WHITE PAPER

Application Guidelines for Field-Applied Touch-up Paint Systems on Metal Panels

Introduction

The information provided is intended to serve as a guide for the application of field applied air-dry paint systems used in small areas where the factory applied paint systems may be scratched or marred during the construction phase of a project. MCA does not condone or endorse the use of field applied air-dry paint systems and ultimate acceptance of such field work is at the discretion of others. Air-dry (touch-up) paint systems are essential tools to be utilized when completing building construction. In some cases, it may be necessary to maintain the quality of the overall structure by applying field applied air-dry paint systems. In still other cases, the best option may be to replace the entire panel or panels. It is strongly suggested that the building panel supplier be consulted to identify any particulars of the factory-applied paint system and provide guidance before attempting to apply a touch-up paint system.

When applying a field applied air dry paint system it is important to apply a system with the same quality and performance of the original factory paint system to prevent areas from different weathering rates. Figure 1 shows an example of what can happen after several years of UV exposure to a building roof when a low performance field applied air-dry paint system is used over a high performance factory paint system.

Figure 1 - Appearance of a pre-coated metal roofing where a low performance field applied air-dry paint system was used

Any field applied air-dry paint system needs to be matched up as close as possible to performance requirements of the original factory-applied paint system.

Touch-up Product Options

Recommendations for air-dry paint systems used on factory applied paint systems:

Original Factory Paint System	Air-Dry System
1. PVDF/FEVE Fluoropolymer	PVDF/FEVE
2. Silicone Modified Polyester/Super Polyester	PVDF/FEVE
3. Standard Polyester	Acrylic Lacquer

It should be noted that factory-applied paint systems and field applied air-dry paint systems will most likely not ever match or weather exactly the same over time. With different resin qualities and pigments for each system a perfect solution cannot be promised, but there can be a vast improvement in long term performance when compatible paints are matched up properly.

PVDF & FEVE Fluoropolymer Air-Dry Paint Systems

PVDF air-dry paint systems are one-component fluoropolymer based systems, specially designed for touch-up and repair of factory-applied painted metal surfaces over small blemishes. Formulated with durable pigmentation, these air-dry paint systems provide performance characteristics comparable to factory-applied PVDF/FEVE paint systems in the area of long term chalk and fade resistance.

PVDF field applied air-dry paint systems can be applied as a single coat over most minor surface scratches with only a light scuff-sanding to maximize the mechanical bond of the air-dry paint system. The paint manufacturer's recommendations should be followed in these applications to confirm the appropriate surface preparation for the project.

For small touchup, PVDF field applied air-dry paint systems can be brushed-on using an artist's brush, dauber pen, or aerosol can. Rolling or brushing this type of coating generally does not provide a smooth film due to the very fast drying speed of the product.

FEVE field applied air-dry paint systems are two-component fluoropolymer based systems that are also designed for touch-up applications. These paint systems are only recommended for repair of larger areas. It is highly recommended that this work be done by an experienced contractor to blend the coatings together and create an acceptable finished product.

Acrylic Lacquer Air-Dry Paint Systems

Acrylic lacquer one coat touch-up materials are a good choice for standard polyester and interior coating repairs. They are generally easy to apply, are low cost, and weather at approximately the same rate as factory applied standard polyesters.

Information on these type paint systems can be easily obtained through aerosol and automotive refinish establishments where the color can be very closely matched to the original factory applied color.

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Precautions

Air-dry paint systems must be properly mixed, reduced, and applied according to the manufacturer's instructions, under tightly controlled conditions to ensure the best possible results.

Due to changing governmental legislation regarding the emission of volatile organic solvents (VOC), the use of field applied air-dry paint systems in certain regions is regulated and may require a special permit prior to use. It is always highly recommended to contact the local authorities to determine the local ordinances or air quality regulations prior to any application.

After the project is completed, any remaining materials must be disposed of properly and in accordance with local regulations. This includes unused coating materials, thinners, cleaners, and any potentially hazardous debris.

