## PAINT MATERIAL REQUIREMENTS - METAL PARTS

### 1. SCOPE

1.1 This specification covers specific performance requirements for paint materials used on CNH Industrial metal parts. Paint performance is specified for CNH Industrial products based on durability and appearance requirements. Paint materials supplied to this specification shall also comply with color requirements of CNH MAT0101 (86628042) Color Requirements and Color Control. Approved paint materials for use on CNH Industrial metal parts are shown in CNH MAT0103Q (48158409) Approved Paint Materials - Metal Parts.

1.2 Finish system performance requirements are provided in Tables 7 and 8 for both paint materials and process paint for production of finished metal painted parts. Only certain thermal or chemical cure primers, topcoats, or powder material systems can achieve Class 3, 4, 4W, 5, and 6 performance levels.

1.3 Primer performance requirements are provided for both primer materials and process primer paint. Properties listed in Table 9 apply when only primer materials and primed only parts are specified.

1.4 Table 1 provides a basic cross-reference between new CNH Industrial paint performance Classes and comparable prior company material specifications and performance level designations.

**TABLE 1: Former Company Paint Performance Designations**

| CNH MAT0103 Performance Class | New Holland, Case, and CNH Former Designations |
|---|---|
| **Complete Finish System** | |
| Class 1 (86628056) | - NH Penna, Standard Perf., FNHA-2-J-061.00 (86509537)<br>- Case, Standard Perf. MS-1 |
| Class 2 (86628055) | - NH Tractor, NHT MS 002, Classes C and D |
| Class 3 (86628054) | - NH Penna, Premium Perf., FNHA-2-J-062.01 (86570426)<br>- Case, Superior Perf., MS-1<br>- NH Tractor, NHT MS 002, Class B4 |
| Class 4 (86628053) | - NH Tractor, NHT MS 002, Class B1, B2, B3 |
| Class 4W (48011482) | - Not applicable |
| Class 5 (86628052) | - CNH MAT0103, Class 4 (86628053)<br>- NH Tractor, NHT MS 002, Class A, B1, B2 and B3 |
| Class 6 (87070110) | - ES-PA014 (84196364) Class 6 |
| **Primer and Primed Only Parts** | |
| Class 1P (86628059) | - NH Penna, Standard Primer Perf., FNHA-2-J-065.00 (86514388)<br>- Case, Standard Primer Perf., MS-1 |
| Class 2P (86628058) | - NH Penna, Premium Primer Perf., FNHA-2-J-066.00 (86565256)<br>Case, Superior Primer Perf., MS-1<br>- NH Tractor, NHT MS 002, Class B4, C and D |
| Class 3P (86628057) | - NH Tractor, NHT MS 002 Class A1, A2, A3, B2 and B3 |

1.5 This specification may involve hazardous materials, apparatus, and procedures. This specification does not claim to address all the safety, health, and environmental issues associated with its use, application, or removal. Specification users bear responsibility for consulting appropriate safety, health, and environmental practices, and determining the applicability of regulatory limitations prior to use, application, or subsequent removal of paints supplied to this specification. Consult with facility safety, health, and environmental professionals or contact CNH Industrial Corporate Environmental Health and Safety if guidance in this area is needed.

## 2. DESIGNATION ON DRAWINGS AND PURCHASE ORDERS

2.1 Paint performance Class, color designation, and corresponding part numbers must be specified in the Engineering Parts List on the Engineering drawing. Figure 1 provides an example of how the color and performance Class can be specified on the engineering drawing.

| | |
|---|---|
| 86628054 | SPECIFICATION, CL 3 PAINT PERF 86628044 |
| 86609757 | COLOR, AG RED STD 86628042 |
| 878xxxxx | BASE PART NAME |

