

## SELECTION & SPECIFICATION DATA

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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| <b>Generic Type</b>                | Inorganic Zinc Silicate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Description</b>                 | Time-tested corrosion resistant coating that provides excellent galvanic corrosion protection to steel in some of the harshest environments. For over five decades, Carbozinc 11 has been the industry standard for high-performance inorganic zinc protection on steel structures worldwide.                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Features</b>                    | <ul style="list-style-type: none"> <li>• Meets Class B slip co-efficient and creep testing criteria for use on faying surfaces.</li> <li>• Rapid cure. Dry to handle in 45 minutes at 60°F (16°C) and 50% relative humidity</li> <li>• Low temperature cure down to 0°F (-18°C)</li> <li>• High zinc loading</li> <li>• Meets FDA requirements</li> <li>• Zinc supplied meets ASTM D520 (Type II)*</li> <li>• Meets SSPC Paint 20 Type I, Level 1 for zinc content</li> <li>• Very good resistance to salting</li> <li>• May be applied with standard airless or conventional spray equipment</li> <li>• VOC compliant in many areas</li> <li>• Approved MPI #19</li> </ul> <p>*Type III zinc dust is available upon special order.</p> |
| <b>Color</b>                       | Green (0300); Gray (0700)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Finish</b>                      | Flat                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Primer</b>                      | Self Priming                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Dry Film Thickness</b>          | <p>2 - 3 mils (51 - 76 microns) .</p> <p>Dry film thickness in excess of 6.0 mils (150 microns) is not recommended.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Solid(s) Content</b>            | <p>By Volume 62.3% +/- 2%</p> <p>Measured in accordance with ASTM D 2697.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Total Zinc Dust in Dry Film</b> | By Weight: 85%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Coverage Rate</b>               | <p>1000 ft<sup>2</sup>/gal at 1 mil (24.5 m<sup>2</sup>/l at 25 microns) DFT</p> <p>333 ft<sup>2</sup>/gal at 3 mils (8.2 m<sup>2</sup>/l at 75 microns) DFT</p> <p>Measured in accordance with ASTM D 2697. Allow for loss in mixing and application.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>VOC Values</b>                  | <p><b>As Supplied</b> : EPA Method 24: 4.0 lbs./gal (479 g/l)</p> <p>Thinned:</p> <p>7 oz/gal w/ Thinner 21: 4.1 lbs./gal (492 g/l)</p> <p>5 oz/gal w/ Thinner 26: 4.1 lbs./gal (492 g/l)</p> <p>5 oz/gal w/ Thinner 33: 4.1 lbs./gal (492 g/l)</p> <p>8 oz/gal w/ Thinner 254: 4.2 lbs./gal (503 g/l)</p> <p>These are nominal values.</p>                                                                                                                                                                                                                                                                                                                                                                                             |

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| <b>Maximum Service Temperature</b> | <u>Untopcoated</u><br>Continuous: 750°F (400°C)<br>Non-Continuous: 800°F (427°C)                                                                                                                                                                                                                                                      |
|                                    | <u>With recommended high heat topcoats:</u><br>Continuous: 1000°F (540°C)<br>Non-Continuous: 1200°F (650°C)                                                                                                                                                                                                                           |
| <b>Topcoats</b>                    | Not required for certain exposures. May be topcoated with Armorlast Series inorganic silicate finishes. May also be topcoated with Waterborne Acrylics, Epoxies, Polyurethanes, High-Temperature Silicones and other coatings as recommended by Carboline. Under certain conditions a mist coat may be required to minimize bubbling. |

## SUBSTRATES & SURFACE PREPARATION

|                |                                                                                                                                                                 |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>General</b> | Surfaces must be clean and dry. Employ adequate methods to remove dirt, dust, oil and all other contaminants that could interfere with adhesion of the coating. |
|                | <u>Non-Immersion:</u> SSPC-SP6 and obtain a 1.0-3.0 mil (25-75 micron) angular blast profile.                                                                   |
| <b>Steel</b>   | When using under fireproofing products, defer to the primer surface preparation requirements in the product data sheet of the fireproofing product.             |