Touch Up Paint Scenarios

The following instructional procedures cover the most common types of touch-up field repair situations. This information is intended to provide general guidelines only. Specific scenarios may require modifications to these procedures.

Scratches

Always minimize the area being repaired. This is especially important when repairing metallic colors containing aluminum flakes or pearlescent colorants. Those color types are extremely difficult to obtain a good match between the field applied air-dry and factory applied paint systems. The use of a template during application can help minimize dry spray halo.

Clean the area to be repaired so it is free from dirt, oil and fingerprints using a mild detergent and a soft cloth. Rinse well to ensure no residue is left on the surface that may interfere with adhesion/appearance of the air-dry repair. Allow the repair area to dry thoroughly prior to painting.

Apply the air-dry paint system using a small brush or dauber pen. Feather in the edges to blend the repair with the surrounding area.

In some instances, simply scuff-sanding may not be enough to provide adequate surface preparation for adhesion and a primer may be required. Refer to the air-dry paint system manufacturer's instructions for guidance in this area.

Uncoated Metal Surfaces

Uncoated metal surfaces and exposed edges must be cleaned, to remove all surface corrosion, and pretreated with a field-applied conversion coating to produce a bright surface appearance. This surface preparation will help maximize paint adhesion and surface protection from corrosion. Follow the primer recommendations provided by the field applied air-dry paint system manufacturer specifically for the uncoated substrate being painted.

Primer Selection

There are no defined repair procedures that cover all the possible substrate scenarios. When field painting bare metal, a determination must be made concerning the method of cleaning, chemical treating and priming prior to air dry paint application. This usually depends on the size of the repair area.

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Proper surface preparation will help maximize paint adhesion and provide substrate protection from corrosion. The choice of which primer to use depends on substrate composition and its propensity for corrosion under normal weather conditions.

For surfaces with an intact paint finish showing no exposed substrate metal, a roughening of the surface followed by a cleaning with soap and water may be all that is needed to get good adhesion with an air-dry paint system. After paint application, an adhesion test should be performed after 24 hours dry time to confirm that adequate adhesion has been obtained. Use Scotch 610 or Permacel 99 brand tape to perform a non-destructive adhesion tape test. Be aggressive in the testing. If the air-dry finish can be indented with a fingernail, the paint is not completely dry and will require additional time to post-cure before performing the adhesion test.

If the air-dry paint system fails the adhesion test, a primer is required. Confirmation of adequate adhesion is also required for the complete air-dry paint system over the primer. Repeat the adhesion test procedure described above to show adequate adhesion.

Clear Coat

A clear coat is required over all basecoat colors that contain aluminum flake and certain deep-tone solid colors such as bright red and green. Consult the Product Data Sheet for the specific product code being used to confirm if a clear coat is required.

For repairing scratches, spot touch-ups, or small accessory parts, the clear coat is generally omitted. Proper judgment should be followed when deciding if clear coat is necessary to maintain acceptable long term color uniformity over the entire project.

NOTE: Metallic finishes will shift to slightly darker when the clear coat is applied. Consideration must be given to this degree of shift when matching the color to the surrounding factory applied coating, to get the best possible visual match

Application Using Spray Equipment

On occasion, touch-up material is purchased in one to five gallon pails for larger projects. In those cases, thinning and spray equipment is required to apply the material.

Thinning and Application:

The air-dry paint system must be mixed thoroughly before use. Optimum appearance properties are obtained when the products are sprayed between 50 to 100°F (10 to 38°C).

Reducing Solvents for Air-Dry Topcoats:

All solvents are not compatible with all paints. Solvent blends can be used to reduce air-dry paint systems for spray application. The following guide can be used as a general rule:

- **SLOW**: This is a slow solvent blend for use when surface temperatures are above 70°F (21°C) and the relative humidity is >60%.
- **FAST**: This is a faster solvent blend for use when surface temperatures are below 70°F (21°C) and the relative humidity is <60%.

