ZINC PLATING

1. SCOPE

1.1 This specification covers CNH requirements for zinc electroplated and mechanically plated finishes. Six Types of standard finishes and five Classes of standard zinc plating thickness are defined, see Tables 2 and 3. Types ZN TCR and ZNM TCR prohibit the use of hexavalent chromium passivation. This specification is intended to replace Former CNH Company specifications listed in Table 1 and should be used for all new and updated engineering drawings and standards.

1.2 CNH has begun the process of eliminating hexavalent chromium passivation and compounds from all zinc plated finishes supplied to this specification. CNH is implementing a transition to trivalent chromium passivation which can provide the same frictional characteristics and corrosion protection as hexavalent chromium passivation. This transition to trivalent chromium passivation will apply to all standard hardware, pins, hydraulic fittings and tubing, and other individually plated parts. During the transition period, both hexavalent and trivalent chromium passivation are permitted where finish Types specified allow the use of hexavalent chromium passivation unless otherwise specified or restricted. However, early implementation of trivalent chromium passivation is recommended wherever possible for all zinc plated finishes supplied to CNH.

1.2.1 In addition to meeting the requirements of this specification, there are defined implementation requirements for the transition to trivalent chromium passivation that must be met for zinc plated parts supplied to the CNH Wichita facility, see CNH ES-H176 Trivalent Implementation Requirements and Timing for Wichita, KS Products.

Table 1 Former CNH Company Material Specifications

CNH Type	CASE	NH Pennsylvania FNHA Standard (1)	O&K Engineering		NH Tractor Engineering
			Standard Fasteners	General Parts	
ZN YCR (Yellow)	MS-201 Class A	2-H-500 (86508305) ZN YCR	EN ISO 4042, A1C, A2C, or A3C	DIN 50961, Fe/Zn **X**c C EN 12329, Fe/Zn **X**c C	Fiat 9.57405, Type III
ZN TCR (Clear)	---	---	---	---	Fiat 9.57405. Type IV
ZN CCR (Clear)	MS-201 Class B	2-H-500 (86508305) ZN CCR	EN ISO 4042, A1B, A2B, or A3B	DIN 50961,Fe/Zn **X**c B EN 12329, Fe/Zn **X**c B	Fiat 9.57405, Type II
ZN BCR (Black)	MS-203	2-H-500 (86508305) ZN BCR	EN ISO 4042, A1R, A2R, or A3R	DIN 50961, Fe/Zn **X**c F EN 12329, Fe/Zn **X**c F	Fiat 9.57405, Type VI
ZNM YCR (Yellow)	---	2-H-505 (86580475) ZNM YCR	---	---	---
ZNM TCR (Clear)	---	---	---	---	---

(1) Zedelgem Engineering Standard WS 48.01 was superseded by FNHA 2-H-500

2. APPLICATION

2.1 Zinc plated finishes are used primarily as a protective coating on ferrous based materials. They are intended to extend the corrosion resistance of the substrate material. Required corrosion protection and appearance are factors to consider in specifying the Type and Class of zinc plating for an application. Painting a part or use of a high corrosion resistance coating per CNH MAT0320 should be considered where significantly improved corrosion resistance compared to zinc plating is required.

