

# Parapro Roof Membrane

A detailed architectural floor plan diagram, rendered in white lines on a dark background. It shows a complex layout of rooms, corridors, and structural elements, with various symbols and annotations typical of a technical drawing.

# Installer's Guide



## **Table of Contents**

<b>I.</b>	<b>System Overview and Products</b>	<b>1</b>
<b>II.</b>	<b>Personal Protection</b>	<b>2</b>
<b>III.</b>	<b>Storage</b>	<b>2</b>
<b>IV.</b>	<b>Installation Materials, Tools, and Equipment</b>	<b>2</b>
<b>V.</b>	<b>Substrate Requirements, Preparation, and Repair</b>	<b>3</b>
<b>VI.</b>	<b>Measuring and Mixing PMMA Resins</b>	<b>8</b>
<b>VII.</b>	<b>Pro Primer W, Pro Primer T, and Pro Primer R Resins</b>	<b>11</b>
<b>VIII.</b>	<b>Pro Primer E Resin</b>	<b>12</b>
<b>IX.</b>	<b>Pro Paste Resin and Pro Mortar</b>	<b>14</b>
<b>X.</b>	<b>Pro Fleece</b>	<b>15</b>
<b>XI.</b>	<b>Parapro 123 Flashing System</b>	<b>15</b>
<b>XII.</b>	<b>Parapro Roof Membrane System</b>	<b>17</b>
<b>XIII.</b>	<b>Pro Color Finish and Walkway Surfacing</b>	<b>19</b>
<b>XIV.</b>	<b>Summary of Unit Coverage and Application Rates</b>	<b>20</b>
<b>XV.</b>	<b>Parapro Roof Membrane System Application over Paradiene 20 P Series Products</b>	<b>22</b>

# I. System Overview and Products

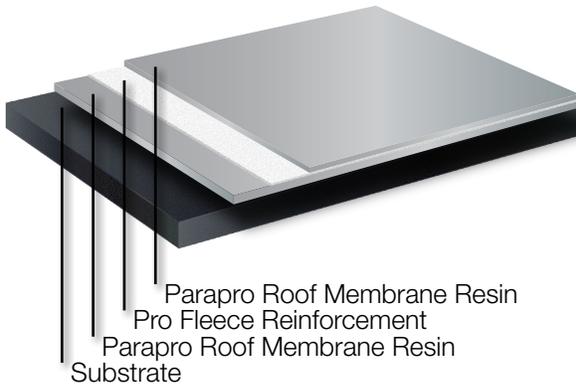
## System Overview

The Parapro Roof Membrane System is a liquid-applied, PMMA resin-based system designed to provide watertight protection in low and high slope applications. Parapro Roof Membrane is used in conjunction with the Parapro 123 Flashing System. The Parapro Roof Membrane System is a layered application consisting of one coat of primer (where required depending on substrate conditions), and waterproofing layers reinforced with polyester fleece fabric.

## Products

The following products are used in the field construction of a Parapro Roof Membrane System:

### Parapro Roof Membrane System



## Primers

- Pro Primer R Resin
- Pro Primer W Resin
- Pro Primer T Resin
- Pro Primer E Resin

## Flashing Membrane

- Parapro Flashing Resin

## Roofing Layers

- Pro Base Series Sheets
- Parapro Roof Membrane Resin

## Reinforcement

- Pro Fleece

## Finish Resin

- Pro Color Finish

## Surfacing Aggregates

- Siplast No. 11 Roofing Granules
- Pro Texture

## Other

- Pro Catalyst Liquid
- Pro Catalyst Powder
- Pro Paste
- Pro Mortar
- Pro Prep & Pro Prep M

Product	Description	Application Method
Pro Base LP	Low-profile SBS-modified base ply with Syntan acrylic coating on the top surface and sanded bottom surface.	Approved mopping asphalt or SFT Adhesive
Pro Base LP TG	Low-profile SBS-modified base ply with Syntan acrylic coating on the top surface and torch-grade asphalt on the bottom surface.	Torch or heat weld
Pro Base LP SA	Low-profile SBS-modified base ply with Syntan acrylic coating on the top surface and self-adhesive blend/release film on the bottom surface.	Self-adhesive
Pro Base	SBS-modified base ply with Syntan™ acrylic coating on the top surface and sanded bottom surface.	Approved mopping asphalt or SFT Adhesive
Pro Base TG	SBS-modified base ply with Syntan acrylic coating on the top surface and torch-grade asphalt on the bottom surface.	Torch or heat weld
Pro Base TS	Semi-adhered SBS-modified base ply with Syntan acrylic coating on the top surface and stripes of torch-grade asphalt on the bottom surface.	Torch or heat weld
Pro Base SA	SBS-modified base ply with Syntan acrylic coating on the top surface and self-adhesive blend/release film on the bottom surface.	Self-adhesive
Pro Base TS SA	Semi-adhered SBS-modified base ply with Syntan acrylic coating on the top surface and stripes of self-adhesive blend/release film on the bottom surface.	Self-adhesive

### **Weather Restrictions**

Do not apply Parapro or Pro products if there is a threat of precipitation, condensation is present on the substrate or the ambient temperature is within 5°F of the dew point. Ambient and substrate temperatures can affect the application of Siplast Parapro and Pro materials. Ambient and substrate temperature guidelines and restrictions vary by product, and are noted in the product sections of this guide.

### **Protection**

Upon completion of new work (including all associated work), use appropriate procedures for protection of finished work during the remainder of the construction period. Protect all areas where membrane has been installed.

## **II. Personal Protection**

### **Safety and Protection**

Refer to the Safety Data Sheet (SDS) for each Parapro and Pro product for specific PPE information. Parapro and Pro Resins are flammable, and are harmful if inhaled, swallowed, or absorbed through the skin. They can cause skin, eye, and respiratory irritation, and may cause skin and respiratory sensitization.

Do not smoke around Parapro or Pro Resins. Keep the products away from open flame, fire, or ignition sources. Avoid breathing Parapro or Pro Resin vapor and Pro Catalyst Powder dust. Use the products

with adequate ventilation or respiratory protection as needed to keep exposure below threshold limit values (TLV). Do not ingest the products, and avoid contact with eyes, skin, and clothing. Wear suitable gloves and eye/face protection. Wash thoroughly after handling Parapro and Pro products. Keep the products out of reach of children.

First aid information is available on Parapro and Pro product Safety Data Sheets (available at [Siplast.com](http://Siplast.com)) and product containers.

## **III. Storage**

### **Storage**

Store Parapro and Pro products indoors in closed containers in a well-ventilated, cool, dry area away from direct sunlight, heat, open fire, ignition sources, oxidizing agents, strong acids, and strong alkalis. Resin products may auto-polymerize at temperatures greater than 140°F (60°C). Resin product shelf life Parapro/Pro Resins and Pro Catalyst is 6 months from ship date. The shelf life of resin products will be reduced if the products are stored at temperatures above 77°F (25°C). Pro Catalyst is extremely heat sensitive. Proper storage is important to help ensure handling safety and maintain product quality. The storage temperature of Pro Catalyst should not exceed 77°F (25°C). The reactivity/effectiveness of Pro Catalyst will decrease progressively when stored under high temperature conditions.

Exposure to a temperature of 122°F (50°C) or higher can result in self-accelerating decomposition of Pro Catalyst. Self-accelerating decomposition is signaled by the presence of bright white smoke, and can create temperatures in excess of 500°F (260°C), depending on the environmental conditions and quantity of catalyst present. Such temperatures can be hazardous in the presence of flammable materials. Therefore, Pro Catalyst should never be subjected to conditions that can result in self-accelerating decomposition.

Materials stored on the job site during application should be kept on a pallet in a shaded, well-ventilated area. In unshaded areas, cover materials with a white, reflective tarp in a manner that allows air circulation beneath the tarp.

## **IV. Installation Materials, Tools, and Equipment**

### **Substrate Preparation**

- Blower, vacuum, & broom
- Drum scarifier
- Shot blaster with dust collector/air-pulse compressor
- Hand grinders with carbide disk or diamond cup wheel
- Pro Prep or Pro Prep M
- Pro Paste
- Pro Mortar

### Mixing

- Plastic tarps or sheeting
- Variable speed drill with 1/2-inch chuck or double-auger mortar mixer
- Mixing agitator or stir sticks
- 1-tablespoon and 1-cup measure
- Plastic mixing buckets (1 and 5-gallon)
- Battery operated scale with 40-lb (20-kg) capacity

### Application

- Masking Tape
- Application brushes
- Application rollers
- Pro Prep
- Heavy duty scissors
- Disposable butyl rubber or nitrile gloves
- Pro Tape or Eternabond Webseal

### Miscellaneous

- Clean cotton rags
- Box or razor knife
- Infrared thermometer
- Pro Prep or Pro Prep M

## V. Substrate Preparation and Repair

### Roof Deck Requirements General

Structural roof decks should be properly designed to support anticipated dead and live loads and normal construction traffic without excessive deflection or movement. Provisions for structural expansion and contraction should be incorporated into the design. All openings, walls, or projections through the roof deck should be completed before application of the roof membrane is started. The deck should be constructed according to the deck manufacturer's specifications and best-established practices. Any Siplast acceptance of a deck as satisfactory to receive roofing is based strictly on the condition of the surface to be roofed. The design of the roof deck is the responsibility of the architect, engineer, or building owner.

