

ITEM 16572.03nnnn - SHOP APPLIED STRUCTURAL STEEL PAINT SYSTEM

DESCRIPTION

This work shall consist of applying a three coat structural steel paint system to structural steel parts. All painting work, except field touch-up and bolt painting, shall be done in the shop.

The three coat paint system shall consist of the following components:

1. Inorganic Zinc-Rich Primer
2. Epoxy Intermediate Coat
3. Polyurethane Topcoat

MATERIALS

Abrasive for Blast Cleaning. Abrasive material for blast cleaning shall be selected by the Contractor. The abrasive material shall leave the cleaned steel surface with nominal angular blast profile in the range of 50-75 µm.

Paint. All paint used on any one structure shall be produced by one of the following manufacturers, and shall be the exact paint listed. The zinc dust pigment used in the primer shall meet the requirements of ASTM D 520 Type II.

Manufacturer	Inorganic Zinc-Rich Primer	Epoxy Intermediate	Polyurethane Topcoat
Ameron Protective Coating Division Brea, CA	Dimetcote D9 HS	Amercoat385	Amercoat 450 HS
Carboline Co. St. Louis, MO	Carbo-Zinc 11 HS	Carboline 893	Carbothane 133 HB
PPG Pittsburgh Paint, Inc. Pittsburgh, Pa.	Metalhide 1001	Pittguard All Weather DTR Epoxy	Pitthane Low VOC Acrylic Urethane 97-850

Prior to applying any paint, the manufacturer shall provide the inspector with certification that the zinc pigment used in the paint met the requirements of ASTM D 520 Type II, and that the primer has been tested and has a Class B Slip Coefficient as defined by the Research Council on Structural Connections.

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All paint in storage shall be protected from damage and maintained between 5°C and 32°C.

Each single paint (zinc primer, epoxy intermediate coat and polyurethane topcoat) shall be of a different color from the others. The color of the primer and intermediate coat will be the Contractor's option. However, they shall contrast with the underlying steel substrate or previously applied paints. The intermediate coat color shall be such that it can be completely hidden by a single coat of topcoat applied at the minimum specified dry film thickness.

The color of the topcoat shall be a specified in the contract documents or as directed by the Engineer.

All components of the system (primer, intermediate coat and topcoat) will be accepted on the basis of the manufacturer's written certification that the batch produced meets their product specification. Only paint arriving at the work site in new, unopened containers and labeled with the manufacturer's name, product name, component part, batch number and shelf life date shall be used. Paint in containers having expired shelf life dates shall be immediately removed from the work site and not used.

CONSTRUCTION DETAILS

Weld Spatter. Remove slag, flux deposits and weld spatter. Grind any burrs smooth.

Edge Preparation. Break all flame cut and sheared edges to an approximate 2mm chamfer.

Remove the surface of flame hardened steel, by grinding, to the extent necessary to achieve the specified profile during blast cleaning.

Cleaning. All structural steel surfaces to be painted shall be cleaned to bare steel in accordance with SSPC-SP10, Near-White Blast Cleaning. All blast cleaning and painting shall be performed at the same facility.

Before blast cleaning begins, visible deposits of oil, grease, dirt, salt, or other contaminants shall be removed by the methods specified in SSPC-SP1, Solvent Cleaning.

No blast cleaning operations will be conducted under the following conditions:

1. The relative humidity exceed 85%.
2. The surface temperature is less than 3°C above the new dew point.

The area cleaned shall be limited to that which can be cleaned and prime coated within a 8-hour

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period provided the condition known as flash rusting does not occur. Cleaned areas shall be approved by the Engineer or Inspector prior to priming.

After blast cleaning is completed, cleaned surfaces shall be defined by SSPC-Vis 1-89, Visual Standard for Abrasive Blast Cleaning Steel A SP10 or B SP10, as applicable. All surfaces shall be cleaned of blasting products and other residues in accordance with SSPC-SP10. Cleaned surfaces shall be cleared of all foreign matter by vacuuming.

Painting-General. At least five working days prior to the start of work the Contractor shall supply the Engineer with one copy of the paint manufacturer's current technical data for each paint furnished. Instructions, suggestions and precautions shall be followed to the extent they do not contradict the provisions of this specification.

All paint shall be thoroughly mixed in accordance with the manufacturer's instructions, Mechanical mixers shall be used. In addition, continuous mechanical agitation of the zinc-rich primer shall be required during application.

Only properly sealed and unopened paint containers will be permitted for use. Containers opened prior to the Engineer's or Inspector's authorization, or containers indicating tampering, shall be rejected and removed from the work site. All such containers shall be replaced by properly sealed containers at no additional cost.

Thinning of paint will be allowed only with the express permission of the Engineer or Inspector. All thinning shall be done in strict accordance with manufacturer's instructions. Only the type and quantity of thinner recommended by the manufacturer shall be used. Unauthorized use of thinners will result in the recleaning and repainting of the affected surface in a manner satisfactory to the Engineer or Inspector at no additional cost.

All paint at the shop shall be applied by spray method. Touch-up paint in the field shall be performed using brushes or rollers. Spray painting in the field may be performed with the Engineer's approval.

Individual coats shall be applied in sufficient quantity so that the following minimum dry film thickness (DFT) result:

<u>Primer</u>	<u>Intermediate</u>	<u>Finish</u>
75 - 100 µm*	100 µm	75 µm

* The film thickness shall not be less than surface profile, and no more than the thickness recommended by the manufacturer.

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NOTE: The wet film thickness required to obtain the required DFT is dependent upon the percent solids by volume of the paint. This will vary somewhat for each system.

