CONSIDERATIONS FOR

COASTAL COATINGS

By Joseph “Cris” Crissinger, CCS, CCCA

INTRODUCTION
This article is presented in three parts. Part I, published in March, provided an analysis of types of paints and coatings. In Part II, published in June, surface preparation and application were discussed. This, Part III of the series, will conclude the discussion on recommended coating systems and application procedures for a coastal environment.

APPLICATION
If the coating is not applied properly by skilled applicators, all the efforts in selecting the coating and preparing the surfaces are wasted. Successful application includes the following:

- Proper tools.
- Proper curing.
- Back priming.
- Proper thickness.
- Stripe inside outside corners, welds.
- Proper conditions (temperature, humidity, moisture, wind).
- Proper training and familiarity with the coatings to be applied.

TOOLS
The most frequently used tools are brushes, rollers, and sprays. Since each method produces different coating thicknesses and finishes, except for extenuating circumstances, the methods should not be mixed on the same surface.

**Brushes**
Brushes allow for the most control of coating application with the least amount of waste and mess. A brush usually produces the thinnest film build per coat. Actually, it may be difficult to achieve the listed wet-film thickness per coat with a brush, especially if a high-build coating is being applied.

The same type of brush cannot be used for all coatings, and the manufacturer’s recommendations for brushes should be followed. Always select the type of brush recommended (natural bristle, synthetic bristle, etc.) and of the best quality, as the difference in brush quality can easily be seen and felt. Premium quality brushes can be cleaned repeatedly, while economy brushes are considered disposable. Brushes tend to leave stroke marks and streaks and are more likely to leave thin spots or “holidays.” However, premium brushes tend to leave fewer noticeable marks. When doing furniture refinishing, premium brushes were used to apply varnishes, and when the brushes were no longer suitable for varnish, they were relegated to painting.

**Rollers**
Rollers allow the coating to cover a larger area faster and the application of the coating to a thicker film build than a brush. Normally, coatings formulated for spray application can also be applied by brush or roller, but film build will be significantly less and may not be as smooth as when applied by spray. However, always ensure that the coating can be applied with a roller, as there are some coatings that are made for spray application. Usually, brushes can apply...
MATCH THE COATING SYSTEM WITH THE AMBIENT CONDITIONS AND SELECT THE BEST COATING SYSTEM THE BUDGET CAN AFFORD.

coatings more accurately than a spray or roller. Depending on nap size and length, rollers tend to leave an orange-peel appearance, and do not cover corners well. Coatings that contain strong solvents can literally dissolve economy rollers and leave residue from the dissolved rollers in the roller pans and on surfaces.

Roller covers come in different nap thicknesses that can be matched to the surface being coated and the desired finish. The longer the nap, the thicker the coating application and the greater the spatter. The usual nap thicknesses are 1/4-in, 3/8-in, 1/2-in, 3/4-in, and 1 in. Like paint brushes, roller covers come in different quality levels. The best ones can be washed repeatedly. Rollers usually apply coatings to a thicker film than brushes, but they tend to sling paint where it is not wanted, especially when a longer-nap roller is used. Short-nap rollers should be used on smooth surfaces or when a smooth finish is desired, while long-nap rollers should be used for rough surfaces or when an orange-peel effect is desired.

Spray
Spray is the fastest method of application and requires the most skill and proper equipment to ensure a successful result. Spraying can usually apply coatings to thicker film while producing considerable overspray and waste. Coatings applied by spray tend to be smoother but are prone to runs and sags because of the thicker application. Spraying can produce significant waste, especially when small profiles such as small diameter pipe bar joists and chain-link fences are being painted. Wind, which is common in coastal regions, can carry spray a long way and make for unhappy tourists!

COSTS
The following cost estimates are for comparison and include surface preparation, materials, and labor. Where finishes are field-applied, costs are based on primer being shop-applied. Costs may vary according to geographic location, applicator’s experience and capabilities, and product availability.

CMU and Brick
Costs include primer/filler/finish.
- High-performance acrylic:
  +25% over unpainted CMU.
- Modified epoxy, self-priming:
  +25% over acrylic (system is self-priming; requires only two coats).

Roofing Siding Panels
Mill-finish Galvalume is base cost.
- Shop-applied silicone polyester finish:
  +10% over mill finish.
- Shop-applied Kynar, two-coat finish:
  +18% over mill finish.