### Roofing over Lightweight Insulating Concrete Surfaces

Siplast requires that one ply of Parabase Plus, Parabase, Parabase FS or Parabase Plus P be laid dry and fastened over all lightweight insulating concrete substrates prior to application of the applicable Pro Base series base ply and Parapro Roof Membrane System. All fastening should be done with Zono-tite fasteners for ZIC and Insulcel Lightweight Insulating Concrete substrates having a minimum 2-inch thickness, and with NVS Fasteners for NVS substrates having a minimum 1-inch thickness. The applicable Pro Base ply sheet is then fully adhered over the nailed base sheet. Venting provisions should be incorporated into all roof constructions over lightweight insulating concrete substrates. Contact Siplast for detailed information on venting requirements.

### Roofing over Insulcel RT Lightweight Insulating Concrete

Siplast Pro Base TS is applied directly to the prepared surface of an Insulcel RT Lightweight Insulating Concrete System. Venting provisions should be incorporated into all roof constructions over lightweight insulating concrete substrates. Contact Siplast for detailed information on venting requirements.

### Paradiene 20 TS P and Paradiene 20 TS SA P Applications over Poured Reinforced Concrete

The concrete deck should be fully cured, dry, frost-free, smooth, and free from release or curing agents. The deck should be primed with PA-1125 or PA-917 LS at the rate of 1 gallon per 100- 400 sf and allowed to dry thoroughly. Pro Base 20 TS is typically torch applied and Pro Base TS SA is adhered directly to the prepared/primed substrate prior to application of the Parapro Roof Membrane System.

### Concrete Substrate to Receive Pro Primer and a Parapro Roof Membrane System

The concrete substrate should have a minimum compressive strength of 3500 psi (25 N/mm<sup>2</sup>), provide for bottom-side venting, and have a maximum moisture content as indicated in the following section titled Moisture Content Guidelines on page 4.

Concrete repair materials are acceptable provided that they have been tested/approved in advance by Siplast. Contact Siplast Technical Support for a list of products that have been tested and approved.

Concrete construction types that require project-specific review by Siplast Technical Support include:

- Split-slabs with a between-slab vapor impermeable membrane.
- Slab-on-grade construction.
- Concrete placed over a metal pan (including vented metal).
- Concrete with a moisture content exceeding published maximums.
- Concrete "T"-type constructions or pre-cast concrete panel construction without an overlay of reinforced concrete.
- Concrete utilizing porous aggregate (lightweight structural concrete).

Concrete substrates listed below should not be considered as a substrate for a Parapro System.

- Concrete that has been treated with curing compounds, surface densifiers or waterproofing agents that cannot be removed in their entirety.
- Concrete contaminated/affected by hydrocarbons, organic compounds such as bitumen (asphalt) or coal tar, alkaline silica reaction (ASR), alkaline aggregate reaction (AAR), chlorides (salts), or unreacted silicates.

**New Concrete Pours**

The mix design for new concrete pours to receive a Siplast Pro Primer should be submitted to Siplast for review prior to placement. New concrete must be allowed to hydrate for a minimum of 28 days in accordance with American Concrete Institute (ACI) Bulletin 308 – Guide to Curing Concrete, in addition to being below the maximum moisture content. Concrete should not utilize curing agents, penetrating release agents, or be treated with waterproofing materials as these materials can affect primer penetration and/or adhesion.

New concrete pours may require an extended exposure time before an acceptable moisture content is reached. To prevent delays in system installation, the use of Pro Primer E or an approved epoxy-based moisture mitigation system should be considered when the moisture content is expected to be above the published maximum at the time of roofing/waterproofing system application.

**Existing Concrete Substrates**

Existing concrete to be considered as a substrate for a direct application of Pro Primer should be cored (3 inches in diameter with a depth of 2 inches) and evaluated by an accredited lab. The number of cores should be sufficient to provide a representation of all areas to be roofed. Testing procedures should include ion chromatography, infrared spectroscopy, x-ray diffraction, and thin-section petrographic analysis. The depth of carbonation should also be measured. The presence of contaminants or carbonated concrete may affect adhesion of the roofing/waterproofing system. Contaminants include hydrocarbons or other organic compounds, concrete affected by alkaline silica reaction (ASR), alkaline aggregate reaction (AAR) or unreacted silicates. The lab should provide an executive summary, including recommendations for remedial work required to bring the concrete substrate into a condition suitable to receive the roofing/waterproofing system. Reviewing the performance of an existing coating, roofing or waterproofing system is also recommended when evaluating a concrete substrate. If blistering or loss of adhesion of the existing coating/waterproofing is evident, the source of the problem should be investigated and addressed with a plan of action before the existing system is removed and a new system applied.

**Moisture Content Guidelines for Concrete Substrates**

High moisture levels in both new and existing concrete substrates can adversely affect the adhesion of a resinous roofing/waterproofing system. The presence of moisture can affect initial adhesion of resinous primers. Additionally, the presence of moisture can transport soluble salts into the condensation zone beneath the membrane, resulting in osmosis, which can disbond the system from the concrete surface after the system has been in service for a period of time.

Siplast recommends testing for moisture content in the form of measuring relative humidity within the concrete slab. Relative humidity testing requires specific ambient conditions for the testing period. This may preclude performing moisture testing under hot, cold, or wet weather conditions.

ASTM F2170 “Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes” requires that holes be drilled into the concrete slab. Plastic sleeves are then inserted into the holes. Relative humidity levels within the sleeved cavity are then measured following an equilibrium period. The depth of penetration allows for an understanding of the moisture percent throughout the core of the substrate, rather than the near-surface readings calculated using other test methods.

Relative humidity testing must be performed under specific ambient conditions to yield proper results.

For a direct application of Pro Primer T or Pro Primer W to a concrete substrate, the following are Siplast guidelines for maximum relative humidity (RH) based upon testing in accordance with the above-listed protocol. The use of Pro Primer E or an approved epoxy-based moisture mitigation system should be

ASTM Method	Maximum Limit
ASTM F2170	75% Relative Humidity

considered when the relative humidity within the slab is expected to be above 75% at the time of roofing or waterproofing system application.

Siplast does not perform moisture content evaluations. The above test is offered by most independent labs that provide services to design firms that utilize concrete in construction. The final acceptance of the concrete substrate is the responsibility of the design authority and/or roofing or waterproofing contractor.

**Adhesion Testing for Concrete Substrates**

Adhesion testing is an excellent indicator of the presence of unforeseen contaminants such as sealers, oils and surface moisture that can affect adhesion of the primer layer and can also be used to detect the presence of a weak concrete cap, although it should not be relied upon as the sole means of evaluation. Adhesion testing is required for all concrete surfaces to be considered as a substrate for Pro Primer W and Pro Primer T.

Adhesion to concrete is evaluated using a device conforming to ASTM D4541 that utilizes a 50 mm stainless steel dolly. The concrete surface should be prepared using the same techniques of surface preparation that will be required, or at a minimum, prepared to a CSP 2 profile. The dolly is then adhered to the concrete surface using the applicable primer for the substrate. The adhesion value should exceed 220 psi to be considered acceptable.

The results of adhesion testing performed by Siplast personnel are strictly for informational purposes and should be evaluated by the design authority and contractor to verify the accuracy, adequacy, and appropriateness of the results.

### **Preparation of Concrete Substrates**

Concrete preparation methods should be chosen based upon how much of the surface requires removal and the desired concrete surface profile (CSP). For existing concrete substrates, core testing will provide the information needed to determine the amount (depth) of concrete to be removed from the surface. Concrete affected by carbonation and/or contamination must be removed in its entirety. Concrete surfaces should be prepared to a profile designated by the International Concrete Repair Institute (ICRI) as CSP 2 through CSP 4. Preparation methods for concrete substrates include shotblasting or scarification followed by shotblasting. Multiple passes with scarification and shotblasting equipment may be required to remove materials from the concrete surface and achieve the desired concrete preparation depth and surface profile. Grinding can be considered for preparation of concrete flashing substrates but it is important to note that generation of the specified CSP 2 to CSP 4 profile using a grinder can prove difficult.

Concrete preparation should be immediately followed by application of the appropriate primer. Exposure of the prepared concrete surface to the elements may result in contamination, which can adversely affect Pro Primer adhesion.

