

## Selection & Specification Data

**Generic Type** Organic Zinc-Rich Epoxy

**Description** Low VOC organic zinc epoxy steel primer with extremely fast cure-to-topcoat characteristics for in-shop applications and quick turnaround requirements in the field. Carbozinc 859 has less than 3.0 lbs/gallon VOC (thinned) and is used extensively in virtually all industrial markets.

- Features**
- Meets Class B slip co-efficient and creep testing criteria for use on faying surfaces
  - Rapid cure. Dry to recoat in 30 minutes at 75°F (24°C) and 50% relative humidity.
  - Complies with SSPC Paint 20 (Type II)
  - Low temperature cure down to 35°F (2°C)
  - Excellent adhesion
  - Protects against undercutting corrosion
  - Field proven primer that applies well by spray methods
  - Excellent touch-up primer by brush or roll for small areas.
  - VOC compliant to current AIM regulations

**Color** Green (0300); Gray (0700)

**Finish** Flat

**Primer** Self Priming

**Dry Film Thickness** 3 - 5 mils (76 - 127 microns) per coat

Dry film thickness in excess of 10.0 mils (250 microns) per coat is not recommended.

**Total Zinc Dust in Dry Film** By Weight: 81%

**Solids Content** By Volume 66% +/- 2%

Tested in accordance with ASTM D2697.

**Theoretical Coverage Rate**

1059 ft<sup>2</sup>/gal at 1.0 mils (26.0 m<sup>2</sup>/l at 25 microns)  
 353 ft<sup>2</sup>/gal at 3.0 mils (8.7 m<sup>2</sup>/l at 75 microns)  
 212 ft<sup>2</sup>/gal at 5.0 mils (5.2 m<sup>2</sup>/l at 125 microns)

Allow for loss in mixing and application.

**VOC Values**

Thinner 2 13 oz/gal: 3.12 lbs./gal (374 g/l)  
 Thinner 236 E 13 oz/gal: 2.72 lbs./gal (326 g/l)  
 Thinner 33 13 oz/gal: 3.15 lbs./gal (378 g/l)  
 As Supplied 2.72 lbs./gal (326 g/l)

These are nominal values.

\*Use Thinner 76 for projects requiring non-photochemically reactive solvents.

**Dry Temp. Resistance** Continuous: 400 °F (204 °C)

Non-Continuous: 425 °F (218 °C)

**Topcoats** Acrylics, epoxies, polyurethanes and others as recommended by your Carboline sales representative.

Under certain conditions, a mist coat is required to minimize topcoat bubbling.

## Substrates & Surface Preparation

**General** Surfaces must be clean and dry. Employ adequate methods to remove dirt, dust, oil and all other

## Substrates & Surface Preparation

contaminants that could interfere with adhesion of the coating.

**Steel** SSPC-SP6 with a 1.0-3.0 mil (25-75 micron) surface profile.  
 SSPC-SP2 or SP3 with a roughened surface for touch-up.

## Performance Data

Test Method	System	Results
ASTM D2794 Impact	A. 859 B. 859/ Polyurethane Gardner Impact Tester, Direct (Intrusion), inch- pounds, over 1/8" steel	A. 160 B. 100 min.
ASTM D4541 Adhesion	A. Carbozinc 859 B. 859 / Polyurethane C. 859 / Epoxy/ Polyurethane	A. 841 psi Pneumatic B. 1,100 min. psi Pneumatic C. 602 psi Elcometer
ASTM D522 Flexibility	A. 859 B. 859/ Polyurethane	A. >6% B. >5%
ASTM D970 Immersion	A. Carbozinc 859/ Epoxy/Polyurethane Salt Water (5% sodium chloride) at 75°F, 30 days B. 859 / Epoxy/Polyurethane; Fresh Water @75°F for 30 days	A & B had no rusting in the scribe; and no blistering, softening or discoloration with either environment
Slip Co-efficient	Carbozinc 859 A-490 bolt spec; 6 mils dry film maximum 10% max thinning	Meets requirements for class B rating

Test reports and additional data available upon written request.

## Mixing & Thinning

**Mixing** Power mix Part A completely. Then slowly sift in the zinc filler under agitation. Power mix Part B separately and add slowly to the mixture. Pour mixture through a 30 mesh screen. DO NOT MIX PARTIAL KITS.

**Tip:** Sifting zinc through a window screen will aid in mixing process by breaking up or catching dry zinc lumps.

**Thinning** Normally not required but may be thinned up to 13 oz/gal (10%) with Thinner 2, Thinner 76 or Thinner 236E. In hot or windy conditions, may be thinned up to 13 oz/gal with Thinner 33. Use of thinners other than those supplied by Carboline may adversely affect product performance and void product warranty, whether expressed or implied. Use of Carboline Thinner 236E to thin this product will minimize HAP and VOC emissions. Consult Carboline Technical Service for guidance

# Carbozinc<sup>®</sup> 859

## Mixing & Thinning

**Ratio** .80 Gal. Kit  
Part A: .35 gallons  
Part B: .20 gallons  
Zinc Filler: 14.6 lbs  
4.00 Gal. Kit  
Part A: 1.77 gallons  
Part B: 1 gallon  
Zinc Filler: 73 lbs.

