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Below you will find instructions for coating both Concrete and Metal. These instructions are a basic guideline for most projects. Always follow the instructions provided by the paint manufacturer.

## **Basic Guidelines for Coating Concrete and Metal**

### **Instructions for Coating Concrete**

Coating concrete doesn't have to be complicated, but, if done properly, will take some time and effort, all worth it when the job is completed and you have a floor, or other surface, that will yield years of trouble-free service. For all coating projects, make sure the manufacturer's instructions are followed.

#### **New Concrete**

Since concrete surfaces come in two forms, new and old, let's begin with the new. New concrete must be allowed to cure for approximately 30 days. Curing is very dependent upon temperature and humidity. In a cold and damp environment, expect curing to take a little longer. Just the opposite is true if the temperature is very warm, or hot, with low humidity.

Coating new concrete before it completely cures will lead to a disastrous result, peeling, cracking and an overall failure. Water based coatings can be somewhat forgiving on cured concrete that is slightly damp but will not work on concrete that has not fully cured. The curing paint film will be compromised by water that is still evaporating from below the concrete surface.

An excellent way to test for the presence of moisture in concrete that is at, or near, the 30-day curing recommendation is to cut a plastic trash bag into four or five 18-inch by 18-inch squares. Tape these plastic sheets on several different areas of the concrete surface with duct tape or some other adhesive tape that will completely seal the plastic to the concrete. Leave the plastic in place for at least 16 hours, preferably 24. Lift the plastic and check for moisture on the plastic itself or for a darkened area underneath the plastic and on the concrete surface. Should moisture be seen in either place, the concrete is not cured and is not ready for paint.

If you inherited a new, and fully cured, concrete floor, make sure that the concrete does not have a sealer in place that could prevent a coating from gaining proper adhesion. Sealers tend to make the concrete surface smoother and more glossy than uncoated concrete. Neither water, nor paint, will penetrate the sealer, so a determination as to its existence must be made.

Do a water test. Take a few drops of water and place in several areas of the concrete floor. Watch these small drops of water, about one teaspoon full, and see how quickly they absorb into the concrete pores. If the water sits there without absorbing, steps must be taken to either remove the sealer or open the pores of the concrete. The water should adsorb within 30 seconds to one minute.

If you are not sure if your concrete surface has been sealed, rub your fingers across the surface. Unsealed concrete can be slightly rough, and there may be a light dust on the surface that is caused by efflorescence, more on that later.

Take some muriatic acid and dilute three parts acid with one part water or as instructed by the muriatic acid container, since muriatic acid comes in different concentrations. Always add acid to water and not the other way around, to avoid having acid potentially react with the water and potentially splash in your eyes, always wear safety goggles. After applying the acid solution to the concrete, a hissing sound should be heard as the acid reacts with calcium and other salts generated during the curing phase. If you do not hear this, a sealer was most likely applied. In that case, you will be limited in your choices of paint. The key is to determine what type of sealer was applied so that a determination can be made as to an appropriate top-coat or whether the sealer must be removed.

Efflorescence, what is it? Efflorescence is simply the movement of moisture, which carries with it soluble salts of calcium, sodium and potassium from inside the concrete to its surface. This happens during the curing phase of new concrete and can occur for quite some time, if other sources of water are present underneath the concrete surface. New concrete, without a sealer, must then either be acid etched or sanded to remove these salts, which could cause a coating failure. Etching or sanding also creates a profile for better mechanical adhesion. The smoother the concrete finish, the less porous the surface and the tougher it will be to gain proper adhesion.

Summarizing, the steps below will help you to prepare a new concrete surface so that the completed project will give you many years of useful service.