### **Concrete Crack and Joint Treatment**

Before application of the Parapro System, cracks and joints should be prepared and treated in accordance with Siplast details. Siplast recommendations for crack and joint preparation/treatment are intended to provide methods on a best effort basis to construct a watertight system. Differential movement at cracks and between divided areas subject to differential movement can potentially compromise long-term system performance. Dynamic (moving) cracks should be investigated and the causes addressed before system application. Mechanical expansion joint systems should be considered for waterproofing structural expansion joints.

### **Wood/Plywood**

Wood decks should be constructed of dry, well-sea-

soned lumber of a minimum 1-inch thickness, tongue and groove, and shiplap or splined together at side joints, and matched at end joints. Boards should have a bearing on rafters at each end and be securely nailed. Cracks wider than 1/4-inch and knotholes larger than one inch in diameter should be covered with sheet metal.

Plywood decks should be designed and fabricated in accordance with the recommendations of the APA – The Engineered Wood Association. Each panel should be identified with the appropriate APA trademark, and must meet the requirements of the latest edition of the U.S. Product Standard PS-1 for Construction and Industrial Plywood. Plywood panels must meet or exceed a span rating of 32/16 and be a minimum of 15/32-inch thick. They should be produced to meet or exceed the requirements of Exposure 1 Durability Classification. Plywood panels should be applied at right angles to rafters, continuous over two or more spans with either solid backing or panel clips stiffening all joints between rafters. Rafter spacing should be a maximum of 24 inches.

Siplast specifications call for one ply of Parabase Plus, Parabase, Parabase FS or Parabase Plus P to be laid dry and fastened to approved wood/plywood substrates prior to application of the appropriate Pro Base base ply. All nailing should be done with annular-threaded or spiral-threaded type nails having attached caps of minimum 1-inch diameter. Siplast recommends that a fastener pullout test be performed by the contractor on site to verify the appropriateness of the fastener to meet applicable design criteria.

### **Plywood Substrates to Receive a Direct Parapro Application**

Contact Siplast Technical Support for information on the direct application of a Parapro Roof Membrane or Parapro 123 Flashing System to plywood substrates.

### **Pre-cast Hollow Core Slabs, Pre-cast Concrete Panels and Pre-stressed T or Double T Panels**

Pre-cast hollow core slabs or pre-cast concrete panels should be dry, fully cured, clean, and free of imperfections. Slabs should be securely fastened to the sub frame to prevent movement or sagging, and should be set level with all joints aligned and closely butted to provide a smooth, even surface. Pre-stressed T or Double T sections shall be dry, fully cured, clean, and free from excessive camber or “set.” Pre-stressed sections should be securely anchored against uplift and lateral movement. Welding plates should be positioned next to the edge and on the top surface of the member for mid-span securement. Camber differential resulting in offset edges in excess of 1/4-inch should be corrected with an approved grout prior to the application of insulation and roofing. Grout all joints between uneven units to a slope not to exceed 1/8-inch per foot on the low member. Cover all of the joints with an 8-inch wide strip of

Parabase Plus or Parabase, adhered on one side only with PA-1021 Plastic Cement. Pre-cast Hollow Core Slabs, Pre-cast Concrete Panels and Pre-stressed T or Double T Panels should not be considered for a direct membrane application and must be covered by a lightweight insulating concrete fill or an acceptable rigid roof insulation.

### **Steel**

Steel roof decks should be constructed in accordance with the FM Approvals structural requirements listed in the current Factory Mutual Loss Prevention Data Sheet 1-29. Steel roof decks should be 22-gauge minimum, and factory galvanized or factory coated with aluminum zinc alloy for corrosion protection. When specifying galvanized protection, the designer should specify a coating that complies with ASTM A525, Class G-60 or Class G-90. When specifying aluminum zinc alloy protection, the designer should specify a deck complying with ASTM A792. Deck manufacturers should be contacted when specifying decks where highly corrosive atmospheric conditions exist. Steel decks should be clean and dry, and the ribs of the deck should be free of snow, ice, and water. The top flanges of installed steel decks should be flat. Laps should be secured according to industry standard requirements; spacing between the side lap fasteners and bar joists or beams should not exceed 3 feet. Siplast recommends that insulation fastener pull-out tests be performed by the fastener manufacturer or contractor on site to verify the appropriateness of the fastener to meet all applicable roof design criteria. Steel decks must be covered by an acceptable rigid roof insulation or lightweight insulating concrete pour.

### **New or Unusual Roof Decks**

Approval must be secured from the Siplast Technical Department prior to the installation of roofing over new or unusual decks.

### **Rigid Roof Insulation**

Rigid roof insulation should be kept dry at all times. Insulation panels should be installed strictly according to the insulation manufacturer's and applicable code or approval agency requirements (as applicable). Edges of the insulation panels should be butted without forcing and cut to fit neatly against adjoining surfaces. The insulation layer should present a smooth surface to accept the roof membrane. No more insulation should be installed than can be covered and made water-tight the day of application. Improperly attached/adhered insulation can result in roof blow-offs. Siplast will not be responsible for (and the standard Siplast guarantee does not include) roof blow-offs due to loss of adhesion of the insulation layer or performance failure of the insulation itself. Rigid insulation materials used as a roofing substrate must be specifically approved by Siplast prior to use, and a coverboard is required over all polyisocyanurate panels prior to installation of the Parapro Roof Membrane System. Paratherm and other Siplast-supplied rigid insulation

products, when incorporated into a full Siplast roof system construction and attached with Parafast Fasteners or a Siplast-supplied insulation adhesive may be eligible for coverage under a Siplast Membrane/System Guarantee.

### **Parapro System application directly to Coverboards**

Siplast recommends the use of a Pro Base series sheet over rigid insulation panels although, it may be possible to apply a Parapro Roof Membrane directly to an approved rigid insulation panel. Contact Siplast Technical Support for information on approved rigid panels and preparation/treatment of such panels for a direct application of a Parapro Roof Membrane.

### **Re-cover Applications**

Each re-cover application is unique and should be considered individually. See the Siplast Technical Guide or Contact Siplast Technical Support for information on re-cover options..

### **General Substrate Preparation**

All substrates must be free from gross irregularities, loose material, unsound material, foreign material (such as dirt, ice, snow, water, grease, oil, release agents, paints/coatings), or any other condition that would be detrimental to the adhesion of the ply sheet and/or catalyzed resin to the substrate. Some surfaces such as concrete or masonry may require shotblasting, scarification followed by shotblasting, or grinding to achieve a suitable substrate.

Preparation guidelines for substrates to receive a direct application of resins appear in the chart on the following page. However, requirements can vary for a particular situation. In applications where adhesion to a substrate not listed in the chart is required, please contact the Siplast Technical Department at 1-800-922-8800 for information on testing such substrates for adhesion by performing a field bond test.

Substrate	Preparatory Guidelines	Pro Primer W Required	Pro Primer T Required	Pro Primer E Required	Pro Primer R Recommended
Steel, Galvanized Steel, Lead	1, 2, 3, 4				
Stainless Steel, Copper, Aluminum	1, 2, 3, 4, 12				
Galvalume Metal (not approved)					
Paint/Coating	7				
Oxidized Mopping Asphalt/ Smooth-Surfaced SBS-modified bitumen, Hot Rubberized Asphalt	1, 10, 11			•	•
Concrete (horizontal)	1, 5		•		
Concrete (vertical)	1, 5	•			
Concrete (high moisture content)	1, 5, 13			•	
Concrete Repair Materials	1, 8	•			
Clay, Ceramic Tiles, Brick	1, 6	•			
Wood/ Plywood (flashing substrate)(ACX or marine-grade)	1, 9	•			
Mortar	1, 5	•			
DensDeck Prime, DexCELL FA	1, 9	•			
Approved Cementitious panels	1, 9	•			
Paradiene 20	1, 11				•
Pro Base series sheets	1, 14				•
Paradiene 30	1, 11				•

### Key to Preparation Guidelines

- Substrate must be clean and dry and free from gross irregularities, loose material, unsound material, or any foreign material (such as dirt, ice, snow, water, grease, bitumen/coal tar, oil, release agents, lacquers, paint coverings), or any other condition that would be detrimental to the adhesion of the catalyzed primer and/or resin to the substrate.
- Remove rust or other oxidation layers.
- Abrade surface to bright finish prior to cleaning with Pro Prep or Pro Prep M.
- Wipe down thoroughly with Pro Prep or Pro Prep M prior to coating. Allow Pro Prep/Pro Prep M a minimum of 20 minutes drying time after application before continuing. The next application process should be completed within 60 minutes of cleaning with Pro Prep/Pro Prep M.
- See substrate preparation and repair guidelines on page 6.
- Grind surface to remove glaze. Tiles must be fully bonded to a sound foundation with no moisture should be present beneath tiles.
- All paint coverings and coatings must be removed.
- Refer to concrete manufacturer's requirements for suitability as a substrate for waterproofing materials. Prepare by shotblasting or grinding. Contact Siplast for a list of approved concrete repair products.
- Tape all joints between panels and panel edges at all walls, perimeters, and penetrations using gaffer's tape before priming or apply Pro Tape or Eternabond Webseal after priming.
- Mopping asphalt residue should be removed from the primary substrate that will receive the Parapro or Parapro Flashing materials.
- While priming of the Paradiene 20 is not required, Pro Primer R can be applied to lower substrate temperatures and maintain a consistent aesthetic appearance. Pro Primer R cannot be used over concrete or masonry and is not intended for use over asphalt contaminated roofing or flashing substrates as an alternative to proper substrate preparation.
- Qualify/prepare substrate and prime with Rust-Oleum™ High Performance V2100 System Enamel Primer (Rust-Oleum part #2182838 Flat Gray) in accordance with Rust-Oleum specifications.
- See the section covering Pro Primer E on page 10 for concrete substrate evaluation, testing and preparation.

