

COLOR REQUIREMENTS AND COLOR CONTROL

1. SCOPE

1.1 This specification identifies the appearance properties (color, gloss and surface conditions) for paint materials, plastics and decals used on CNH Industrial products and parts (Table 1). Colors specific only to decals are listed in Table 2. These requirements apply to all CNH Industrial facilities and to suppliers providing parts to CNH Industrial.

1.2 Performance requirements for paint materials and finish painted parts relative to colors designated in this specification are provided in applicable CNH Industrial Material Specifications for metals plastics, and decals.

1.4 This specification replaces New Holland FNHA-2-J-005.00 Color Designation and Case MS-1 Paint, General Requirements. It does not cover surface finish acceptance criteria; continue to reference applicable sections of former CNH Industrial Company and local standards for these requirements.

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. 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 paint materials supplied to this specification.

2. DESIGNATIONS ON DRAWINGS

2.1 Color designation, performance class and corresponding part numbers must be specified on the Engineering drawing.

2.2 Figure 1 provides an example of how color and performance class may be specified on the engineering drawing. See also CNH DWGA110 for additional details related to specifying paint color and performance classes on drawings.

(Engineering Parts List directly above the Drawing Title Block)

86628054	SPECIFICATION, CL 3 PAINT PERF. STD 86628044
86609757	COLOR, AG RED STD 86628042
878xxxx	BASE PART NAME

Figure 1: Example - How to List Color and Performance Class on Drawings

3. RELATED STANDARDS

CNH DWGA110 (86641291) Requirements for Painted Parts
 CNH MAT0103 (86628044) Paint Material Requirements – Metal Parts
 CNH MAT0103Q (48158409) Approved Paint Materials for Metal Parts
 CNH MAT0103S (47406457) Process Paint Materials for Metal Parts, Supply Requirements
 CNH MAT0105 (87021657) Paint Materials on Plastic Parts, Performance Requirements
 CNH MAT0105S (87021659) Paint Materials on Plastic Parts, Initial Supply Requirements
 CNH MAT0105Q (87021658) Approved Paint Materials for Plastic Parts,
 CNH MAT0110 – 0499: Individual Paint Material or Color Specifications

ISSUED BY J. HANSEN 31MAR21	ECN NO. 35332206	NAME COLOR REQUIREMENTS AND COLOR CONTROL	
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3. RELATED STANDARDS (continued)

CNH MAT0350 (87692734) Pressure Sensitive Decal (Marking) Materials
 CNH MAT3004 (87523703) Integrally Colored Plastic (ICP) Performance Requirements
 CNH MAT3004Q (87523704) Approved Integrally Colored Plastic (ICP) Materials
 CNH MAT4501 (87556298) Substance Use Restriction
 CNH MTM0110 (86628049) Heat Resistance of Paint
 DuPont Standard Colors
 Federal Standard 595B - Colors
 Munsell Color Systems
 New Holland FNHA-4-007 (86529862) Surface Requirements
 RAL Standard Colors

4. COLOR DESCRIPTION AND DESIGNATION

TABLE 1: CNH COLOR DESIGNATIONS (Paint Material, Plastics, and Decals)