1. Allow the concrete to cure the full 30 days. Make sure that there was no sealer applied to your concrete structure. Do the plastic sheet test with 18 x 18-inch plastic squares to check for entrapped moisture.
2. If no moisture is present, either do a muriatic acid etch or rent a concrete sander designed to prepare concrete floors for paint. Follow the directions listed on the muriatic acid container as to dilution.
3. After an acid etch, allow 24 hours for the concrete surface to dry before applying the paint. If using a sander, make sure that all the dust is removed from the surface, preferably by rinsing the surface with water. Again, wait 24 hours for the surface to dry. Providing circulating fans can speed the drying process.

4. Place a small drop of water on several areas of the concrete, a teaspoon will do. Make sure the water adsorbs in to the concrete quickly, within about 30 seconds to one minute. If it does not and remains as a beaded puddle, either etching, sanding or further chemical or steam cleaning must be done to gain maximum adhesion.
5. Apply the paint in the manner in which directed by the manufacturer. Make sure to wait the proper amount of time between coats and to apply the specific number of coats per the manufacturer's suggestions. Use appropriate application tools to insure compatibility. For instance, rollers and brushes designed for water-based products will be destroyed by a solvent based system.
6. Allow the paint to cure in accordance with the manufacturer's curing schedule and follow all other instructions.

Now you are ready to enjoy the benefits of your labor.

### **Old Concrete**

Old concrete can come with its own specific challenges. Sure, it will be fully cured, but other challenges exist. If the surface was previously coated, check its integrity. Is it, for the most part, still in good condition? If the answer is yes, it may be recoated. Try to find out what type of coating was previously applied. This is important to ensure excellent adhesion between the old and the new paint.

Ensuring that the new paint will adhere to the old is a critical step in the process. Old epoxies are especially difficult to recoat because of their crosslink density after curing. It can be extremely difficult to gain proper adhesion to a fully cured epoxy system unless proper steps are taken, including sanding the old surface.

If the old concrete was not previously painted, check for contamination from oils, greases and other chemicals that might cause a coating failure if not properly removed.

Follow these steps:

1. Examine the old paint, if one exists. If, for the most part, its adhesion is sound, a new coating may be applied over it. Make sure to scrape paint that is not properly adhered and any other damaged paint. Also, check in a small area to make sure that the new paint is compatible and that proper adhesion can be acquired.
2. Clean the surface so that all contaminants are removed. If using water, allow 24 hours to dry.
3. If the old concrete is contaminated from oils, greases and other contaminants, they must be cleaned using solvents or steam.
4. If cleaning with solvents, use oxygenated solvents such as ketones, Methyl Ethyl Ketone (MEK) and Methyl Isobutyl Ketone (MIBK) are excellent choices. Unlike most hydrocarbon solvents, such as Mineral Spirits, Toluene or Xylene, the Ketones will not

leave behind an oily residue that could compromise adhesion. These solvents are available at most paint stores.

5. Steam cleaners can be rented and are an excellent choice as well.
6. After cleaning and drying, place a small drop of water on several areas of the concrete, a teaspoon will do. Make sure the water adsorbs in to the concrete quickly, within about 30 seconds. If it does not and remains as a beaded puddle, either etching, sanding or further chemical or steam cleaning must be done to gain maximum adhesion.
7. If the concrete passes the water drop tests, it is ready to be painted.
8. Always make sure the surface is clean and as free, as possible, of dust and other contaminants. A clean surface is your ticket to a successful application.
9. Always follow the manufacturer's instructions.

If at any time you have questions as to preparation, or application, give AMI a call. We are always happy to assist, (678) 821-3273.

## **Instructions for Coating Metal**

No matter the substrate, proper preparation is critical for success. As with concrete, you will be faced with coating both new and old metals, and the procedures vary. No matter the substrate, make sure that the proper temperature and humidity conditions exist for the type of paint intended for the project. Always follow the manufacturer's instructions.

### **New Metal**

Many of the principals for coating concrete hold true for coating metal, primarily that the surfaces should be clean and free from all contamination. The key to any successful coating is substrate preparation.

