

# DURO-SHIELD™ SILICONE ROOF COATING INSTALLATION GUIDE

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## GENERAL REQUIREMENTS

- Roof substrate preparation is the responsibility of the installer.
- Do not begin work with Duro-Shield™ silicone products until preliminary work has been completed or until unsatisfactory conditions have been corrected as per the Duro-Shield Silicone Roof Coating Installation Guide. The substrate must be clean, dry and free of any foreign objects prior to application of Duro-Shield silicone products. Do **not** apply Duro-Shield silicone products, including all Duro-Shield silicone primer and silicone coatings, to unacceptable substrates.
- Positive drainage is recommended.
- Protect any surfaces that should not receive Duro-Shield silicone products.
- Do not apply Duro-Shield silicone products whenever weather conditions are unfavorable or inclement.
- Primer-less applications require adhesion testing. Refer to **TESTING** on page 6.
- Duro-Shield Silicone Roof Primer: Universal 2-Part Epoxy may be used to increase adhesion.

# SUBSTRATE PREPARATION

## GENERAL

Inspect each substrate and repair any of the following issues as described in this section.

METAL SUBSTRATES	
Issue	Repair
<b>Rust</b>	<ul style="list-style-type: none"> <li>Severely damaged or rusted seams and/or fasteners must be replaced.</li> <li>Metal panels that have holes must be replaced.</li> <li>Metal panels with light rust must be treated with Universal 2-Part Epoxy Primer to prevent further deterioration. The entire roof surface must have no more than 20% rust.</li> </ul>
<b>Fasteners</b>	<ul style="list-style-type: none"> <li>All fasteners must be retightened, secured, or replaced as necessary.</li> <li>All stripped fasteners must be replaced with new, larger grommet-head fasteners.</li> <li>All deteriorated or missing fasteners must be replaced.</li> <li>All fasteners must be fully encapsulated with Duro-Shield Silicone Brush-Grade Sealant.</li> </ul>
<b>Small Gaps (Less than 1/8 inch)</b>	<ul style="list-style-type: none"> <li>For gaps less than 1/8 inch, seal with Duro-Shield Silicone Brush-Grade Sealant.</li> </ul>
<b>Large Gaps (1/8 inch or greater)</b>	<ul style="list-style-type: none"> <li>For gaps greater than 1/8 inch, install backer rod and seal with a three-course treatment of Duro-Shield Silicone Brush-Grade Sealant, Polyester Reinforcement Fabric and another layer of Duro-Shield Silicone Brush-Grade Sealant.</li> </ul>

NON-METAL SUBSTRATES	
Substrate	Repair
<b>Aged Duro-Last®</b>	<ul style="list-style-type: none"> <li>Any areas where Duro-Last is torn, cracked, and/or buckled must be repaired using the same type of Duro-Last products.</li> <li>Any wet insulation must be replaced.</li> </ul>
<b>Other aged PVCs (Polyvinyl Chloride)</b>	<ul style="list-style-type: none"> <li>Any areas where PVC is torn, cracked, and/or buckled must be repaired using similar products.</li> <li>Any wet insulation must be replaced.</li> </ul>
<b>EPDM (Ethylene Propylene Diene Monomer)</b>	<ul style="list-style-type: none"> <li>Any areas where EPDM is torn, cracked, and/or buckled must be repaired using similar products.</li> <li>Any wet insulation must be replaced.</li> </ul>
<b>TPO (Thermoplastic Polyolefin)</b>	<ul style="list-style-type: none"> <li>Any areas where TPO is torn, cracked, and/or buckled must be repaired using similar products.</li> <li>Any wet insulation must be replaced.</li> </ul>