**Figure 1: Example Color and Performance Class Specified on Drawing**

2.2 Additional details for specifying paint on drawings are provided in standard DWGA110.

## 3. REFERENCED SPECIFICATIONS

ASTM B117 Standard Practice for Operating Salt Spray (Fog) Apparatus
ASTM D523 Standard Test Method for Specular Gloss
ASTM D714 Standard Test Method for Evaluating Degree of Blistering
ASTM D870 Standard Practice for Testing Water Resistance of Coatings
ASTM D1014 Std. Pract. Conducting Exterior Exposure Tests of Paints & Coatings on Metal Substrates
ASTM D1210 Standard Test Method for Fineness of Dispersion of Pigment-Vehicle Systems by Hegman-Type Gage
ASTM D1475 Standard Test Method for Density of Liquid Coatings, Inks, and Related Products
ASTM D1654 Std.Test Method Evaluation of Painted Coated Specimens in a Corrosive Environment
ASTM D1729 Standard Practice for Visual Appraisal of Color and Color Differences of Diffusely Illuminated Opaque Materials
ASTM D1735 Standard Practice for Testing Water Resistance of Coatings using Water Fog Apparatus
ASTM D2369 Standard Test Method for Volatile Content of Coatings
ASTM D2697 Standard Test Method for Volume Nonvolatile Matter in Clear or Pigmented Coatings
ASTM D2794 Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
ASTM D3170 Standard Test Method for Chipping Resistance of Coatings
ASTM D3335 Standard Test Method for Low Concentrations of Lead, Cadmium, and Cobalt in Paint by Atomic Absorption Spectroscopy
ASTM D3363 Standard Test Method for Film Hardness by Pencil
ASTM D3718 Standard Test Method for Low Concentrations of Chromium in Paint by Atomic Absorption Spectroscopy
ASTM D4212 Standard Test Method for Viscosity by Dip-Type Viscosity Cups
ASTM D4366 Standard Test Method for Hardness of Organic Coatings by Pendulum Damping Test
ASTM D5965 Standard Test Methods for Density of Coating Powders
ASTM E308 Standard Practice for Computing the Colors of Objects by Using the CIE System
CNH DWGA110 (86641291) Requirements for Painted Parts

**REFERENCED SPECIFICATIONS-Continued**

CNH MAT0101 (86628042) Color Requirements and Color Control
CNH MAT0103Q (48158409) Approved Paint Materials for Metal Parts
CNH MAT0103S (47406457) Process Paint Materials for Metal Parts, Supply Requirements
CNH MTM0102 (86628045) Test Panel Preparation
CNH MTM0104 (86628046) Recoating of Finishes
CNH MTM0104 (86628046) Recoating of Finishes
CNH MTM0106 (86628047) Cyclic Corrosion Test
CNH MTM0108 (86628048) Chemical Resistance
CNH MTM0113 (87556294) Weatherometer Test
CNH MTM0120 (87021663) Tape Adhesion, Paint Materials
CNH MTM0124 (87021665) Flexibility Test
FNHA-4-A-007 Surface Requirements

## 4. REQUIREMENTS

### 4.1 PAINT PERFORMANCE CLASS

4.1.1 Paint materials, as finished paint systems, applied to CNH Industrial parts or components shall meet Class 3 performance requirements as a minimum unless another performance Class is specified

4.1.2 Primer paint materials applied for primed only parts shall meet Class 2P performance requirements as a minimum unless another performance Class is specified.

### 4.2 DRY FILM PROPERTIES

4.2.1 Paint Materials over Laboratory Test Panels for Engineering Approval

Paint materials supplied to this specification shall meet cured, dry film material property requirements established by this specification. Paint materials submitted for testing to obtain CNH Industrial Materials Engineering approval shall be applied to Bonderite M-FE 1000TM iron phosphate with Bonderite M-PT 99X chrome-free seal test panels per CNH MTM0102 (86628045) Test Panel Preparation.

4.2.2 Process Paint Materials for Finished Painted Parts

Process paints are approved paint materials, listed in the MAT0103Q, supplied to CNH Industrial or supplier facilities for the production of finished metal painted parts. Process paint performance, topcoat and/or primer materials, shall comply with specified performance class requirements and shall be verified according to CNH MAT0103S. Test samples for process paint material testing shall be prepared per MTM0102.

4.2.3 Process Paint Materials, Production Approval

Process paint materials intended for production use at CNH Industrial Plants shall not be used before completion of successful plant production trials. Materials Engineering shall be notified by the applicable Manufacturing plant upon successful completion of these trials.

4.2.4 Paint Storage: Plant storage and application areas should be climate controlled per the recommendations of the paint manufacturer to avoid potential application issues. As an example, powder coating application performance can be negatively affected by temperature and humidity.

4.2.5 All parts should be painted prior to assembly whenever possible. Uniform film build that meets the recommended minimums shall be achieved on all surfaces, including edges and recesses. Parts shall be primed and/or topcoated only with materials that have been approved by CNH Industrial Materials Engineering. Finished parts shall be cured per the specified schedule prior to exposure to any detrimental environment.

4.2.6 Primer Paint Materials

Primer paint materials supplied to this specification shall meet dry film material property requirements listed in Table 9 for the appropriate Primer Class specified. Primer requirements are the same regardless of whether a primed only part is subsequently topcoated and must also comply with requirements of a finish system performance Class. Testing for approval of primer materials shall follow methods and procedures specified for material on test panels according to Sections 4.2.1 and 4.2.2.

