Intercoastal Paint Company

Waterborne Fast Dry
Shop Primers
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Waterborne Shop Primers, Why Use Them?

Waterborne industrial primers are being used more frequently today due primarily to increasing environmental regulations. The issue here is the amount of solvent, or VOC, that is released into the atmosphere when the coating is applied. “VOC” stands for “Volatile Organic Compounds”. These emissions are usually expressed in pounds of VOC per gallon of paint. See VOC calculations on the following page. Below are some examples of typical VOC levels.

1. **Conventional solventborne ready to spray shop primer**
   - 4.0-4.5 lbs/gal VOC

2. **High solids solventborne shop primer**
   - 2.8-3.5 lbs/gal VOC

3. **Intercoastal WP-1009 waterborne shop primer**
   - .33 lbs/gal VOC

Shop primers for structural steel in the metal building industry are usually required to have a VOC of 3.5 lbs/gal or less in areas where air quality is an issue.

Other reasons for using waterborne primers include fire and health issues. Intercoastal’s waterborne primers are non flammable. The Fire Marshall and fire insurance underwriters both look favorably upon waterborne coatings. Likewise, lower levels of organic vapors in the work place are a plus from a health standpoint.

Finally is the reason of quality of the coating. Properly applied and cured films of waterborne shop primers can equal or even surpass the real world performance of solventborne counterparts. Intercoastal’s waterborne primers do not fade like their solvent borne high solids primers. They exhibit good adhesion to a wide variety of substrates, such as galvanized steel or aluminum. They accept finish coats of many types such as alkyds, other latexes, lacquers, 2 part epoxies and 2 part polyurethanes. These primers are more versatile as universal primers than their solventborne counterparts.
VOC Calculations

Method I: "As applied" or "As packaged"

This is the weight of solvent in 1 gallon of paint. (This is the actual amount emissions in one gallon of paint).

Example divide the weight of solvent by the volume of paint.

(Here, we are using 100 gallon formula)

\[ \text{VOC I} = \frac{33.20 \text{ lbs solvent}}{100 \text{ gallons of paint}} = 0.332 \text{ lbs/gallon} \]

Method II: "Less water"

This is the weight of solvent in 1 gallon of paint minus the volume of water in 1 gallon of paint. (This method is sometimes required by the EPA).

Example divide the weight of solvent by the volume of paint minus the volume of water.

\[ \text{VOC II} = \frac{33.20 \text{ lbs solvent}}{100 \text{ gallons} - 62.40 \text{ gallons}} = 0.883 \text{ lbs/gallon water} \]

Method III: "Per applied solid gallon"

This is the weight of the solvent in 1 gallon of paint minus the volume of water and the volume of solvent in 1 gallon of paint.

(This method was discontinued by TNRCC in February 1996).

Example divide the weight of solvent by the volume solids of the paint

\[ \text{VOC III} = \frac{33.20 \text{ lbs solvent}}{33.06 \text{ gallons} (\text{volume solids})} = 1.004 \text{ lbs/gallon} \]
**VOC Calculations (continued)**

**Conversion Factors** (all methods):

To convert lbs/gal to kg/l; multiply by 0.1199

To convert kg/l to lbs/gal; multiply by 8.327

*Waterborne primer used as example WP-1009*

33.06% volume solids

62.40 gallons water per 100 gallons

33.20 pounds VOC per 100 gallons
How Waterborne Primers Dry

1. Before the primer is applied, the liquid paint contains individual particles of resin called micelles. These are suspended in a water medium by emulsification.

2. When the primer is applied and the water begins to evaporate, the resin particles begin to collect on the surface of the steel.

3. As the last of the water leaves, the particles melt together to form a continuous film. The small amount of solvent (VOC) is what primarily melts the particles.

If the water stays in the film longer than the solvent, these particles do not melt together properly. This results in an inferior film. The most common causes are high humidity and/or low temperature. The simple act of spraying waterborne shop primers can sharply raise the humidity in the spray booth.

Intercoastal’s waterborne shop primers are unique because they dry in high humidity and low temperature conditions. When comparing the dry times of waterborne shop primers from several vendors, we strongly suggest that the comparisons be made side by side at the same time under the same conditions (humidity and temperature) and the same mil thickness, etc. We feel confident that the comparison will demonstrate that Intercoastal has the fastest dry time by far.
Properties of Intercoastal’s Waterborne Shop Primers

1. **Dry Time** From a production standpoint, dry time is the most important property. Many waterborne primers will dry satisfactorily in warm weather. However, when the temperature drops and the humidity rises, they stop drying or slow down enough to result in an unsatisfactory paint job. Intercoastal’s waterborne primers will produce good films under these same conditions.

