**SECTION 07 56 00**

**COLD LIQUID APPLIED MEMBRANE ROOFING**

**(Specification for a fully-reinforced, Derbiflash RS PMMA roofing membrane with surfacing options)**

*NOTE: This guide specification is provided as a guideline and must be modified, as required, by the Designer of Record for each project. This specification is prepared in general accordance with CSI format to be included under Division 7 – Thermal and Moisture Protection. Additional information is provided. [delete this paragraph]*

***Optional information is presented in “blue” font below. Choose appropriate options, delete as necessary. [delete this paragraph]***

1. **GENERAL**
	1. SUMMARY
		1. The new roofing and waterproofing system shall consist of a cold liquid applied reinforced waterproofing membrane, flashings and finish layers as specified.
		2. Work shall include, but is not limited to, the following:
			1. Preparation of existing (new), concrete, steel, wood, gypsum, cementitious wood fiber roof deck, and all flashing substrates.
			2. Liquid applied, reinforced flashings.
			3. Liquid applied, reinforced waterproofing membrane.
			4. Refer to related Sections for Insulation, Cover Board, and Roof Edge Systems.
			5. All related materials and labor required to complete specified waterproofing necessary to receive specified manufacturer’s warranty.
	2. RELATED SECTIONS
		1. Division 010000 - General Requirements
		2. Division 011000 - Summary of Work
		3. Division 072200 - Roof Insulation
		4. Division 072713 - Modified Bituminous Sheet Vapor Retarders
		5. Division 076200 - Sheet Metal Flashing and Trim
	3. DEFINITIONS
		1. ASTM D 1079- Standard Terminology Relating to Roofing and Waterproofing.
		2. The National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual, Fifth Edition Glossary.
	4. REFERENCES
		1. AMERICAN SOCIETY OF CIVIL ENGINEERS - Reference Document ASCE 7, Minimum Design Loads for Buildings and Other Structures.
		2. AMERICAN STANDARD OF TESTING METHODS (ASTM):
			1. ASTM C 836 - Standard Specification for High Solids Content, Cold Liquid applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course.
			2. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants
		3. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)::
			1. ANSI/SPRI/FM 4435/ES-1 - Wind Design Standard for Edge System Used with Low Slope Roofing System.
			2. ANSI/SPRI FX-1 - Standard Field Test Procedure for Determining the Withdrawal Resistance of Roofing Fasteners.
			3. ANSI/SPRI IA-1 - Standard Field Test Procedure for Determining the Mechanical Uplift Resistance of Insulation Adhesives over Various Substrates.
			4. ANSI/FM 4474 - American National Standard for Evaluating the Simulated Wind Resistance of Roof Assemblies Using Static Positive and/or Negative Differential Pressures.
		4. FACTORY MUTUAL (FM):
			1. FM 4450 - Approval Standard - Class I Insulated Steel Roof Decks.
			2. FM 4470 - Approval Standard - Class I Roof Covers.
		5. FLORIDA BUILDING CODE (FBC):
			1. 20XX Florida Building Code (FBC).
		6. INTERNATIONAL CODES COUNCIL (ICC):
			1. 20XX International Building Code (IBC).
		7. NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA).
			1. UL 790 - Standard Test Methods for Fire Tests of Roof Coverings.
			2. UL 1256 – Fire Test of Roof Deck Constructions.
	5. ACTION SUBMITTALS
		1. Product Data Sheets: Submit manufacturer’s product data sheets, installation instructions and/or general requirements for each component.
		2. Safety Data Sheets: Submit manufacturer’s Safety Data Sheets (SDS) for each component.
		3. Sample warranty from the manufacturer and contractor.
		4. Provide roof plan and representative detail drawings.
	6. INFORMATIONAL SUBMITTALS
		1. Submit a letter from the roofing manufacturer indicating the contractor is an authorized applicator.
	7. CLOSEOUT SUBMITTALS
		1. Warranty: Provide manufacturer’s and contractor’s warranties upon project completion.
	8. QUALITY ASSURANCE
		1. MANUFACTURER QUALIFICATIONS:
			1. Manufacturer shall have 20 years of manufacturing experience.
			2. Manufacturer shall have trained technical service representatives employed by the manufacturer, independent of sales.
			3. Manufacturer shall provide site visit reports in a timely manner.
		2. CONTRACTOR QUALIFICATIONS:
			1. Contractor shall be authorized by the manufacturer to install specified materials prior to the bidding period through satisfactory project completion.
			2. Applicators shall have completed projects of similar scope using same or similar materials specified.
			3. Contractor shall provide full time, on-site superintendent or foreman experienced with the specified roofing from beginning through satisfactory project completion.
			4. Applicators shall be skilled in the application methods for all materials.
			5. Contractor shall maintain a daily record, on-site, documenting material installation and related project conditions.
			6. Contractor shall maintain a copy of all submittal documents, on-site, available at all times for reference.
		3. SUBSTRATE EVALUATION:
			1. Contractor shall evaluate substrate moisture content and adhesion of waterproofing materials to substrate throughout the work and record with daily inspection reports or other form of reporting acceptable to the owner or his designated representative and waterproofing manufacturer.
				1. Moisture content: Evaluate substrate moisture content to determine acceptability for application of the specified liquid applied waterproofing materials. Moisture testing shall be performed by means suitable to the project application, or by testing substrate relative humidity (RH) in accordance with ASTM F 2170 when needed, required, or if substrate moisture content is in question.
				2. Adhesion: Evaluate soundness and surface preparation of concrete and/or masonry substrates. Prepare representative areas using specified methods complete with applied primer and waterproofing membrane. Test for minimum acceptable tensile bond strength values as required in accordance with ASTM D 4541. Evaluate all areas where concrete appears to differ in appearance or consistency, if multiple areas are involved in the scope of work, evaluate each area with a minimum of (3) tests for every 5,000 ft2 or as required by project conditions.
	9. DELIVERY, STORAGE AND HANDLING
		1. Refer to each product data sheet or other published literature for specific requirements.
		2. Deliver materials and store them in their unopened, original packaging, bearing the manufacturer's name, related standards, and any other specification or reference accepted as standard.
		3. Protect and store materials in a dry, well-vented, and weatherproof location. Only materials to be used the same day shall be removed from this location. During cold weather, store materials in a heated location, removed only as needed for immediate use.
		4. When materials are to be stored outdoors, store away from standing water, stacked on raised pallets or dunnage, at least 4 in (100 mm) or more above ground level. Carefully cover storage with “breathable” tarpaulins to protect materials from precipitation and to prevent exposure to condensation.
		5. Carefully store roof membrane materials delivered in rolls on-end with selvage edges up. Store and protect roll storage to prevent damage.
		6. Properly dispose of all product wrappers, pallets, cardboard tubes, scrap, waste, and debris. All damaged materials shall be removed from job site and replaced with new, suitable materials.
	10. SITE CONDITIONS
		1. SAFETY:
			1. The contractor shall be responsible for complying with all project-related safety and environmental requirements.
			2. The contractor shall review project conditions and determine when and where conditions are appropriate to utilize the specified liquid applied or semi-solid roofing materials. When conditions are determined by the contractor to be unsafe or undesirable to proceed, measures shall be taken to prevent or eliminate the unsafe or undesirable exposures and conditions, or equivalent approved materials and methods shall be utilized to accommodate requirements and conditions.
			3. The contractor shall review project conditions and determine when and where conditions are appropriate to utilize the specified hot asphalt-applied materials. When conditions are determined by the contractor to be unsafe or undesirable to proceed, measures shall be taken to prevent or eliminate the unsafe or undesirable exposures and conditions, or equivalent approved materials and methods shall be utilized to accommodate requirements and conditions.
			4. The contractor shall refer to product Safety Data Sheets (SDS) for health, safety, and environment related hazards, and take all necessary measures and precautions to comply with exposure requirements.
		2. ENVIRONMENTAL CONDITIONS:
			1. Monitor substrate and material temperature, as well as all environmental conditions such as ambient temperature, moisture, sun, cloud cover, wind, humidity, and shade. Ensure conditions are satisfactory to begin work and ensure conditions remain satisfactory during the installation of specified materials. Materials and methods shall be adjusted as necessary to accommodate varying project conditions. Materials shall not be installed when conditions are unacceptable to achieve the specified results.
			2. Precipitation and dew point: Monitor weather to ensure the project environment is dry before, and will remain dry, during the application of roofing materials. Ensure all roofing materials and substrates remain above the dew point temperature as required to prevent condensation and maintain dry conditions.
			3. Contractor shall implement odor control measures where required during the application of waterproofing materials and adjust methods as necessary to accommodate varying project conditions.
	11. PERFORMANCE REQUIREMENTS
		1. WIND UPLIFT RESISTANCE:
			1. Performance testing shall be in accordance with ANSI/FM 4474, FM 4450, FM 4470, UL 580 or UL 1897.
				1. Roof System Design Pressures: Calculated in accordance with ASCE 7, or applicable standard, for the specified roof system attachment requirements:

Field of Roof (Zone 1): - 0 psf.

Perimeter of Roof (Zone 2): - 0 psf.

Corners of Roof (Zone 3): - 0 psf.

* + 1. FIRE CLASSIFICATION:
			1. Performance testing shall be in accordance with UL 790, ASTM E108, FM 4450 or FM 4470 to meet the \_:12 roof slope requirement.
				1. Meets requirements of UL Class A or FM Class A.
			2. Performance testing shall be in accordance with UL 1256, FM 4450 or FM 4470 to meet the specified requirements for interior flame spread and fuel contribution.
				1. Meets requirements of UL 1256, or FM Class 1.
		2. ROOF SLOPE:
			1. Finished roof slope for liquid applied membrane surfaces shall be ¼ inch per foot (2 percent) minimum for roof drainage or as allowed by applicable building and jurisdictional codes for roof assembly.
		3. IMPACT RESISTANCE:
			1. Performance testing for impact resistance shall be in accordance with FM 4450 or FM 4470 to meet the specified impact resistance requirements.
	1. WARRANTY
		1. Manufacturer's No Dollar Limit (NDL) Waterproofing Warranty: The manufacturer shall provide the owner with the manufacturer’s warranty providing labor and materials for 10 15 20 years from the date the warranty is issued.
		2. Manufacturer’s Surfacing & Finish Warranty: Provide waterproofing manufacturers standard warranty for repair of aesthetic surfacing or finish layer due to failure in materials or workmanship for a period of 1 3 5 years from the date of completion depending on the surfacing option selected.
		3. The contractor shall guarantee the workmanship and shall provide the owner with the contractor’s warranty covering workmanship for a period of 2 years from completion date.
1. **PRODUCTS**
	1. MANUFACTURER
		1. SINGLE SOURCE MANUFACTURER: All liquid applied PMMA/PMA membrane and accessories shall be manufactured by a single supplier with 20 years or more manufacturing history in the US.
			1. Comply with the manufacturer’s requirements as necessary to provide the specified warranty.
		2. PRODUCT QUALITY ASSURANCE PROGRAM: Manufacturer shall be an ISO 9001 registered company. A ‘Quality Compliance Certificate (QCC) for reporting/confirming the tested values of the membrane materials will be supplied upon request.
		3. ACCEPTABLE MANUFACTURER:
			1. PERFORMANCE ROOF SYSTEMS, INC., A SOPREMA GROUP COMPANY, located at: 4800 Dr. Martin Luther King Jr. Blvd., Kansas City, MO 64130; Tel: 816-921-0221; Tel 800-727-9872; Website: [www.performanceroofsystems.us](http://www.performancesystems.us)
			2. Acceptable alternate manufacturers: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. LIQUID APPLIED WATERPROOFING SYSTEM
		1. FLASHING MEMBRANE:
			1. POLYMETHYL METHACRYLATE FLASHING MEMBRANE (PMMA):
				1. DERBIFLASH RS 230 FLASH: Rapid curing, polymethyl methacrylate (PMMA) liquid resin with an embedded polyester reinforcement fabric used for monolithic waterproofing flashing membranes.

VOC content: 4.2 g/L

Color: White, Grey, Custom Color

* + - * 1. DERBIFLASH RS DETAILER: Micro-fiber enhanced, rapid curing, polymethyl methacrylate (PMMA) paste resin used for flashing difficult penetrations where a resin/fleece/resin application is not practical.