<b>NON-METAL SUBSTRATES (CONTINUED)</b>	
<b>Substrate</b>	<b>Repair</b>
<p><b>Mineral &amp; Granule Surfaced BUR or Modified Bitumen (SBS &amp; APP)</b></p> <p><b><u>OR</u></b></p> <p><b>Smooth Surfaced BUR or Modified Bitumen (SBS &amp; APP)</b></p>	<ul style="list-style-type: none"> <li>• Any areas where BUR or modified bitumen are blistered, buckled and/or otherwise damaged must be removed and repaired using similar products.</li> <li>• New BUR or modified bitumen repair materials must be allowed at least 30 days to weather before applying liquid-applied products to these repaired areas.</li> <li>• All areas where BUR or modified bitumen have significantly craze-cracked (gaps 1/8 inch or greater in width and/or depth) must be repaired using the three-course treatment described on page 3 in the <b>Large Gaps</b> section of <b>Metal Substrates</b> preparation.</li> </ul>
<b>Wood</b>	<ul style="list-style-type: none"> <li>• Any areas where substrate is rotten, wet and/or otherwise damaged must be removed and repaired using similar products.</li> <li>• All large or excessive gaps (greater than 1/8 inch) existing between roof panels and/or penetrations must be repaired using the three-course treatment described on page 3 in the <b>Large Gaps</b> section of <b>Metal Substrates</b> preparation.</li> <li>• All fasteners must be retightened, secured, or replaced as necessary. All stripped fasteners must be replaced with new, larger fasteners.</li> <li>• All deteriorated or missing fasteners must be replaced.</li> <li>• All fasteners must be fully encapsulated with Duro-Shield Silicone Brush-Grade Sealant.</li> </ul>
<b>Concrete</b>	<ul style="list-style-type: none"> <li>• For gaps less than 1/8 inch, seal with Duro-Shield Silicone Brush-Grade Sealant.</li> <li>• All areas where concrete has significant cracks (gaps 1/8 inch or greater in width and/or depth) must be repaired using the three-course treatment described on page 3 in the <b>Large Gaps</b> section of <b>Metal Substrates</b> preparation.</li> </ul>
<b>Sprayed Polyurethane Foam</b>	<ul style="list-style-type: none"> <li>• Any areas where polyurethane foam is blistered, buckled and/or otherwise damaged must be removed and repaired using similar products.</li> <li>• Any wet polyurethane foam must be replaced.</li> </ul>

# CLEANING PROCEDURES

## GENERAL – ALL SUBSTRATES

- Roof wash-off catchment systems should be in place when required. Follow all state and local requirements for roof wash-off catchments during the cleaning process.
- Kill and remove any living organisms such as algae, mold or fungus with a fungicidal treatment. Ensure that the substrate will not be adversely affected by the treatment.
- Pressure wash (1,000 psi, maximum) with water and/or approved cleaner. Do not damage or inject water into the substrate during washing. Allow to dry completely.
- Use stiff bristle push broom to remove all dirt, dust, loose and flaking particles, grease, oil, laitance and other contaminants or loose materials that may interfere with proper adhesion.
- EPDM roofs require extra force to wash and clean, and may need to be cleaned twice.
- Rinse well to remove cleaner.

# TESTING

## GENERAL

Adhesion testing is performed to verify the suitability of any substrate to receive Duro-Shield silicone products. It is the responsibility of the installer to determine the suitability prior to the installation of any Duro-Shield silicone products.

When adhesion tests are conducted:

- Test patches shall be labeled and photographed to document adhesion results for your records.
- Installer can consult with Duro-Last's Engineering Services Department by email (engineering@duro-last.com) or by phone (800-248-0280) concerning all adhesion test results.

Duro-Last recommends the following test method:

<b>TEST METHOD: FIELD PEEL ADHESION</b>	
<b>Overview</b>	ASTM D903 "Peel adhesion" is found in all roof coating standards. Primers and enamels may also be evaluated by a similar test called ASTM D3359 "Tape Adhesion." Often it is important to run the test wet; this is called "wet adhesion."
<b>Preparation</b>	<ul style="list-style-type: none"> <li>• Make a mock-up of the intended system.</li> <li>• Duplicate any mechanical substrate preparation.</li> <li>• Simulate cleaning and pressure washing.               <ul style="list-style-type: none"> <li>○ A worn Scotch-Brite™ cleaning pad makes a good pressure washing simulation.</li> </ul> </li> <li>• Prime as required.</li> <li>• Apply a layer of coating to the substrate.</li> </ul>
<b>Test Method</b>	<ul style="list-style-type: none"> <li>• Testing should be completed in same atmospheric conditions as Duro-Shield silicone products will be installed.</li> <li>• Wet about 6 inches of a pre-cut 1-inch wide by 12-inch long fabric strip with the coating.</li> <li>• Allow the remaining 6 inches of the fabric to be available to pull on the test sample.</li> <li>• Apply another layer of coating to encapsulate the wetted section of fabric.</li> <li>• Allow to dry.               <ul style="list-style-type: none"> <li>○ This can be anywhere from 24 hours to 2 weeks.</li> <li>○ In warm weather, 1 day may be sufficient.</li> <li>○ In cold weather, 5 days is often required.</li> <li>○ The standard practice is 2 weeks.</li> </ul> </li> <li>• Soak prior to testing (best practice).               <ul style="list-style-type: none"> <li>○ One hour is usually sufficient, use wet rag and cover with a bucket lid or plastic.</li> </ul> </li> </ul>