2. **Sag Resistance** Generally, airless application will result in 5-6 wet mils of paint per pass. This can potentially be doubled at the intersection of two welded pieces because of overlapping. In adverse weather conditions, these heavy films can sag and run, resulting in uneven coverage and an unsightly paint job. Intercoastal’s waterborne primers perform well under these conditions, producing a consistent and even film without sags, runs, or “curtains”.

3. **Early Water Resistance** This is an important property because occasionally rain water will collect in the web of the beam while the steel is on the truck or at the job site. Intercoastal’s waterborne primers are designed to exhibit good early water resistance to minimize water damage or water marking.

4. **Color** Our brown oxide waterborne primer, WP-1009, matches the color of MBCI coil steel. Every batch of primer is checked for color, and the batch to batch color consistency is excellent.

5. **Weatherability** All Intercoastal’s waterborne primers are exposed to the weather at 45º South on our test fence. We have data on the bare primers exposed for 24 months without serious rusting or other film deterioration. This real world testing is a better measure of weathering than accelerated testing methods.

6. **Quality Control** Each batch of Intercoastal’s waterborne primers must pass 8 quality control assessments before it can be shipped. A complete record is kept of the batch number and test results as well as a sample from each batch. We can retrieve quality control information and samples of batches that were produced years previously.
Intercoastal fast dry waterborne coatings are made using a special polymer, which allows them to dry rapidly and to dry under adverse weather conditions such as high humidity and/or low temperature. Since the binder is rapid drying, the paint can actually be made to set up in the container or application equipment before it is applied. To avoid this gellation, some simple precaution can be taken.

1. AVOID CONTACT WITH REACTIVE METALS
   All spray equipment that comes into contact with these products must be made of non reactive metals (stainless steel or chrome), or of plastic. Continuous contact with mild steel, galvanized steel, or other reactive metals in pressure pots, cups, agitators, pumps, hoses, lines, filters or spray guns can cause the paint to dry on the part, which can eventually lead to malfunction.

2. KEEP CONTAINERS COVERED
   Excessive exposure to air can set off the drying mechanism in these paints. The higher the temperature, more important this becomes.

3. STIR PAINT SLOWLY- DO NOT OVER AGITATE IT
   These products only require mild stirring. Rapid agitation with mechanical agitators can heat up the paint and can cause air entrapment. This can cause gellation. Usually sweep blade agitators turning 50-60 RPM are ideal. Propeller type blades can whip air into the paint when the container is nearly empty.

4. DO NOT THIN PAINT
   These products are formulated ready to spray as is. Improper thinning can cause development of gel particles or “trash” in the paint.

5. KEEP EQUIPMENT CLEAN
   When not painting for an extended period of time, flush the application equipment with clean water. For breaks of shorter duration, place the spray gun in a container of water. This prevents the paint from drying in the tip.

6. STORE PAINT IN A COOL PLACE
   Obviously, this is not always practical. When possible, avoid storing the paint outside in 100 degree summer heat. Likewise, keep the paint from freezing in the winter.
Intercoastal fast dry waterborne primers are made using a special polymer which allows them to dry rapidly and to dry under adverse weather conditions such as high humidity and/or low temperatures. However, some precautions should be taken when the winter conditions become severe at either the plant site where the paint is applied or the building site. Below are some suggestions which can help prevent problems caused by the weather.

1. **PROTECT PRODUCT FROM FREEZING**
   Store tanks or drums inside and away from freezing weather.

2. **MAKE CERTAIN STEEL IS DRY BEFORE PAINTING**
   When the humidity rises rapidly, the steel surface can “sweat”, which is the condensation of moisture from the air onto the steel surface. If the surface is wet when the primer is applied, the drying will be much slower, and adhesion and rust problems can occur.

3. **APPLY PRIMER TO STEEL ONLY WHEN SURFACE TEMPERATURE IS ABOVE 50 DEGREES FAHRENHEIT**
   This is not always easy to do in the winter time. If the steel is cold, the dry time and the cure time will be lengthened.

4. **CIRCULATE THE AIR AROUND FRESHLY PAINTED STEEL**
   When the weather gets cold and damp, all of the shop doors and windows are usually closed. As more waterborne primer is sprayed, the humidity in the building rises sharply, slowing the dry and the cure. Strong pedestal fans (3500RPM) will help this problem considerably.