4.2.7 Primer and Topcoat Compatibility

4.2.7.1 Primer performance and the corresponding paint technology will affect the overall performance of the complete finish system. Primer performance Classes will typically support complete finish system performance as shown in Table 2.

**TABLE 2: Typical Performance Compatibility**

| Primer | | Complete Finish System Performance Class |
|---|---|---|
| **Performance Class** | **Material Technology Example** | |
| 1P | Alkyd | 4, 3, 2, 1 |
| 2P | Urethane, Epoxy, Isocyanate, Non-Isocyanate(NISO) | 6, 5, 4W, 4, 3, 2, 1 |
| 3P | Epoxy | 6, 5, 4W, 4, 3, 2, 1 |

4.2.7.2 Paint material incompatibility may exist between certain primers and finish system performance classes or technologies. Contact Materials or the paint supplier for information on specific applications.

4.2.8 Performance Class Application

In general, the following paint technologies are capable of meeting complete finish system performance Class requirements as indicated in Table 3. This does not mean that all paint material technologies listed will meet the CNH Industrial performance Class requirements. Before use, specific formulations being considered for CNH Industrial product applications must be approved by CNH Industrial Materials Engineering.

**TABLE 3: Performance Class Applications**

| Paint Material Technology | Complete Finish System Performance Class |
|---|---|
| Alkyd Enamel | 2, 1 |
| Acrylic, Urethane, Isocyanate, Non-Isocyanate(NISO), Powder | 6, 5, 4W, 4, 3 |

4.2.9 Performance Class Substitutions

Table 4 indicates paint classes which can be used or substituted where the part drawing indicates a class requirement.

**TABLE 4: Paint Performance Class Substitutions**

| For a Part Drawing Indicating Class: | Paint Materials Listed in MAT0103Q with these classes can be used: |
|---|---|
| 1 | 1, 3, 5, 4, 2 |
| 2 | 2, 3, 5, 4 |
| 3 | 3, 5, 4W, 4 |
| 4 | 4, 5 |
| 4W | 4W, 6 |
| 5 | 5 (no substitute for class 5) |
| 6 | 6 (no substitute for class 6) |
| Order of Preference | Most Preferred → Least Preferred |

4.2.10 Complete Finish System Requirements are specified in Tables 7 and 8.

4.2.11 Primer Material and Process Paint-Primer Requirements are specified in Table 9.

4.3 LIQUID AND POWDER PROPERTIES

All paint materials supplied to this specification shall meet the following property guidelines of Table 5 and Table 6, in addition to any specified performance Class requirements.

**TABLE 5: Liquid Material Requirements**

| Properties | Material Requirements | Test Method |
|---|---|---|
| Weight Per Unit Volume | Report value via TDS(1); shall be within ± 0.120kg/L of qualification sample | ASTM D1475 |
| Weight Solids, % by Weight | Report value via TDS(1); ± 2% from qualification sample | ASTM D2369 |
| Volume Solids, % by Volume | Report value via TDS(1); ± 2% from qualification sample | ASTM D2697 |
| Viscosity at 25°C, Seconds | Report value via TDS(1); ± 5 seconds from qualification sample | ASTM D4212 |
| Volatile Organic Content (VOC), % by Weight | Report value via TDS(1); Shall be less than local regulations where used | ASTM D2369 |
| Fineness of Grind | Report value via TDS(1); | ASTM D1210 |

(1) TDS = Technical Data Sheet

**TABLE 6: Powder Material Requirements**

| Properties | Material Requirements | Painted Part Requirements | Test Method |
|---|---|---|---|
| Specific Gravity | Report value via TDS(1); shall be within ± 0.05 of qualification sample | | ASTM D5965 |
| Particle Size Distribution | Report value via TDS(1); | | Supplier Method |

(1) TDS = Technical Data Sheet

4.4 SURFACE QUALITY

Where required, surface finish requirements or quality for parts shall be specified on the engineering drawing using established specifications such as FNHA-4-A-007 Surface Requirements. Acceptance levels defined in FNHA-4-A-007 are applicable for metallic and non-metallic substrates.