Color Description	Part Number	ID Code (Reference)	Gloss (2) 60°/20°	Color Standard-Source / Unique Spec Number (3)
Blue				
NH Blue RAL5017 STD 86628042	86575407	---	50 ±10 @ 60°	RAL 841 GL – 5017
NH Blue RAL5024 STD 86628042	87652311	---	≥90 / NA	RAL 5024
NH Blue STD 86628042 (New NH Blue)	86593620	---	≥90 / NA	Contact Materials Engineering
NH Blue M3635D STD 86628042	86505504	M-3635-D	50 ±10 @ 60°	RAL Design Series – 240-70-30
NH Blue M1639A STD 86628042	86505485	M-1639-a	≥90 / NA	RAL 841 GL – 5017
NH Medium Blue STD 86628042	86513226	NH 2AC	5 ±5 @ 60°	RAL Design Series – 240-50-40
NH Violet – Blue STD 86628042	86511865	NH-22	85 ±15 @ 60°	RAL 841 GL – 5002
Case Translucent Blue 86628042 (Warning Lights)	86629846	MS 40-22		RAL Design Series – 270-20-10
Intense Blue STD 86628042	87015898			Contact Materials Engineering
Blue Green STD 86628042	87024450	Kobelco	≥90 @ 60°	RAL Design Series – 190-60-45
Power Blue STD 86628042	84467154		≥90 @ 60°	CNH; Restricted Application (4)
Signal Violet RAL4008 STD 86628042	47675100	RAL4008	≥90 @ 60°	RAL 841 GL 4008
Ulissee Blue STD 86628042	47980894	---		Contact Materials Engineering
Red				
Ag Red STD 86628042 (Previously Case Red) ⁽¹⁾	86609757	MS-3	≥90 / ≥80	Contact Materials Engineering
NH Red STD 86628042 OBSOLETE replaced by Ag Red (86609757)	86511877 (OBSOLETE)	NH-18	≥90 / NA	Contact Materials Engineering
NH Red RAL2002 STD 86628042	86575408	---	≥90 @ 60°	RAL 841 GL – 2002
Case Translucent Red STD 86628042 (Warning Lights)	86629847	MS 40-20		RAL 841 GL – 3001
NH Terracotta STD 86628042	86505495	TA-19	≥90 @ 60°	RAL Design Series – 040-30-40
Whaler Red STD 86628042	87015899			CNH
Flame Red STD 86628042	87020911	RAL3000	≥90 / NA	RAL 841 GL – 3000
Traffic Red STD 86628042	87591055	Kobelco	≥90 @ 60°	RAL 841 GL 3020
Case Viper Red STD 86628042	51533040		≥90 @ 60°	CNH; Restricted Application (4)
CNH Metallic Terracotta 86628042	51598234		≥ 90 @ 60°	CNH; Restricted Application (4)
Yellow and Tan				
Case Power Tan STD 86628042 ⁽¹⁾	86609760	MS-42	≥90 / ≥80	Contact Materials Engineering
NH Bright Yellow STD 86628042	86572648	---	≥90 / NA	Contact Materials Engineering
NH Translucent Yellow 86628042	86643495		50 ±10 @ 60°	RAL 841 GL – 1023
Light Tan STD 86628042	86631900		50 ±10 @ 60°	Contact Materials Engineering
Yellow Mark IV STD 86628042	87024451	Kobelco	≥90 @ 60°	Contact Materials Engineering

- (1) Color requirements in individual color specifications are superseded by MAT0101 and MAT0103 color and performance requirements.
 (2) Gloss levels are minimums for paint materials unless a range is specified. For decals consult part drawings to verify proper gloss level. For integrally colored plastic (ICP) materials and parts, gloss shall meet requirements specified per CNH MAT3004.
 (3) See Section 5.2-5.5 for explanation of the method for obtaining Color Standards
 (4) Restricted Application; contact CNH Industrial Materials Engineering before specifying this color for any application.

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TABLE 1 (continued): CNH COLOR DESIGNATIONS (Paint Material, Plastics, and Decals)