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Table 2	CNH Grade and Material Description
CNH Type	**Description** (1)
ZN YCR	Zinc electroplating with yellow colored chromate passivation. Trivalent or hexavalent passivation is permitted, see Section 2.2.1 and 2.2.3. Type ZN YCR exhibits good corrosion resistance and is the most commonly used Type for exterior applications, hydraulic tubing, and other components.
ZN TCR	Zinc electroplating with clear trivalent chromium passivation; No hexavalent chromium permitted. Type ZN TCR can provide corrosion resistance comparable to Type ZN YCR. Used for exterior applications, hydraulic fittings and tubing, and other components.
ZN CCR	Zinc electroplating with clear or colored and leached clear chromate passivation. Trivalent or hexavalent chromium passivation is permitted, see Section 2.2.1 and 2.2.3. Type ZN CCR finish exhibits the least corrosion resistance and its use should be minimized.
ZN BCR	Zinc electroplating with black colored chromate passivation. Trivalent or hexavalent chromium passivation is permitted, see Section 2.2.1 and 2.2.3. Type ZN BCR finish exhibits moderate corrosion resistance and is primarily used for appearance purposes in interior applications.
ZNM YCR	Zinc mechanical plating with yellow colored chromate passivation and a matte finish. Trivalent or hexavalent chromium passivation is permitted, see Section 2.2.1 and 2.2.3. Specifying Type ZNM YCR is required for applications such as spring steel wire in coiled springs, snap rings, and ISO 898/1 Class 12.9 bolts and higher strength fasteners.
ZNM TCR	Zinc mechanical plating with clear trivalent chromium passivation; No hexavalent chromium permitted. Same applications as described for Type ZNM YCR. Type ZNM TCR may be substituted for ZNM YCR with the same conditions as described for ZN TCR in Section 2.2.1, 2.2.2, 2.2.3, and 2.2.4.

(1) See Table 3 for plating appearance requirements.

2.2 The zinc passivation finishes have typically contained hexavalent chromium. Per the European Commission Directive 2000/53/EC, regarding end-of-life vehicles, hexavalent chromium containing finishes are not permitted on new automobiles and light trucks sold in Europe after 01 July 2007. Although this directive does not govern off-highway equipment, availability of these passivation types may become problematic in Europe and also in North America.

2.2.1 Type ZN TCR may be supplied for all parts where Type ZN YCR or ZN CCR is specified on existing part drawings. Approval of this substitution by the procuring CNH facility is required prior to supplier shipment of parts. See also Sections 2.2.3 and 7 for required actions related to changes in the zinc plating.

2.2.2 It is recommended that Type ZN TCR be specified for all new applications where Types ZN YCR or ZN CCR have typically been specified. No special part approval is required where the Type ZN TCR is specified and the finish meets Table 3 defined corrosion resistance and color requirements.

2.2.3 When applied properly, finishes with trivalent chromium passivation can provide corrosion resistance (white and red) that fully meets the corrosion resistance requirements specified in Table 3. Special approval for trivalent chromium passivated parts supplied to this specification is not required where the submitted parts meet the defined corrosion resistance and color requirements for the specified plating Types. Part approval, prior to shipment of the parts, must be obtained from the procuring CNH facility in cases where this substitution results in reduced corrosion resistance or the color of a trivalent chromium finish applied to parts is distinctly different from the finish color typically supplied (e.g. light iridescent yellow hue versus a dark yellow or bronze color). Prior to making any changes to the zinc plating finish, such as the type of chromium passivation, the supplier shall notify the procuring CNH facility of the proposed changes, See also Section 7.

Table 3	Zinc Plating Appearance, Thickness, and Neutral Salt Spray Corrosion Resistance Requirements				
CNH Type	Appearance	Plating Class	Min. Thickness after Passivation, µm (inches)	Corrosion Resistance (see Section 4.6) White and Black Corrosion Hours, Minimum	Corrosion Resistance (see Section 4.6) Red Corrosion Hours, Minimum
ZN YCR	Iridescent light yellow or gold to light bronze or dark yellow	3 (1)	3 (0.00010)	72	90
		5	5 (0.00020)		110
		8	8 (0.00030)		140
		13	13 (0.00050)		170
		18	18 (0.00070)		200
ZN TCR	Dull to semi-bright metallic finish with no or slight iridescent light yellow hue	3 (1)	3 (0.00010)	72	90
		5	5 (0.00020)		110
		8	8 (0.00030)		140
		13	13 (0.00050)		170
		18	18 (0.00070)		200
ZN CCR	Bright silvery or light blue hue	3 (1)	3 (0.00010)	8	32
		5	5 (0.00020)		54
		8	8 (0.00030)		94
		13	13 (0.00050)		120
ZN BCR	Black	3 (1)	3 (0.00010)	24	45
		5	5 (0.00020)		64
		8	8 (0.00030)		110
		13	13 (0.00050)		150
ZNM YCR	Same appearance as ZN YCR, smooth matte to semi-bright finish	3 (1)	3 (0.00010)	72	90
		5	5 (0.00020)		110
		8	8 (0.00030)		140
		13	13 (0.00050)		170
ZNM TCR	Similar appearance to ZN TCR; matte to semi-bright metallic finish; no or slight iridescent yellow hue	3 (1)	3 (0.00010)	72	90
		5	5 (0.00020)		110
		8	8 (0.00030)		140
		13	13 (0.00050)		170

(1) This coating class should only be specified for small sized fasteners as described in Table 4.