## TABLE 7: Paint Material and Process Paint Performance Requirements – (Classes 6,5,4,4W,3)

| Performance Class and Part Number | | Class 6 (87070110) | | Class 5 (86628052) | | Class 4 (86628053) | | Class 4W (48011482) | | Class 3 (86628054) | | Test Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Properties | | Paint Material | Process Paint (1) | Paint Material | Process Paint (1) | Paint Material | Process Paint (1) | Paint Material | Process Paint (1) | Paint Material | Process Paint (1) | |
| Color – Visual | | Visual Match to Color Standard; No visible metamerism permitted Evaluate under CIE Illuminant light sources: D65, daylight; A-10, incandescent; and F02-10, (CWF) cool white fluorescent | | | | | | | | | | ASTM D1729 |
| Color Tolerance, maximum | | Paint Material (Standard Test Panels) $\Delta L^* = 0.3$, $\Delta a^* = 0.3$, $\Delta b^* = 0.3$, $\Delta E^* = 0.5$ | | | | | | Finished Painted Parts (Parts/Process Panels) $\Delta L^* = 0.6$, $\Delta a^* = 0.6$, $\Delta b^* = 0.6$, $\Delta E^* = 1.0$ | | | | ASTM E308 CIE LAB Spherical D65/10° included |
| Hardness, Full cure, minimum | | Persoz = 150 | | Persoz = 250 | | Persoz = 250 | | Persoz = 150 | | Persoz = 150 | | ASTM D4366-95 Method B |
| | | Pencil = H | | Pencil = 2H | | Pencil = 2H | | Pencil = H | | Pencil = H | | ASTM D3363 |
| Impact Resistance, Forward, minimum | | 30 kg cm | | 40 kg cm | | 40 kg cm | | 30 kg cm | | 30 kg cm | | ASTM D2794 |
| Chip Resistance, min. | | 5B | | | | | | | | | | ASTM D3170 |
| Flexibility | | 7% elongation, minimum No cracks or adhesion loss | | | | | | | | | | CNH MTM0124 Method A |
| Adhesion | | Ad 1, minimum | | | | | | | | | | CNH MTM0120 |
| Accelerated Weathering (WOM) And South Florida Exposure, (FE) | 600 Hrs (WOM), 12 Months (FE) | N/A | | Gloss Retention, 60° = 90%, min 20° = 65%, min $\Delta E^* \leq 3.0$ change | | Gloss Retention, 60° = 90%, min 20° = 65%, min $\Delta E^* \leq 3.0$ change | | N/A | | Gloss Retention, 60° = 90%, min 20° = 65%, min $\Delta E^* \leq 3.0$ change | | Weatherometer: CNH MTM0113 (87556294) Modified ASTM G155-05a Cycle 7A<br>Florida Exposure: ASTM D1014 |
| | 1200 Hrs (WOM), 24 Months (FE) | N/A | | Gloss Retention, 60°=75%, min 20°=45%, min $\Delta E^* \leq 5.0$ change | | Gloss Retention, 60°=75%, min 20°=45%, min $\Delta E^* \leq 5.0$ change | | N/A | | Gloss Retention, 60°=75%, min 20°=45%, min $\Delta E^* \leq 5.0$ change | | |
| | 1800 Hrs (WOM), 36 Months (FE) | N/A | | N/A | | N/A | | Gloss Retention, 60° = 90%, min 20° = 65%, min $\Delta E^* \leq 3.0$ change | | N/A | | |
| | 2400 Hrs (WOM), 48 Months (FE0 | N/A | | N/A | | N/A | | Gloss Retention, 60°=75%, min 20°=45%, min $\Delta E^* \leq 5.0$ change | | N/A | | |
| | 3600 Hrs (WOM), 72 Months (FE) | Gloss Retention 60° = 90% min 20° = 65% min $\Delta E^* \leq 3.0$ change | | N/A | | N/A | | N/A | | N/A | | |
| | 4800 Hrs (WOM), 96 Months (FE) | Gloss Retention 60° = 75% min 20° = 45% min $\Delta E^* \leq 5.0$ change | | N/A | | N/A | | N/A | | N/A | | |

(1) Accelerated weathering is not required to verify process paint performance. Verify process paint initial supply performance requirements according to MAT0103S