Aluminum Extrusions
Mill-finish aluminum is base cost.
- Shop-applied clear anodized:
  +26% over mill finish.
- Shop-applied bronze anodized:
  +360% over mill finish.
- Shop-applied Kynar, two-coat:
  +360% over mill finish.
- Shop-applied powder coat, thermoset:
  +400% over mill finish.
Steel, Shop-primed
Fabricator’s standard shop primer at 1 - 1.5 mils DFT is base cost.
- One coat of high performance alkyd at 3 mils DFT: +100%.
- One coat of epoxy primer at 3 - 4 mils DFT: +150%
- One coat inorganic zinc primer at 3 mils DFT: +450%.

Steel, Field-coated
Two coats of field-applied, standard oil paint is base cost.
- Two coats of field-applied, high-build alkyd (base cost): +25%.
- Two coats of field-applied, high-performance acrylic: +50%.
- One coat field-applied, epoxy polyamide and aliphatic polyurethane finish: + 80%.

SUGGESTED COATING SYSTEMS FOR THE COAST

DEFINITIONS
The terms and commonly accepted definitions below are often encountered when coating systems are described.

Substrate: The base being coated, such as wood, steel, or CMU. It is not the primer or undercoat.

Coating: A thick film usually applied at approximately three mils dry film thickness (DFT). Typically has a primary purpose of protection and a secondary purpose of aesthetics.

Paint: A thin film usually applied at approximately two mils DFT or less. Normally has a primary purpose of
aesthetics and a secondary purpose of protection.

**Primer:** The first coat applied to a substrate. Establishes the foundation for additional coats.

**Intermediate coat:** First coat applied over a primer and under the finish coat. In a four-coat system, the two coats between the primer and finish coats would be intermediate coats.

**Finish coat:** The last coat applied, directly exposed to ambient conditions.

**Top coat:** Same as a finish coat.

**Undercoat:** Coating between the primer and finish coat. The same as an intermediate coat in a three-coat system.

**Tie (barrier) coat:** A coating that can
be applied directly over an unknown coating without dam-
aging the coating. Will accept most top coats.

Back priming: Applying a primer to the back or unexposed side
of a substrate.

Strip coat: Applying a thin coat to
only the inside and outside
corners and edges of a sub-
strate prior to coating overall
substrate to ensure proper film
build.

Figures 3-1 through 3-11 show the
effects of various coating systems.

Typically, a coating system con-
sists of the surface preparation,
primer, intermediate coat, and finish
coat. Surface preparation is included
in the system because it varies with
the type of substrate, the type of coating,
and ambient and environmental
conditions.

To keep things simple, the most
frequently encountered substrates are
listed. These substrates are carbon
steel, galvanized steel, wood, concrete
block, concrete, brick, coil-coated
metal, and aluminum extrusions. The
suggested coating systems are for
exterior application, are strictly gener-
ic, and are not representative of any particular products or manufacturers. The listed coating systems also presume that all proper and recommended surface preparations have been performed prior to application. Coating systems for interior situations are not included because, except for industrial situations, interior coating systems are generally the same for coastal and non-coastal conditions. Of course, all coating systems should be confirmed and verified with the respective coating manufacturer’s product data sheets. Listings are not in any particular order.

CONCLUSION

Except for the materials used, coating procedures for coastal areas differ little from those for rural and urban areas. Match the coating system with the ambient conditions and select the best coating system the budget can afford. Ensure that proper surface preparation is addressed and that the materials are applied correctly. Many projects are subjected to “value engineering,” and finishes are usually one of the first items to feel the pressure of the budget squeeze. This may be acceptable in some urban and rural areas, but compromising exterior protection in coastal areas should be discouraged. After all, since your project is the best, it deserves the best!

REFERENCES

AAMA 608.1, American Architectural Metals Association (AAMA).