5. **APPLY ONLY 1 ½ - 2 MILS (DRY) OF PRIMER**
   Thicker films are slower to dry and cure. If ice is allowed to form on the painted steel before the film is cured, loss of adhesion can occur.
Bulletin III

Spray Equipment Cleaning Procedures:
Changing From Solvent Based Primers to Water Based Primers

Waterborne coatings are not compatible with conventional solventborne coatings, therefore care must be taken to properly clean application equipment and avoid contaminations. When changing from solvent to water, all hoses, spray guns, and other equipment must be cleaned as follows:

1. **Thorough solvent wash**
2. **Flush well with isopropyl alcohol or butyl cellosolve**
3. **Flush well again with water**

When changing from water to solvent, reverse procedure.
When it comes to surface contamination, water based coatings are usually less forgiving than solvent based coatings. However, it is not difficult to properly prepare steel (or other substrates) for painting with Intercoastal’s waterborne shop primers. A few simple steps are all that is required.

1. **Degreasing:**
   Any cutting oil or other greasy or oily substances should be removed from the surface before painting. This can be done easily with a degreaser. If environmental issues prevent the use of solvents, a VOC compliant degreaser such as Simple Green can be used. This product is VOC free and totally biodegradable. Usually one part of Simple Green reduced with ten parts of water is effective. The oily areas can be wiped clean and without residue with a rag saturated with this mixture.

2. **Cleaning:**
   Hand tool cleaning according to the Surface Preparation Specification No. 2 (SSPC-SP2) is all that is required. Painting over rust and other surface contaminants can result in an unsatisfactory paint job.

3. **Drying:**
   Occasionally, on days with high humidity, the steel will “sweat” as water condenses on the surface. Painting over wet steel can retard the dry process as well as prevent good adhesion. A simple wipe down with a clean rag is usually all that is required.
Occasionally structural steel pieces painted with Intercoastal’s waterborne shop primers will require some touch up painting in the field. This could be areas that have rusted due to scrapes, welding, or other factors. Sometimes a customer will require a finish coat of a particular color or type to be applied over the shop primer. In these cases, a few simple steps are required.

1. **Cleaning:**
   The steel surface must be clean, dry and free of oil or other contaminants. Hand tool cleaning according to the Surface Preparation Specification No. 2 (SSPC-SP2) is satisfactory. Painting over rust and other surface contaminants can result in an unsatisfactory paint job. It is best to neutralize any rust with a rust converter such a “RUST-X” manufactured by Integrity Industries before painting.

2. **Finish Coat:**
   Intercoastal’s waterborne shop primers exhibit good adhesion with a wide range of finish coats. Intercoastal’s alkyd enamels, 2-part epoxies, and 2-part polyurethanes all work well over these primers. If the customer is in doubt about a particular finish coat that has not been tested, we encourage the use of a small test patch before painting the entire job. In aggressive environments such as near salt water or in atmospheres of salt air, the customer should consider a high performance finish. The two component epoxies, two component acrylic polyurethanes, or combinations of these are good choices.
Intercoastal Fast Dry Waterborne Shop Primers exhibit excellent weatherability and water resistance. However, delays due to bad weather or other factors can require the steel to be stored outside in the elements for an extended period of time. A few simple field storage procedures can prevent damage to the paint job during the time before the building can be erected. These procedures can be made a part of the delivery acknowledgement so the customer understands the proper method to store the steel to prevent damage from the environment.

1. **Do not store the steel directly on the ground.**
   - If the ground is continuously dry and without contaminants, there would be no problem. If the ground is wet (which is sometimes the cause of delay in pouring the slab), the steel is in effect subjected to immersion in water. Ground contaminants, such as salt or chemicals, can have a detrimental effect on the paint job. Storing the steel on boards is all that is generally required to accomplish this.

2. **Allow for air circulation under the steel.**
   - This prevents excessive buildup of humidity.

3. **Elevate one end of the material higher than the other end.**
   - This allows accumulated water to drain off the steel. This is especially important in climates where ice can form.

4. **Cover the steel with a tarp or drop cloth.**
   - This is important when the steel is going to be stored for a while.

These procedures require a little extra time and effort on the part of your customer, but they can prevent difficulties and other delays later.
Airless or Air-Assisted Airless industrial spray units with stainless steel or chrome components are suitable for application of Intercoastal’s Fast Dry Waterborne Shop Primers. Consult your local spray equipment vender for details on choosing the proper make and model for your needs.

It is extremely important to apply the specified film thickness to the steel, in this case, 5 to 6 wet mils to yield 1.6 to 2.0 dry mils. Too little film build can lead to early rusting. Too great a film build is a waste of paint, and can slow the dry time and also can cause unsightly runs.