## TABLE 7 *continued*: Paint Material and Process Paint Performance Requirements – (Classes 6,5,4,4W,3)

| Performance Class and Part Number | Class 6 (87070110) | | Class 5 (86628052) | | Class 4 (86628053) | | Class 4W (48011482) | | Class 3 (86628054) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Properties** | **Paint Material** | **Process Paint (1)** | **Paint Material** | **Process Paint (1)** | **Paint Material** | **Process Paint (1)** | **Paint Material** | **Process Paint (1)** | **Paint Material** | **Process Paint (1)** | **Test Method** |
| Cyclical Corrosion | 5 Cycles Rating 6, min. | | 5 Cycles Rating 8, min. | | 5 Cycles Rating 6, min. | | 5 Cycles Rating 6, min. | | 5 Cycles Rating 6, min. | | |
| | Edges on Test Panels: Rating 8, min. | | | | | | | | | | CNH MTM0106 |
| | Un-scribed Areas: No Blisters, No Visible Corrosion | | | | | | | | | | |
| Salt Spray Resistance Complete Finish System Minimum requirements | 700 hrs | 500 hrs | 1000 hrs | | 700 hrs | 700 hrs | 700 hrs | 500 hrs | 700 hrs | 500 hrs | ASTM B117 |
| | Scribed(2) Rating 6 | Scribed(2) Rating 6 | Scribed(2) Rating 7 | | Scribed(2) Rating 6 | Scribed(2) Rating 6 | Scribed(2) Rating 6 | Scribed(2) Rating 6 | Scribed(2) Rating 6 | Scribed(2) Rating 6 | ASTM D1654-05 Procedure A Method 2 |
| | Edges on Test Panels: Rating 8, min. | | | | | | | | | | ASTM D1654-05 Procedure C Method 2 |
| | Un-scribed Areas: No Blisters, No Visible Corrosion | | | | | | | | | | ASTM D1654-05 Procedure B |
| Humidity Complete Finish System | 400 hrs, minimum | | 600 hrs, minimum, | | 600 hrs, minimum | | 400 hrs, minimum | | 400 hrs, minimum | | ASTM D1735 |
| | 2 hours Recovery<br>Gloss Retention: 60° = 95% min.; 20° = 95% min<br>No visual color change<br>ΔE* = 0.5 change, max<br>Blisters: Size=8, Frequency=Few (F) | | | | | | | | | | ASTM D523<br>ASTM D1729<br><br>ASTM D714 |
| Water Immersion, at 25 ± 2°C<br><br>Complete Finish System | 300 hr. | 200 hr. | 500 hr. | 400 hr. | 500 hr. | 400 hr. | 300 hr. | 200 hr. | 300 hr. | 200 hr. | ASTM D870 |
| | 4 hours Recovery<br>Gloss Retention: 60° = 95% min; 20° = 95% min<br>No visual color change<br>ΔE* = 0.5 change, max<br>Blisters: Size=8, Frequency=Few (F)<br>Adhesion: Ad 1, minimum<br>Hardness: 15% change, max | | | | | | | | | | ASTM D523<br>ASTM D1729<br><br>ASTM D714<br>CNH MTM0120<br>ASTM D4366-95 |
| Chemical Resistance | Pass | | | | | | | | | | CNH MTM0108 |
| Recoatability | No visual defects<br>Adhesion; Ad 1, minimum | | | | | | | | | | CNH MTM0104,<br>CNH MTM0120 |
| Lead Content, Wt.%, | 0.06, maximum | | | | | | | | | | ASTM D3335 |
| Chromium Content, Wt.% | 0.01, maximum | | | | | | | | | | ASTM D3718 |

(1) Accelerated weathering is not required to verify process paint performance. Verify process paint initial supply performance requirements according to MAT0103S

(2) Test panels shall be scribed with an X pattern with the diagonal scribe lines crossing at the middle of the panel

## TABLE 8: Paint Material and Process Paint Performance Requirements – (Classes 1 and 2)

| Performance Class and Part Number | | Class 2 (86628055) | | Class 1 (86628056) | | |
|---|---|---|---|---|---|---|
| Properties | | Paint Material | Process Paint (1) | Paint Material | Process Paint (1) | Test Method |
| Color – Visual | | Visual Match to Color Standard; No visible metamerism permitted. Evaluate under CIE Illuminant light sources: D65, daylight; A-10, incandescent; and F02-10, (CWF) cool white fluorescent | | | | ASTM D1729 |
| Color Tolerance, maximum | | Paint Material (StandardTest Panels) ΔL* = 0.3, Δa* = 0.3, Δb* = 0.3, ΔE* = 0.5 | | | | ASTM E308 CIE LAB Spherical D65/10° included |
| | | Finished Painted Parts (Parts/Process Panels) ΔL* = 0.6, Δa* = 0.6, Δb* = 0.6, ΔE* = 1.0 | | | | |
| Hardness, Full cure, minimum | | Persoz = 150 | | Persoz = 100 | | ASTM D4366-95 Method B |
| | | Pencil = H | | Pencil = B | | ASTM D3363 |
| Impact Resistance, Forward, minimum | | 30 kg cm | | 20 kg cm | | ASTM D2794 |
| Chip Resistance, min. | | 5B | | 4B | | ASTM D3170 |
| Flexibility | | 7% elongation, minimum No cracks or adhesion loss | | | | CNH MTM0124 Method A |
| Adhesion | | Ad 1, minimum | | | | CNH MTM0120 |
| Accelerated Weathering (WOM) | 600 Hrs (WOM), 12 Months (FE) | Gloss Retention, 60° = 65%, min 20° = 45%, min ΔE* ≤ 4.0 change | | | | Weatherometer: CNH MTM0113 (87556294) Modified ASTM G155-05a Cycle 7A<br><br>Florida Exposure: ASTM D1014 |
| And<br><br>South Florida Exposure, (FE) | 1200 Hrs 1800 Hrs 2400 Hrs 3600 Hrs 4800 Hrs (WOM), 24 / 48 / 72 / 96 Months (FE) | N/A | | N/A | | |

