed roofs:Sikalastic®-835i: Approx 20 ft²/gal (2.0 kg/m2). |
| **System performance** |
| Working life |  | Up to 20 years |
| Climatic zones |  | Moderate & Severe |
| Resistance to mechanical damage (perforation) |  | Compressible & non-compressible substrates |
| Roof slope |  | Low to high degree slope |
| Lowest surface temperature resistance |  | -22⁰F (-30°C) |
| Highest surface temperature surface |  | +194⁰F (+90°C) |
| Reaction to fire |  | Euroclass E |
| Watertightness |  | Passed  |
| Release of dangerous substances |  | No performance determined |
| Resistance to wind upload |  | ≥ 7.25 psi (50 kPa) for tear-resistant substrates |

##### In addition to the above system performance, the liquid-applied roofing/waterproofing system shall consist of the following materials which are subject to individual minimum performance properties as follows:

1. Primer for concrete and sealing cementitious substrates shall be Sika Concrete Primer Lo-VOC by Sika Corp., a single component, rapid curing, high solids, moisture cured primer or Sikalastic Primer EP Primer/Sealer by Sika Corp., a two-component, cyclo-aliphatic, amine cured material.
2. Primer for green and damp concrete shall be Sikalastic® GDC primer by Sika Corp., a 2-component, moisture mitigating epoxy primer for Green, Damp and Dry Concrete surfaces.
3. Primer for metal substrates shall be Sikalastic® EP Primer/Sealer by Sika Corp., a two-component, cyclo-aliphatic, amine cured material with a high level of corrosion resistance for metal, bleed blocking on stable asphaltic surfaces, and chemically treated wood, by Sika Corp.

##### High performance, roofing/waterproofing membrane to concrete surfaces:

 The high performance, roofing/waterproofing membrane to concrete surfaces shall be Sikalastic® 835i, a two component, elastic, crack-bridging, rapid-curing polyurea membrane with the following minimum properties:

|  |  |  |
| --- | --- | --- |
| **Technical Data** | **Standard** | **Min requirement** |
| Description |  | A two component, elastic, crack-bridging, rapid-curing polyurea membrane for roofs & podium decks. |
| Shore D Hardness | EN ISO 868 | ~ 48 |
| Crack bridging capacity | DIN EN 1062-7 | Static Class A4, > 1250 µm at 23°CDynamic Class B3.1 (-20°C) |
| Fire resistance | DIN EN 13501 | Euroclass E |
| Mixed resin density | DIN EN ISO 2811-1 | Aprox. 1.1 kg/litre @ 23°C |
| Setting / gel time |  | 5 - 10 seconds |
| Solid content |  | > 99% |
| Permeability to Water Vapour | ASTM E96 | ~ 0.025 |
| Tensile strength | DIN 53 504 | ~18 N/mm2 |
| Tear strenght | UNI ISO 34-1:2010 | ~100 kN/m |
| Elongation at break | DIN 53 504 | ~ 350% (28 days at 23°C) |
| Chemical resistance | ASTM D1308 | Sikalastic®-835 I is resistant to many chemicals (Test Method at +25°C). It is also resistant to long-term contact with hydrocarbons (diesel and gasoline) for at least 72 hours. |
| Gas permeability | UNI EN 1779 / UNI EN 1330-8 | Helium 40 d: 15'd / 1,2 bar - no leakMethane 40 d: 15'd / 1,2 bar - no leakRadon 40 d /ambient - 9 Bq/m3 |
| Thermal resistance |  | Resistant to hot poured asphalt applied at up to max. +464⁰F (+240°C) |
| VOC Content |  | Complies with maximum allowable VOC limit of ≤ 50 g/l.  |
| LEED rating | EQ credit 4.2: Low Emitting Materials: Paints & Coatings | VOC < 100g/litre |
| Color |  | Liquid / RAL7040 Standard Grey, RAL9005 Black, RAL9010 White – Custom colors available upon request. |
| Layer thickness |  | Minimum 80 mils (2.0 mm) with additional topcoat for exposed roofs.Minimum 80 mils (2.0 mm) when used as stand-alone waterproofing membrane for green, inverted and ballasted roofs |

##### UV-resistant topcoat

The UV-resistant topcoat for the roofing/waterproofing system shall be Sikalastic®-701SF, a cold-applied, UV-resistant, highly elastic, two-component, polyaspartic liquid roof waterproofing membrane with the following minimum properties:

|  |  |  |
| --- | --- | --- |
| **Technical Data** | **Standard** | **Min requirement** |
| Description |  | A cold-applied, UV-resistant, highly elastic, two-component, polyaspartic liquid roof waterproofing membrane. |
| External fire performance | EN 13501-5 | BRoof (t1) |
| Density at 23°C | EN ISO 2811-1 | 1.45 kg/litre |
| Solid content |  | >99% |
| Elongation at break | EN ISO 527-3 | 140% |
| Abrasion resistance | BS 13892-4:2002 | Abrasion resistance class AR 0.5 special |
| VOC Content |  | Complies with maximum allowable VOC limit of ≤ 50 g/l.  |
| Coverage rate |  | Single coat: Approx 10-12 mils WFT, 160-130 ft²/gal (0.3 kg/m2 to give > 0.2mm thickness. |