## PERFORMANCE DATA

**All test data was generated under laboratory conditions. Field testing results may vary.**

| Test Method                                       | System                                                     | Results                                                                                                           |
|---------------------------------------------------|------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| AASHTO M300 Bullet Hole Immersion Paragraph 4.6.9 | 1 ct. CZ11 over Abrasive blasted steel                     | No blistering or rusting of coating or rusting of bare steel area after 650 hrs. Immersion in 5% sodium chloride. |
| ASTM A-325 Slip Co-efficient                      | Blasted Steel 1 ct. CZ 11 @6 mils (150 microns)            | 0.68; meets requirement for Class B rating                                                                        |
| ASTM B117 Salt Spray                              | 1 ct CZ11 at 2 mils dry film thickness over blasted steel. | No rusting blistering cracking delamination after 43000 hrs. Moderate salting of the surface only.                |
| ASTM D3363 Pencil Hardness                        | 1 ct. CZ11                                                 | Pencil Hardness "2H"                                                                                              |

## MIXING & THINNING

|               |                                                                                                                                                                                                                                                                                                                                           |
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| <b>Mixing</b> | Power mix base, then combine and power mix as follows. Pour zinc filler very slowly into premixed base with continuous agitation. Mix until free of lumps. Pour mixture through a 30 mesh screen. Sifting zinc through a screen will aid in the mixing process by breaking up or catching dry zinc lumps. <b>DO NOT MIX PARTIAL KITS.</b> |
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## MIXING & THINNING

|                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
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| <b>Thinning</b> | <b>Preferred Thinner Uses and Application</b><br>Ambient and warm surfaces: Up to 12 oz/gal (10%) with Thinner 26 or 33<br>Very warm or windy conditions (above 85°F/29°C): Up to 12 oz/gal (10%) with Thinner 254<br>Cool weather and low humidity (below 40°F /4°C): Up to 12 oz/gal (10%) with Thinner 21 or 237<br>Thinner should be added in accordance with local VOC regulations. Use of thinners other than those supplied or recommended by Carboline may adversely affect product performance and void product warranty, whether expressed or implied. |
|                 | Thinner 216M (while not available in the US) may be used in the Middle East; but its use may shorten pot life.                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Ratio</b>    | 1 Gal. Kit - Part A - 0.75 gal (2.84 L)<br>1 Gal Kit - Zinc Filler - 14.6 lbs (6.6 kg)<br>5 Gal Kit - Part A - 3.75 gal (14.2 L)<br>5 Gal Kit - Zinc Filler - 73 lbs (33 kg)                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Pot Life</b> | 8 Hours at 75°F (24°C) and less at higher temperatures. Pot life ends when coating becomes too viscous to use.                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

## 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.

|                                    |                                                                                                                                                                                                                                                                                                                              |
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| <b>Spray Application (General)</b> | The following spray equipment has been found suitable and is available from equipment manufacturers. Keep material under mild agitation during application. If spraying stops for more than 10 minutes, recirculate the material remaining in the spray line. Do not leave mixed coating in the hoses during work stoppages. |
| <b>Conventional Spray</b>          | Agitated pressure pot equipped with dual regulators, 3/8" (0.95 cm) I.D. minimum material hose, with a maximum length of 50 feet; 0.070" (0.18 cm) I.D. fluid tip and appropriate air cap.                                                                                                                                   |
| <b>Airless Spray</b>               | Pump Ratio: 30:1 (min.)<br>GPM Output: 3.0 (min.)<br>Material Hose: 3/8" (0.95 cm) I.D. (min.)<br>Tip Size: 0.019-0.023" (0.05-0.06 cm)<br>Output PSI: 1500-2000 Filter Size: 60 mesh<br>PTFE packings are recommended and available from the pump manufacturer.                                                             |
| <b>Brush</b>                       | For touch-up of areas less than one square foot only. Use medium bristle brush and avoid rebrushing.                                                                                                                                                                                                                         |
| <b>Roller</b>                      | Not recommended.                                                                                                                                                                                                                                                                                                             |

## APPLICATION CONDITIONS

| Condition | Material     | Surface      | Ambient      | Humidity |
|-----------|--------------|--------------|--------------|----------|
| Minimum   | 0°F (-18°C)  | 0°F (-18°C)  | 0°F (-18°C)  | 30%      |
| Maximum   | 130°F (54°C) | 200°F (93°C) | 130°F (54°C) | 95%      |

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.