2.2.4 Basic zinc plating with hexavalent or trivalent chromium passivation will typically exhibit comparable coefficient of friction values. However, it is recognized that both finishes can exhibit significant variability in coefficient of friction and related torque tension characteristics. Sealants are permitted for any of the CNH plating Types, but they are not required. Reportedly, sealants are often applied over trivalent chromium passivation to achieve required corrosion resistance. Where a sealant, including those formulated or used with friction modifiers, is applied over any plating Type it shall not significantly affect the coefficient of friction and related torque-tension characteristics when compared to a corresponding basic hexavalent chromium conversion finish. When a change from hexavalent to trivalent passivation is made or where sealants are applied, finishes are expected to comply with torque-tension values per CNH ENS7001.

2.3 CNH Type ZN YCR has been the most commonly used plating finish and is typically specified for standard hardware due to its good corrosion resistance and process availability. See STPA020 (87026717) for information regarding standard fastener finishes. If necessary special color requirements should be specified on the drawing or purchase order by agreement between the supplier and the procuring CNH facility. Type ZN CCR or ZN BCR may be specified if required for appearance reasons. Black Type ZN BCR is susceptible to highly visible white corrosion in exterior applications. Autophoretic coating, FNHA-2-J-071, or high corrosion resistant coatings per CNH MAT0320 are available in a black finish with higher corrosion resistance for exterior applications.

2.4 Certain zinc electroplated parts may require a baking treatment due to the possibility of hydrogen embrittlement, see Section 4.7. Mechanical zinc plating shall be specified for applications that are highly susceptible to hydrogen embrittlement from electroplating, such as those listed in Table 2.

2.5 Zinc plated parts shall not be used in applications that have direct contact with aluminum. Direct contact between the two metals will result in unacceptable galvanic corrosion of the zinc plated components. This restriction does not apply to anodized aluminum.

3. RELATED SPECIFICATIONS

ANSI B1.3 Screw Thread Gaging Systems for Dimensional Acceptability
ASTM B117 Salt Spray (Fog) Testing
ASTM B183 Practice for Preparation of Low Carbon Steel for Electroplating
ASTM B201 Practice for Testing Chromate Coatings on Zinc and Cadmium Surfaces
ASTM B242 Practice for Preparation of High Carbon Steel for Electroplating
ASTM B320 Practice of Preparation of Iron Castings for Electroplating
ASTM B487 Method for Measurement of Metal & Oxide Coating Thickness by Microscopical Examination of a Cross Section
ASTM B504 Measurement of Thickness of Metallic Coating by the Coulometric Method
ASTM B499 Measurement of Coating Thickness by the Magnetic Method, Nonmagnetic Coating on Magnetic Basis Metals
ASTM B571 Test Adhesion of Metallic Coatings
ASTM B839 Method - Residual Embrittlement of Metallic Coated Externally Threaded Articles, Fasteners, and Rod-Inclined Wedge Method
ASTM B850 Post-Coating Treatment of Steel for Reducing Risk of Hydrogen Embrittlement
CNH ENS7001 (86629329) Tightening of Threaded Fasteners
CNH ES-H176 Trivalent Implementation Requirements and Timing for Wichita, KS Products
CNH MAT0320 (87346989) High Corrosion Resistance Coatings
CNH MAT1003 (86979049) Metallic Material Designations on Engineering Drawings
CNH ENPJ100 (86619032) Significant Characteristics
FNHA-2-J-071 (86615362) Autophoretic Coating
ISO 898/1 Mechanical Properties of Fasteners - Bolts, Screws and Studs
ISO 898/2 Mech. Properties of Fasteners, Nuts - Specified Proof Load Values-Coarse Thread
ISO 4042 Fasteners - Electroplated Coatings
ISO 10587 Metallic & Other Inorganic Ctgs – Test for Residual Embrittlement Inclined Wedge Method
SAE J429 Mechanical & Material Requirements for Externally Threaded Fasteners
SAE J995 Mechanical & Material Requirements for Steel Nuts

