V-PRO™ PROTECTION SYSTEMS

valmont
STRUCTURES

VALMONT STEEL FINISHES

Valmont Structures offers an assortment of pole finish colors to meet your design specifications. Our durable and attractive colors are chemical, corrosion and abrasion resistant in the appropriate surroundings and when combined with suitable surface preparation techniques. As industry experts, we make finish recommendations based on your environment and performance expectations, along with many other variables. It is our knowledgeable personnel and factual data and analysis that set us apart from the competition. Enhance your pole's aesthetic appeal by selecting one of our bold colors for emphasis or a subtle color to blend into the environment. Or if a custom color is what you're looking for, please contact our factory for more information.

Valmont Structures - your durable, long lasting choice for pole finishes.

GALVANIZED

Galvanize GV

SAMPLE

Paint Name Order Code

POWDER COATING

White WH

Sandstone ST

Black BK

Silver Metallic SM

Silver SL

Light Gray LG

Slate Gray SG

Dark Tan DT

Medium Bronze MB

Bronze CB

Dark Bronze DB

Brown BN

Hunter Green HG

Dark Green DG

Red RD

Actual color may vary slightly due to area, sheen, application or lighting. For colors not shown, additional charges apply and a minimum order is required.

V-PRO™ PROTECTION SYSTEMS FOR STEEL

Valmont Structures offers several options for steel paint coatings and control systems. V-PRO™ Protection Systems were developed exclusively for Valmont by utilizing independent laboratory testing. Depending on your service expectations and environmental conditions, the following corrosion protection systems are available:

V-PRO 1

- Basic one coat powder.
- Appropriate for most geographic areas with applications of slow speed traffic, parking lots, shopping malls, office complexes, apartments, parks, tennis courts, etc.
- Zero or very limited exposure to de-icing salts, ocean spray, or acid rain.
- Gloss and color retention is moderate to good.
- Suitable over galvanized where additional corrosion protection is required and with carbon steel.
- Not recommended for weathering steel.
- Economical cost.

V-PRO 2

- Two coat powder or liquid. Includes primer and top coat.
- Appropriate for most roadside applications of moderate speed traffic or where poles are sufficiently set away from high speed traffic.
- Use where there is light ambient salt, road rock salt or moderate acid rain.
- Color retention is moderate to good.
- Suitable over galvanized and carbon steel.
- Not recommended for weathering steel.
- Economical cost.

V-PRO 3

- Two coat powder or liquid. Includes zinc primer and top coat.
- Appropriate for more extreme roadside applications with high speed traffic, and where poles are located close to traffic. Most geographic areas are applicable.
- Use where there is high ambient salt, rock salt, high impact abuse, and rock chip resistance required.
- Color retention is good to very good.
- Suitable over galvanized steel.
- Applied over galvanizing provides superior protection where high concentrations of liquid de-icing agents or other corrosive compounds utilized.
- Moderate cost.

V-PRO 4

- Two coat powder or liquid. Includes zinc primer and premium top coat.
- Appropriate for extreme applications where color and gloss retention is vital for 5 to 10 years or more.
- Great for decorative poles, bright colors and high sun exposure areas.
- Appropriate for roadside applications with high speed traffic. Most geographic areas are applicable.
- Use where there is high ambient salt, rock salt, high impact abuse, and rock chip resistance required.
- Applied over galvanizing provides superior protection where high concentrations of liquid de-icing agents or other corrosive compounds utilized, including acid rain.
- Suitable over galvanized steel.
- Color retention is very good.
- Premium cost.

Why Choose V-PRO Protection Systems?

Valmont Structures devoted extensive research to ensure your steel poles receive maximum protection from the environment. We qualify our protection systems by utilizing the most sophisticated testing techniques available to the industry. Our testing includes:

- Cathodic Delamination Testing
- Electrochemical Impedance Spectroscopy (EIS)
- Cross-Section Analysis
- Cyclic Exposure
- UV Testing
- Gravelometery
- Gloss and Color

Valmont's V-PRO Protection Systems were developed utilizing comprehensive testing while working with various paint coating manufacturers. Our systems were evaluated under numerous environmental conditions by an independent laboratory. Through this testing, we know how our systems will perform over time and provide you the service life you expect.

