



**05 00 00 METALS / 09 00 00 FINISHES  
COLD GALVANIZING COMPOUND**

By ZRC Worldwide  
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**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

A. Cold Galvanizing of structural steel members, assemblies and metal fabrications.

**1.02 RELATED SECTIONS**

- A. Section 05100 Structural Metal Framing;
- B. Section 05200 Metal Joists;
- C. Section 05300 Metal Decking;
- D. Section 05400 Cold-Formed Metal Framing;
- E. Section 05500 Metal Fabrications;
- F. Section 05580 Sheet Metal Fabrications;
- G. Section 05700 Ornamental Metal;
- H. Section 05900 Hydraulic Structures;

**1.03 REFERENCES**

**A. SPECIFICATION CONFORMANCE DATA**

ZRC-221 meets the performance requirements of:

Federal Specification DOD-P-21035B (formerly MIL-P-21035)  
Galvanizing Repair Specification;  
Federal Specification MIL-P-26915D(USAF Zinc Dust Primer);  
Federal Specification TT-P-460 (Type I, Zinc Dust);  
Canadian Government Specification 1-GP-181A (Zinc Coating).

**B. REFERENCE STANDARDS**

- 1. American Society for Testing and Materials (ASTM):
  - A 239 Locating the Thinnest Spot in a Zinc (Galvanized) Coating in Iron or Steel Articles by the Preece Test (Copper Sulfate Dip);
  - A 780 Repair of Damaged Hot-Dip Galvanizing;
  - B 117 Salt Spray (Fog) Testing;
  - D 520 Type III Specification for Zinc Dust (Metallic Zinc Powder);
  - E 376 Measuring Coating Thickness by Magnetic-Field or Eddy Current (electromagnetic)



Test Methods.

2. Steel Structures Painting Council (SSPC)

SSPC-PS 12.00 Guide to Zinc-Rich Coating Systems.

SSPC Paint 20 Zinc-Rich Primers, Type II, Level 1, Organic.

SSPC-SP1 Surface Preparation Specification No. 1, Solvent Cleaning.

SSPC-5P3 Surface Preparation Specification No. 3, Power Tool Cleaning.

SSPC-5P6 Surface Preparation Specification No. 6, Commercial Blast Cleaning.

SSPC-SP10 Surface Preparation Specification No. 10, Near White Blast Cleaning.

#### **1.04 DEFINITIONS**

A. Cold Galvanizing: A method of applying a zinc coating to structural steel members, assemblies and fabrications at ambient temperatures to achieve long-term corrosion protection.

B. Cathodic Protection: Reduction or prevention of corrosion of a metal surface by making it a cathode in an electrolytic cell.

C. Galvanic Action: When two dissimilar metals come into electrical contact with each other in the presence of an electrolyte, the less noble metal (zinc) will sacrifice itself (corrode) to protect the more noble metal (steel, iron, or aluminum).

#### **1.05 SYSTEM DESCRIPTION**

A metallic zinc coating, containing 92% zinc in the dried film, that imparts cathodic protection to ferrous and nonferrous metals through its galvanic action, with low VOC content. This coating, in its dry form, is non-toxic and essentially free of such heavy metals as lead, cadmium, barium, antimony, arsenic, chromium, copper, mercury, molybdenum, selenium, silver and tellurium.

#### **1.06 SUBMITTALS**

A. Subcontractor shall furnish the architect/engineer with certification that the materials furnished under this specification meet or exceed the requirements herein.

B. Subcontractor shall furnish the architect/engineer with certification that surface preparation of the substrate to be coated has been performed satisfactorily, as herein specified.

#### **1.07 DELIVERY, STORAGE AND HANDLING**

A. PACKING AND SHIPPING: Gallon (26 lb.) containers of types suitable to prevent leakage of contents.

B. ACCEPTANCE AT SITE: Material shall be accepted at site providing no damage deleterious to products' function is visible and applicable material safety data sheets are present.

C. STORAGE AND PROTECTION: Do not store containers above 104 degrees F. Store containers out of sunlight and away from heat and sparks. Keep containers away from children.



### **1.08 PROJECT/SITE CONDITIONS**

- A. Drying time of coating is dependent upon temperatures, but product has no application temperature limit.
- B. Surface temperature of the substrate to be coated shall be at least 5 degrees F. above the dew point to avoid possible condensation.
- C. Humidity shall be less than 85% R.H.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

ZRC Worldwide, 145 Enterprise Drive, Marshfield, Massachusetts 02050, Tel. 781-319-0400  
Fax. 781-319-0404, Toll Free. 1-800-831-3275, Email: [info@zrcworldwide.com](mailto:info@zrcworldwide.com)  
Product Names: ZRC-221 Cold Galvanizing Compound

### **2.02 MATERIALS**

#### **A. SPECIFICATIONS:**

Type -Single pack, premixed, ready to apply, liquid organic zinc compound.

Finish -Flat light gray.

Theoretical coverage -400 square feet per gallon at 1.5 mil dry film thickness.

Metallic zinc content -92% by weight in dry film.

Flash point -109 degrees F (SETA method, ASTM D-3278).

Weight per gallon -26 lbs.

Solids content -56% by volume (ASTM D-2832).

VOC content -221 g/l (1.8 lbs/gal) (ASTM D-1475).