4. REQUIREMENTS

4.1 CNH zinc plated parts shall meet all requirements of this specification in addition to any special requirements specified on the drawing. These requirements only apply to significant surfaces. Significant surfaces are those where the plating is necessary to the function or appearance of the part after assembly and may be defined on the drawing or previously agreed upon in the purchase order. Generally, it is that portion of the visible surface on the part that can be contacted by a 13 mm (0.50 inch) diameter sphere. Unless otherwise specified; holes, recesses, threads, sharp edged rims, and angles are considered non-significant surfaces, see Section 4.4.1 for minimum plating requirements.

Table 4	Threaded Fasteners, Required Zinc Plating Thickness Range					
Metric Fasteners Classes 6g & 6G Thread Fits				US Customary (inch) Fasteners Classes 2A & 2B Thread Fits		
Thread Pitch, mm	Required Thickness Class (1)	Maximum Thickness, µm (inches)		Threads per Inch	Required Thickness Class (1)	Maximum Thickness, µm (inches)
l.00 and finer	3	6 (0.00025)		24 and finer	3	6 (0.00025)
1.25 through 1.75	5	8 (0.00030)		20 through 14	5	8 (0.00030)
2.00 and coarser	8	13 (0.00050)		13 through 6	8	13 (0.00050)

(1) See Table 3 for minimum thickness requirements.

4.2 STRESS RELIEVE

Where zinc plating is specified, stress relieve all steel parts prior to the surface preparation process that have a surface hardness above 31 HRC (or equivalent) and contain tensile residual stresses from machining, grinding, straightening, or cold-forming operations. Hardened and tempered parts with no subsequent processing to cause tensile residual stresses in the part are exempt from this requirement. Stress relieve parts at 190 ± 15° C (375 ± 25° F) for a minimum of three (3) hours at temperature without reducing the hardness below the specified minimum.

4.3 SURFACE PREPARATION

4.3.1 Prior to plating, parts shall be thoroughly cleaned and free of tool marks, rust, scale, oil, pits, foreign matter, and any surface conditions detrimental to plating finish or adhesion. Cleaning operations, particularly acid cleaning, must be controlled to prevent hydrogen embrittlement, particularly on parts that are hardened, cold worked, and/or highly stressed in service. Acid cleaning is not permitted for parts with hardness above 39 HRC (or equivalent). For both electroplated and mechanical plated coatings it is recommended that appropriate cleaning practices be used, such as ASTM B183, ASTM B242, or ASTM B320.

4.3.2 Prior to mechanical zinc plating, parts shall be deposited with a thin coating of copper (i.e. copper flash) or similar metal by immersion in appropriate chemical solutions without the use of electric current. There is no thickness requirement for this coating.

4.4 PLATING THICKNESS

4.4.1 Fasteners & Threaded Areas

The minimum required plating thickness Class and the maximum permissible plating thickness for threaded surfaces are shown in Table 4. Zinc plating thickness requirements are indicated for metric fasteners with Class 6g (external) and Class 6G (internal) thread fits and US customary (inch) fasteners with Class 2A (external) and Class 2B (internal) thread fits. The maximum thickness may be altered if the manufacturer of the threaded fastener takes into account the changes in pitch diameter due to the plating and can assure there is an allowance maintained within standard threaded manufacturing practice after plating. This shall be negotiated with the procuring CNH facility and Materials Engineering activity prior to submittal of samples. Internal threaded component parts having a hole depth greater than 6mm (0.25 inches) need not meet the thickness requirements on the threaded portion unless otherwise specified on the Engineering drawing or standard.