**TEST METHOD: FIELD PEEL ADHESION (CONTINUED)**

**Quantitative Evaluation (Best Practice)**

- Use a force gauge such as a digital fish scale or trigger-pressure gauge.
- A loop, staple or clamp is used to hold the fabric in the gauge.
- Pull slowly, the peak value should be above 1 lb. and preferably over 2 lbs. (standard is 2 lbs./inch).



**Qualitative Evaluation**

**Good:** 70% or greater cohesion (2 lbs./inch or greater)



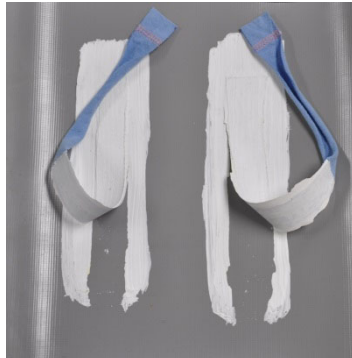
**Fair:** 50 – 69% cohesion (1 – 2 lbs/inch)



**Poor:** 10 – 49% cohesion (1 lb./inch or greater)



**Fail:** Less than 10% cohesion (Less than 1 lb./inch)



# SEAM TREATMENT

## GENERAL

Roof seams can be a primary area where leaks occur. All horizontal and vertical seams must be flashed in accordance with the following Duro-Shield Silicone Brush-Grade Sealant application instructions.

- Product can be applied when the ambient temperature is below 32° F (0° C), however curing will not begin until the temperature is above freezing.
- Do **not** apply when rain, cold or nightfall are imminent.
- Do **not** use under water or below grade.
- Thinning the product is **not** allowed.

## INSTALLATION

1. Joint dimensions should not exceed 1 inch by 5/8 inch deep. Use polyethylene backing rod for depths exceeding 5/8 inch. Seal with a three-course treatment of Duro-Shield Silicone Brush-Grade Sealant, Polyester Reinforcement Fabric and another layer of Duro-Shield Silicone Brush-Grade Sealant.
2. Use a putty knife or trowel to apply product to cracks and voids. Refillable caulking guns may also be used to apply the product.
3. If re-coating is needed, wait 1 hour for first treatment to dry.
4. Allow to dry for 24 hours.

## CLEANUP

- Uncured product may be removed with virgin mineral spirits. Do not use water.
- Application equipment should be cleaned immediately after use with virgin mineral spirits. Do not use water.



# PRIMING

## DURO-SHIELD SILICONE ROOF PRIMER: UNIVERSAL 2-PART EPOXY

Used for priming of aged galvanized metal, all BUR and modified bitumen, and ponding water areas over EPDM, aged Duro-Last and other aged PVCs.

### GENERAL

- Refer to the warranty requirements tables on pages 13 to 16 for substrate criteria.
- Only apply product when the surface and ambient temperatures are between 40° F (4° C) and 100° F (37° C). Product should be stored between 50° F (10° C) and 90° F (32° C) for 24 hours prior to installation.
- Do **not** apply when rain, cold or nightfall are imminent. Humidity should be below 90%.
- Thinning the product is **not** allowed.
- Use a brush, roller (1-inch nap, min.), or airless sprayer to apply. Best results are obtained when using an airless sprayer. Care should be taken when using an airless sprayer to apply Duro-Shield silicone products. Wind-blown over-spray may damage property adjacent to the project site.