##### Expansion joint over banding (if required)

The expansion joint over banding system if required shall be Sikadur-Combiflex© SG, a high performance, modified Flexible Polyolefin (FPO) membrane set into a solvent-free epoxy adhesive, with the following minimum properties:

|  |  |  |
| --- | --- | --- |
| **Technical Data** | **Standard** | **Min requirement** |
| Chemical base (tape)Chemical base (adhesive) |  | Modified Flexible Polyolefin (FPO)Modified, solvent free, filled 2-part epoxy resin |
| Drinking water approval | WRAS | Approved |
| Drinking water suitability | KTW- Guideline of the Federal Environment Agency (UBA) | Approved |
| Root resistance | CEN/TS 14416 | Resistant |
| Bond strength |  | Dry concrete: >2 N/mm2 (concrete failure)Damp Concrete: >2 N/mm2 (concrete failure)Steel (blast cleaned): >5 N/mm2  |
| Chemical resistance | EN 1548 | Long term resistance to water, sea water, salt solutions, domestic sewage etc |
| Appearance | N/A | Light grey membrane with perforations either side, along the entire length. |
| Thickness | N/A | 1 & 2 mm thick rolls |
| Roll dimensions | N/A | 4, 8 and 12 in. wide by 20 ft. long and 82 ft. long |
| Fire classification | EN ISO 11925-2 | Euroclass E |
| Fire classification | EN 13501-1 | Euroclass E |
| Tensile strength | EN 12311-2 | > 12 N/mm2 |
| Tear strength | ISO 34-B | > 40 N/mm2 |
| Elongation at break | EN 12311-2 | 600% |
| Seam strength | EN 12316-2 | > 300 N/5cm |
| Seam strength | EN12317-2 | > 400 N/5cm |
| Behaviors under hydrostatic pressure | EN 1928 Method B | No leakage @ 6 bar for 72 hours |
| Thermal resistance: aging  | SIA V280 | Passed |
| Thermal resistance: bonding test | EN 495-5 | No cracks at -40oC |
| Thermal resistance: artificial weathering | SIA V280 | 2500 hours passed |

# EXECUTION

#### AREAS OF USE

Typically used for roofing/waterproofing applications such as:

##### Complicated shaped roofs

##### Exposed roofs

##### Plaza / podium deck waterproofing

#### SURFACE PREPARATION

##### Concrete surfaces particularly if new, should be at least 7 days old, clean, dry, free from contamination & with a minimum compressive strength of 3500 psi (25 MPa). Testing using a rebound hammer or similar equipment is highly recommended.

##### Prepare concrete surfaces, following ICRI CSP Guidelines, by mechanical methods such as grinding or grit blasting to remove laitance, curing compounds and other loose materials, to provide a mechanical key for the coating system.

##### Low movement joints can be taped over with masking tape, ready to be sprayed over with the **Sikalastic®-835i.**

##### If the moisture content of the concrete substrate is >4%, **Sikalastic GDC Primer®** (see separate data sheet) must be used.

##### If a moisture blocking primer is not required, apply a scratch coat of **Sikadur®-31** to fill all blow holes & surfaces imperfections in concrete prior to priming.

##### Exposed drain bowls, pipes, and other metal surfaces shall be cleaned by power tool cleaning (SSPC SP-3 or SP-11) to remove corrosion deposits back to a clean, bright metal followed by a solvent wipe prior to application of the specified primer.

* 1. PRIMING
		+ - 1. Concrete, Masonry:

Mix and apply specified primer for concrete/masonry surfaces by brush or roller at the application rate shown on the technical data sheet. Porous, rough or absorbent surfaces will decrease coverage rates.

Allow to cure and dry in accordance with manufacturer’s technical data sheets.

* + - * 1. Metal:

Apply specified primer for metal surfaces to clean and prepared drain bowls and other metal surfaces by brush or roller at the application rate shown on the technical data sheet to achieve an overall wet film thickness of 6-8 mils. High porosity and roughness of the substrate will decrease coverage rates.

Allow to cure and dry in accordance with manufacturer’s technical data sheets.

#### MIXING AND APPLICATION

##### High pressure plural component equipment must be used for the mixing and application of **Sikalastic®-835i**.

##### The substrate temperature must be at least 5⁰F (3 ºC) and rising, above dew point.

##### After preparation & priming, apply **Sikalastic®-835i R** by plural component equipment to the prepared surface, at a rate of 20 ft²/gal (1.1 kg/m2 /mm). A minimum thickness of 80 mils (2.0) mm is required.

##### Extreme care should be taken with preparation on overlaps & new to previously applied polyurea, to ensure a homogenous layer. Overcoat windows and re-activation methods as per the PDS or method statements must be observed.

##### After the membrane has set, apply 1 -2 sealing coats of **Sikalastic®-701SF** by roller or squeegee at a total theoretical consumption of 160-130 ft²/gal (0.3 kg/m2) onto the membrane. Allow to cure fully.

##### All products should be mixed and applied in accordance with the current Product Data Sheets (PDS).

##### On site testing to establish bond, holidays etc should be carried out as highlighted in section 1.5 C.

##### Areas subject to damage should be repaired as per the instructions in the Method Statement (MS).

#### CLEANING

##### Clean all tools and equipment immediately after use. All hardened or cured material can only be removed mechanically.

* + - 1. CLEAN-UP
				1. Work areas are to be kept clean, clear and free of debris at all times.
				2. Do not allow trash, waste, and/or debris to collect on the roof deck area. Trash, waste, and/or debris shall be removed from the roof on a daily basis.
				3. All tools and unused materials shall be collected at the end of each workday and stored properly off of the finished roof surface and protected from exposure to the elements.
				4. Dispose of or recycle all trash and excess material in a manner conforming to current EPA regulations and local laws.
				5. Properly clean the finished roof surface after completion, and make sure the drains and gutters are not clogged.
				6. Clean and restore all damaged surfaces to their original condition.

END OF SECTION

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Target Market Waterproofing Target Market Roofing