(1) Accelerated weathering is not required to verify process paint performance. Verify process paint performance requirements according to MAT0103S

## TABLE 8 *continued*: Paint Material and Process Paint Performance Requirements – (Classes 1 and 2)

| Performance Class and Part Number | Class 2 (86628055) | | Class 1 (86628056) | | |
|---|---|---|---|---|---|
| **Properties** | **Paint Material** | **Process Paint (1)** | **Paint Material** | **Process Paint (1)** | **Test Method** |
| Cyclical Corrosion | 4 Cycles<br>Rating 6, min. | | | | CNH MTM0106 |
| | Edges on Test Panels:<br>Rating 8, min. | | | | |
| | Un-scribed Areas:<br>No Blisters, No Visible Corrosion | | | | |
| Salt Spray Resistance<br>Complete Finish System<br>Minimum requirements | 500 hrs | 350 hrs | 400 hrs | 200 hrs | ASTM B117<br>ASTM D1654-05<br>Procedure A Method 2 |
| | Scribed(2)<br>Rating 6 | Scribed(2)<br>Rating 6 | Scribed(2)<br>Rating 6 | Scribed(2)<br>Rating 6 | |
| | Edges on Test Panels<br>Rating 8, min. | | | | ASTM D1654-05<br>Procedure C Method 2 |
| | Un-scribed Areas:<br>No Blisters, No Visible Corrosion | | | | ASTM D1654-05<br>Procedure B |
| Humidity<br>Complete Finish System | 200 hrs, minimum, | | | | ASTM D1735 |
| | 2 hours Recovery:<br>Gloss Retention 60° = 90% min.; 20° = 90% min<br>No visual color change<br>$\Delta E^*$ = 0.5 change, max<br>Blisters: Size=8, Frequency=Few (F) | | | | ASTM D523<br>ASTM D1729<br>ASTM D714 |
| Water Immersion,<br>at 25 ± 2°C<br><br>Complete Finish System | 200 hr. | 100 hr. | 200 hr. | 100 hr. | ASTM D870 |
| | 4 hours Recovery<br>Gloss Retention: 60° = 90% min; 20° = 90% min<br>No visual color change<br>$\Delta E^*$ = 0.5 change, max<br>No Rust;<br>Blisters: Size=8, Frequency=Few (F)<br>Adhesion: Ad 1, minimum<br>Hardness: 15% change, max | | | | ASTM D523<br>ASTM D1729<br>ASTM D714<br>CNH MTM0120<br>ASTM D4366-95 |
| Chemical Resistance | Pass | | | | CNH MTM0108 |
| Recoatability | No visual defects<br>Adhesion; Ad 1, minimum | | | | CNH MTM0104,<br>CNH MTM0120 |
| Lead Content, Wt.%, | 0.06, maximum | | | | ASTM D3335 |
| Chromium Content, Wt.% | 0.01, maximum | | | | ASTM D3718 |

(1) Accelerated weathering is not required to verify process paint performance. Verify process paint performance requirements according to MAT0103S
(2) Test panels shall be scribed with an X pattern with the diagonal scribe lines crossing at the middle of the panel