### Substrate Preparation and Repair of Masonry Walls

Masonry walls should be prepared in the same manner as concrete substrates (see page 5). Pro and

Parapro materials must not be applied over soft or scaling brick or masonry, faulty mortar joints, or walls with broken, damaged or leaking coping. Laitance and carbonated concrete must be completely removed

by shotblasting or grinding. The Siplast Parapro Roof Membrane Guarantee excludes from coverage moisture entry through walls above the termination of the Parapro 123 Flashing System.

#### **Metal & Rigid Plastic Flashing Substrates**

Lightly abrade and clean metal and rigid plastic substrates. Extend the preparation area a minimum of 1/4-inch (7 mm) beyond the termination of the Parapro 123 Flashing System

#### **Cracks, Joints, and Small Indentations**

Before application of the Parapro Flashing Membrane and Parapro 123 Flashings (and after priming if required), all joints, cracks, voids, fractures, depressions, and deficiencies in the substrate must be filled. Siplast recommends the use of the appropriate Pro

Primer and Pro Paste for all such substrate repairs. The use of additional reinforcement in the form of strip(s) of Parapro Flashing Resin/Pro Fleece/Parapro Flashing Resin is recommended over joints or cracks subject to movement. The Parapro Flashing Membrane and Parapro Roof Membrane may be applied immediately after the Pro Paste sets and/or reinforcing strip(s) cure(s).

#### **Substrate Leveling & Patching**

Following preparation and priming (if required), low areas (up to 5 mm (3/16")) may be leveled using Pro Primer and Pro Paste. Pro Mortar can be used for areas requiring a thickness of 5 mm to 50 mm (3/16 to 2 inches). See page the Section Titled Pro Paste Resin and Pro Mortar on page 11 for additional information.

## **VI. Measuring and Mixing PMMA Resins**

#### **General Guidelines**

Siplast PMMA resins used in Parapro Roof Membrane Systems are fast setting and should only be catalyzed as needed. Depending on the resin type and ambient temperature, the amount of catalyst needed will vary.

#### **Mixing Siplast PMMA Resins**

Thoroughly mix the entire drum of uncatalyzed resin for 2-3 minutes prior to pouring off into a second container when batch mixing. This will redistribute liquids/solids that may have separated during storage. Catalyze only the amount of resin that can be used within the anticipated pot life. Add pre-measured Pro Catalyst Liquid or Pro Catalyst Powder to the resin component, and stir for a full 2 minutes using a slow-speed mechanical agitator or mixing stick before applying to the substrate.

#### **Liquid Measure of Resins**

The amount of Pro Catalyst to be used is based on the weight of the uncatalyzed resin. Resin products have different volumes for the same measure of weight. When a scale is not available, the approximate liquid measure on the following table may be used for Pro and Parapro Resins.

#### **Batch Weighing**

The most accurate means for field measuring resin is with a portable, battery-operated scale.

#### **Measure of Pro Catalyst**

Pro Catalyst Liquid is supplied in 10-cup containers and is measured using a culinary-type cup or a 1-tablespoon measuring spoon. A measuring cup and spoon are supplied with each container of Pro Catalyst Liquid. Pro Catalyst Powder is supplied in a vented box containing ten pre-measured 0.1 kg (100 gram) bags for a total of 1 kilogram per box. A 1-tablespoon measuring spoon (10 grams) is included with each box of Pro Catalyst Powder. The amount of Pro Catalyst Liquid or Powder added to Siplast PMMA resins should never be less than indicated in the mixing ratio tables. If resin mixed with the required catalyst does not offer sufficient pot life, the resin temperature may be too high.

Parapro and Pro Resins may be field measured using the following conversions:

## Pro Catalyst Liquid Mixing Charts

Pro Catalyst Liquid Mixing Chart Pro Primer R, Pro Primer W, and Pro Primer T						
Resin Quantity	Ambient Temperature 77°F to 95°F (25°C to 35°C)		Ambient Temperature 41°F to 77°F (5°C to 25°C)		Ambient Temperature 32°F to 41°F (0°C to 5°C)	
	Tablespoons	Cups	Tablespoons	Cups	Tablespoons	Cups
1 kg (1 liter)	2	n/a	4	n/a	6	n/a
10 kg (10 liters)	n/a	1	n/a	2	n/a	3
Substrate temperature range for application of Pro Primer W, T, and R Resins is 32°F to 95°F (0°C to 35°C).						

Pro Catalyst Liquid Mixing Chart Summer Grade Parapro Roof Resin and Parapro Flashing Resin				
Resin Quantity	Ambient Temperature 68°F to 104°F (20°C to 40°C)		Ambient Temperature 59°F to 68°F (15°C to 20°C)	
	tablespoons	cups	tablespoons	cups
1 kg (0.72 liter)	2	n/a	4	n/a
10 kg (7.2 liters)	n/a	1	n/a	2
20 kg (14.3 liters)	n/a	2	n/a	4
Substrate temperature range for application of Summer Grade Parapro and Terapro resins is 59°F to 122°F (15°C to 50°C).				

Pro Catalyst Liquid Mixing Chart Winter Grade Parapro Roof Resin and Parapro Flashing Resin						
Resin Quantity	Ambient Temperature 59°F to 68°F (15°C to 20°C)		Ambient Temperature 41°F to 59°F (5°C to 15°C)		Ambient Temperature 23°F to 41°F (-5°C to 5°C)	
	tablespoons	cups	tablespoons	cups	tablespoons	cups
1 kg (0.72 liter)	2	n/a	4	n/a	6	n/a
10 kg (7.2 liters)	n/a	1	n/a	2	n/a	3
20 kg (14.3 liters)	n/a	2	n/a	4	n/a	6
Substrate temperature range for application of Winter Grade Parapro and Terapro resins is 23°F to 77°F (-5°C to 25°C).						

Pro Catalyst Liquid Mixing Chart Pro Color Finish						
Resin Quantity	Ambient Temperature 59°F to 95°F (15°C to 35°C)		Ambient Temperature 41°F to 59°F (5°C to 15°C)		Ambient Temperature 32°F to 41°F (0°C to 5°C)	
	Tablespoons	Cups	Tablespoons	Cups	Tablespoons	Cups
1 kg (1 liter)	2	n/a	4	n/a	6	n/a
10 kg (10 liters)	n/a	1	n/a	2	n/a	3
Substrate temperature range for application of Pro Color Finish is 32°F to 95°F (0°C to 35°C).						

Pro Catalyst Liquid Mixing Chart Pro Paste Resin						
Resin Quantity	Ambient Temperature 77°F to 95°F (25°C to 35°C)		Ambient Temperature 41°F to 77°F (5°C to 25°C)		Ambient Temperature 32°F to 41°F (0°C to 5°C)	
	Tablespoons	Cups	Tablespoons	Cups	Tablespoons	Cups
1 kg (0.72 liter)	2	n/a	4	n/a	6	n/a
Substrate temperature range for application of Pro Paste Resin is 32°F to 122°F (0°C to 50°C).						

## Pro Catalyst Powder Mixing Charts

Pro Catalyst Powder Mixing Chart Pro Primer R, Pro Primer W, and Pro Primer T						
The amount of Pro Catalyst Powder used with Pro Primers varies from a minimum of 2% to 6% maximum by weight, depending upon the ambient temperatures as indicated in the following table:						
Resin Quantity	Ambient Temperature 2% Catalyst 77°F to 95°F (25°C to 35°C)		Ambient Temperature 4% Catalyst 41°F to 77°F (5°C to 25°C)		Ambient Temperature 6% Catalyst 32°F to 41°F (0°C to 5°C)	
	Tblsp.	0.1-kg Bags	Tblsp.	0.1-kg Bags	Tblsp.	0.1-kg Bags
1 kg (1 liter)	2	n/a	4	n/a	6	n/a
5 kg (5 liters)	n/a	1	n/a	2	n/a	3
10 kg (10 liters)	n/a	2	n/a	4	n/a	6
Substrate temperature range for application of Pro Primer W, T, and R Resins is 32°F to 95°F (0°C to 35°C).						