There are several factors that can influence film thickness. Some of the more important factors are as follows.

1. **Spray Gun Pressure** - A good starting point is 40 psi, depending upon the particular unit being used. Excessive pressure can apply too much paint, or it can cause dry spray.

2. **Tip Size** - A .017” to .019” orifice size is best for heavy structural steel. The .019” tip can yield higher production levels by allowing the painter to use faster hand speed. In order to limit the loss due to overspray, the tip should have a fan width appropriate for the size of the pieces being painted. Again, the user should consult their local spray equipment vender for advice on the fan width size.

3. **Hand Speed** - The painter should be able to apply 5 to 6 wet mils per pass, (1.2 to 2.0 dry mils), easily with the .019” tip and the proper hand speed. Too slow, too much paint, too fast, too little paint. Using a wet mil gauge, it is an easy technique to learn.

4. **Spray Gun Distance** - For most spray units, the distance from the spray gun tip to the steel surface should be from 12” to 18”. Any closer can deposit too much paint and cause runs. Any much greater distance can result in dry spray, and thereby poor adhesion. Tip extensions are available for painting larger surfaces.

5. **Trigger release** - At the end of each pass, the trigger should be completely released before reversing direction. If this is not done, a build up of paint can occur at the end of the pass.

6. **Overlapping** - Not much can be done about overlapping on the next pass. If the hand speed and other factors mentioned above are correct, overlapping seldom if ever, causes a serious problem.
Bulk Tank Agitation Set Up

Agitation speed- 60 RPM- faster agitation can trap air

Run agitator 30-45 minutes before using paint

Make certain tank is completely empty before switching tanks

Replace tank cover immediately after removing agitator.

Bottom drain with tank bottom slanted towards drain.

The fitting on the tank is 3/4" SS. Part A (male) cam and groove coupling.

Customer will need 3/4" SS Part B (female) cam and groove coupling to hook up the tank.

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Intercoastal Waterborne Primer Colors

WP-1009 Brown Oxide

WP-1020 Metal Prep Gray

WP-1012 Dark Gray
Product Specification - WP-1009 Brown Oxide Fast Dry Waterborne Primers

**Date:** February 26, 2002

**Product No.:** WP-1009  **Color:** Brown Oxide

**Type of Coating:** Fast dry waterborne shop primer

**Recommended Use:** Industrial shop primer

**Substrate:** Mild steel, galvanized steel, or aluminum

**Surface Preparation:** Surface must be clean, dry, and free of oil or other contaminants

**Application:** Airless spray or brush

**Reduction Spray:** None

**Thinner:** Do not thin

**Brush:** None

**Thinner:** Airless Thinner

**Weight per Gallon:** 10.42 ± .2 lbs/gallon

**Solids by Weight:** 46.9 ± 1%

**Solids by volume:** 33.1 ± 1%

**Packaged Viscosity:** @ 77º F 25" # 3 zahn cup Voc .33 lbs/gallon as packaged

**Gloss:** Low satin

**Theoretical Coverage:** @ 1 mil 530 sq ft

**Practical Coverage:** @ 1 Mil 450 sq ft

**Recommended Film Thickness:** Wet 5-6 mils **Dry** 1.6-2.0 mils

**Drying Time (77 F. @ 55% Relative Humidity)**

**Touch:** 25 Minutes  **Recoat:** overnight  **Dry Hard:**

**Bake Schedules:**

**Clean-Up:** Water
**Remarks:** New Technology! This unique waterborne primer will dry in high humidity and low temperature conditions without sagging or running. It is extremely environmentally friendly with a VOC of only .33 lbs/gallon. It exhibits good adhesion to a wide variety of substrates and can be top coated with conventional alkyd enamels as well or topcoats with hot solvents such as epoxies or polyurethanes.

**Caution:** All spray equipment, which comes into contact with this product, must be of non-reactive metals (stainless or chrome) or plastic. Continuous contact with mild steel, galvanized steel, or other reactive metals in pressure pots, cups, hoses, lines, and spray guns can cause the primer to dry on the part and could eventually cause malfunction.

**Caution:** Keep from freezing.

The recommendations made herewith and the information set forth with respect to the performance or use of our products are based on our own research and are believed to be accurate. The products discussed are sold without warranty, as to fitness of performance, expressed or implied, and upon condition that purchasers shall make their own tests to determine the suitability of such products for their particular purposes. Likewise, statements concerning the possible uses of our products are not intended as recommendations to use our products in the infringement of any patent.