

AASHTO/NSBA Steel Bridge Collaboration
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Guide Specification for Application of Coating Systems with Zinc-Rich Primers to Steel Bridges

AASHTO/NSBA Steel Bridge Collaboration
SSPC: The Society for Protective Coatings

AMERICAN ASSOCIATION OF
STATE HIGHWAY AND
TRANSPORTATION OFFICIALS
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Preface

This document is a standard developed by the AASHTO/NSBA Steel Bridge Collaboration and SSPC: The Society for Protective Coatings. The primary goal of the Collaboration is to achieve steel bridge design and construction of the highest quality and value through standardization of the design, fabrication and erection processes. The mission of SSPC: The Society for Protective Coatings is to advance the technology and promote the use of protective coatings to preserve industrial, marine, and commercial structures, components and substrates. This standard represents the consensus of a diverse group of professionals representing state departments of transportation, quality and inspection firms, design firms, bridge fabricators and coating suppliers.

It is intended that Owners adopt and implement Collaboration standards in their entirety to facilitate the achievement of standardization. It is understood, however, that local statutes or preferences may prevent full adoption of the document. In such cases Owners should adopt these documents with the exceptions they feel are necessary.

This document is a new and updated version of the 2006 *Guide Specification for Application of Coating Systems With Zinc-Rich Primers to Steel Bridges*.

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AASHTO / NSBA STEEL BRIDGE COLLABORATION TASK GROUP 8, COATINGS

TOM CALZONE, Carboline Company, *Chair*

Aimee Beggs, The Society for Protective Coatings

Mike Damiano, The Society for Protective Coatings

Dennis Dubois, HRV Inc.

Steve Duke, Florida Dept. of Transportation

Jon Edwards, DOT Quality Services

Heather Gilmer, Florida Structural Steel

Jamie Hilton, KTA Inc.

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Introduction

This Guide Specification represents a consensus on best industry practice for shop application of zinc-rich coating systems to previously uncoated bridge steel and includes the proper preparation of the steel. To simplify the application parameters for a system based on zinc-rich primers on new steel bridges, a series of charts has been developed. These charts provide a convenient summary listing the detailed requirements for surface preparation, environmental conditions, coating application, curing, verification testing, and prevention and remediation of non-conformances. The guide specification addresses a three-coat system consisting of primer, intermediate coat, and topcoat, but is also appropriate for application of a two-coat system or primer only.

Two nonmandatory appendices have been added to this revision. Appendix A lists causes and remedies for non-conformances commonly encountered when preparing new steel for the application of coatings, and includes a list of references providing methods to verify that the problem has been corrected. Appendix B presents similar information for non-conformances encountered during application of organic and inorganic zinc-rich primers and subsequent coatings.

This document establishes and defines the functions, operations, requirements, and activities needed to achieve consistent quality in steel bridge painting. It is based on a cooperative approach to quality, where the Owner's and Contractor's representatives work together to meet their responsibilities, resulting in efficiently painted steel bridges meeting all contractual requirements. Manufacturer's recommendations shall apply when referenced herein or where the contract specifications do not provide guidance. When manufacturer recommendations do not agree with the contract specifications, the specifications shall govern.

Guide Specification acceptance does not preclude anyone, whether adopting the standard or not, from manufacturing, marketing, purchasing, or using products or procedures not addressed herein.

Environmental, containment, and safety issues referenced herein are outside the scope of this Guide Specification and should be addressed in other documents.

1 Definitions

1.1 Applicator (“Paint Shop”)

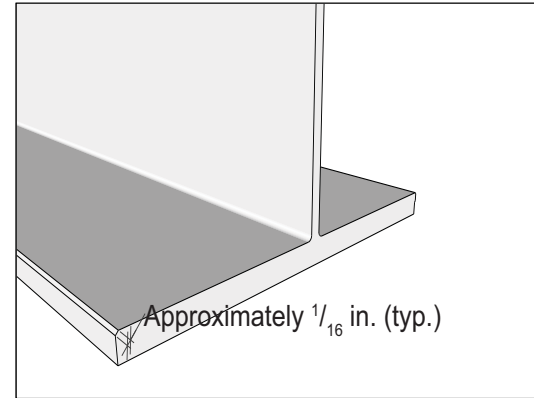
Person or contractor who applies a coating.

1.2 Breaking the Corner (Corner Chamfering)

A process by which a sharp corner is flattened by passing a grinder or other suitable device along the corner, normally in a single pass.