Pro Catalyst Powder Mixing Chart Summer Grade Parapro Roof Resin and Parapro Flashing Resin				
The amount of Pro Catalyst Powder used with Summer Grade Resin varies from a minimum of 2% to 4% maximum by weight, depending upon the ambient temperatures as indicated in the following table:				
Resin Quantity	Ambient Temperature 2% Catalyst 68°F to 104°F (20°C to 40°C)		Ambient Temperature 4% Catalyst 59°F to 68°F (15°C to 20°C)	
	Tblsp.	0.1-kg Bags	Tblsp.	0.1-kg Bags
1 kg (1 liter)	2	n/a	4	n/a
10 kg (7.2 liters)	n/a	2	n/a	4
20 kg (14.3 liters)	n/a	4	n/a	8
Substrate temperature range for application of Summer Grade Resin is 59°F to 122°F (15°C to 50°C).				

Pro Catalyst Powder Mixing Chart Winter Grade Parapro Roof Resin and Parapro Flashing Resin						
The amount of Pro Catalyst Powder used with Winter Grade Resin varies from a minimum of 2% to 6% maximum by weight, depending upon the ambient temperatures as indicated in the following table:						
Resin Quantity	Ambient Temperature 2% Catalyst 59°F to 68°F (15°C to 20°C)		Ambient Temperature 4% Catalyst 41°F to 59°F (5°C to 15°C)		Ambient Temperature 6% Catalyst 23°F to 41°F (-5°C to 5°C)	
	Tblsp.	0.1-kg Bags	Tblsp.	0.1-kg Bags	Tblsp.	0.1-kg Bags
1 kg (0.72 liter)	2	n/a	4	n/a	6	n/a
10 kg (7.2 liters)	n/a	2	n/a	4	n/a	6
20 kg (14.3 liters)	n/a	4	n/a	8	n/a	12
Substrate temperature range for application of Winter Grade Resin is 23°F to 77°F (-5°C to 25°C).						

Pro Catalyst Powder Mixing Chart Pro Color Finish						
The amount of Pro Catalyst Powder used with Pro Color Finish varies from a minimum of 2% to 6% maximum by weight, depending upon the ambient temperatures as indicated in the following table:						
Resin Quantity	2% Catalyst 59°F to 95°F (15°C to 35°C)		4% Catalyst 41°F to 59°F (5°C to 15°C)		6% Catalyst 32°F to 41°F (0°C to 5°C)	
	Tblsp.	0.1-kg Bags	Tblsp.	0.1-kg Bags	Tblsp.	0.1-kg Bags
1 kg (1 liter)	2	n/a	4	n/a	6	n/a
10 kg (10 liters)	n/a	2	n/a	4	n/a	6
Substrate temperature range for application of Pro Color Finish is 32°F to 95°F (0°C to 35°C).						

## VII. Pro Primer W, Pro Primer T, and Pro Primer R Resins

### General Application Guidelines

Priming with catalyzed Pro Primer T Resin is required prior to application of Parapro Roof Systems where horizontal areas of concrete are to be treated. Pro Primer W is required for concrete in a vertical orientation and other substrates as outlined in the substrate preparation chart on page 7. Pro Primer E may be required for concrete substrates having a high moisture content. For specific priming requirements, refer to the substrate preparation chart on page 7 of this guide.

Priming with catalyzed Pro Primer R Resin is recommended prior to application of Parapro Roof Membrane Systems over asphaltic substrates where aesthetics are a concern. For specific priming requirements, refer to the substrate preparation chart on page 7 of this guide.

See the table below for ambient and substrate temperature limitations when applying Pro Primer T, Pro Primer W, or Pro Primer R.

Ambient & Substrate Temperature Limitations Pro Primer T, Pro Primer W and Pro Primer R	
Minimum Ambient and Substrate Temperature	32°F (0°C)
Maximum Ambient and Substrate Temperature	95°F (35°C)

Discontinue primer application when the ambient and/or substrate temperature exceeds 95°F (35°C). In warm temperatures, shade the substrate for a sufficient period of time both prior to and during application, as necessary, to maintain substrate temperatures

below 95°F (35°C).

Pro Primer W, Pro Primer T, and Pro Primer R are applied with a roller and can be covered with Parapro Roof Membrane or Flashing Resin after the primer is

cured (generally a minimum of 45 minutes following application). Pro Primer W and Pro Primer T can be exposed for up to 6 months. If work is interrupted for more than 12 hours, or the surface of the primer becomes dirty or contaminated from exposure to the elements, thoroughly clean the in-place and cured

primer with Pro Prep or Pro Prep M. Pro Prep or Pro Prep M should be allowed a minimum of 20 minutes drying time after application before continuing. Following the Pro Prep or Pro Prep M drying time, the next application process should be completed within 60 minutes.

### Pro Primer W, Pro Primer T, and Pro Primer R Application Rates

Application Rates (minimum) Pro Primer T, Pro Primer W and Pro Primer R	
Pro Primer W over Wood, Plywood, Vertical Concrete and other Substrates Listed on page 7	0.037 kg/sf (3.7 kg/sq) (0.4 kg/m <sup>2</sup> )
Pro Primer T over Horizontal Concrete	
Pro Primer R over Smooth Surfaced SBS Sheets	
Pro Primer W over DensDeck Prime and approved cement boards	0.074 kg/sf (7.4 kg/sq) (0.8 kg/m <sup>2</sup> )

**NOTE:** Application rates will vary with substrate type, surface profile, and porosity. In all cases, a continuous film of cured primer is required prior to application of subsequent layers of Parapro and Pro resins. Primer application rate should be increased over more absorptive substrates such as DensDeck Prime and cement boards.

### Pro Primer W, Pro Primer T, and Pro Primer R Pot Life and Set/Cure Times

Pot life and set/cure times noted below are approximate, and may vary. The information provided is

based on laboratory conditions, and is intended for use as a guideline only. Actual pot life and set/cure times should be established in the field, based on actual field conditions.

Pot Life & Set/Cure Times (approx.) at 68°F (20°C) Pro Primer T, Pro Primer W and Pro Primer R	
Pot Life	15 minutes
Rain Proof	25 minutes
Ready for Next Coat	45 minutes

**NOTE:** Pot life will be reduced if the resin or liquid/aggregate mixture is at higher temperatures. Pot life can be maximized by storing product under controlled conditions and ensuring that the liquid resin and aggregate are at the low range of minimum storage temperature during/following catalyzation and prior to application. In warm temperatures, the substrate should be shaded for a sufficient period of time both prior to and during application, as necessary, to maintain substrate temperatures below published maximums.

## VIII. Pro Primer E Resin

### General Information

Priming with Pro Primer E is required prior to application of Parapro 123 Flashing and/or the Parapro Roof Membrane Systems over approved concrete substrates where the moisture content is higher than that allowable for application of PMMA-based Pro Primers.

### Mixing Pro Primer E

Pro Primer E is supplied in kit form that requires mixing in full batch quantities. Pro Primer E should be a minimum of 60°F (15°C) at the time of mixing. Pierce a

hole through the rubber membrane in the lid and continue through the bottom of the lid well. Ensure that Part B in the upper reservoir fully drains into the lower reservoir containing Part A – this may require several piercings. Stir mixture for 5 minutes using a Jiffy Mixer at low speed (approximately 300 rpm) to generate a homogeneous, streak-free consistency. Keep the mixer blades fully submerged during stirring to avoid trapping air. Pour the mixed material into a clean, secondary container and mix again for an additional 30 seconds. Ensure that the bottom and sides of the

container are fully scraped to disperse any materials that may have settled.

### Application of Pro Primer E

See the information below for ambient and substrate temperature limitations when applying Pro Primer E.

Ambient & Substrate Temperature Limitations Pro Primer E	
Minimum Ambient and Substrate Temperature	45°F (8°C)
Maximum Ambient and Substrate Temperature	95°F (35°C)

In warm temperatures, the substrate should be shaded for a sufficient period of time, as necessary, to maintain substrate temperatures below 95°F (35°C). Pro Primer E should always be applied when ambient and substrate temperatures are falling rather than rising to minimize the potential for the formation of pinholes in the applied primer. Ensure that the primer system will be protected from direct sunlight, wind, precipitation/condensation, and bond-inhibiting surface contaminants (dust, dirt and tear-off debris) during the curing process.

Prior to application of Pro Primer E, wet the qualified and prepared concrete substrate and ensure that it is in a saturated-surface-dry (SSD) condition.