**Pot Life** 4 Hours at 75°F (24°C) and less at higher temperatures. Pot life ends when coating loses body and begins to sag.

## Application Equipment Guidelines

Listed below are general equipment guidelines for the application of this product. Job site conditions may require modifications to these guidelines to achieve the desired results.

**Spray Application (General)** The following spray equipment has been found suitable and is available from manufacturers such as Binks, DeVilbiss and Graco. Keep material under mild agitation during application.

**Conventional Spray** Agitated pressure pot equipped with dual regulators, 3/8" I.D. minimum material hose, .070" I.D. fluid tip and appropriate air cap.

**Airless Spray** Pump Ratio: 30:1 (min.) with pail agitator\*  
GPM Output: 3.0 (min.)  
Material Hose: 3/8" I.D. (min.)  
Tip Size: .017-.023"  
Output PSI: 2000-2200  
Filter Size: 60 mesh  
\*Teflon packings are recommended and available from the pump manufacturer

**Brush & Roller (General)** For small areas and touch-up only. Preferred method for large areas is spray application.

## Application Conditions

Condition	Material	Surface	Ambient	Humidity
Minimum	40 °F (4 °C)	35 °F (2 °C)	35 °F (2 °C)	0%
Maximum	90 °F (32 °C)	120 °F (49 °C)	110 °F (43 °C)	95%

Industry standards are for the substrate temperatures to be 5°F (3°C) above the dew point. This product simply requires the substrate temperature to be above the dew point. Condensation due to substrate temperatures below the dew point can cause flash rusting on prepared steel and interfere with proper adhesion to the substrate. Special application techniques may be required above or below normal application conditions which are as follows: material 60°F-85°F (16°C-29°C), surface & ambient 60°F-90°F (16°C-32°C) and humidity 0% - 90%.

## Curing Schedule

Surface Temp.*	Dry to Handle	Dry to Recoat & Topcoat w/ other finishes
35 °F (2 °C)	8 Hours	6 Hours
50 °F (10 °C)	5 Hours	2 Hours
75 °F (24 °C)	2 Hours	30 Minutes
100 °F (38 °C)	1 Hour	30 Minutes

These times are based on a 3.0 mil (75 micron) dry film thickness. Higher film thickness, insufficient ventilation or cooler temperatures will require longer cure times and could result in solvent entrapment and premature failure.

The general requirement is a 24 hour cure for Carboline epoxy intumescent applications. Maximum recoat time is unlimited. Must have a clean, dry surface free of chalk, zinc salts, etc. per typical good painting practices. Consult Carboline Technical Service for specific information.

## Cleanup & Safety

**Cleanup** Use Thinner 2 or Acetone. In case of spillage, absorb and dispose of in accordance with local applicable regulations.

**Safety** Read and follow all caution statements on this product data sheet and on the MSDS for this product. Employ normal workmanlike safety precautions. Hypersensitive persons should wear protective clothing, gloves and use protective cream on face, hands and all exposed areas.

**Ventilation** When used in enclosed areas, thorough air circulation must be used during and after application until the coating is cured. The ventilation system should be capable of preventing the solvent vapor concentration from reaching the lower explosion limit for the solvents used. In addition to ensuring proper ventilation, appropriate respirators must be used by all application personnel.  
This product contains flammable solvents. Keep away from sparks and open flames. All electrical equipment and installations should be made and grounded in accordance with the National Electric Code. In areas where explosion hazards exist, workmen should be required to use non-ferrous tools and wear conductive and non-sparking shoes.

## Packaging, Handling & Storage

**Shelf Life** Part A: 36 months at 75°F (24°C)  
Part B: 24 months at 75°F (24°C)  
Part C: 24 months at 75°F (24°C)

\*Shelf Life: (actual stated shelf life) when kept at recommended storage conditions and in original unopened containers.

**Shipping Weight (Approximate)** .80 Gallon Kit - 22 lbs (10 kg)  
4.00 Gallon Kit - 105 lbs (48 kg)

**Storage Temperature & Humidity** 40° - 120°F (4°-49°C) Store indoors  
Can be stored down to 20°F (-7°C) for no longer than 30 days  
0-100% Relative Humidity

**Flash Point (Setaflash)** Part A: 49°F (9°C)  
Part B: 38°F (3°C)  
Zinc Filler: NA

**Storage** Store Indoors



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