VOC content: 2.6 g/L

Color: Grey

* + 1. FIELD MEMBRANE:
			1. POLYMETHYL METHACRYLATE MEMBRANE (PMMA):
				1. DERBIFLASH RS 230 FIELD: Rapid curing, polymethyl methacrylate (PMMA) liquid resin with an embedded polyester reinforcement fabric used for monolithic waterproofing field membranes.

VOC content: 2.3 g/L (summer), 2.4 g/L (winter).

Color: White, Grey, Custom Color.

Elongation at peak load, avg. (ASTM D412): 55%.

Peak load at 73°F, avg. (ASTM D412): 809 lbf/in2.

Tear strength (ASTM D 5147): 107 lbf.

Shore A hardness, avg. (ASTM D2240): 81

Water absorption (Method I, 24h@73°F)(ASTM D570): 0.41%.

Water absorption (Method I, 48h@122°F)(ASTM D570): 1.57%.

Low temperature flexibility (ASTM D5147): -13°F.

Dimensional stability (ASTM D5147): -0.063%.

* 1. ACCESSORIES
		1. PRIMERS:
			1. DERBIFLASH RS 276 PRIMER: Rapid curing, polymethyl methacrylate (PMMA) liquid resin used to promote adhesion of PMMA/PMA membranes over wood, concrete and approved waterproofing board substrates.
				1. VOC content: 2.6 g/L
				2. Color: Clear
			2. DERBIFLASH RS 222 PRIMER: Rapid curing, polymethyl methacrylate (PMMA) liquid resin used to promote adhesion of PMMA/PMA membranes over asphaltic substrates, wood, concrete, and approved waterproofing board substrates.
				1. VOC content: 2.5 g/L
				2. Color: Clear
			3. DERBIFLASH RS METAL PRIMER: Solvent-based primer used to improve the adhesion of PMMA/PMA membranes to metal substrates.
				1. VOC content: 50 g/L
				2. Color: Off White
		2. CATALYST:
			1. DERBIFLASH RS CATALYST POWDER: Reactive agent used to cure PMMA/PMA liquid resins.
		3. REINFORCING FABRIC:
			1. DERBIFLASH RS FLEECE: Woven polyester reinforcement used in PMMA/PMA liquid applied membrane and flashing applications.
				1. Thickness: 30-40 mils (0.8-1 mm)
				2. Weights: 110 g/m2
				3. Width(s): 10.3 in (26 cm), 13.8 in (35 cm), 20.7 in (53 cm), 41.3 in (105 cm). Size as required.
				4. Length: 164 ft (50 m)
			2. DERBIFLASH RS PRE-CUT FLEECE: Factory pre-cut woven polyester reinforcement used for a variety of penetration flashings in PMMA/PMA liquid applied membrane and flashing applications.
				1. Thickness: 30-40 mils (0.8-1 mm)
				2. Weights: 110 g/m2
				3. Component/Size(s): Small Pipe Flashing ½ - 3 in (13 - 76 mm), Large Pipe Flashing 4 - 8 in (102 – 203 mm), Universal Corner sizes as required.
		4. PASTE AND MORTARS:
			1. DERBFLASH RS PASTE: Rapid curing, polymethyl methacrylate (PMMA) paste resin used to fill small cracks and voids on non-traffic bearing substrates prior to the application of PMMA/PMA membranes.
				1. VOC content: 4.4 g/L
				2. Color: Grey
			2. DERBIFLASH RS CLEANER: Clear, blended solvent used to clean and prepare plastic and metal surfaces, and used to clean existing DERBIFLASH RS surfaces prior to the application of PMMA/PMA liquid applied membrane and flashings.
				1. VOC content: 900 g/L
				2. Color: Clear
1. **EXECUTION**
	1. EXAMINATION
		1. Examination includes visual observations, qualitative analysis, and quantitative testing measures as necessary to ensure conditions are satisfactory to begin and remain satisfactory throughout the project.
		2. The contractor shall examine all waterproofing substrates including, but not limited to: decks, walls, curbs, equipment, fixtures, and wood blocking.
		3. The applicator shall not begin installation until conditions have been properly examined and determined to be clean, dry and, otherwise satisfactory to receive specified roofing and waterproofing materials.
	2. PREPARATION
		1. Before commencing work each day the contractor shall prepare all substrates to ensure conditions are satisfactory to proceed with the installation of specified materials.
		2. Preparation of substrates includes, but is not limited to, the following:

* + - 1. General:
				1. All substrates must be clean, dry and free from gross irregularities, loose, unsound or foreign material such as dirt, ice, snow, water, grease, oil, release agents, lacquers, or any other condition that would be detrimental to adhesion of primer and/or resin materials to the substrate. Most surfaces will require mechanical abrasion in the form of scarifying, shot-blasting or grinding to achieve a suitable substrate.
				2. Inspect all substrates and correct defects before application of waterproofing materials. Fill all surface voids 1/16 in (1.5 mm) or greater wide and/or deep with appropriate fill material.
			2. Concrete Substrates:
				1. Concrete shall comply with requirements of ACI 301 and ACI 308.
				2. Concrete compressive strength: 3,500 psi for all primers or 2,500 psi minimum when use of a moisture mitigation primer is required.
				3. Relative humidity: Maximum 75 percent per ASTM F2170 unless otherwise approved.
				4. Surface: Scarify, shot-blast or grind to ICRI Concrete Surface Profile CSP 3 to CSP 5; CSP 3 being the preferred profile.
				5. Adhesion: Adhesion of specified primer and liquid applied membrane shall be minimum 220 psi for traffic bearing waterproofing applications or 116 psi for roofing or non-traffic bearing waterproofing applications per ASTM D4541.
				6. Areas of spalls, voids, bug holes and other deterioration on vertical or horizontal surfaces shall be repaired as required or recommended.
			3. Masonry Substrates:
				1. Walls shall be structurally sound built of hard kiln dried brick, reinforced concrete block, or waterproof concrete block construction.
				2. Liquid applied membrane must not be applied over soft or scaling brick or block, faulty mortar joints, or walls with broken, damaged or leaking coping. Areas of spalls, voids, bug holes and other deterioration on vertical surfaces shall be repaired as required or recommended.
				3. Walls of ordinary hollow tile, or other materials which in themselves are not waterproofed, should not be accepted as suitable to receive liquid applied membrane unless properly waterproofed to prevent moisture infiltration from above or behind the new liquid applied membrane.
				4. Relative humidity: Maximum 75 percent per ASTM F2170 unless otherwise approved.
				5. Surface: Scarify, shot-blast or grind to ICRI Concrete Surface Profile CSP 2 to CSP 4.
				6. Adhesion: Adhesion of specified primer and liquid applied membrane shall be minimum 220 psi for traffic bearing waterproofing applications or 116 psi for roofing or non-traffic bearing waterproofing applications per ASTM D4541.
			4. Metal Substrates:
				1. Clean and prepare metal to near-white metal in accordance with SSPC – SP3 (power tool clean) to a point maximum 1/8 in (3 mm) beyond the termination of liquid applied membrane materials and wipe with solvent cleaner to remove oils, debris or contaminants.
				2. Stainless Steel Series 300 and 400: Abrade to provide rough, open surface and wipe with solvent cleaner to remove oils, debris or contaminants.
				3. Galvanized & Zinc-Rich Metals: Galvanized and/or zinc rich metals are coated with either a layer of oil to prevent white rust or is passivated which must be completely removed prior to applying primer or liquid applied waterproofing. This can be confirmed by applying a coat of copper sulfate solution to the prepared and cleaned galvanized/zinc metal. A properly prepared surface will turn black indicating the passivator has been removed. If the surface does not turn black, additional abrasive cleaning will be required.
				4. Adhesion: Examine metal substrates by conducting adhesion testing. Prime with specified metal primer where required to achieve adequate adhesion.
			5. Rigid Plastics (PVC & ABS):
				1. Rigid plastics should be lightly abraded and wiped with solvent cleaner. Extend preparation maximum 1/8 in (3 mm) beyond the specified termination of the liquid applied membrane flashing materials.
			6. Wood Substrates:
				1. Provide sanded ¾ in (19 mm) minimum thickness APA A-C, Group 1, Exterior or Exposure 1, 48 in (1220 mm) x 96 in (2440 mm) tongue & groove sheathing panels. Install all panels with “A” side up, edges supported by blocking or structural framing, fastened using only non-corrosive screw fasteners with heads installed flush with sheathing applied at 6 in (150 mm) minimum o.c. along panel edges and 12 in (300 mm) o.c. over intermediate supports and/or additional fastening as required by jurisdictional codes. All new plywood substrates shall be structural panels performance-rated pursuant to National Institute of Standards and Technology (NIST) voluntary product standard PS-1-95; identified with American Plywood Association (APA) grade designations.
				2. Hygroscopic building materials such as wood plank, timber or plywood will normally have higher moisture content (in the range of 8% to 12%) as they adsorb or desorb moisture to reach equilibrium moisture content with the surrounding air. Cold liquid applied primer and reinforced membrane should not be applied to damp or wet sheathing materials but may be applied to materials with higher moisture contents as indicated above, provided the exposed surface is clean and dry. Ultimately, determinations of moisture content and the resulting bond strength should be performed periodically to determine acceptability. If poor adhesion or blistering occurs, substrate will require additional drying time before proceeding.
				3. After priming plywood panels, fill joint gaps, holes and cracks with proprietary PMMA paste or PMMA mortar. All joints must be covered with minimum 1 in (25 mm) wide bond breaker tape followed with minimum 6 in (150 mm) wide strips of cold liquid applied reinforced waterproofing membrane centered over joint. Cover knot holes or cracks with strips of cold liquid applied reinforced waterproofing membrane.
			7. Acceptable Rigid Insulation & Roof Cover Boards:
				1. After panels, fill joint gaps, holes and cracks with proprietary PMMA paste or PMMA mortar. All joints must be covered with minimum 6 in (150 mm) wide strips of cold liquid applied reinforced waterproofing membrane centered over joint.