Saturated-surface-dry is a condition in which the substrate is wetted but no standing/ ponding water is present. Pro Primer E is applied with a brush or roller. Following application, use a brush to scrub the primer into the concrete surface. Follow the scrubbing process by using a non-shed roller to ensure that the Pro Primer E is distributed evenly and that there is a continuous layer of primer. Allow the primer to cure for 12 hours. Pro Primer E must be overlaid with catalyzed Parapro resins within 48 hours of primer application without exception. Thoroughly clean the Pro Primer E surface with warm water or Pro Prep or Pro Prep M prior to application of Parapro resins. The water and/or Pro Prep or Pro Prep M should be allowed to fully dry before application of Parapro resins.

### Pro Primer E Application Rates

Application Rates (minimum) Pro Primer E	
Pro Primer E over approved concrete substrate having an internal RH of up to 75%	0.032 kg/sf (3.2 kg/sq) (0.35 kg/m <sup>2</sup> )
Pro Primer E over approved concrete substrate having an internal RH of 75% to 100%	0.046 kg/sf (4.6 kg/sq) (0.5 kg/m <sup>2</sup> )

**NOTE:** Application rates vary with substrate type, surface profile, and porosity. In all cases, a continuous film of cured primer is required prior to application of subsequent layers of Parapro and Pro resins.

### Pro Primer E Pot Life, Set/Cure Times and Maximum Exposure Times

Pot life and set/cure times noted below are approximate and may vary. The information provided is based on laboratory conditions, and is intended for use as a

guideline only. Actual pot life, set/cure times and pot life should be established in the field, based on actual field conditions. The maximum exposure time (48 hours) of Pro Primer E should not be exceeded.

Pot Life & Set/Cure Times Pro Primer E	
Pot Life (approx.)	30 minutes
Typical Set/Cure Time for Pro Primer E prior to application of Parapro or Pro Resins (typical)	12 hours
Maximum exposure time prior to application of Parapro Resins	48 hours

# IX. Pro Paste Resin and Pro Mortar

## Pro Paste Resin and Pro Mortar

### General Information

Pro Paste Resin is a PMMA-based paste used for remediation of depressions in substrate surfaces or other irregularities prior to application of the Parapro System.

Pro Mortar consists of separate resin and aggregate components that are mixed to create a concrete patching product. Pro Mortar has a compressive strength similar to that of structural concrete. Approved concrete substrates are prepared and primed using the appropriate Pro Primer prior to application of Pro Paste.

Pro Paste and Pro Mortar are typically applied by trowel and can be covered with Pro Primer, the Parapro 123 Flashing System, or the Parapro Roof Membrane System after the Pro Paste or Pro Mortar is set.

### Application of Pro Paste and Pro Mortar

See the information below for ambient and substrate temperature limitations when applying Pro Paste and Pro Mortar.

Ambient & Substrate Temperature Limitations Pro Paste and Pro Mortar	
Ambient Temperature Range	32°F to 95°F (0°C to 35°C)
Substrate Temperature Range	32°F to 122°F (0°C to 50°C)

The resin and/or aggregate/resin mixture itself should be within storage temperature guidelines at the time of catalyzation to ensure that the product maintains a workable pot life. Discontinue application when the ambient temperature exceeds 95°F (35°C) and/or the substrate temperature exceeds the 122°F (50°C) maximum. Provide adequate shade over the substrate area both prior to and during application as necessary to maintain surface temperatures below the maximum.

Pro Paste Resin and Pro Repair Mortar, as with all Parapro and Pro resin products, may require the application of a Pro Primer product before application. See the table on page 7 for specific substrate preparation guidelines.

When Pro Paste or Pro Mortar are to be applied

over a Pro or Parapro product, thoroughly clean the surface of the in- place resin product with Pro Prep or Pro Prep M. This step is required even if the Pro or Parapro product has been recently applied. Pro Prep or Pro Prep M should be allowed a minimum of 20 minutes of drying time after application before continuing. Following the Pro Prep or Pro Prep M drying time, complete the Pro Paste or Pro Mortar application process within 1 hour.

Due to its porosity, catalyzed Pro Mortar should not be exposed to precipitation or allowed to be exposed overnight. If Pro Mortar will not be overlaid with Parapro Flashing or Parapro Base Resin immediately following application, seal the surface using Pro Primer W or Pro Primer T at a minimum rate of 0.037 kg/sf (3.7 kg/sq) (0.4 kg/m<sup>2</sup>).

### Pro Paste Application Rates and Maximum Thickness per Lift

Application/Coverage Rates (approximate) and Maximum Thickness per Lift Pro Paste	
Application rate per 1 mm of thickness	0.13 kg/sf (1.4 kg/m <sup>2</sup> )
Maximum Thickness per Lift	5 mm (3/16")

## Pro Mortar Yield and Minimum/Maximum Thickness per Lift

Yield Per Unit and Minimum/Maximum Thickness per Lift Pro Mortar	
Yield per Unit (one pail of Pro Mortar and two bags of Pro Mortar Aggregate)	10 board feet
Minimum Thickness per Lift	3/16" (5 mm)
Maximum Thickness per Lift	2" (50 mm)

### Pro Paste and Pro Mortar Pot Life and Set/Cure Times

Pot life and set/cure times noted below are approximate and may vary. The information provided is based

on laboratory conditions, and is intended for use as a guideline only. Actual pot life, set/cure times and pot life should be established in the field, based on actual field conditions.

Pot Life & Set/Cure Times at 68°F (20°C) Pro Paste	
Pot Life	15 minutes
Rain Proof	30 minutes
Ready for Next Coat	1 hour
Pro Mortar	
Rain Proof	30 minutes
Ready for Next Coat	45 minutes
Stress Resistant	1 hour

**NOTE:** Pot life will be reduced if the resin or resin/aggregate mixture is at higher temperatures. Pot life can be maximized by storing product under controlled conditions and ensuring that the liquid resin and aggregate are at the low range of minimum storage temperature during/following catalyzation and prior to application. Minimum set times noted above are approximate and may vary. The information provided is based on laboratory conditions and is intended for use as a guideline only. Actual set/cure times should be established in the field, based upon actual field conditions.

## X. Pro Fleece

### Pro Fleece

Pro Fleece is the reinforcement layer used in Parapro Roof Membrane Systems and Parapro Flashing applications.

### Pro Fleece Sizes

Pro Fleece is available in three widths: 12-inch (315 mm) and 25-inch (630 mm) for use in the Parapro Flashing System and 41-inch (1050 mm) for use in Parapro Roof Membrane applications

## XI. Parapro 123 Flashing System

### Parapro 123 Flashing System - General Application Guidelines

Parapro Flashing Resin, when catalyzed, is combined with fleece fabric to form the Parapro 123 Flashing System, a monolithic, reinforced flashing membrane used for flashing details. Parapro Flashing Resin is available in two formulations: Summer Grade and Winter Grade. Care should be taken to ensure that

the correct formulation of Parapro Flashing Resin (Summer Grade or Winter Grade) is chosen for the application based upon the ambient temperature during application. All flashing applications installed in conjunction with the Parapro Roof System should be completed prior to field membrane application.

See the information below for ambient and substrate temperature limitations when applying Parapro Flashing Resin

Ambient & Substrate Temperature Limitations Parapro Flashing Resin	
Summer Grade Parapro Flashing Resin <u>Ambient</u> Temperature Range	59°F to 104°F (15°C to 40°C)
Summer Grade Parapro Flashing Resin <u>Substrate</u> Temperature Range	59°F to 122°F (15°C to 50°C)
Winter Grade Parapro Flashing Resin <u>Ambient</u> Temperature Range	23°F to 68°F (-5°C to 20°C)
Winter Grade Parapro Flashing Resin <u>Substrate</u> Temperature Range	23°F to 77°F (-5°C to 25°C)

**NOTE:** Discontinue resin application when the ambient and/or substrate temperatures are outside of the ranges listed above. In warm temperatures, the substrate should be shaded for a sufficient period of time both prior to and during application, as necessary, to maintain substrate temperatures below published minimums.

### Parapro Flashing Resin Application

Apply an even, generous base coat of catalyzed Parapro Flashing Resin to the substrate with an application roller or brush. Pro Fleece reinforcement is worked into the wet, catalyzed Parapro Flashing Resin base coat using a roller or brush to fully embed the fleece in the resin and remove trapped air. Overlap Pro Fleece a minimum of two inches (51 mm). An additional coat of catalyzed Parapro Flashing Resin must be placed between all layers of overlapping fleece. Extend Catalyzed Parapro Flashing Resin a maximum 1/4-inch beyond the Pro Fleece reinforcement. Apply an even, generous top coat of catalyzed Parapro Flashing

Resin following embedment of the fleece to ensure full saturation of the fleece reinforcement.

If work is interrupted for more than 12 hours, or the surface of the catalyzed Parapro Flashing Resin becomes dirty or contaminated from exposure to the elements, thoroughly clean the transition area with Pro Prep or Pro Prep M. Pro Prep and Pro Prep M should be allowed a minimum of 20 minutes evaporation time after application before continuing work. Following the drying time, complete the next application process within 1 hour.