For additional information, please contact your Valmont Structures' representative.

CASES/SCENARIOS

Choose the right coating and corrosion protection solution for your steel pole environment.

Selecting the appropriate steel paint protection system is not always an easy, simple task. Your environment and service conditions are primary considerations as they greatly affect the overall performance of any paint coating and corrosion protection system applied to your steel pole. Pole life is directly determined by how well corrosion is controlled. Corrosion left unchecked will, in time, destroy a pole. The appropriate paint finish with good corrosion control matched to its environment and service conditions will provide for a long life pole.

Why Do Finishes Fail?

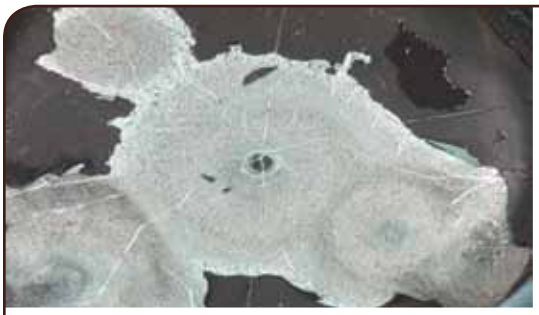
- Pole life expectancy is determined by how well corrosion is controlled.
- Coatings provide barrier protection against corrosion.
- All coatings have a limited life, determined by:
  - Coating systems not matched to service environment
  - Adhesion loss
  - UV deterioration
  - Mechanical damage
  - Corrosion mechanisms
  - Environmental considerations
  - Resins
  - Installation

Topic: Coating breakdown due to high ultraviolet exposure.

Scenario: I'm in Pensacola, Florida, and have problems with peeling paint. It's most common on poles that are exposed to a lot of sunlight. We also see a lot of corrosion. What does Valmont recommend for high sun exposure?

Explanation: Ultraviolet (UV) rays from the sun can, over time, cause fading and breakdown of many paint coatings. In environments that have high exposures to UV, Valmont recommends resins that are resistant to the affects of UV. UV resistant coatings can provide many years of barrier and color protection.

V-PRO Recommendation: V-PRO 4



Topic: Corrosion caused by rock chips resulting in undercutting (peeling) of paint.

Scenario: I'm located in Chicago, Illinois, and we constantly have poles with corrosion that started out by what appears to be rock chips on the poles caused by vehicles passing by. What does Valmont recommend?

Explanation: This corrosion is also referred to as cathodic disbondment. Paint coatings provide protection from corrosion by creating a barrier between the pole material (steel, aluminum, etc.) and the corrosive effects of the service environment. When this protective barrier is chipped, scratched or otherwise broken, corrosion products begin to form at the break and over time, try to undercut (peel) the paint at the damaged area. Paints resistant to cathodic disbondment will minimize paint peeling in damaged areas.

V-PRO Recommendation: V-PRO 2 or V-PRO 3

ENVIRONMENT AND SERVICE CONDITION FACTORS

Type of Substrate (Metal) Comprising the Pole Structure: Most metal poles are made of carbon steel, weathering steel or aluminum. Each has advantages and disadvantages in different environments. Galvanizing steel adds another layer of corrosion protection to a steel substrate due to the sacrificial action of zinc.

Environmental Corrosion Exposure: Corrosive agents in the environment result from conditions such as: acid rain in industrial areas, road de-icing compounds used for traffic safety in snow areas, animal urine, and fertilizer in rural and residential areas. **Recommendation:** V-PRO 3 over galvanizing.

Topic: De-icing salts pose aggressive corrosion issues and surface deterioration.

Scenario: In Denver, Colorado, we experience a lot of corrosion from the de-icing compounds used for traffic safety. We even see this on poles that are only a few years old. In these areas, what can protect against this type of corrosion damage?

Explanation: Where de-icing salts and solutions are used for winter safety, special considerations for a pole coating system are required. Paint systems required in de-icing environments should possess excellent barrier properties. Additionally, a galvanized substrate is preferable over carbon steel.

V-PRO Recommendation: V-PRO 3

Topic: Continuous soil immersion can pose aggressive corrosion issues.