### PRIMER APPLICATION

1. In a clean 5-gallon pail, stir equal amounts of parts A and B together until an even consistency is achieved. A slow-speed drill with mixer attachment is recommended. Expected pot life under normal conditions is approximately 4 hours after mixing.
2. Apply at the following approximate coverage rates:
  - All metal substrates – 300 square feet per gallon.
  - All non-metal substrates – 150 square feet per gallon.
3. Allow to dry for at least 8 hours.

### CLEANUP

- Uncured product may be removed by wiping with warm water, soap and a clean cloth.
- Application equipment should be cleaned immediately after use with warm water, soap and a clean cloth.

## **DURO-SHIELD SILICONE ROOF PRIMER: TPO**

Used for priming of all TPOs.

### **GENERAL**

- **Refer to the warranty requirements tables on pages 13 to 16 for substrate criteria.**
- Only apply product when the surface and ambient temperatures are between 35° F (1° C) and 100° F (37° C). Product should be stored between 50° F (10° C) and 80° F (26° C) for 24 hours prior to installation.
- Do **not** apply when rain, cold or nightfall are imminent.
- Thinning the product is **not** allowed.
- Use a brush or roller (1-inch nap, min.) to apply.

### **PRIMER APPLICATION**

1. Stir until an even consistency is achieved. A slow-speed drill with mixer attachment is recommended.
2. Apply at an approximate coverage rate of 900 square feet per gallon. Application should be as thin as possible.
3. Allow to dry for 1 to 2 hours.

### **CLEANUP**

- Uncured product may be removed with methyl ester.
- Application equipment should be cleaned immediately after use with methyl ester.

# COATING

## GENERAL

Install Duro-Shield Silicone Roof Coating once all of the instructions above have been completed.

- Only apply product when the surface and ambient temperatures are between 35° F (1° C) and 100° F (37° C). Do not apply product when the ambient temperature is within 5° F of the dew point. Product should be stored between 50° F (10° C) and 80° F (26° C) for 24 hours prior to installation.
- Do not apply to concrete roofs that may be subject to vapor drive from conditioned spaces below.
- Do **not** apply when rain, cold or nightfall are imminent.
- Thinning the product is **not** allowed.
- Open and partially full containers will skin over quickly. If this occurs, remove the skin and continue using the remaining product.
- Use a brush, roller (1-inch nap, min.), or airless sprayer to apply. Best results are obtained when using an airless sprayer. Care should be taken when using an airless sprayer to apply Duro-Shield silicone products. Wind-blown over-spray may damage property adjacent to the project site.

## COATING APPLICATION

1. Stir until an even consistency is achieved. A slow-speed drill with mixer attachment is recommended.
2. The length of the desired warranty will determine the number of required coats and application volume per coat. Refer to the warranty requirements tables on pages 13 to 16.
3. To achieve a **20-Year warranty over aged galvanized metal roofs**, at all seams, transitions, or flashings, Polyester Reinforcement Fabric must be laid into the first coat while it is still wet. Refer to installation photos below.



4. Allow to dry completely.
5. When two coats are required, application of the second coat should be perpendicular to the first coat and at approximate coverage rate and thickness per the tables on pages 13 to 16. Areas with Polyester Reinforcement Fabric may need more coating to fully cover the fabric than what is listed in the tables on pages 13 to 16.
6. Allow to dry completely.

## CLEANUP

- Uncured product may be removed with virgin mineral spirits. Do not use water.
- Application equipment should be cleaned immediately after use with virgin mineral spirits. Do not use water.

# WARRANTY REQUIREMENTS

5-Year Material Warranty Requirements				
Substrate	Primer	Coating Base Coat	Coating Top Coat	Total Dry MILS
<b>Aged Galvanized Metal</b>	YES – 300 square feet per gallon Universal 2-Part Epoxy Primer	1 gallon per 100 square feet (16 wet mils)	Not required	15 mils
<b>Kynar® Metal</b>	NO			
<b>Vinyl-Coated Metal</b>	NO			
<b>Concrete</b>	NO			
<b>Wood</b>	NO			
<b>BUR and Modified Bitumen</b>	YES – 150 square feet per gallon Universal 2-Part Epoxy Primer			
<b>Aged Duro-Last and Other Aged PVCs</b>	Based on adhesion testing * **			
<b>EPDM</b>	Based on adhesion testing * **			
<b>TPO</b>	YES – 900 square feet per gallon TPO primer			
<b>Spray-Applied Polyurethane Foam</b>	NO			

\* For EPDM, aged Duro-Last and other aged PVCs, Universal 2-Part Epoxy primer must be used in areas of ponding water.