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Additional reducing solvent can be added in accordance with the supplier's recommendations to further smooth out the spray air-dry paint finish. The spray air-dry paint finish should be applied to a dry, clean surface and only when air, product and surface temperatures are above 50°F (10°C) and at least 10°F (-12°C) above the dew point. At temperatures outside of this range, condensation may form on the surface being painted which can impact appearance and adhesion.

Spray Techniques

Multiple light passes should be used to build the film thickness and to avoid sagging. The air-dry paint should be applied to obtain complete hiding and acceptable appearance when compared to the surrounding area. Most air-dry paint systems can be recoated as needed to achieve the desired results. The recoat time will vary depending on humidity conditions. A recoat should not take place if the previous coat is still wet to the touch or is wrinkling/slumping. These guidelines are not universal to all field applied paint finishes. The field applied paint manufacturer should be consulted before applying a spray-applied touch-up finish.

Application & Curing Conditions

Under normal conditions, 77°F (25°C) and 50% relative humidity, the air-dry finish should be dry to touch in approximately 60 minutes and dry to handle and recoat in approximately 4 hours. The final cure is obtained within 24 hours. Dry times will vary based on temperature and humidity conditions.

Any unused and reduced paint can be saved for future use if stored properly in sealed containers. Unused paint should be stirred or agitated thoroughly before determining if further reduction is required.

Application Equipment

Air-dry coatings can be applied with a variety of spray equipment.

Recommended Equipment:

- Conventional air atomizing spray guns with a 35-90 PSI pressure range
- Aerosol can application
- HVLP (High Volume/Low Pressure) spray set at 10 PSI maximum pressure
- Airless spray with up to 3000 PSI hydraulic pressure

Rolling or brushing is not recommended, except for small touch-up using an artist's brush or dauber pen, due to the drying speed of the air-dry paint system.

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Trouble Shooting

The following information pertains to common paint problems that may be encountered when spraying air-dry paint systems. Their cause and recommended steps to correct the problems are shown.

Problem	Cause	Fix
APPLICATION:		
Cobwebbing out of the spray gun	High viscosity	Add more reducing solvent
Sagging	Applying wet film too quickly	Use multiple light passes to build film
APPEARANCE:		
Looks like sandpaper	Hot surface temperature	Add slower reducer solvent or wait for surface to cool down
Looks ropey or has an orange peel appearance	High viscosity	Add more reducing solvent
High gloss	High film build; Product was force-dried too soon following application	Use multiple light passes to build film; Allow gloss to fall within range before force drying
Non-uniform low gloss	Blushing due to high humidity; Uneven film thickness	Use a slower reducing solvent: ADS-SLOW. Resume spraying when relative humidity decreases
MISCELLANEOUS		
False body consistency	Paint was stored at low temperature; Paint was previously reduced	Mix paint thoroughly and raise temperature above 50°F before using

Summary

- There are a wide variety of field-applied (touch-up) air dry paint systems. Application is generally done for repair of small areas where the original factory-applied paint system has been scratched or marred during construction.
- There are precautions for all types of air-dry paint systems and the techniques used to apply these coatings
- The proper surface preparation and drying parameters are critical to the performance of air dry paint systems
- Common problems that may occur with selection of the type and application of air-dry paint systems are diagnosed with recommendations in this document.
- It is important to match the performance of the air-dry paint system to the original factory-applied paint system as close as possible so the air-dry paint system will weather at the same rate of time in the field and avoid premature failures.

Photo Gallery

Showing various cases where the air-dry “touch-up” paint systems did not match the performance of the factory-applied paint systems.