4.4.2 General Parts

The plating thickness of significant surfaces shall meet the minimum required by the plating thickness Class specified on the engineering drawing or standard. Standard plating classes are shown in Table 3. Non-significant surfaces must be visibly plated and shall have a minimum plating thickness of the next lowest class with respect to the designated plating class. Where Class 3 thickness is specified, non-significant surfaces shall have a minimum plating thickness of 1.5 micrometers (0.00006 inches).

4.5 DIMENSIONS AND TOLERANCES

4.5.1 General Parts

The dimensions specified on drawings where zinc plating is specified shall be after plating unless otherwise specified.

4.5.2 Fasteners & Threaded Areas

In general when fasteners are assembled, both the external and internal threaded component must run freely in their intended use. For metric threads, dimensional requirements and gauging shall be per ISO 4042. For external inch threads, acceptability of screw threads shall be determined based on System 21 per ANSI B1.3. The Class 2A maximum diameters apply to a part before plating or coating, whereas the basic diameters (Class 2A maximum diameters plus the plating allowance) apply to a part after plating or coating. Internal inch threads shall meet the Class 2B gauging requirements before and after plating.

4.6 CORROSION RESISTANCE

4.6.1 White and Black Corrosion

Evaluate the amount of corrosion visible to the unaided eye on significant surfaces after neutral salt spray testing of samples for the number of hours specified in Table 3. There shall be no white corrosion products visible on significant surfaces. Black corrosion products, if present, must be less than ten percent (<10%) of the total significant surfaces.

4.6.2 Red Corrosion

After neutral salt spray testing, for the number of hours specified in Table 3, there shall be no more than one spot of red corrosion visible to the unaided eye per 650 square millimeters (one spot per square inch) of significant surface. On pieces having less than 650 square millimeters (1 square inch) of significant surface, a maximum of one spot of red corrosion is permissible. No individual red corrosion spot larger than 1.5 mm (0.060 inches) in diameter is permissible.

4.7 HYDROGEN EMBRITTLEMENT / BAKING

4.7.1 Susceptible Parts

All steel parts subsequently zinc electroplated having a measured surface hardness above 34 HRC (or equivalent) and all highly stressed cold worked parts can experience hydrogen embrittlement. This encompasses all standard Class 10.9 fasteners meeting ISO 898/1 or Grade 8 meeting SAE J429. The baking of such parts immediately after electroplating helps to relieve this condition. Baking per Section 4.7.3 is required for these susceptible parts. The baking requirement shall be noted on the drawing with "Baking is Required", see Section 8.3.1 example. Susceptibility to hydrogen embrittlement is significantly reduced by specifying mechanical zinc plating or a high corrosion resistant coating per CNH MAT0320.

4.7.2 Exempted Parts

Class 10 nuts meeting ISO 898/2 and Grade 8 nuts meeting SAE J995 and all standard fasteners specified per ISO 898/1 Class 8.8 or SAE J429 Grade 5 and lower are exempted from the baking requirement given in Section 4.7.3. Mechanical plated parts are also exempted. Under limited circumstances the susceptible parts described in Section 4.7.1 may be exempted from the baking requirement, these parts shall note "Baking Not Required" on the engineering drawing, see Section 8.3.1 example.

4.7.3 Baking Requirement

Unless exempted or otherwise specified on the drawing, the zinc electroplated parts described in Section 4.7.1 must be baked (relieved) immediately after electroplating and before other chemical treatment (i.e. chromate passivation) by heating to 175°C (350°F) minimum for at least 4 hours at temperature. Treatment at higher temperatures and for longer times may be necessary to ensure freedom from hydrogen embrittlement. Hardened parts that are tempered at less than 175°C (350°F) shall be heated to 150°C (300°F) for at least 8 hours at temperature. Baking treatment per ISO 4042 Annex 1 or ASTM B850 are acceptable alternative practices to assure freedom from hydrogen embrittlement.

4.7.4 A constant load test, such as ASTM B839 or ISO 10587, to determine if parts have been affected by hydrogen embrittlement may be required by agreement between the supplier and procuring CNH facility. Development of unique load tests for certain parts may be necessary and in these cases should be specified on the engineering drawing.