Color Description	Part Number	ID Code (Reference)	Gloss ⁽²⁾ 60°/20°	Color Standard-Source / Unique Spec Number ⁽³⁾
Gray				
NH Gray RAL7043 STD 86628042	84392927	---	≤20 @ 60°	RAL 840 HR 7043
NH Gray RAL7037 STD 86628042	86603711	---	50 ± 5 @ 60°	RAL 841 GL 7037
NH Gray RAL7024 STD 86628042	86572647	---	≥90 / NA	RAL 841 GL 7024
NH Gray RAL7046 STD 86628042	87651941		≥90 / NA	RAL 840 HR 7046
NH F-H Gray STD 86628042	86570829	F/H 1:1	≥90 / NA	Federal STD 595 – 26270
Cab Interior Gray STD 86628042 Superseded	86512347 (Superseded)	NH-7D	5 ± 5 @ 60°	Superseded to Slate Gray (86629853)
Wheat STD 86628042	86614422	MS 40-26		Contact Materials Engineering
Light Wheat STD 86628042	47926201	---	≤10 @ 60°	Contact Materials Engineering
Dark Wheat RAL DS 080 30 05 STD 86628042	84403003	---	≤20 @ 60°	RAL Design Series 080 30 05
Case Graphite Gray STD 86628042 ⁽¹⁾	86609761	MS-37	≥90 / ≥80	Federal STD 595 – 26008
Case Trim Gray – Light STD 86628042	86629849	MS 40-10		RAL 840 HR 7037
Case Trim Gray Dark STD 86628042 (DuPont 45875L)	86629850	MS 40-11		RAL 840 HR 7011
Case Medium Gray 86628042, (Rubber Parts, DuPont C8439LH)	86629851	MS 40-12		RAL 840 HR 7024
Case Dawn Gray STD 86628042	86629852	MS 40-25		Federal STD 595 - 16081
Slate Gray STD 86628042	86629853	MS40-28 / RAL7015		RAL 840 HR 7015
CNH CE Gray STD 86628042	86981868		≥90 / NA	Contact Materials Engineering
CNH Dark Gray STD 86628042 (3)	84433810	MS-49	≥90 / NA	Contact Materials Engineering
CNH Gray RAL7004 STD 86628042	47406484	RAL7004	≤20 @ 60°	RAL 840 HR 7004
Fiat Anthracite 650 STD 86628042 (previously referenced as color 86629853)	47914784	---		CNH; Restricted Application (4)
Fiat Light Gray 670 STD 86628042 (previously referenced as color 47406484)	47914785	---		CNH; Restricted Application (4)
Fiat Gray 672 STD 86628042	47914787	---		CNH; Restricted Application (4)
FPT Engine Dark Gray STD 86628042	47472130	RAL7021	≥80 / NA	RAL 841 GL 7021
Light Gray STD 86628042	87591054	Kobelco	≥90 @ 60°	RAL 841GL 7042
Seat Gray STD 86628042	87037374		≤10 @ 60°	Contact Materials Engineering
8-N Gray STD 86628042	84130983		≥90 @ 60°	Contact Materials Engineering
Granite Crystal STD 86628042	47959255			CNH; Restricted Application (4)
Black				
CNH Black STD 86628042 ⁽¹⁾	86600186	M1724P/MS-45	40 ± 3 @ 60°	Contact Materials Engineering
NH Black M1724G STD 86628042	86505493	M-1724-G	20 ± 3 @ 60°	RAL 840 HR 9011
CNH Heat Resistant Black STD 86628042	86629854	MS-16		RAL 840 HR 9011 / see MAT0141(86630224)
Heat Resistant Black, High Corrosion Resistance STD 86628042	87034371			RAL 840 HR 9011 / see MAT0143(87034370)
CNH Hi Temp Ceramic Black STD 86628042	87034363			RAL 841 GL 9011 / see MAT0142(87034361)
Black RAL9005 STD 86628042	86629856	MS 40-13		RAL 840 HR 9005
Black High GL STD 86628042	87026672	Kobelco	≥90 @ 60°	RAL 841 GL 9005
Grayish Black STD 86628042	84406259	Kobelco	≥90 / NA	Kobelco (KCM)

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(3) See Section 5.2-5.5 for explanation of the method for obtaining Color Standards

(4) Restricted Application; contact CNH Industrial Materials Engineering before specifying this color for any application.