Scenario: I'm located in Boston, Massachusetts, and experiencing peeling of paint on the bottom portion of poles that are exposed to soil. What can be done to prevent this type of damage?

Explanation: When painted poles are buried or surrounded by soil or wet debris, the constant moisture will cause corrosion deterioration of standard paint finishes. In areas where the pole service life is exposed to continuous moisture, an immersion coating is required. However, Valmont recommends that painted pole bases should not be buried below grade to allow for proper drainage.

V-PRO Recommendation: V-PRO 3, and elevate pole base above grade level.

Traffic Density: In high traffic areas, more wear and tear to a pole's coating happens through impact with sand and debris from passing vehicles. Traffic density and vehicle speeds above 30 m.p.h. sufficiently mix sand and corrosive road de-icing compounds into the air to heights which take a toll on paint finishes up the entire length of the pole. In areas with high traffic, paint coatings with good impact, abrasion resistance, and ductility are desirable. The greater the distance the pole is set back from the roadway lessens the amount of corrosion due to impact damage. **Recommendations:** V-PRO 2 or V-PRO 3 over galvanizing.

Ultra Violet Exposure: Depending on the paint finish, UV exposure over time will break down the resin in the coating. A coating with a UV inhibitor in the top coat provides longer lasting fade and gloss retention in areas with greater exposure to sun or where long term decorative appearance is desired. **Recommendations:** V-PRO 2 or V-PRO 3; V-PRO 4 for extreme UV environments.

RECOMMENDED

NOT RECOMMENDED

Topic: Grouting

Scenario: In Dallas, Texas, we regularly grout the bottom portion of our poles. Does Valmont recommend this?

Explanation: Valmont does not recommend grouting to seal the pole base to the foundation. Grouting does not allow for proper moisture drainage from the pole interior. Grouted poles hold water which causes internal corrosion. However, we do recommend the use of screens for pest control.

V-PRO Recommendation: V-PRO 1, V-PRO 2, V-PRO 3, V-PRO 4

Topic: Economic paint/corrosion protection.

Scenario: I'm located in Phoenix, Arizona, and need an economic protective coating that resists paint peeling and protects from corrosion in our local shopping center's parking lot.

Explanation: In environments with low speed traffic conditions, such as parking lots, and where de-icing compounds are not utilized, a one coat powder system provides limited corrosion protection. This coating system is not intended for long term protection.

V-PRO Recommendation: V-PRO 1

ENVIRONMENT AND SERVICE CONDITION FACTORS

Impact Damage: Mechanical damage caused from automobiles, bicycles, lawn mowers, weed eaters, signage attachments, chained structures such as a newspaper dispenser, cause breaks in the coating barrier which allows for corrosive compounds to directly reach the substrate causing premature corrosion damage. Left un-repaired, any break in the barrier coating results in severe corrosion damage and significantly reduces structure life. In areas of high impact potential, coatings that have good impact, ductility and abrasion resistance, along with being easily repaired with a brush or roller and color matched are desirable. **Recommendations:** V-PRO 2 or V-PRO 3

Installation Damage: Damage to the pole caused during the handling and installation processes that causes breaks in the barrier results in severe corrosion damage and significantly reduces structure life if left un-repaired. Coatings should lend themselves well to easy touch-up, such as a brush or roller with good color match, after installation. Repair of any damage to the barrier coating during installation is a warranty requirement and necessary for long lasting corrosion protection. Valmont's V-PRO systems can be color matched to repair damage to the original paint finish. As colors age and fade over time, color match to repair damaged areas becomes more difficult.

Topic: Red rust corrosion of galvanized layer.

Question: In Miami, Florida, we have several poles showing red rust through the galvanizing. What causes this and what can I do about it?

Explanation: When the galvanized layer of a painted pole becomes damaged or worn down to the carbon steel substrate, corrosion occurs. Areas where the galvanized is damaged need to be repaired by removing any corrosion products and recoated with the appropriate paint primer and top coat.

V-PRO Recommendation: V-PRO 3 or V-PRO 4

Topic: Improper storage results in coating problems.