4.8 ADHESION

For all classes, plating shall demonstrate satisfactory adhesion to the substrate by passing the indicated adhesion tests shown in Section 6.3.

4.9 PLATING QUALITY & APPEARANCE

The plating shall be dense, uniform, and free of porosity, pinholes, blisters, flaking, cracks, and stains. The plating shall be free of other discontinuities that affect appearance, part reliability (such as arc strikes), or corrosion resistance. It shall not exhibit gray or burned areas. The color of the finished part shall meet the description given in Table 3 for the designated CNH Type. Unique color requirements may be specified on the drawing as a special requirement or obtained by agreement between the procuring CNH facility and supplier. Zinc plated fasteners should be received effectively dry with only minimal residual oil from processing expected.

5. SPECIAL REQUIREMENTS

5.1 Special surface finishes, conditions, methods, or plating thicknesses may be applied as special requirements (SPCL). These requirements shall be indicated on the engineering drawing and apply to the specified CNH plating class.

5.2 SPCL PLATING TYPES & CLASSES

The finish Types and thickness Classes given in Table 3 should be the primary finishes designated. A special plating finish, type, color, and/or minimum plating thickness may be designated for unique appearance or corrosion resistance requirements. Special plating finishes include plain or olive-drab chromate. Special zinc alloy plating types, such as zinc cobalt and zinc nickel, are available. In addition to a special finish, type, and/or minimum plating thickness, a modified salt spray corrosion resistance requirement may also be specified on the engineering drawing, see Sections 8.3.3 and 8.3.4 for drawing note examples.

5.3 WAXES AND SPECIAL LUBRICANTS

Waxes or special lubricants are not permitted on nuts and bolts, except as noted below, unless their application is agreed to by the procuring CNH facility and the supplier. Industry practice in some regions is to apply wax or special lubricant to Inch Prevailing Torque Nuts (lock nuts) to reduce torque-tension coefficients to that of standard nuts. If wax or special lubricant is applied to standard fasteners, testing to establish new torque-tension values will be necessary.

5.4 SEALANTS

Sealants may be applied to zinc plated parts to improve white corrosion resistance but are not required unless specified on the drawing. The sealant should be applied less than 30 minutes after the chromate treatment. Sealant application to threaded components may affect the torque-tension values, see Sect 2.2.4. Testing should be conducted to verify torque-tension values with the actual joint involved for these parts.

6. METHODS OF TEST

All National Standards and related test method designations are to be latest issue unless otherwise specified.

6.1 PLATING THICKNESS

Plating thickness shall be measured on significant surfaces using one of the following methods: microscopic method per ASTM B487, magnetic method per ASTM B499, coulometric method per ASTM B504, or other equivalent method. Plating thickness on threaded fasteners shall be determined on the shank, bolt head, hexagon flats, or other smooth surface.

6.2 CORROSION RESISTANCE

6.2.1 The neutral salt spray test shall be performed per the ASTM B117 method. Evaluation of results will be based only on significant surfaces unless otherwise specified on the Engineering drawing. The plating shall conform to limitations for white, black, and red corrosion as defined in Section 4.6 after the minimum test hours specified in Table 3.

6.2.2 For testing corrosion resistance, the complete part is the preferred test specimen size. Parts may be cut into smaller test specimens as necessary, but shall not be less than 150 mm (6 inches) in length.

6.2.3 Test specimens shall be suitably cleaned and free of fingerprints and other stains. Loose particles should be removed by gentle wiping with a clean, dry, soft cloth. Cleaning with a mild detergent in warm water is recommended to remove fingerprints, stains, etc. Then dry the specimen with a clean, soft towel. Oily or greasy surfaces should not be used for testing. Degreasing with organic solvents is not permitted particularly for waxed or sealed surfaces.