## TABLE 9: Primer Materials and Process Paint-Primer Performance Requirements

| Performance Class and Part Number | Class 3P (86628057) | | Class 2P (86628058) | | Class 1P (86628059) | | |
|---|---|---|---|---|---|---|---|
| **Properties** | **Paint Material** | **Process Paint (1)** | **Paint Material** | **Process Paint (1)** | **Paint Material** | **Process Paint (1)** | **Test Method** |
| Color – Visual | Visual Match to Color Standard | | | | | | ASTM D1729 |
| Hardness, Full cure, minimum | Persoz = 200 | | Persoz = 100 | | Persoz = 100 | | ASTM D4366-95 Method B |
| | Pencil = H | | Pencil = F | | Pencil = B | | ASTM D3363 |
| Adhesion | Ad 1, minimum | | | | | | CNH MTM0120 |
| Recoatability | No visual defects<br>Adhesion; Ad 1, minimum | | | | | | CNH MTM0104<br>CNH MTM0120 |
| Flexibility | 7% elongation, minimum<br>No cracks or adhesion loss | | | | | | CNH MTM0124 Method A |
| Chipping Resistance, minimum | 5B | | | | 4B | | ASTM D3170 |
| Impact Resistance, Forward, minimum | 30 kg cm | | 20 kg cm | | 20 kg cm | | ASTM D2794 |
| Salt Spray Resistance<br>Minimum requirements | 800 hrs<br>Scribed (2)<br>Rating 7 | 700 hrs<br>Scribed (2)<br>Rating 7 | 400 hrs<br>Scribed (2)<br>Rating 6 | 300 hrs<br>Scribed (2)<br>Rating 6 | 150 hrs<br>Scribed (2)<br>Rating 6 | 100 hrs<br>Scribed (2)<br>Rating 6 | ASTM B117<br>ASTM D1654-05<br>Procedure A Method 2 |
| | Edges on Test Panels:<br>Rating 8, min. | | | | | | ASTM D1654-05<br>Procedure C Method 2 |
| | Un-scribed Areas:<br>No Blisters, No Visible Corrosion | | | | | | ASTM D1654-05<br>Procedure B |
| Cyclical Corrosion | 5 Cycles,<br>Rating 8, min | | 5 Cycles,<br>Rating 6, min | | 1 Cycle,<br>Rating 6, min | | CNH MTM0106 |
| | Edges on Test Panels:<br>Rating 8, min. | | | | | | |
| | Un-scribed Areas:<br>No Blisters, No Visible Corrosion | | | | | | |
| Humidity | 400 hours, minimum, | | 200 hours, minimum, | | 100 hours, minimum, | | ASTM D1735, D523<br>ASTM D1729, D714 |
| | 4 hours Recovery: Blisters: 8 (min.) Few (max.) | | | | | | |
| Water Immersion<br>at 25 ± 2°C | 500 hr | 400 hr | 300 hr | 200 hr | 150 hr | 100 hr | ASTM D870, D523<br>ASTM D1729, D714<br>ASTM D4366-95<br>CNH MTM0120 |
| | 4 hours Recovery: No Rust; Blisters: 8 (min) Few (max)<br>Hardness: 15% change, max; Adhesion: Ad 1, min | | | | | | |
| Lead content, Wt%, maximum | 0.06 | | | | | | ASTM D3335 |
| Chromium content, Wt%, maximum | 0.01 | | | | | | ASTM D3718 |

(1) Verify process paint-primer performance requirements according to MAT0103S

(2) Test panels shall be scribed with an X pattern with the diagonal scribe lines crossing at the middle of the panel.

## 5. QUALITY

5.1 All paint supplied to this specification shall be formulated and manufactured using good commercial practices and shall comply with all applicable governmental regulations.

5.2 All paint shall be non-hazardous with regard to heavy metals and comply with the CNH MAT4501 (87556298) Substance Use Restriction specification. Upon analyzing ash from a completely incinerated sample of dried paint, the amount of each heavy metal found shall not exceed the levels defined as hazardous in either OSHA or Resource Conservation and Recovery ACT (RCRA) regulations. All paint shall be free of foreign matter and other hazardous materials, unless details of such other hazardous materials are furnished in advance of initial qualification.

5.3 Pigments used shall be exterior grade conforming to CNH Industrial requirements and those designated in individual material specifications.

5.4 All paints reduced with solvents and applied under normal manufacturing conditions shall flow properly and build the recommended film thicknesses.

## 6. PACKAGING AND IDENTIFICATION – PAINT MATERIALS

6.1 Paint containers, except pressurized cans, shall be clearly marked with the following information:

Gross, Tare, and Net Weight
Name of Supplier
Destination
Formula Number or Code and Date of Manufacture
Paint Specification Number and Name
Purchase Order Number
Precautionary Labels (Danger, Caution, or Warning) as Required by Governmental Regulations such as the FDA Hazardous Substance Labeling Act

6.2 Pressurized containers shall be clearly marked with the following information on each container:

Net Weight
CNH Industrial Part Number
Type of Propellant
Formula Number or Code
Date of Manufacture
Paint Specification Number and Name
Precautionary Labels (Danger, Caution, or Warning) as Required by Governmental Regulations such as the FDA Hazardous Substance Labeling Act

6.3 Finish painted parts supplied to this specification shall be packaged to prevent damage and deterioration during handling, transportation, and storage.

