

Chromate Treated Bright Zinc Electroplate; Sulfuric Acid

FOR GE INDUSTRIAL SOLUTIONS ONLY: INACTIVE FOR NEW DESIGN, this document is superseded by F50HD70.

EMPIS Finish F70B4 identifies bright surface zinc electroplate with a sulfuric acid-sodium dichromate treatment, as follows:

EMPIS designation		Minimum thickness of electroplate, inch (2)
Not treated	Treated to minimize danger from hydrogen embrittlement (1)	
F70B4A	F70B4A2	0.0002
F70B4B	F70B4B2	0.0005
F70B4C	F70B4C2	0.001
F70B4D	F70B4D2	0.00015
F70B4E	F70B4E2	0.0003

REFERENCED DOCUMENTS:

ASTM B117 Standard Practice for Operating Salt Spray (Fog) Apparatus
ASTM B487 Measurement of Metal and Oxide Coating Thickness by Microscopical Examination of a Cross Section
ASTM B850 Post-Coating Treatments of Steel for Reducing Risk of Hydrogen Embrittlement
SAE AMS 2759 Hydrogen Embrittlement Relief (Baking) of Steel Parts

PROPERTIES:

Thickness of electroplate – All material shall have a thickness of electroplate on significant surfaces, as follows: (3)

EMPIS designation	Thickness of electroplate, inch
F70B4A, F70B4A2	0.0002 - 0.0004 (3)
F70B4B, F70B4B2	0.0005 - 0.00075
F70B4C, F70B4C2	0.001 - 0.0015
F70B4D, F70B4D2	0.00015 - 0.0003
F70B4E, F70B4E2	0.0003 min

NOTE: All other significant surfaces of the fastener and significant surfaces of the thread portion of tapping screws shall have plating thickness as required by the selected designation.

Salt spray resistance – The chromate film shall withstand the salt spray test for 96 hours. At completion of this test the appearance of white corrosion products, visible to the unaided eye at normal reading distance, at accidental scratches through the chromate film to the zinc plate, or at unscratched areas of the chromate film shall be cause for rejection, except white corrosion products at the edges shall not constitute failure. The test specimen shall be aged for 24 hours before subjection to the salt spray. When the plated articles are of such a form as to be not readily adaptable to the salt spray test separate specimens plated concurrently with the articles represented may be used. The tests are to be made at the place of manufacture unless otherwise specified.

ADDITIONAL REQUIREMENTS:

Preparation – The material to be plated shall be substantially free from flaws or other imperfections that will be detrimental to the appearance or the protective value of the coating. It shall be subjected to such cleaning procedures as are necessary to yield deposits with the desired appearance and quality. Oil, grease, etc. shall be removed by suitable cleaners. Scale shall be removed mechanically rather than by pickling from hardened steel parts which are to be plated and treated to minimize danger from hydrogen embrittlement. Such parts shall not be flexed prior to baking.

Plating – The finished plating shall have a uniform appearance, shall be adherent and free from blister, and substantially free from other imperfections that may affect the appearance or protective value of the coating.

Embrittlement relief treatment – Where called for by the designation, material shall be given a baking treatment to minimize danger from hydrogen embrittlement. This embrittlement relief treatment shall be given prior to the chromate treatment and preferably within one hour after plating. Reference ASTM B850 and AMS 2759/9A for additional information regarding heat treatment procedures.

Chromate treatment – Shall be a sulfuric acid-sodium dichromate treatment to retard the formation of white corrosion products and to give the material a golden brown iridescent appearance.

(See last page of this document for all footnotes.)

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REFEREE METHODS:

Hydrogen embrittlement – Parts treated to minimize danger from hydrogen embrittlement shall be clamped, extended, or otherwise flexed to approximate the stress induced in the intended application and held in such position for 16 hours. After such tests no parts shall show any signs of failure. Where the application is not obvious, the test shall be by agreement between supplier and purchaser.

Plating thickness ASTM B487 (4)
Salt spray test ASTM B117

CERTIFICATE OF TEST:

When requested, the supplier shall submit promptly to the purchaser at the point of delivery a certificate of test showing the results of tests for properties required by this specification. This certificate shall be addressed to the section, unit, or person specified on the purchase order, and shall contain the EMPIS designation, the purchase order number, and the quantity shipped so that the certificate may be identified with the shipment.

PACKING AND MARKING:

Material shall be shipped in standard commercial containers suitable to meet DOT and carriers' regulations and to protect the product from loss, damage or contamination in normal shipping and storage conditions.

Each container shall be legibly marked with the purchase order number, the supplier's name, the EMPIS designation, and appropriate safety and hazard information.

DOCUMENT REVISION STATUS:

<u>Rev</u>	<u>Description</u>	<u>Revision Date</u>
S9	Previous revision	1998 Nov 30
S10	Reinstated designation C2	2012 Jul 31
S11	Added Inactive for new design note for GE Energy Management	2016 Nov 30

FOOTNOTES:

(1)	Specify for hardened steel parts only.
(2)	See table below for maximum limits.
(3)	Only applies to surfaces that can be touched by a sphere 0.75 inch in diameter. The screw portion of externally threaded products that are mated with nuts or enter internally tapped holes shall have a total thickness of deposit between 0.0002 - 0.0003 inch.
(4)	Alternate methods are permitted as a suitable means of determining plating thickness; however, in the case of dispute, metallographic methods per ASTM B487 shall be the basis for acceptance or rejection of the material for plating thickness.

