

## I. INTRODUCTION

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System Three manufactures a marine topcoat and primer that offer increased environmental friendliness, without sacrificing performance. Since these products thin and clean up with water they are less hazardous and less costly to use than their solvent-containing counterparts. Because they are non-flammable they can be used where flammable solvent-based paints cannot. Once cured, the combination is water and chemical-resistant and offers maximum protection from sun and weather, for watercraft and many other projects. Pennant Primer has easy-sanding properties, while Pennant Topside Paint contains ultra-violet light absorbers, to give it extended durability.

## II. PRODUCT DESCRIPTIONS

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### A. PENNANT PRIMER

Pennant Primer is a waterborne, two-part marine epoxy primer. It cures to an easily sanded surface for System Three topcoats. For marine applications, the Primer can be applied above or below the waterline. Pennant Primer will also seal fairing or other filler work prior to top coating or the application of anti-fouling paint.

#### RECOMMENDED USES:

For marine use on properly prepared substrates such as:

- Epoxy coated surfaces
- Fiberglass Gelcoat
- Concrete

#### PRODUCT CHARACTERISTICS:

VOLUME SOLIDS:	36%
WEIGHT SOLIDS:	52%
MIXED VISCOSITY:	75-80 KU
COLOR:	GRAY
MIXED VOC:	<200 G/L
MIX RATIO:	4:1
POT LIFE:	USE WITHIN 3 HOURS
INDUCTION:	LET MIXED PRIMER STAND 15 MINUTES BEFORE USE
APPLICATION CONDITIONS:	55°F (13°C) MINIMUM, 95°F (35°C)
CLEAN UP:	WATER
DRY TO RECOAT:	2-3 HOURS @ 70°F (21°C)
RECOAT TO PAINT:	24 HOURS @ 70°F (21°C)
COVERAGE RATE:	200-300 SQ. FT. PER GALLON
WET MIL THICKNESS PER COAT:	5-8

## **SURFACE PREPARATION:**

Surface must be clean, dry, and free from oil, grease, or wax contaminants to ensure adequate adhesion of the Pennant Primer. If using topcoats other than those from System Three, pre-testing is recommended to make certain good adhesion is present. See below for specific substrate requirements.

## **MIXING:**

Stir contents of the Hardener (Part B) thoroughly to remix any settled material. Mix 4 parts Hardener (Part B) with 1 part Resin (Part A) by volume and stir thoroughly. Allow the material 15 minutes to induct, before use. Mix only enough material which can be used well within 3 hours @ 70°F. Higher temperatures will reduce pot life, while cooler temperatures will increase pot life.

## **APPLICATION:**

**Brush / Roller:** Use a high quality synthetic bristle brush or short nap roller made for waterborne paints. No reduction is necessary for application. Best results are achieved by using the foam nap roller in combination with a synthetic brush (roll and tip).

### **Conventional Pressure Pot:**

- Pot Pressure: 10-15 psi
- Atomization Pressure 25-30 psi
- Tip: 1.4 – 1.8 mm tip
- Reduction: As needed, up to 15% (water or denatured alcohol)

### **Airless Spray:**

- Pressure: 2700-3000 PSI
- Hose: ¼" ID
- Tip: .013"-.015"
- Reduction: As needed, up to 10% (Denatured alcohol or water)

## **COVERAGE:**

3 coats are recommended for best results at 200-300 sq. ft. per gallon. Some porous substrates may require additional coats of Pennant Primer.

- Wet film thickness per coat: 5-8 mils
- Dry film thickness per coat: 2-3 mils

## **NOTES:**

- Store in moderate environment and prevent freezing. If product has frozen, do not force thaw; allow to thaw at room temperature.
- Cover any outdoor work to prevent dew from forming on the uncured primer surface.
- Clean brushes, rollers, and spray equipment promptly after the application.
- If using topcoats other than System Three, testing is recommended to ensure that proper adhesion is occurring.
- Mix only enough material which can easily be used within 3 hours.

## **1. CLEAR EPOXY RESIN:**

Some epoxy resin systems leave an amine blush on the surface. Amine blush can interfere with the adhesion of the Pennant Primer. Take proper precautions to remove surface blush before priming with Pennant Primer.

1. Remove surface blush by using a Scotch-Brite pad with detergent and warm water. Then flush the surface with fresh water.
2. Sand the epoxy surface with 150 grit paper, making sure to completely degloss the surface.
3. After sanding, remove sanding dust with a vacuum or clean, dry shop air.