* + - 1. Tie-In to Emulsion Coated or Smooth APP Modified Bitumen Membrane:
				1. The top surface of existing emulsion coated, or smooth APP modified bitumen membrane shall be broadcast to excess with #1 (0.7 - 1.2 mm) kiln-dried quartz silica. Liquefy the top surface of the in-place membrane using a torch and broadcast silica aggregate into the liquid asphalt to excess. After the asphalt has cooled, remove all loose granules, dust, dirt or debris from the surface of the membrane by broom, blower or power vacuuming.
			2. Single ply and Other Flashing Surfaces:
				1. Remove all contaminants and prepare substrate as needed to receive liquid applied waterproofing.
				2. Adhesion: Examine substrates by conducting adhesion testing. Prime with specified primer where required to achieve adequate adhesion.
		1. Where conditions are found to be unsatisfactory, work shall not begin until conditions are adjusted appropriately. Commencing of work shall indicate contractor’s acceptance of conditions.
	1. PRIMER APPLICATION (GENERAL)
		1. Refer to manufacturer’s detail drawings, product data sheets and published general requirements for application rates and specific installation instructions.
		2. Examine all substrates and conduct adhesion peel tests as necessary to ensure satisfactory adhesion is achieved.
	2. PMMA PRIMER APPLICATION (DERBIFLASH RS 276/222)
		1. Mix primer resin and catalyst approximately 2 minutes using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of primer that can be used within the application time.
		2. Apply the appropriate specified primer to dry, compatible substrates as required to enhance adhesion of new specified waterproofing materials.
		3. Apply primer using brush or roller at the rate published on the product data sheet. Do not allow primer to pond or collect in low areas.
		4. Project conditions vary throughout the day. Monitor changing conditions, and the curing time of primers.
		5. Allow primer to fully cure before membrane application.
	3. METAL PRIMER APPLICATION (DERBIFLASH RS METAL PRIMER)
		1. Mix primer resin approximately 2 minutes using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of primer that can be used within the application time.
		2. Apply the appropriate specified primer to dry, compatible substrates as required to enhance adhesion of new specified waterproofing materials.
		3. Apply primer using brush or roller at the rate published on the product data sheet. Do not allow primer to pond or collect in low areas.
		4. Project conditions vary throughout the day. Monitor changing conditions, and the curing time of primers.
		5. Allow primer to fully cure before membrane application.
	4. INSTALLATION & STAGING
		1. In a normal cold liquid applied membrane application the substrate is prepared and primed, flashings are installed, followed by the application of the waterproofing membrane and finish. When applying broadcast aggregate, the aggregate should not be left subject to the elements, and therefore must be top-coated with finish the same day of application whenever possible.
		2. If work is interrupted for more than 12 hours use manufacturer’s proprietary cleaner to clean and reactivate applied primer, resin mortar, flashing membrane or field membrane transition areas. Cleaner should be allowed a minimum of 20 minutes evaporation time after application and covered within 60 minutes of application or as recommended by the manufacturer.
	5. FLASHING MEMBRANE APPLICATION (DERBIFLASH RS 230 FLASH
		1. General:
			1. Refer to manufacturer’s detail drawings, product data sheets and published general requirements for application rates and specific installation instructions.
			2. Provide a minimum vertical height of 8 in (200 mm) for all flashing terminations wherever possible. Flashing height shall be at least as high as the potential water level that could be reached as a result of a deluging rain and/or poor slope.
			3. Do not flash over existing through-wall flashings, weep holes and overflow scuppers.
			4. All flashing shall be terminated as required by the manufacturer. Cap flashings or counter flashings may be constructed of metal, stone, tile or other materials properly installed in accordance with industry-accepted practice.