Viscosity -1100 cps. - Brookfield spindle #6 at 100 RPM at 25 degrees C (ASTM D-2196).

Maximum service temp. -750 degrees F (ASTM D-2485).

Specific gravity -3.15 (ASTM D-1963)

Electrical conductivity -73 million ohms per 3 mil dry.(Resistivity).

Pot life -At least 24 hours.



Shelf life -Bulk type, 3 years minimum.

Dry time -(Set to touch) When ambient air dried, 20-30 minutes (ASTM D-1640).

Recoat time -(Second coat) After 12 hrs. Under certain conditions, recoat time can be reduced. Please contact manufacturer for specifics.

#### **B. SUBSTRATE ACCEPTABLE FOR COATING:**

1. Substrates shall be of iron, steel or aluminum including structural shapes, pipe, sheet, fabrications and assemblies.
2. Substrates of iron, steel or aluminum may be satisfactorily coated regardless of carbon, phosphorus, manganese or silicon inclusion.

#### **2.03 EQUIPMENT**

- A. Coating shall be applied by brush, roller, low pressure compressor-type spray or airless-type spray.
- B. Refer to Section 3.03B for specific equipment information.

#### **2.04 MIXES**

- A. Coating herein specified is a one-component, premixed, ready to apply compound.
- B. Contents of containers shall be stirred well upon opening and during application to ensure homogeneous mix.

### **PART 3 - EXECUTION**

#### **3.01 EXAMINATION**

- A. Iron, steel, or aluminum surfaces to be coated shall be clean; i.e. devoid of grease, oil, mill scale, oxidation, loosely adherent rust, paint, etc.
- B. Coating shall be applied directly to metal surface to be galvanically active.

#### **3.02 PREPARATION**

- A. Surface preparation is dependent upon substrate condition and intended service.
- B. Typical examples are as follows:  
 Grease and Oils - Solvent clean to SSPC-SP1  
 Rust scale or easy to remove paint - Power tool clean to SSPC-SP3  
 Mill scale or firmly adhered paint - Sandblast to SSPC-SP6 (commercial)  
 Water immersion - (100 degrees F maximum) Sandblast to SSPC-SP10(near-white)

#### **3.03 APPLICATION**

##### **A. GENERAL APPLICATION INFORMATION**

1. The coating shall be applied at sufficient wet film thickness to achieve a minimum dry film build of 2.5 - 3.5 mils, using manufacturer's recoat time directions.



2. The coating has good brushing properties and is suitable for spray application, when such application is specified.
3. Thinning with appropriate thinners as recommended by the manufacturer is allowed provided film thickness requirements can be maintained and other properties of the coating remain uncompromised.
4. The coating shall be well stirred before use so that it is completely homogeneous during application.
5. Continuous agitation (by means of an in-pot power mixer) is strongly recommended to ensure the continuous application of a completely homogeneous material at all times.
6. Omit coating of surfaces to be welded in the field.
7. Material partially used at the end of any day shall be protected from skinning by placing thin blanket of solvent over remaining coating followed by careful closing of containers. Coating may be reused on the following day after total rehomogenization.

## B. SPECIFIC APPLICATION INFORMATION

### 1. APPLICATION BY BRUSH OR ROLLER:

Apply as received in container. For Brush Application, we recommend only 100% Natural Chinese bristle brushes. For Roller Application, we recommend rollers with a 3/8" nap, made of mohair or lambs wool (sheepskin).

### 2. APPLICATION BY LOW-PRESSURE COMPRESSOR TYPE SPRAY:

Atomized air pressure - 50 lbs.

Fluid pressure - 15-20 lbs.

Orifice of tip - 80/100ths (.80).

Viscosity reduction - 5 parts Coating to 1 part parachloro-trifluoromethyl-benzene.

### 3. APPLICATION BY AIRLESS TYPE SPRAY:

Pump - 30:1 Ratio

Hose - 1/2" (I.D.) Airless type.

Orifice of tip - 600 - 26/1000 ths. (.026).

Type of tip - Tungsten carbide, reversing (self-cleaning).

Filter screens - Complete removal is recommended. If screens are employed, use no less than 30 mesh.

Viscosity - No reduction required.

Recommended procedure - Connect hose directly to pump without filter assembly, ensuring a hose length of 50 feet maximum. Use least pressure possible. Start at 1500 lbs. and increase as required for good spraying properties.



### C. CLEAN-UP

1. Use mineral spirits solvent or Xylene.

### **3.04 FIELD QUALITY CONTROL**

- A. Inspect installed galvanized materials, fabrications and assemblies for coating thickness in accordance with ASTM E-376.

### **3.05 ADJUSTING**

- A. After erection, on all uncoated areas, prepare and apply coating per Section 3.03 above.
- B. Touch-up any areas where shop coat has been damaged in accordance with ASTM A-780.

### **3.06 PROTECTION**

- A. Only if desired, after 24-48 hours, cold galvanizing coating can be top-coated with acrylic, chlorinated rubber, epoxy, urethane or vinyl type products.
- B. DO NOT TOP-COAT with alkyd or lacquer type products.

## **PART 4 - MEASUREMENT**

### **4.01 MEASUREMENT**

- A. Measurement for METAL FINISHES will be made on a contract lump sum basis including surface preparation, application of coating specified and the installation and removal of all items of public health and environmental protection required.