### Parapro Flashing Resin Application Rates

Application Rates (minimum) Parapro Flashing Resin over Smooth Substrates	
Parapro Flashing Resin – Base Coat	0.19 kg/sf (0.13 liter/sf) (2 kg/m <sup>2</sup> )
Parapro Flashing Resin – Top Coat	0.12 kg/sf (0.09 liter/sf) (1.3 kg/m <sup>2</sup> )
Parapro Flashing Resin – Total	0.31 kg/sf (0.22 liter/sf) (3.3 kg/m <sup>2</sup> )

**NOTE:** Application rates vary with substrate profile. Resin base coat application will require an increase over substrates having a rough profile.

Application Rates (minimum) Parapro Flashing Resin over Granule-Surfaced Substrates	
Parapro Flashing Resin – Base Coat	0.28 kg/sf (0.2 liter/sf) (3 kg/m <sup>2</sup> )
Parapro Flashing Resin – Top Coat	0.12 kg/sf (0.09 liter/sf) (1.3 kg/m <sup>2</sup> )
Parapro Flashing Resin – Total	0.4 kg/sf (0.29 liter/sf) (4.3 kg/m <sup>2</sup> )

**NOTE:** Application rates vary with substrate profile. Resin base coat application will require an increase over substrates having a weathered/crazed granule surface.

**Parapro Flashing Resin Pot Life and Set/Cure Times**

Pot life and set/cure times noted below are approximate, and may vary. The information provided is

based on laboratory conditions, and is intended for use as a guideline only. Actual pot life and set/cure times should be established in the field, based on actual field conditions.

Pot Life & Set/Cure Times (approx.) at 68°F (20°C) Parapro Flashing Resin	
Pot Life	15 minutes
Rain Proof	30 minutes
Ready for Next Coat	45 minutes
Ready for Foot Traffic	2 hours

**NOTE:** Pot life will be reduced if the resin or liquid/aggregate mixture is at higher temperatures. Pot life can be maximized by storing product under controlled conditions and ensuring that the liquid resin and aggregate are at the low range of minimum storage temperature during/following catalyzation and prior to application. Minimum set times noted above are approximate and may vary. The information provided is based on laboratory conditions and is intended for use as a guideline only. Actual set/cure times should be established in the field, based upon actual field conditions.

## XII. Parapro Roof Membrane System

**General Application Guidelines**

Parapro Roof Membrane Resin, when catalyzed, forms the waterproofing layer of the Parapro Roof Membrane System. Parapro Roof Membrane Resin is available in two formulations: Summer Grade and Winter Grade. Care should be taken to ensure that the correct formulation of Parapro Roof Membrane Resin (Summer Grade or Winter Grade) is chosen for the ap-

plication based upon the ambient temperature during application. All flashing applications should be completed before application of the Parapro Roof System field membrane.

See the information below for ambient and substrate temperature limitations when applying Parapro Roof Resin.

Ambient & Substrate Temperature Limitations Parapro Roof Resin	
Summer Grade Parapro Roof Membrane Resin - <u>Ambient</u> Temperature Range	59°F to 104°F (15°C to 40°C)
Summer Grade Parapro Roof Membrane Resin - <u>Substrate</u> Temperature Range	59°F to 122°F (15°C to 50°C)
Winter Grade Parapro Roof Membrane Resin - <u>Ambient</u> Temperature Range	23°F to 68°F (-5°C to 20°C)
Winter Grade Parapro Roof Membrane Resin - <u>Substrate</u> Temperature Range	23°F to 77°F (-5°C to 25°C)

**NOTE:** Discontinue resin application when the ambient and/or substrate temperatures are outside of the ranges listed above. In warm temperatures, the substrate should be shaded for a sufficient period of time both prior to and during application, as necessary, to maintain substrate temperatures below published minimums.

After priming with the appropriate Pro Primer (if applicable), apply an even base layer of catalyzed Parapro Roof Membrane Resin using a stub roller. Embed Pro Fleece reinforcement into the wet, catalyzed Parapro Roof Membrane Resin waterproofing layer using a roller to fully embed the fleece into the resin and remove trapped air. At side and end laps, overlap Pro Fleece a minimum of 2 inches (51 mm). An additional coat of catalyzed Parapro Roof Membrane Resin must be placed between all layers of overlapping fleece. Im-

mediately apply a top coat of catalyzed Parapro Roof Membrane Resin following embedment of the fleece to ensure full saturation of the fleece reinforcement. Allow the Parapro Roof Membrane to cure for a minimum of 45 minutes before application of the optional wearing layer and surfacing.

If work is interrupted for more than 12 hours, or the surface of the Parapro Roof Membrane Resin layer becomes dirty or contaminated from exposure to the

elements, thoroughly clean the area with Pro Prep or Pro Prep M. Pro Prep products should be allowed a minimum of 20 minutes evaporation time after appli-

cation before continuing work. Following the drying time, the next application process should be completed within 1 hour.

### Parapro Roof Membrane Resin Application Rates

Application Rates (minimum) Parapro Roof Membrane Resin over Smooth Substrates	
Parapro Roof Membrane Resin – Base Coat	0.19 kg/sf (0.13 liter/sf) (2 kg/m <sup>2</sup> )
Parapro Roof Membrane Resin – Top Coat	0.12 kg/sf (0.09 liter/sf) (1.3 kg/m <sup>2</sup> )
Parapro Roof Membrane Resin – Total	0.31 kg/sf (0.22 liter/sf) (3.3 kg/m <sup>2</sup> )

**NOTE:** Application rates vary with substrate profile. Resin base coat application/coverage will require an increase over substrates having a rough profile.

Application Rates (minimum) Parapro Flashing Resin over Granule-Surfaced Substrates	
Parapro Roof Membrane Resin – Base Coat	0.28 kg/sf (0.2 liter/sf) (3 kg/m <sup>2</sup> )
Parapro Roof Membrane Resin – Top Coat	0.12 kg/sf (0.09 liter/sf) (1.3 kg/m <sup>2</sup> )
Parapro Roof Membrane Resin – Total	0.4 kg/sf (0.29 liter/sf) (4.3 kg/m <sup>2</sup> )

**NOTE:** Application rates vary with substrate profile. Resin base coat application/coverage will require an increase over substrates having a weathered/crazed granule surface.

### Parapro Roof Membrane Resin Pot Life and Set/Cure Times

Pot life and set/cure times noted below are approximate, and may vary. The information provided is

based on laboratory conditions, and is intended for use as a guideline only. Actual pot life and set/cure times should be established in the field, based on actual field conditions.

Pot Life & Set/Cure Times (approx.) at 68°F (20°C) Parapro Roof Membrane Resin	
Pot Life	15 minutes
Rain Proof	30 minutes
Ready for Next Coat	45 minutes
Ready for Foot Traffic	2 hours

**NOTE:** Pot life will be reduced if the resin or liquid/aggregate mixture is at higher temperatures. Pot life can be maximized by storing product under controlled conditions and ensuring that the liquid resin and aggregate are at the low range of minimum storage temperature during and following catalyzation and prior to application. Minimum set/cure times noted above are approximate and may vary. The information provided is based on laboratory conditions and is intended for use as a guideline only. Actual set/cure times should be established in the field, based upon actual field conditions.

### Night Seals

Night seals are necessary to ensure that water does not migrate beneath the new membrane during breaks in application. At the end of the day's work, or when precipitation is imminent, a night seal must be installed at all open edges. Such tie-ins can be built

using Parapro materials constructed to withstand protracted periods of service. Refer to the substrate preparation table or contact the Siplast Technical Department for information on compatibility with special materials not shown. Night seals must be completely removed prior to the resumption of work.

### XIII. Pro Color Finish and Walkway/Skid-Resistant Surfacing

**Pro Color Finish**

Pro Color Finish can be applied as a supplemental finish layer over the cured Parapro 123 Flashing System and Roof Membrane System. Pro Color Finish offers a durable surface finish in a variety of standard colors.

**Pro Color Finish - General Application Guidelines**

Catalyzed Pro Color Finish Resins are applied using a roller over the completed Parapro 123 Flashing System and Parapro Roof Membrane System. Pro Color Finish layers must not be applied until the Parapro 123 Flashing System and/or Parapro Roof Membrane System has been in place for approximately 2 hours, and is set (cured).

**Optional Walkway/Skid Resistant Surfacing**

There are two options for constructing walkway/skid resistant surfacings over Parapro Roof Membrane Systems: The first involves embedment of Siplast No.

11 Granules in a supplemental embedment layer of Parapro Roof Membrane Resin. The second involves broadcast of Pro Texture Beads in an embedment layer of Pro Color Finish.