Galvanizing, A Practical Reference For Designers, Galvanizers Association of America.
### Suggested Coating Systems

<table>
<thead>
<tr>
<th>Substrate</th>
<th>Primer</th>
<th>Intermediate</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Carbon steel</strong></td>
<td>1 coat inorganic, zinc-rich primer</td>
<td>1 coat epoxy polyamide</td>
<td>1 or 2 coats aliphatic polyurethane</td>
</tr>
<tr>
<td></td>
<td>1 coat epoxy polyamide primer</td>
<td>1 coat epoxy mastic</td>
<td>1 or 2 coats aliphatic polyurethane</td>
</tr>
<tr>
<td></td>
<td>1 coat epoxy polyamide primer</td>
<td>1 coat 100% acrylic high build</td>
<td>1 or 2 coats 100% acrylic high build</td>
</tr>
<tr>
<td></td>
<td>1 coat inorganic, zinc-rich primer</td>
<td>1 coat aluminum mastic epoxy</td>
<td>1 or 2 coats aliphatic polyurethane</td>
</tr>
<tr>
<td>Powder coating</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Galvanized Steel</strong></td>
<td>1 coat epoxy polyamide primer</td>
<td>1 coat epoxy mastic</td>
<td>1 or 2 coats aliphatic polyurethane</td>
</tr>
<tr>
<td></td>
<td>1 coat epoxy polyamide primer</td>
<td>1 coat aluminum mastic epoxy</td>
<td>1 or 2 coats aliphatic polyurethane</td>
</tr>
<tr>
<td></td>
<td>1 coat vinyl wash primer</td>
<td>1 coat 100% acrylic high build</td>
<td>1 or 2 coats 100% acrylic high build</td>
</tr>
<tr>
<td>Powder coating</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Wood</strong></td>
<td>1 coat alkyd, high-build primer</td>
<td>1 coat 100% acrylic</td>
<td>1 or 2 coats 100% acrylic</td>
</tr>
<tr>
<td><strong>Concrete Block</strong></td>
<td>1 coat breathable, cementitious, modified epoxy ester</td>
<td>1 coat breathable, cementitious, modified epoxy ester</td>
<td>Not normally necessary</td>
</tr>
<tr>
<td></td>
<td>1 coat alkali-resistive primer</td>
<td>1 coat heavy-duty, breathable, block filler coating</td>
<td>1 or 2 coats 100% acrylic high build</td>
</tr>
<tr>
<td><strong>Concrete</strong></td>
<td>1 coat breathable, cementitious, modified epoxy ester</td>
<td>1 coat breathable, cementitious, modified epoxy ester coating</td>
<td>Not normally required</td>
</tr>
<tr>
<td></td>
<td>NA</td>
<td>1 coat heavy-duty, breathable, block filler coating</td>
<td>1 or 2 coats 100% acrylic high build</td>
</tr>
<tr>
<td><strong>Brick</strong></td>
<td>1 coat alkali-resistive primer</td>
<td>1 coat breathable, cementitious, modified epoxy ester</td>
<td>1 or 2 coats 100% acrylic high build</td>
</tr>
<tr>
<td></td>
<td>NA</td>
<td>1 coat heavy-duty, breathable, block filler coating</td>
<td>1 or 2 coats 100% acrylic high build</td>
</tr>
<tr>
<td><strong>Coil-coated metal</strong></td>
<td>2 or 3 coats 70% fluoropolymer system</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Aluminum</strong></td>
<td>Class I clear or color anodized</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

### SUGGESTED COATING SYSTEMS

International Molybdenum Association
Case Studies 05, 06, and 09.
Volume 1, Good Painting Practice, Steel Structures Painting Council (SSPC).
Volume 2, Systems and Specification, SSPC.*

### ACKNOWLEDGEMENTS

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Joseph “Cris” Crissinger, CCS, CCCA

Joseph “Cris” Crissinger has completed the NACE course of instruction in Protective Coatings and Corrosion Control and is a Construction Materials Specifier with 22 years of experience. As a partner with McMillan Smith and Partners Architects in Spartanburg, Greenville, and Charleston, SC, he evaluates new products and develops all written construction specifications for the firm. His responsibilities also include facility assessment, field investigations, and the coordination of internal training programs. Mr. Crissinger is a Certified Construction Specifier, a Certified Construction Contracts Administrator, and a member of the Construction Specifications Institute, the Building Performance Committee of ASTM, and the Design and Construction Division of the American Society for Quality, and serves in his community on the Construction Board of Appeals for the city of Spartanburg, South Carolina, the board of directors for the Spartanburg Boys’ Home, and the Camp Croft Restoration Advisory Board.