\*\* Primer-less applications require adhesion testing.

10-Year Material Warranty Requirements				
Substrate	Primer	Coating Base Coat	Coating Top Coat	Total Dry MILS
<b>Aged Galvanized Metal</b>	YES – 300 square feet per gallon Universal 2-Part Epoxy primer	1.5 gallons per 100 square feet (24 wet mils)	Not required	23 mils
<b>Kynar Metal</b>	NO			
<b>Vinyl-Coated Metal</b>	NO			
<b>Concrete</b>	NO			
<b>Wood</b>	NO			
<b>BUR and Modified Bitumen</b>	YES – 150 square feet per gallon Universal 2-Part Epoxy primer			
<b>Aged Duro-Last and Other Aged PVCs</b>	Based on adhesion testing * **			
<b>EPDM</b>	Based on adhesion testing * **			
<b>TPO</b>	YES – 900 square feet per gallon TPO primer			
<b>Spray-Applied Polyurethane Foam</b>	NO			

\* For EPDM, aged Duro-Last and other aged PVCs, Universal 2-Part Epoxy primer must be used in areas of ponding water.

\*\* Primer-less applications require adhesion testing.

15-Year Material Warranty Requirements				
Substrate	Primer	Coating Base Coat	Coating Top Coat	Total Dry MILs
<b>Aged Galvanized Metal</b>	YES – 300 square feet per gallon Universal 2-Part Epoxy primer	2 gallons per 100 square feet (32 wet mils)	Not required	31 mils
<b>Kynar Metal</b>	NO			
<b>Vinyl-Coated Metal</b>	NO			
<b>Concrete</b>	NO			
<b>Wood</b>	NO			
<b>BUR and Modified Bitumen</b>	YES – 150 square feet per gallon Universal 2-Part Epoxy primer			
<b>Aged Duro-Last and Other Aged PVCs</b>	Based on adhesion testing * **			
<b>EPDM</b>	Based on adhesion testing * **			
<b>TPO</b>	YES – 900 square feet per gallon TPO primer			
<b>Spray-Applied Polyurethane Foam</b>	NO			

\* For EPDM, aged Duro-Last and other aged PVCs, Universal 2-Part Epoxy primer must be used in areas of ponding water.

\*\* Primer-less applications require adhesion testing.

20-Year Material Warranty Requirements				
Substrate	Primer	Coating Base Coat	Coating Top Coat	Total Dry Mills
<b>Aged Galvanized Metal ***</b>	YES – 300 square feet per gallon Universal 2-Part Epoxy primer	1 gallon per 100 square feet (16 wet mils)	1.5 gallons per 100 square feet (24 wet mils)	39 mils
<b>Kynar Metal</b>	NO			
<b>Vinyl-Coated Metal</b>	NO			
<b>Concrete</b>	NO			
<b>Wood</b>	NO			
<b>BUR and Modified Bitumen</b>	YES – 150 square feet per gallon Universal 2-Part Epoxy primer			
<b>Aged Duro-Last and Other Aged PVCs</b>	Based on adhesion testing * **			
<b>EPDM</b>	Based on adhesion testing * **			
<b>TPO</b>	YES – 900 square feet per gallon TPO primer			
<b>Spray-Applied Polyurethane Foam</b>	NO			

\* For EPDM, aged Duro-Last and other aged PVCs, Universal 2-Part Epoxy primer must be used in areas of ponding water.

\*\* Primer-less applications require adhesion testing.

\*\*\* Refer to **COATING APPLICATION** on page 11 for additional requirements when coating over aged galvanized metal.

Refer to the Duro-Shield Silicone Coating Calculator on the Duro-Last website for assistance in calculating quantities and pricing.