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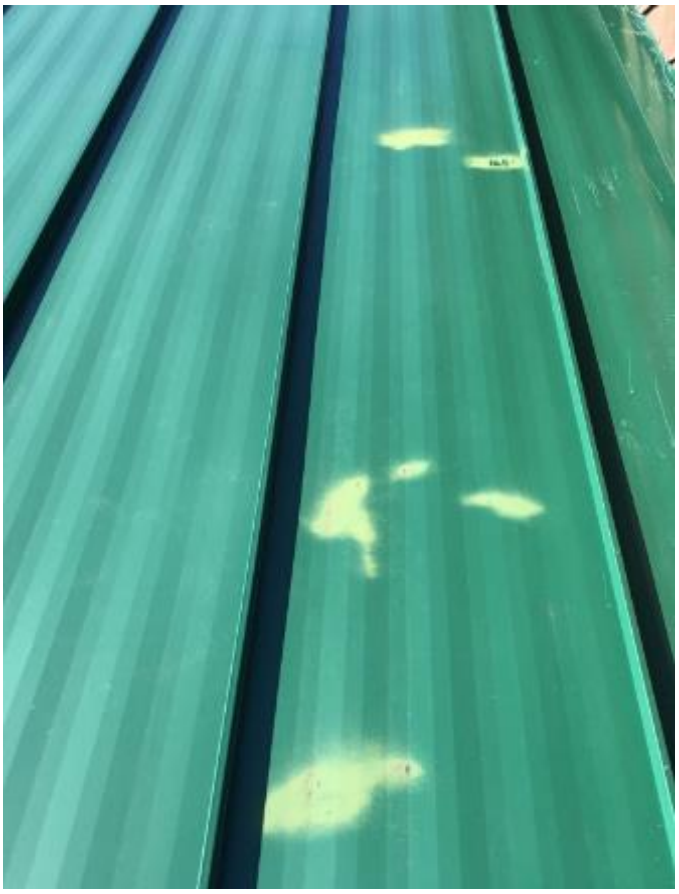

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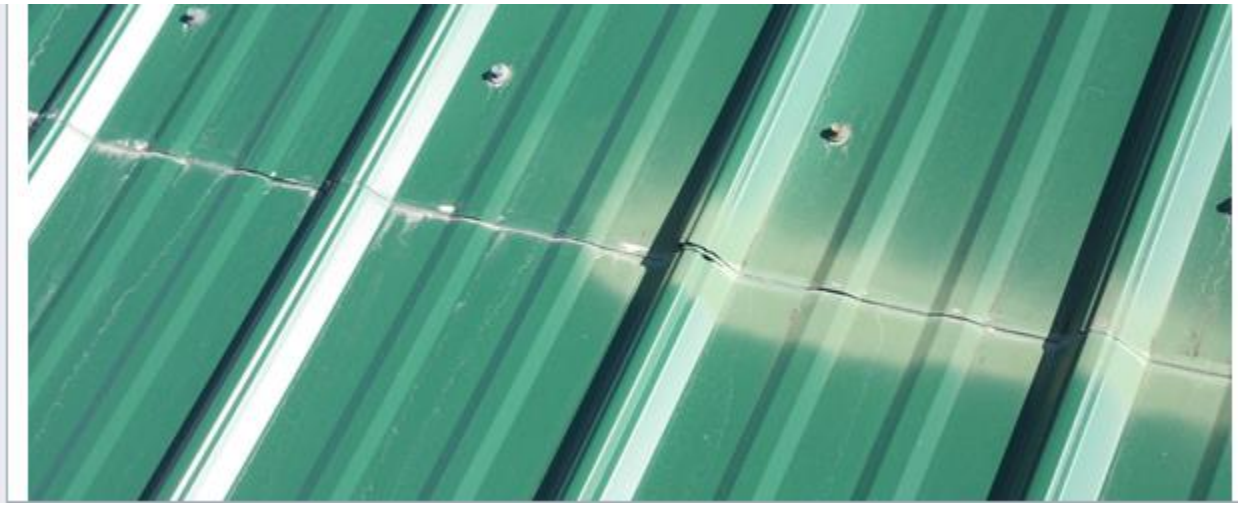

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For more information, please visit the MCA Web site at www.metalconstruction.org

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