6.3 ADHESION

Plating shall pass the burnishing test and the grind-saw test defined in ASTM B571. Blistering, lifting, or peeling of the plating is evidence of unsatisfactory adhesion (failure to meet the adhesion requirement). Other tests for adhesion that are appropriate for zinc plating are detailed in ASTM B571. Depending on the end use of the plated part or its method of fabrication, passing one or more of these tests, such as a bend test, may also be required. In those instances, the procuring CNH facility shall specify the additional adhesion tests that the plating must pass.

6.4 CHROMATE PASSIVATION

Determine the presence of clear chromate passivation according to applicable sections of ASTM B201 used to test for colorless (clear) coatings. The presence of other colored chromate coatings may be determined by visual examination.

7. INSPECTION AND REJECTION

All zinc plated parts supplied to this specification shall be equivalent in every respect to samples approved by the procuring CNH location. Prior to making any changes to the zinc plating used for an application under this specification, whether or not the change affects the plating meeting the specified requirements, the supplier shall notify the procuring CNH facility of the proposed changes. Test data, test samples, a new supplier code, or other information may be required for the proposed material change as part of the Initial Sample Inspection Report (ISIR) supplier quality requirements. While the purchasing location may test samples from incoming shipments for quality assurance, the supplier is responsible for ensuring that shipments meet the stated requirements without depending upon the purchaser's inspection.

8. DRAWING SPECIFICATIONS

8.1 Specifying a restricted (RSTR) or special (SPCL) plating thickness, finish, or process may require the use of a significant characteristic per CNH Engineering Procedure ENPJ100 (86619032). This determination will be made as part of the design review process.

8.2 The engineering drawing shall contain a note for the specification of zinc plating. The notation shall include the plating generic name, CNH Material Specification number, the plating finish Type and plating thickness Class. Where used in the plating designation, 'ZN' indicates electroplated zinc and 'ZNM' indicates mechanical plated zinc.

8.3 The following are examples of zinc plating designations on drawings. Examples 1 to 3 include the material designation in the CNH and Local Material blocks of the title block.

8.3.1 Zinc Electroplate

Example 1, Electroplate TCR 5 Micrometers

CNH Material Angle, CNH MAT1016, Grade A
Local Material Angle, EN 10025, S235JRG2

Material Note (on drawing above title block):
Zinc Plate, CNH MAT0310, ZN TCR 5

Example 2, Baking Required

CNH Material
ETD Round, CNH MAT1067, Grade B
Local Material
ETD Round, 1144, 'Fatigue-Proof'

Material Note (on drawing above title block):
Zinc Plate, CNH MAT0310, ZN TCR 8
Baking Required

Example 3, Exempt from Baking

CNH Material
Alloy QTCF Round, CNH MAT1055, Grade B
Local Material
Alloy QTCF Rd, EN 10277-5, 42CrMoS4+QT+SH

Material Note (on drawing above title block):
Zinc Plate, CNH MAT0310, ZN YCR 13
Baking Not Required

8.3.2 Mechanical Zinc Plate

Material Note (on drawing above title block):
Mechanical Zinc Plate, CNH MAT0310, ZNM TCR 5

8.3.3 Special Plating Thickness (SPCL)

For a non-standard minimum plating thickness, designate the required minimum plating thickness (in micrometers) after the finish Type and before SPCL. Note the minimum plating thickness and any additional corrosion resistance requirements under special requirements in the material note on the drawing.

Material Note (on drawing above title block):
Zinc Plate, CNH MAT0310, ZN YCR 25, SPCL
Special Requirements Are:
25 Micrometers Min Plating Thickness
275 Hours Min Salt Spray Red Corrosion Resistance

8.3.4 Special Plating Finish (SPCL)

For non-standard minimum plating finish types, replace the plating finish Type with 'ZN' or 'ZNM' and designate SPCL after the plating thickness Class. Under special requirements in the material note specify the plating finish type and any additional corrosion resistance requirements.

Material Note (on drawing above title block):
Zinc Plate, CNH MAT0310, ZN 8, SPCL
Special Requirements Are:
Olive-Drab Chromate Finish
96 Hours Min Salt Spray White Corrosion Resistance
200 Hours Min Salt Spray Red Corrosion Resistance