When referring to the word "Profile," in these instructions, it simply means the degree of roughening or abrading the metal prior to coating. For example, the naked eye sees the surface of most metals as very smooth. For proper adhesion, we don't want a very smooth surface. When viewed under a microscope, the metal should resemble a series of mountains and valleys, the same for concrete. The more severe the service the metal will experience, the deeper these valleys should be.

1. New metals, many times, are contaminated with oils that were applied during the manufacturing process. Check the metal's surface by wiping with a clean, white rag. If oils and greases are present, they must be removed.
2. In most cases, cleaning the metal should be accomplished using Ketone solvents. Methyl Ethyl Ketone (MEK) and Methyl Isobutyl Ketone (MIBK) are excellent choices. Unlike

most hydrocarbon solvents, such as Mineral Spirits, Toluene or Xylene, the Ketones will not leave behind an oily residue that could compromise adhesion. These solvents are available at most paint stores.

3. If oil is present, and your job calls for sandblasting the metal, always remove the oils first. Sandblasting will not remove the oils. It will only move them around the surface of the metal. They must be removed.
4. Depending on the service required for your project, sand blasting may be necessary. Extreme conditions usually call for a more aggressive "Profile." The "Steel Structures Painting Counsel" (SSCP), should be consulted if you are unsure as to the depth of your required "Profile."
5. After cleaning and creating the proper "Profile," the coating may be applied. If coating the inside of a tank, or other areas where sufficient air flow is not possible, fans should be used move paint solvents away from the curing paint film. Otherwise, curing will be slowed or never achieved.

### **Old Metal**

As with old concrete, old metal, with a previous coating, must be carefully examined.

1. If an old coating does exist, it can be recoated if most of the coating is still intact and adhesion is still good. If you are unsure of what type of coating was previously used, do a small test on the old coating to check for compatibility and proper adhesion.
2. If the coating is an old epoxy, the entire coating must be sanded to create a "Profile" for adhesion. Without sanding, the new epoxy will, most likely, not adhere to the old, and a coating failure is certain to follow. It may be best to remove the old coating through either a solvent cleaning or a sandblast.
3. If the old metal to be coated is rusted, the rust must be removed. Rust is a perpetual reaction. In the presence of moisture and oxygen, rust will spread underneath a coating, making delamination a certainty
4. Two methods of removing rust are available.

First, a sandblast may be performed. See SSPC guidelines for obtaining a "Near White Blast." This will give you a very sound substrate for coating. Remember, coat the metal as soon as possible after the sandblast. Newly blasted metal can "Flash Rust" very quickly which can cause coating failures in the future. If immediate coating is not possible, apply a product such as our "Primecote" rust converter to prevent rust from occurring. Then, coat the metal as soon after as possible.

Second, many times a sandblast is not practical. If this is the case and if the metal is sound, our product, "Primecote," a rust converter, may be applied. Rust is iron oxide. Primecote converts iron oxide to a very stable Iron Phosphate. Simply apply one coat and

allow 24 hours for the reaction to take place. Wipe or blow off any white dust that may occur during the reaction. If the metal is severely rusted, a second coat of "Primecote" may be necessary. The rust will turn from a reddish-brown color to black when the reaction is complete. Once the reaction is complete, coating the metal may be performed. Again, make sure that any white dust, from the reaction, is removed.

Since there are many types of metal, make sure that the intended coating is proper for your project. Certain metals, such as galvanized and stainless, can be difficult substrates for proper paint adhesion. Make sure to match the proper coating to the substrate.

Again, call AMI at any time. We are happy to assist, (678)-821-3273.

**IMPORTANT!!!** Applying any coating to an unprepared surface is a recipe for disaster. Substrates covered in oils, greases, rust and other contaminants will surely cause a coating failure. Proper blasting and sanding profiles for steel and concrete are critical as well. Take your time and do it right the first time. This will ensure a coating that will provide, potentially, many, many years of service.