4. Wipe the surface with denatured alcohol and clean rags.
5. Apply Pennant Primer with roller and brush, or by spray application. At 70°F the primer can be recoated without sanding in as little as 2-3 hours. After 72 hours, the Pennant Primer must be sanded, use 220-320 grit paper. Repeat steps 3-4.
6. 2-3 coats of primer are necessary to achieve a smooth, uniform surface.
7. After 24 hours @ 70°F the Pennant Primer can be top coated. First sand with 220-320 grit paper.
8. Repeat steps 3-4.

## **2. FIBERGLASS GELCOAT:**

Polyester gelcoats often have mold release agents as well as wax contamination of the surface. Pennant Primer can be successfully applied over polyester gelcoats provided the surface is free from contaminants and well sanded.

1. The surface should be cleaned thoroughly using a Scotch-Brite pad with detergent and warm water.
2. Follow with a wax stripper. Flush the surface with fresh water.
3. Once the surface is thoroughly clean, sand using 80-100 grit sandpaper.
4. Fill surface imperfections with QuikFair. Sand repair areas until smooth with 100-120 grit paper.
5. After sanding, remove sanding dust with a vacuum or clean, dry shop air.
6. Wipe the surface with denatured alcohol and clean rags.
7. If the weave is exposed, two coats of a clear System Three epoxy product should be applied. If the gelcoat is sound, then proceed to step 8.
8. Apply Pennant Primer with roller and brush, or by spray application. At 70°F the primer can be recoated without sanding in as little as 2-3 hours. After 72 hours, Pennant Primer must be sanded, use 220-320 grit paper. Repeat steps 3-4.
9. 2-3 coats of primer are necessary to achieve a smooth, uniform surface.
10. After 24 hours @ 70°F, Pennant Primer can be top coated.

## **3. WOOD:**

The substrate must be clean, dry (verify with moisture meter with levels no higher than 14%). Wood components that have insufficient epoxy sealing are likely to fail due to moisture cycling. Additionally, the substrate must be structurally sound with minimal deflection. Use System Three SilverTip Epoxy, Clear Coat Epoxy, or General Purpose Resin to seal raw wood.

1. Sand the raw wood using 80-100 grit sandpaper. Make sure that all edges and corners are minimally, slightly rounded over. Sharp edges promote poor coverage of the epoxy, which can lead to a premature failure of the coating system.
2. Clean sanding dust from the surface using a vacuum and clean, dry shop air.
3. Fill surface imperfections with QuikFair. Sand repair areas until smooth using 100-120 grit paper.
4. Repeat step 2
5. Apply a thin seal coat of System Three Epoxy with an 1/8" nap foam roller. Make sure that all surfaces are coated with epoxy, paying special attention to the end grain.
6. Apply 2-3 additional heavier coats of epoxy. Recoating without sanding can be done within 72 hours of the last coat. If sanding is necessary, use 150 grit sandpaper.
7. Allow the System Three Epoxy to cure sufficiently, usually 48 hours at 70°F before sanding in preparation for Pennant Primer.
8. Apply the primer with roller and brush, or by spray application. At 70°F Pennant Primer can be recoated without sanding in as little as 2-3 hours. After 72 hours, the primer must be sanded, use 220-320 grit paper.
9. 3-4 coats of Pennant Primer are required to fully seal the wood substrate.
10. After 24 hours @ 70°F, Pennant Primer can be top coated. First sand with 220-320 grit paper.
11. After sanding, remove sanding dust with a vacuum or clean,

## **4. CONCRETE:**

Concrete must be cured for at least 30 days @ 75°F. A calcium chloride test is recommended to ensure that excess moisture vapor is not emitting from the concrete. Large areas should be tested in multiple spots. Moisture vapor transmission levels should not exceed 3 lbs./1,000sq. ft./24 hours.

Note: The concrete must also be free from contaminants such as grease and oil before the surface preparation can begin. Pennant Primer is not intended for use over concrete floors.

1. Acid etch or shot blast the surface.
2. Thoroughly clean foreign material from the concrete
3. Apply Pennant Primer with roller and brush, or by spray application. At 70°F the primer can be recoated without sanding in as little as 2-3 hours. After 72 hours, Pennant Primer must be sanded, use 220-320 grit paper.
4. 3-4 coats of Pennant Primer are required. In some cases, more coats may be necessary due to a high degree of porosity.
5. After 24 hours @ 70°F, Pennant Primer can be top coated. First sand with 220-320 grit paper.
6. After sanding, remove sanding dust with a vacuum or clean, dry shop air.
7. Wipe the surface with denatured alcohol and clean rags.