			5. Install all flashing membranes before installing field membranes.
			6. The primed substrate shall be dry and free of any dust, loose particles or contaminants.
			7. Precut reinforcing fleece to conform to terminations, transitions and penetrations being flashed. Ensure a minimum 2 in (50 mm) overlap of fleece at side laps and extend flashing 4 in (100 mm) minimum horizontally onto deck unless otherwise specified. Ensure the completed liquid applied flashing membrane is fully reinforced.
			8. Wherever possible factory pre-cut fleece pipe penetration and universal corners shall be used.
			9. Mix waterproofing resin and catalyst approximately 2 minutes using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of waterproofing resin that can be used within the application time.
			10. Apply the base coat of catalyzed waterproofing resin onto the substrate using a brush or roller, working the material into the surface for complete coverage and full adhesion.
			11. Immediately apply the reinforcing fleece into the wet base coat of resin making sure the smooth side is up. Using a brush or roller, work the reinforcing fabric into the wet resin while applying the second coat of catalyzed waterproofing resin to completely encapsulate the fleece. Avoid any folds and wrinkles.
			12. At membrane tie-ins, clean cured membrane with specified cleaner before application of adjacent membrane.
		2. Penetrations
			1. Pipes, Conduits, Posts, Supports and Unusual Shaped Penetrations:
				1. Pipes, conduits and other items to be flashed must be separated with ½ in (13 mm) minimum clearance or as recommended by manufacturer to adequate waterproof each individual penetration.
				2. All penetrations must be flashed individually. Two or more items ganged together in a flashing will NOT be permitted.
				3. Flash penetrations using cold liquid applied reinforced membrane or proprietary fib rated flashing resin as recommended. Flashing shall be applied using factory pre-cut fleece wherever possible consisting of a reinforced deck skirt/target flashing applied over a reinforced vertical wrap finger flashing.
			2. Drains:
				1. Flash drains using cold liquid applied membrane. Flashing shall consist of a membrane target extending minimum 12 in (300 mm) horizontally onto the substrate applied over a finger flashing extended into the prepared drain bowl a minimum of 3 in (75 mm).
				2. At no time should the cold liquid applied membrane be installed to restrict or reduce the drain inlet in size.
				3. For new drains, contractor shall include cost of all plumbing work, piping and connection to existing storm sewer system.
			3. Hot Pipes:
				1. Protect cold liquid applied membrane components from direct contact with steam or heat sources when the in-service temperature exceeds 150°F (65.5°C). In all such cases flash to an intermediate "cool" sleeve.
				2. Fabricate "cool" sleeve in the form of a metal cone using non-ferrous metal in accordance with manufacturer details.
				3. Flash sleeve using cold liquid applied reinforced membrane similar to a standard pipe flashing. Flashing shall consist of a reinforced target applied over a reinforced vertical wrap finger flashing.
			4. Flexible Penetrations:
				1. Provide a weather-tight gooseneck set in manufacturers resin paste and secured to the deck.
				2. Flash gooseneck penetrations using cold liquid applied reinforced membrane as recommended. Flashing shall consist of a reinforced target and reinforced vertical wrap finger flashing.
			5. Walls, Curbs and Bases:
				1. Flash all walls, curbs and bases using cold liquid applied reinforced membrane. Wherever possible extend flashing up and over tops of walls, curbs and bases so the membrane terminates on the opposite face of the vertical element.
			6. Expansion Joints:
				1. Flash all expansion joints with minimum two layers of manufacturer’s cold liquid applied reinforced membrane applied over an expansion joint compressible filler, expansion tube, backer rod and/or bond breaker tape as recommended by manufacturer.
			7. Non-standard Flashing Details:

When required, consult manufacturer for recommendations on flashing non-standard conditions, penetrations or protrusions.

* + 1. Mud-set Masonry, Tile & Poured-In-Place Concrete (Bonding Layer):
			1. For all areas to receive new direct applied cement, concrete, or mortar setting bed, apply a supplementary wearing coat of membrane manufacturer’s cold liquid applied resin.
				1. Using a lambswool roller, apply an even layer of cold liquid applied resin at the minimum consumption of 30 lbs/100 ft2 (1.5 kg/m2) or as recommended by the membrane manufacturer and broadcast #1 (0.7 - 1.2mm) kiln-dried quartz aggregate into the wet resin to excess for full coverage.
				2. Allow resin bonding layer to cure as recommended by the membrane manufacturer prior to continuing application or applying loads. Remove excess un-adhered aggregate from surface by broom, vacuum or oil-free blower prior to apply overburden.
				3. When required, consult manufacturer for recommendations on flashing non-standard conditions, penetrations or protrusions.
	1. FIELD MEMBRANE APPLICATION (DERBIFLASH RS 230)
		1. Refer to manufacturer’s detail drawings, product data sheets and published general requirements for application rates and specific installation instructions.
		2. Install all flashing membranes before installing field membranes.
		3. The primed substrate shall be dry and free of any dust, loose particles or contaminants.
		4. Precut reinforcing fleece to conform to terminations, transitions and penetrations being flashed. Ensure a minimum 2 in (50 mm) overlap of fleece at side and 4 in (100 mm) at end-laps. Ensure the completed liquid applied membrane is fully reinforced.
		5. Mix waterproofing resin and catalyst approximately 2 minutes using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of product that can be used within the application time.
		6. Apply the base coat of catalyzed waterproofing resin onto the substrate using a brush or roller, working the material into the surface for complete coverage and full adhesion.
		7. Immediately apply the reinforcing fleece into the wet base coat of waterproofing resin making sure the smooth side is up. Using a brush or roller, work the reinforcing fabric into the wet resin while applying the second coat of catalyzed waterproofing resin to completely encapsulate the fleece. Avoid any folds and wrinkles.
		8. At membrane tie-ins, clean cured membrane with specified cleaner before application of adjacent membrane.
	2. WATERPROOFING CONTINUITY TESTING & QC EVALUATION
		1. Prior to applying surfacing or finish, contractor shall conduct a complete evaluation of the installed liquid applied waterproofing membrane and flashings which shall include visual inspection as well as an acceptable method for (low voltage, high voltage or water-flood) continuity testing when required.
		2. Immediately following evaluation and continuity testing, repair all deficiencies identified in liquid applied waterproofing membrane and flashings.
		3. Upon satisfactory completion of all required repairs, proceed with application of finish layers.
	3. CLEAN UP
		1. Uncured resin is considered a hazardous material. Unused resin must be catalyzed and cured prior to disposal.
		2. Clean up and properly dispose of waste and debris resulting from these operations each day as required to prevent damages and disruptions to operations.
	4. PROTECTION
		1. Upon completion of new work (including all associated work), institute appropriate procedures for surveillance and protection of finished work during remainder of construction period. Protect all areas where waterproofing membrane has been installed.

END OF SECTION