DFT determinations will be made by the Engineer or Inspector in accordance with SSPC-PA2, Paint Application Specification No. 2, Measurement of Dry Paint Thickness with Magnetic Gages. The Contractor shall supply:

1. One copy of the Steel Paint Council Surface Preparation Specification SSPC - SP1, Solvent Cleaning and SSPC - SP10, Near-White Blast Cleaning.
2. One copy of the SSPC Pictorial Standard, SSPC-Vis 1-89, Visual Standards for Abrasive Blast Cleaning.
3. One magnetic dry film thickness gage, Type 2 (Fixed Probe).
4. One relative humidity gage.
5. One air thermometer.
6. One surface thermometer.
7. One profile thickness gage (0-250 μm).

No paint shall be applied unless all the following conditions are met:

1. The receiving surface shall be clean and absolutely dry.
2. The surface temperature and ambient air temperature are as recommended by the paint manufacturer except in no case shall painting work be performed when surface and ambient air temperatures are less than 5°C or greater than 38°C.
3. The receiving surface temperature shall be at least 3°C above the dew point.
4. The relative humidity shall not exceed 85%.
5. The Engineer or Inspector determines no poor adhesion or other non-acceptable condition will result.

All paint applied in violation of these conditions shall be completely removed, and the affected surface cleaned and repainted in accordance with stated requirements at no additional costs.

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All individual coats shall be applied as required by the manufacturer's instructions. No coat of paint shall be applied until the previous coat has cured in accordance with the manufacturer's instructions and has been approved by the Engineer or Inspector.

All work is subject to inspection. The Contractor shall provide adequate access and suitable lighting for such inspections to be made. Any work done while the Engineer or Inspector has been refused, denied, or restricted from access, or work performed in a manner that in the Engineer/Inspector's opinion prevents adequate inspection; will automatically be rejected. All such work shall be recleaned and repainted in accordance with these requirements at no additional cost.

PAINTING SHOP

Priming

- All steel surfaces, including metal to metal contact surfaces, shall be primed with zinc primer in the shop.
- The top of the top flanges that will be in contact with concrete shall only be coated for 25 mm from each edge.

Priming shall begin only after all welding and fabrication work is completed and accepted.

Cleaned bare metal surfaces shall have all blasting products removed and shall have the primer applied within 8-hours after completion of the blasting operations, and before the condition known as flash-rusting occurs. No bare steel surface prepared for priming shall be left uncoated long enough to allow the formation of rust. No rust formation of any nature will be permitted. Cleaned areas upon which rust has formed shall be recleaned in accordance with these cleaning requirements at no additional cost. The presence of rust shall be determined by the Engineer or Inspector. Surfaces receiving primer shall be absolutely clean and dry prior to primer application.

All welds, edges of plates, angles or other shapes, corners and crevices shall be striped before the full coat of primer is applied. All stripe painting shall be done by spray application only. The stripe shall extend a minimum of 25 mm from the edge or corner. The stripe coat shall be set (dried) in accordance with the manufacturer's recommendations before application of the full prime coat.

Intermediate Coat. The requirements given under Priming together with the following shall apply:

Faying surfaces shall be masked off and not receive the intermediate or finish coats.

Prior to application, if detrimental material, surface contamination(s), etc. are present, the primed surface shall be cleaned in accordance with the paint manufacturer's recommendations or as directed by the Engineer or Inspector. Stripe painting shall not be required.

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The intermediate coat shall be painted within the time period recommended by the manufacturer for re-coating, except that in no case shall more than 30 days elapse between the time that primer is applied and the intermediate coat is painted. Steel not painted with the intermediate coat within the specified time period(s) shall be recleaned and repainted with another prime coat at the Contractor's expense.

Finish Coat. The requirements of Priming and Intermediate Coat (including the 30-day application requirements for re-coating) shall apply together with the following:

1. Stripe painting shall not be required.
2. Finish coat color shall be that required by the plan, or as directed by the Engineer.

PAINTING FIELD

The only field work allowed to be done under this item is touch-up work and painting of fasteners after all steel erection has been completed and all concrete placement has been completed.

All the requirements of this specification shall apply to field painted material with the following modifications:

1. All surrounding steel that has been previously painted in the shop shall be protected from damage during cleaning operations.
2. Contract surfaces that have been previously painted with zinc primer, and which become damaged shall be repaired by blast cleaning, using vacuum blasters, to SSPC-SP10 and repainted with zinc primer. Then two (2) coats (intermediate and finish) shall be applied.
3. Fasteners shall be blast cleaned, using vacuum blasters, to SSPC-SP10 prior to painting.

All damage to the paint system shall be corrected by the Contractor in accordance with the requirements of this item and to the satisfaction of the Engineer/Inspector at no additional cost of the State.

METHOD OF MEASUREMENT

The unit measurement for this work is the square meter. The total payment quantity will be the number of square meters of structural steel to be painted with the entire paint system as shown in the Estimate of Quantities. No field measurements will be taken.

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BASIS OF PAYMENT

The unit price bid shall include the cost of all labor, materials and equipment necessary to complete the work.

Progress payments will be made in accordance with the following schedule:

1. Eighty (80%) of the lump sum price will be authorized for payment upon delivery and storage of properly painted structural steel to the project site. Shop painted steel will be considered properly painted only if accompanied shop inspector's written certification that the steel delivered as part of any single delivery was painted in accordance with the requirements of this item.
2. Ten percent (10%) of the lump sum price will be authorized for payment upon the completion of cleaning and painting all bolt heads, washers, nuts, and bolt thread extensions.
3. The remainder will be authorized for payment after all touch-up work is completed.