## B. PENNANT TOPSIDE PAINT

System Three Pennant Topside is a high Performance linear polyurethane. It offers exceptional scratch, mar, and exterior durability in marine topside applications. Pennant Topside consists of a can of paint and a bottle of crosslinking material.

### RECOMMENDED USES:

For marine topside applications with the following substrates:

- Epoxy primed surfaces
- Epoxy coated surfaces
- Fiberglass gelcoat

### PRODUCT CHARACTERISTICS:

VOLUME SOLIDS:	32-35%
WEIGHT SOLIDS:	32-36
MIXED VISCOSITY:	75-80 KU
MIXED VOC:	<200 G/L
MIX RATIO:	2OZ. CROSSLINKER PER GALLON OF PAINT
POT LIFE:	USE WITHIN 24 HOURS
APPLICATION CONDITIONS:	55° F (13°C) MINIMUM, 85° F (29°C) MAXIMUM
CLEAN UP:	WATER
DRY TO RECOAT:	SPRAY APPLICATION- 2 HOURS @ 70°F (21°C) ROLL AND TIP- 4-6 HOURS @ 70°F (21°C)
COVERAGE RATE:	400-500 SQ. FT. PER GALLON
WET MIL THICKNESS PER COAT:	3-4
RECOAT W/O SANDING:	24 HOURS
NUMBER OF COATS:	3 OR MORE

### SURFACE PREPARATION:

The surface must be clean, dry, and free from oil, grease, or wax contaminants to ensure adequate adhesion of Pennant Topside. If using a primer other than Pennant Primer, pretesting is recommended to make certain good adhesion is present. See below for specific substrate requirements.

### MIXING:

Stir/shake Pennant Topside thoroughly to remix any settled material. While stirring, slowly add the crosslinker at 2 oz. per gallon of paint. Mix thoroughly to homogenize the paint and crosslinker.

Note: The crosslinker will remain active for 24 hours after addition to the paint. After 24 hours, the paint can be re-crosslinked. Any remaining paint will need to be discarded after 24 hours.

## **APPLICATION:**

### **Roller/Brush:**

Use a high quality synthetic bristle brush. 1/8"-3/16" nap foam rollers work well for lint free applications. For improved wet edge extension, reduce with water at 5-10% by volume.

When applying Pennant Topside with roller and brush (roll and tip) be mindful of your working conditions. It's advisable to work in an environment where the surface is protected from harsh environmental conditions. Surfaces which are heated by the sun, or that are exposed to ventilation/wind can set up too quickly, resulting in poor flow out.

Apply Pennant Topside in thin even coats. Strive for a coverage at 3-4 mils per coat. (Wet film gauges are available at most paint stores.) Avoid overworking the paint, as this will result in lap marks. Larger areas may require additional helpers to maintain the paint's wet edge.

Allow the first coat to dry 4-6 hours before recoating. No sanding is required within 24 hours. After 24 hours, sand with 220-320 grit paper. Remove sanding dust by flushing the surface with plenty of fresh water. Dry with lint-free towel. Apply additional coats in the same manner. Clean application equipment with warm, soapy water. Brushes may be further cleaned with denatured alcohol.

### **Spray Application:**

Note: Conventional cup guns and HVLP paint sprayers are not recommended for spraying Pennant Topside. Best results are achieved using pressure pot or airless spray setups.

### **Pressure Pot Spray:**

Purge lines with denatured alcohol and follow with fresh water. Reduce Pennant Topside as necessary up to 25% by volume with water.

When spraying Pennant Topside, the first coat should be applied ultra-thin, avoiding dry spray. This coat should look patching over the substrate. After a minimum of 15 minutes, apply a medium wet coat at 3-4 mils. Wait a minimum of 2 hours before applying the next coat.

No sanding is required within 24 hours. After 24 hours, sand with 220-320 grit paper. Remove sanding dust by flushing the surface with plenty of fresh water. Dry with a lint-free towel. Apply additional coats in the same manner.