## 7. METHODS OF TEST

7.1 All test designations are latest issue unless otherwise specified. Suppliers must ascertain and be able to demonstrate that their paint or finish painted part will conform to the specification limits when tested by the specified methods. Specified methods will be used to reconcile disputed results.

7.2 CNH Industrial Materials Test Methods are available through CNH Industrial Materials Engineering, CNH Industrial iView, CNH Industrial Technical Standards and Materials Intranet Site and over the Internet on the CNH Industrial Supplier Communication Network (CSCN). Questions or further clarification regarding these test methods may be directed to CNH Industrial Materials Engineering.

7.3 ASTM test methods are available from ASTM, 1916 Race Street, Philadelphia, PA 19103.

7.4 ACT orange peel standards and Bonderite 1000 test panels specified per CNH MTM0102 Test Panel Preparation are available from following sources:

7.4.1 ACT Laboratories, Inc., 273 Industrial Drive, P.O. Box 735, Hillsdale, MI 49242-0735, Ph 517-439-1485

7.4.2 Q-Panel Lab Products, (North America, 26200 First St., Cleveland OH 44145, Ph 440-835-8700) and (European Branch, Express Trading Estate, Farnworth Bolton, BL49TP, England, Ph (01204) 861616).

## 8. MATERIAL AND PROCESS TESTING

8.1 Testing and approval are required for both paint materials and suppliers of primed and/or topcoated parts to CNH Industrial. Material approval shall be based on laboratory, engineering, or plant testing conducted or approved by CNH Materials Engineering. Approved formulations of paint materials for finished metal parts are tabulated in the CNH MAT0103Q (48158409). Full CNH Industrial approval of paint material suppliers and suppliers of primed and/or topcoated parts also requires Supplier Quality auditing by CNH Industrial.

### 8.2 PAINT MATERIALS

No shipments of paint materials shall be made by a new source until samples of materials they propose to supply to this specification have been approved by CNH Industrial Materials Engineering. When requested, the supplier shall furnish samples for formal qualification that may include performance testing. Material submitted for qualification shall be accompanied by detailed test information, certification that the material meets all requirements of this specification, and a completed Materials Safety Data Sheet (MSDS). Additional samples may also be required by the receiving CNH Industrial location in advance of the first and subsequent production shipments in accordance with the provisions of CNH Industrial Supplier Development (SD) or other CNH Industrial quality assurance programs.

### 8.3 FINISH PAINTED PARTS

No shipments of finish painted parts shall be made by a new supplier until samples of finish painted parts (and representative painted test panels if requested,) they propose to supply to this specification have been tested or approved by the receiving CNH Industrial Plant or their designated representative. Finish painted parts submitted for qualification shall be accompanied by detailed test information and certification that they meet all requirements of this specification. Additional samples may also be required by the receiving CNH Industrial location in advance of the first and subsequent production shipments in accordance with the provisions of CNH Industrial Supplier Development (SD) or other CNH Industrial quality assurance programs.

## 9. INSPECTION AND REJECTION

Shipments of paint materials or finish painted parts against contracts or purchase orders citing this specification shall be equivalent in every respect to samples approved by the purchaser. No changes in formulation, processing, or place of manufacture are permitted without prior written approval from CNH Industrial Supplier Development (SD). Test data, test samples and new supplier code identification are to be submitted to CNH Industrial Materials Engineering group with the request for the material change. While the purchaser may test samples from incoming shipments for quality assurance purposes, the supplier is responsible for ensuring that shipments meet the stated requirements without depending upon the purchaser's inspection.

## 10. SUPPLIER RESPONSIBILITY

### 10.1 PAINT MATERIALS

All paint materials supplied to this specification shall be equivalent in all characteristics to the material that was originally approved. Prior to making any changes to a paint material approved under this specification, whether such changes affect the ability of the material to meet specified performance requirements, the supplier shall notify CNH Industrial Materials Engineering of the proposed changes. Test data, test samples and a new supplier identification code are typically required for the proposed material change. The supplier shall obtain written approval from CNH Industrial Materials Engineering prior to any production implementation of a material change. Whenever a new supplier identification code is applied to a paint material formulation new testing and approval are required.

10.2 Contact Materials Engineering for confirmation if a new material code is required.