## CURING SCHEDULE

| Surface Temp. | Dry to Handle | Dry to Topcoat | Final Cure Immersion |
|---------------|---------------|----------------|----------------------|
| 0°F (-18°C)   | 4 Hours       | 7 Days         | NR                   |
| 40°F (4°C)    | 1 Hour        | 2 Days         | 4 Days               |
| 60°F (16°C)   | 45 Minutes    | 24 Hours       | 3 Days               |
| 80°F (27°C)   | 45 Minutes    | 18 Hours       | 2 Days               |
| 100°F (38°C)  | 15 Minutes    | 16 Hours       | 36 Hours             |

These times are based on a 3.0-4.0 mil (75-100 micron) dry film thickness. Higher film thickness, insufficient ventilation and/or cooler temperatures will require longer cure times and could result in solvent entrapment and premature failure. Humidity levels below 50% will require longer cure times.

**For Finishing with Armorlast Series:** Two hours dry to topcoat at 75°F.

**Notes:** 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. Also, loose zinc must be removed from the cured film by rubbing with fiberglass screen wire if: 1) The Carbozinc 11 is to be used without a topcoat in immersion service and "zinc pick up" could be detrimental, or 2) When "dry spray/overspray" is evident on the cured film and a topcoat will be applied. For **accelerated curing or where the relative humidity is below 40%**, allow an initial 2-hour ambient cure followed by misting with clean potable water or steam to keep the coating wet for a minimum of 8 hours. The coating is considered cured sufficiently to topcoat and/or immersion service when the coating achieves a "2H" pencil hardness per ASTM D3363 or a minimum rating of 4 per ASTM D4752. Recoat intervals may vary from those listed above when using under intumescent fireproofing products. Consult Carboline Technical Service for recommended cure times before applying Carboline intumescent products.

## CLEANUP & SAFETY

|             |                                                                                                                                                                                                                                                                                                                                                                                                                      |
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| Cleanup     | Use Thinner 21 or Isopropyl Alcohol. 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 SDS for this product. Employ normal workmanlike safety precautions.                                                                                                                                                                                                                                                                     |
| Ventilation | When used as a tank lining or 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. |

## PACKAGING, HANDLING & STORAGE

|                                |                                                                                                                                                                                                                                                                                                     |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Shelf Life                     | Part A: 12 months at 75°F (24°C)<br>Part B: 24 months at 75°F (24°C)<br><br>Shelf Life: (actual stated shelf life) when kept at recommended storage conditions and in original unopened containers.                                                                                                 |
| Storage Temperature & Humidity | 40-100°F (4-38°C).<br>0-90% Relative Humidity                                                                                                                                                                                                                                                       |
| Storage                        | Store Indoors.<br><br>This product is solvent based and not affected by excursions below these published storage temperatures, down to 10°F (-12°C), for a duration of no more than 14 days. Always inspect the product prior to use to make sure it is smooth and homogeneous when properly mixed. |
| Shipping Weight (Approximate)  | 1 Gallon Kit - 23 lbs (10 kg)<br>5 Gallon Kit - 113 lbs (51 kg)                                                                                                                                                                                                                                     |

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## PACKAGING, HANDLING & STORAGE

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| <b>Flash Point (Setaflash)</b> | Part A: 55°F (13°C)<br>Zinc Filler: NA |
|--------------------------------|----------------------------------------|

## WARRANTY

To the best of our knowledge the technical data contained herein is true and accurate on the date of publication and is subject to change without prior notice. User must contact Carboline to verify correctness before specifying or ordering. No guarantee of accuracy is given or implied. Carboline warrants our products to be free of manufacturing defects in accord with applicable Carboline quality control procedures. THIS WARRANTY IS NOT VALID WHEN THE PRODUCT IS NOT: (1) APPLIED IN ACCORDANCE WITH CARBOLINE'S SPECIFICATIONS, AND/OR (2) PROPERLY STORED, CURED, AND USED UNDER NORMAL OPERATING CONDITIONS. Carboline assumes no responsibility for coverage, performance, injuries, or damages resulting from use of the product. If this product is found not to perform as specified upon inspection by a Carboline representative during the warranty period, Carboline's sole obligation, if any, is to replace the Carboline product(s) proven to be defective or refund the purchase price thereof, at Carboline's sole option. Carboline shall not be liable for any other losses or damages. This warranty excludes (1) labor and costs of labor for the application or removal of any product, and (2) any incidental or consequential damages, whether based on breach of express or implied warranty, negligence, strict liability or any other legal theory. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY CARBOLINE, EXPRESS OR IMPLIED, STATUTORY, BY OPERATION OF LAW, OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. All of the trademarks referenced above are the property of Carboline International Corporation unless otherwise indicated. The whole text of this Product Data Sheet, as well as the documents derived from it, have been written in English, and for legal purposes the English version shall prevail.