**Siplast No. 11 Granules**

Siplast No.11 Granules are broadcast to refusal into a supplemental embedment layer of Parapro Roof Membrane Resin before resin sets (cures). The embedment layer is then allowed to cure and the excess granules are then swept and removed from the roof surface.

**Pro Texture Beads**

An embedment layer of Pro Color Finish is applied over the Parapro Roof Membrane System and Pro Texture Beads are then broadcast into the wet resin using a hopper gun. The surface is then back-rolled using a roller to fully embed the Pro Texture Beads.

**Pro Color Finish Application Rates over Parapro 123 Flashing System and/or Parapro Roof Membrane System**

Application Rates (minimum) Pro Color Finish	
Pro Color Finish over Parapro 123 Flashing System and/or Parapro Roof Membrane System	0.046 kg/sf (4.6 kg/square) (0.5 kg/m <sup>2</sup> )

**Parapro Roof Membrane Resin and Siplast #11 Roofing Granules Application Rates**

Application Rates (minimum) Parapro Roof Membrane Resin and Siplast #11 Roofing Granules	
Parapro Roof Membrane Resin (embedment of granules)	0.09 kg/sf (9 kg/square) (1.0 kg/m <sup>2</sup> )
Siplast #11 Roofing Granules (embedment into Parapro Roof Membrane Resin)	1 lb/sf (100 lbs/square)

**Pro Texture Beads and Pro Color Finish Application Rates**

Application Rates (minimum) Pro Texture Beads and Pro Color Finish	
Pro Color Finish (embedment layer for Pro Texture Beads)	0.046 kg/sf (4.6 kg/square) (0.5 kg/m <sup>2</sup> )
Pro Texture Beads (embedment into Pro Color Finish)	0.0014 kg/sf (0.14 kg/square) (0.015 kg/m <sup>2</sup> )

**NOTE:** The application rate for Pro Texture Beads is minimum and can be increased if a more aggressive profile is desired.

**Parapro Roof Membrane Resin and Pro Color Finish Set/Cure Times**

Pot life and set/cure times noted below are approximate, and may vary. The information provided is

based on laboratory conditions, and is intended for use as a guideline only. Actual pot life and set/cure times should be established in the field, based on actual field conditions.

Pot Life & Set/Cure Times (approx.) at 68°F (20°C) Parapro Roof Membrane Resin and Pro Color Finish	
Pot Life	15 minutes
Rain Proof	30 minutes
Ready for Next Coat	45 minutes
Ready for Foot Traffic	2 hours

**NOTE:** Pot life will be reduced if the resin is at higher temperatures. Pot life can be maximized by storing product under controlled conditions and ensuring that the liquid resin and aggregate are at the low range of minimum storage temperature during and following catalyzation and prior to application. In warm temperatures, the substrate should be shaded for a sufficient period of time both prior to and during application, as necessary, to maintain substrate temperatures below published maximums.

## XIV. Summary of Unit Coverage and Application Rates

Minimum Coverage/Application Rates				
Primers	sf/unit*	kg/sf	kg/sq	kg/m <sup>2</sup>
Pro Primer T (concrete)	270 sf (10-kg pail)	0.037	3.7	0.4
Pro Primer R (smooth substrates)	270 sf (10-kg pail)	0.037	3.7	0.4
Pro Primer W (vertical concrete, wood and plywood)	270 sf (10-kg pail)	0.037	3.7	0.4
Pro Primer W (DensDeck Prime and approved cement boards)	135 sf (10-kg pail)	0.074	7.4	0.8
Pro Primer E (concrete w/RH up to 75%)	310 sf (10-kg pail)	0.032	3.2	0.35
Pro Primer E (concrete w/RH of 75% to 100%)	215 sf (10-kg pail)	0.046	4.6	0.5

Minimum Coverage/Application Rates				
Parapro Flashing Resin (smooth substrates)	sf/unit*	kg/sf	liter/sf	kg/m <sup>2</sup>
Parapro Flashing Resin – base coat	n/a	0.19	0.13	2
Parapro Flashing Resin – top coat	n/a	0.12	0.09	1.3
Parapro Flashing Resin – total	32 sf (10-kg pail)	0.31	0.22	3.3

Minimum Coverage/Application Rates				
Parapro Flashing Resin (granule-surfaced substrates)	sf/unit*	kg/sf	liter/sf	kg/m <sup>2</sup>
Parapro Flashing Resin – base coat	n/a	0.28	0.2	3
Parapro Flashing Resin – top coat	n/a	0.12	0.09	1.3
Parapro Flashing Resin – total	25 sf (10-kg pail)	0.4	0.29	4.3

Minimum Coverage/Application Rates				
Parapro Roof Membrane Resin (smooth substrates)	sf/unit*	kg/sf	liter/sf	kg/m <sup>2</sup>
Parapro Roof Membrane Resin – base coat	n/a	0.19	0.13	2
Parapro Roof Membrane Resin – top coat	n/a	0.12	0.09	1.3
Parapro Roof Membrane Resin – total	64 sf (20-kg pail)	0.31	0.22	3.3

Minimum Coverage/Application Rates				
Parapro Roof Membrane Resin (granule-surfaced substrates)	sf/unit*	kg/sf	liter/sf	kg/m <sup>2</sup>
Parapro Roof Membrane Resin – base coat	n/a	0.28	0.2	3
Parapro Roof Membrane Resin – top coat	n/a	0.12	0.09	1.3
Parapro Roof Membrane Resin – total	50 sf (20-kg pail)	0.4	0.29	4.3

Minimum Coverage/Application Rates				
Product Type and Application	sf/unit*	rate	rate	rate
Pro Color Finish (over Parapro surfaces)	215 sf (10-kg pail)	0.046 kg/sf	4.6 kg/sq	0.5 kg/m <sup>2</sup>
Parapro Roof Membrane Resin (embedment of granules)	220 sf (20-kg pail)	0.09 kg/sf	9 kg/sq	1 kg/m <sup>2</sup>
Siplast #11 Roofing Granules (embedment into Parapro Roof Membrane Resin)	60 sf (65 lbs pail)	1 lb/sf		
Pro Color Finish (embedment of Pro Texture Beads)	215 sf (10-kg pail)	0.046 kg/sf	4.6 kg/sq	0.5 kg/m <sup>2</sup>
Pro Texture Beads (embedment into Parapro Roof Membrane Resin)	3500 sf (5-kg box)	0.0014 kg/sf	0.14 kg/sq	0.15 kg/m <sup>2</sup>

**NOTE:** The coverage and application rates listed above do not include waste, overage due to uneven/rough substrates, product needed to treat joints/cracks/overlaps, material required to saturate roller/covers and residue discarded in less-than-empty pails. See the table below for information on waste and overage factors related to roller cover saturation and fleece overlaps.

Waste and Overage Factors			
Resin Required for Roller Cover Saturation (avg. loss per cover in kilograms)			
Resin Type	Loss per 4" cover	Loss per 9" cover	Loss per 18" cover
Pro Primer/Pro Color Finish	0.1 kg	0.55 kg	1.1 kg
Parapro Flashing Resin/ Parapro Roof Membrane Resin	0.1 kg	0.75 kg	1.5 kg

Waste and Overage Factors			
Two-Inch Fleece Lap Overage (avg. overage per fleece roll width in percent)			
Product Type	12" (315 mm)	25" (630 mm)	41" (1050 mm)
Parapro Flashing Resin/ Parapro Roof Membrane Resin	12%	6%	3.5%
Pro Fleece	17%	8.5%	5%

## XV. Parapro Roof Membrane System Applied over Paradiene 20 P Series Products

**NOTE:** Flashing membrane application is typically accomplished prior to application of the Parapro field membrane. See the Parapro 123 Flashing System Installer's Guide for information regarding detailed application of flashing materials.



1. Using Pro Prep, wipe down thoroughly all horizontal areas of the Parapro Flashing Membrane which will receive an overlap of the Parapro Roof Membrane. Allow Pro Prep a minimum 20 minutes drying time before continuing.



2. Note that certain substrates require priming with Pro Primer before application of Parapro Roof Membrane Resin. Refer to the Substrate Preparation Chart for priming requirements. Apply a base coat of catalyzed Parapro Roof Membrane Resin using an approved stub roller.



3. Install/embed a layer of Pro Fleece into the wet Parapro Roof Membrane Resin.



4. Use a roller to embed the fleece and remove trapped air. Lap fleece layers a minimum of 2 inches, and apply an additional coat of catalyzed Parapro Roof Membrane Resin between layers of overlapping fleece.



5. Apply a top coat of catalyzed Parapro Roof Membrane Resin using a roller immediately following embedment of the Pro Fleece to ensure full saturation of the fleece. Allow to cure for 2 hours prior to application of any optional color finishes or anti-skid surfacings. The completed Parapro Roof Membrane can be exposed to foot traffic after a 2-hour cure time.







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