C1.2

The breaking (flattening) of a sharp corner is sketched below:



Care should be taken to ensure that no new sharp edges are raised by grinding.

Extensive testing has proven shop grinding of corners is unnecessary for improving coating coverage and corrosion protection when using ethyl silicate inorganic zinc-rich primer systems with minimum zinc loading of 83 percent. Limited testing has also shown that, while organic zinc-rich materials sometimes tend to draw thin on square corners, they cover well on corners that are merely flattened (“breaking the edge”). Therefore, when organic zinc-rich materials are applied to corners that have been “cut” (sawed, burned, or sheared), the corners must either be “broken” or stripe coated per SSPC-PA 1, Section 6.6, “Striping.”

1.3 Checking, Crazing

That phenomenon manifested in paint films by slight breaks in the film that do not penetrate through the last applied coating.

See ASTM D660, Standard Test Method for Evaluating Degree of Checking of Exterior Paints.

1.4 Conformance Certification

A verification issued by the coating manufacturer confirming that a particular batch of product was produced in accordance with the manufacturer's standard. This standard of performance for the product must have previously been approved or accepted by the Owner.

1.5 Corner

The intersection of two surfaces.

1.6 Edge

An exposed, through-thickness surface of a plate or rolled shape. Examples include the as-rolled side face of a beam flange, channel flange, or angle leg; and the cross section of a cut piece resulting from thermal cutting, sawing, or shearing. Edges may be planar or rounded, and either perpendicular or skewed to adjacent faces.

1.7 Edge Grinding (Edge Conditioning)

Very shallow grinding or other preblast cleaning preparation of thermal cut edges (TCEs) to remove a thin, hardened layer left by resolidification. It does not include grinding required by the *D1.5 Bridge Welding Code* or ASTM A6 to remove cutting, handling, or material anomalies.

C1.7

Edge grinding can be used to remove martensite, a hardened form of steel that may occur due to rapid resolidification following thermal cutting. This layer is typically very thin, about 0.01 to 0.02 in. (0.25 to 0.50 mm) thick, and is dependent upon the steel's chemistry and thickness. Light grinding is generally sufficient to remove this material, and is only necessary if the hardness interferes with achieving the desired profile during blast cleaning. The presence of martensite and/or the small grooves normally left by thermal cutting are not a fatigue or stress concentration problem.

1.8 Fastener

A mechanical device used to attach two or more items together, e.g., a bolt, nut, and washer.

1.9 Faying Surfaces

Contact surfaces within mechanically connected joints of steel structures.

1.10 Holiday

Pinhole, skip, discontinuity, or void in a coating film that exposes the substrate.

1.11 Limited Access Areas

Partially or completely enclosed surfaces, the majority of which are not visible without the use of special devices such as mirrors, and not readily accessible for coating by routine methods.

1.12 Microcracking

Cracks, visible only under magnification, that develop in a coating at the time of application or during the drying process.

1.13 Mud Cracking

A coating defect resembling the irregular cracking of drying mud that typically arises during the curing of a relatively inflexible coating applied too thickly. Mud cracking is evident without magnification and usually penetrates the entire layer of the coating.

1.14 Pinhole

A holiday or discontinuity that extends entirely through a coating film, approximately the size of a pin, normally caused by solvent bubbling, moisture, or foreign materials.

1.15 Product Data Sheet (PDS)

Coating description document that includes surface preparation, application, curing, and other product-specific details required for good results.

1.16 Qualified Product

A coating product that has been approved based on testing to a Federal, State, or regional agency, or to a test protocol (e.g., AASHTO, NEPCOAT, NTPEP, or DOT protocol).

1.17 Sharp

An acute corner or prominence that is able or appears to be able to cut human flesh.

1.18 Spot Priming

Application of primer paint to localized spots where the substrate is bare or where additional protection is needed because of damage to, or deterioration of, a former coat.

1.19 Stripe Coat

A coat of paint applied only to edges, corners, or welds on steel structures before or after a full coat is applied to the entire surface. The stripe coat is intended to ensure those areas receive the required dry film thickness (DFT) to resist corrosion.

1.20 Visible Coating Defects

Imperfections that may be detected by examination without magnification. These include runs, sags, lifting, chipping, cracking, spalling, flaking, mudcracking, pinholing, and checking.

1.21 Weld Spatter, Tight

Beads of metal produced during the welding process with adequate thermal energy to adhere on metal in the weld area. The droplets retain their individual shape but have sufficient fusion to resist removal by hand scraping with a putty knife, per SSPC-SP 2.