### **Suggestions for spraying:**

- Pot pressure: 10-15 psi
- Atomization pressure: 30-50 psi
- Tip size: 1.0-1.2 mm
- Reduction: As needed up to 25% with water

### **Tips for success:**

- After spraying a coat, submerge the tip of the gun in water. This prevents the polyurethane from setting up in the tip and cap. Before use, wipe excess water from the end of the gun. Point the gun in a safe direction and pull the trigger a few times to displace any water.

### **Airless Spray:**

Purge fluid lines with denatured alcohol and follow with fresh water. No thinning of the Pennant Topside is necessary with airless spray. If environmental conditions require, thin as necessary up to 5%.

Hold the gun 16" from the surface and move quickly, applying an ultra-thin first coat. The surface should be patchy over the substrate. After 15 minutes, apply a medium wet coat at 3-4 mils. Wait a minimum of 2 hours before applying the next coat.

No sanding is required within 24 hours. After 24 hours, sand with 220-320 grit paper. Remove sanding dust by flushing the surface with plenty of fresh water. Dry with lint-free towel. Apply additional coats in the same manner.

### **Suggestions for spraying:**

- Pressure: 2,700-3,000 psi
- Hose: ¼" ID
- Tip size: .009-011
- Reduction: As needed up to 5% with water

**Tips for success:**

- After spraying a coat, submerge the tip of the gun in water. This prevents the polyurethane from setting up in the tip and cap. Before use, wipe excess water from the end of the gun. Point the gun in a safe direction and pull the trigger a few times to displace any water.

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2. Follow with a wax stripper. Flush the surface with fresh water.
3. Once the surface is thoroughly clean, sand using 80-100 sandpaper.
4. Fill surface imperfections with QuikFair. Sand repair areas until smooth with 100-120 grit paper.
5. After sanding, remove sanding dust with a vacuum or clean, dry shop air.
6. Wipe the surface with denatured alcohol and clean rags.
7. Apply Pennant Primer with roller and brush, or by spray application. At 70°F the primer can be recoated without sanding in as little as 2-3 hours. After 72 hours, Pennant Primer must be sanded, use 220-320 grit paper.
8. 2-3 coats of primer are necessary to achieve a smooth, uniform surface.
9. After 24 hours @ 70°F, the Pennant Primer can be top coated with Pennant Topside. First sand with 220-320 grit paper.
10. Repeat steps 5-6

**2. CLEAR EPOXY RESIN:**

Some epoxy resin systems leave an amine blush on the surface. Amine blush can interfere with the adhesion of the Pennant Topside.

Note: Pennant Topside is self-priming over clear epoxy resin and no primer is required. However, primer will aid in achieving better color uniformity, particularly with colors like red, yellow, and orange.

1. Remove surface blush by using a Scotch-Brite pad with detergent and warm water. Then flush the surface with fresh water.
2. Sand the epoxy surface with 150 grit paper to get the surface smoothed out. Follow with 220 grit paper. Make sure that all the surface gloss is removed.
3. After sanding, remove sanding dust with a vacuum, or clean, dry shop air.
4. Wipe the surface with denatured alcohol and clean rags.
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11. After sanding, remove sanding dust with a vacuum, or clean, dry shop air.
12. Wipe the surface with denatured alcohol and clean rags.

#### **MAINTENANCE:**

Pennant Topside has exceptional exterior durability, with excellent scratch and mar resistance. However, the buildup of dirt and grime can significantly affect the longevity of the paint. Dirt and grime can be very abrasive to protective coatings, causing fine scratches to develop, which over time will cause the Pennant Topside to look dull and faded.

Regular maintenance will not only prolong the life of the paint, but it will also make it look it's best. Simply washing the Pennant Topside with a mild detergent and water is all that's needed. Rinse the surface with fresh water and towel dry, preventing water spotting.

Pennant Topside should not be waxed. Wax coatings age rapidly, leading to unwanted time consuming maintenance. Wax coated surfaced also are problematic for paint repairs and future complete recoats.

A benefit of the Pennant Topside is that it can be buffed out unlike many popular two-part polyurethanes. System Three offers a buffing kit which does a great job at removing surface mars and fine scratches. The result is a surface that exhibits a brilliant, glossy new look.

The information contained herein is based on the data available to us and is believed to be correct. However, System Three Resins, Inc. makes no warranty, expressed or implied, regarding the accuracy of these data or the results to be obtained from the use thereof. System Three assumes no responsibility for injury from the use of the product described herein.