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TABLE 1 (continued): CNH COLOR DESIGNATIONS (Paint Material, Plastics, and Decals)

Color Description	Part Number	ID Code (Reference)	Gloss ⁽²⁾ 60°/20°	Color Standard-Source / Unique Spec Number ⁽³⁾
Silver and Chrome				
Case Silver STD 86628042 ⁽¹⁾	86609759	MS-19	≥50 / ≥20	Contact Materials Engineering
Star Bright Silver STD 86628042	47952775	RAL 9023		RAL 840 HR 9023
Fiat Silver STD 86628042	84467155		≥90 @ 60	CNH; Restricted Application ⁽⁴⁾
Silver Anodized STD 86628042	47425531		≤50 @ 60	CNH; Restricted Application ⁽⁴⁾
Ciclo Multichrome STD 86628042	47959258		≥125 @ 60°	CNH; Restricted Application ⁽⁴⁾
White				
NH White STD 86628042	86512107	NH-23	50 ±10 @ 60°	RAL 840 HR 9003
NH White STD 86628042 (Bianco)	86511879	TA-21	≥90 / NA	Contact Materials Engineering
Steyr White STD 86628042	86629827	MS-22-2 / RAL9018	≥80 / NA	RAL 841 GL 9018
Green and Brown				
Brown RAL8002 STD 86628042	87742366		≥90 @ 60°	RAL 841GL – 8002
NH Ginger M3605D STD 86628042	86505503	M-3605-D	50 ±10 @ 60°	RAL 840 HR 8008
NH Dryer Green STD 86628042	86511875	NH-11E	≥90 / NA	RAL Design Series – 160-60-20
NH Green M5020D STD 86628042	86505506	M-5020-D	50 ±10 @ 60°	RAL Design Series – 140-60-70
NH F-H Green STD 86628042	86529933	3258 C	85 ±15 @ 60°	RAL Design Series – 180-70-40
Green – DuPont 651D STD 86628042 Superseded	86837126 (Superseded)	MS 40-1		Superseded to Concord Green (86629861)
Case Translucent Green STD 86628042 (Warning Lights)	86629859	MS 40-19		RAL 841 GL 6005
Steiger Green STD 86628042	86629860	MS-22-1		RAL Design Series – 110-70-70
Concord Green STD 86628042	86629861	MS-22-3		RAL 841 GL 6002
Green RAL6018 STD 86628042	87742367	--	≥90 @ 60°	RAL 841GL – 6018
Orange				
NH F-H Orange STD 86628042	85804148	NH-125	≥90 / NA	RAL Design Series – 50-50-70
CNH Orange RAL2011	47362762	--	≥90 / NA	RAL 841 GL 2011
Orange STD 86628042	86570828	F/H 0.1/ RAL 2009	≥90 / NA	RAL 841 GL 2009
Red Orange RAL2008	51590935	--	≥90 / NA	RAL 841 GL 2008
Case Omaha Orange STD 86628042 (GSA Fed Std 595, Color 12246)	86630219	MS 40-14		Federal STD 595 – 12246
Case Translucent Orange STD 86628042 (Warning Lights)	86630220	MS 40-21		RAL 841 GL 2011

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TABLE 1 (continued): CNH COLOR DESIGNATIONS (Paint Material, Plastics, and Decals)