Question: In Memphis, Tennessee, we normally carry an inventory on our light poles. However, when we pull them from inventory, we sometimes see staining and/or paint damage. What causes this?

Explanation: Extended wet storage of poles creates finish staining, coating delamination of paint, and white rust on galvanized substrates. Poles should not be stored in direct contact with soil or water. Elevating poles on dunnage along with removing wrapping will allow poles to drain and be protected from exposure to soil. Valmont's premium wrap is designed for extended use and may be left on for one year after shipment.

V-PRO Recommendation: V-PRO 3 with Valmont Structures' premium wrap protection.

Wet Conditions: Most pole finish coatings are designed for an environment that has wet and dry cycles of service life and are not designed for continuous exposure to moisture for extended periods of time. Poles that have long periods of moisture exposure or will be standing in water for extended periods of time require an emersion rated coating. Please consult a Valmont representative for further information regarding pole applications requiring continuous exposure to wet conditions.

Below Grade Exposure: Soils low in electrical resistivity pose to be a more corrosive environment with embedded poles. In areas where there are high environmental corrosion conditions, an organic coating with good barrier properties over galvanizing is the preferred solution for corrosion control. For below grade exposures, Valmont has developed specific coating and corrosion control systems. Please consult your Valmont representative for further information regarding below grade application.

Extended Storage: Poles stored prior to installation, unless coated with an emersion rated coating, may become damaged if stored in moist conditions such as low marshy areas, ditches or other areas where standing water or continuously damp conditions contact the pole. Standard wrapping materials which may entrap moisture due to rain or condensation must be removed within five days of pole delivery to prevent damage to the paint finish. Valmont Structure's premium wrap is designed for extended use and may be left on for one year after shipment. All V-PRO systems can be ordered with the premium wrap.

FREQUENTLY ASKED QUESTIONS

What determines the life of my pole structure? It is a fact of life that metal wants to go back to nature. Steel wants to rust, essentially going back to iron ore. This is the corrosion process. Pole life is determined by how well we can control corrosion. The longer we can protect the pole substrate (steel, aluminum, etc.) from corrosion, the longer the pole will remain structurally functional. V-PRO Protection Systems are designed to provide many years of corrosion protection in various environments.

What are the benefits of galvanizing? Galvanized structures are protected from corrosion attack due to both the barrier effect and the galvanic (sacrificial) action of zinc. Zinc does a fine job of protecting a steel pole in most atmospheric conditions and in moderately corrosive and oxidizing soils. Organic coating systems are used over galvanizing as additional protection against corrosive environments.

What causes paint to peel? Paint peeling is the result of a loss of bond between the paint coating and the surface (substrate) of the structure. Over time, paint coatings break down due to corrosive salts, moisture and ultraviolet sun rays. All paint systems are not created equal. Depending on the paint system, application and other properties, some systems are better matched for specific service conditions than others. V-PRO Protection Systems are tested to provide long lasting resistance to paint peeling in various service environments and can be matched to provide superior adhesion in your specific environment.

What is Cathodic Delamination (CD)? As defined by corrosion engineers, cathodic delamination is the destruction of adhesion between a coating and the coated surface caused by products of a cathodic reaction. This means that the coating "delaminates", or lifts and separates from the substrate even though it exhibits good adhesion prior to being exposed to service conditions.

How does cathodic delamination testing benefit my projects? Cathodic delamination testing is the litmus test for how well a paint finish will withstand peeling due to corrosion. Valmont Structures utilizes cathodic delamination testing to determine how well protective coatings resist corrosion after it's been damaged and no longer provides barrier protection in a localized area such as a rock chip. A protective coating with a good CD rating resists the undercutting forces of corrosion in the damaged area, even though the barrier has been compromised.

What is Electrochemical Impedance Spectroscopy (EIS)? EIS is a predictor as to how well a paint coating's barrier properties resist corrosion over time.

How long will my paint color last? Paint color and gloss retention are determined by the formulation of the paint system. Ultraviolet rays of the sun, over time, cause fading of color and loss of gloss. Certain colors are also more prone to fading than are others. The V-PRO 4 Protection System is designed to provide extended resistance to color fading and gloss retention.

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STRUCTURES

Conserving Resources. Improving Life.

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