Color Description	Part Number	ID Code (Reference)	Gloss ⁽²⁾ 60°/20°	Color Standard-Source / Unique Spec Number ⁽³⁾
Safety Colors				
ANSI Safety Red STD 86628042	86505500	25093 / MS40-6	50 ± 10 @ 60°	Munsell 7.5R 4.0/14 (25093)
ANSI Safety Yellow STD 86628042	86505501	25144 / MS40-24	50 ± 10 @ 60°	Munsell 5Y 8.0/12 (25144)
ANSI Safety Orange STD 86628042	86505502	22120 / MS40-23	50 ± 10 @ 60°	Munsell 5YR 6.0/15
ANSI Safety White STD 86628042	86629835	MS40-7	50 ± 10 @ 60°	Munsell N9
Primer Colors				
Case Yellow Primer STD 86628042	86629829	MS-43	NA	Contact Materials Engineering
Case Tan Primer STD 86628042	86629830	MS-43	NA	Contact Materials Engineering
Case White Primer STD 86628042	86630221	MS-43	NA	Contact Materials Engineering
Case Red Oxide Primer STD 86628042	86629828	MS-43	NA	Contact Materials Engineering
Black Primer STD 86628042 (Previously designated Case Black Primer)	86629831	MS-43	NA	Contact Materials Engineering
Case Gray Primer STD 86628042	86629832	MS-43	NA	Contact Materials Engineering
Gray Primer STD 86628042	86837074	RAL 1015	NA	RAL 840 HR 1015
CNH Dark Gray Primer STD 86628042 (Previously designated as color 84433810) Superseded by Black Primer (86629831)	47867137 (Superseded)		NA	Superseded to Black Primer (86629831)
CNH CE Gray Primer STD 86628042	47867142		NA	Contact Materials Engineering
NH Dryer Green Primer STD 86628042	86511875	NH-11E	NA	RAL Design Series – 160-60-20
NH Taupe Primer STD 86628042	86505487		NA	Contact Materials Engineering
Conductive Primer Colors				
Case Conductive Black Primer STD 86628042	86629836	MS-47	NA	Contact Materials Engineering / see MAT0130 (86630222)
Case Conductive Gray Primer STD 86628042	86629837	MS-47	NA	Contact Materials Engineering see MAT0130 (86630222)
Textured Colors				
Textured Black, Level 5 STD 86628042	87041284			Contact Materials Engineering
Clear Top-Coats				
	84489001			CNH; Restricted Application ⁽⁴⁾
Metallic Colors				
Gray Metallic STD 86628042	87024452	Kobelco	≥80 @ 60°	Contact Materials Engineering
Granite Crystal Metallic-86628042	47959257		≥90 @ 60°	CNH; Restricted Application ⁽⁴⁾
Gunmetal Gray STD 86628042	90423670		≥90 @ 60°	Contact Materials Engineering
NH Silver Metal STD 86628042	86511866	NH-19	85 ± 15 @ 60°	Contact Materials Engineering
Sand Metallic STD 86628042	87028602		≥90 @ 60°	Contact Materials Engineering
Zinc Gold Metallic STD 86628042	87049221		≥85 @ 60°	Contact Materials Engineering

(1) Color requirements in individual color specifications are superseded by MAT0101 and MAT0103 color and performance requirements.

(2) Gloss levels are minimums for paint materials unless a range is specified. For decals consult part drawings to verify proper gloss level. For integrally colored plastic (ICP) materials and parts gloss shall meet requirements specified per CNH MAT3004.

(3) See Section 5.2-5.5 for explanation of the method for obtaining Color Standards

(4) Restricted Application; contact CNH Industrial Materials Engineering before specifying this color for any application.

TABLE 1 (continued): CNH COLOR DESIGNATIONS (Paint Material, Plastics, and Decals)

Color Description	Part Number	ID Code (Reference)	Gloss ⁽²⁾ 60°/20°	Color Standard-Source / Unique Spec Number ⁽³⁾
Service Colors				
Case Power Red STD 86628042	86629838	MS-24/MS-2		RAL 841 GL 2002
Ag Red STD 86628042 (Previously Case Red) ⁽¹⁰⁾	86609757	MS-24/MS-3	≥90 / ≥80	Contact Materials Engineering
Case Power Tan STD 86628042	86609760	MS-24/MS-42		Contact Materials Engineering
Case Silver STD 86628042	86609759	MS-24/ MS-19		Contact Materials Engineering
Case Graphite Gray STD 86628042	86609761	MS-24/ MS-37		Contact Materials Engineering
Case Brown STD 86628042	86629839	MS-24/ MS-44		RAL 841 GL 8016
Case Black STD 86628042	86600186	MS-24/ MS-45		Contact Materials Engineering
Case Power White STD 86628042	86629842	MS-24/ MS-7		RAL 841 GL 9001
Case Power Yellow STD 86628042	86629843	MS-24/MS-11		Munsell 5YR6 10
Case Concord Green STD 86628042	86629844	MS-24/MS22-3		RAL 841 GL 6002
Case Desert Sunset STD 86628042	86629845	MS-24/ MS-6		Contact Materials Engineering
Case Gray Primer STD 86628042	86629832	MS-24/ MS 43		Contact Materials Engineering
Case Red Oxide Primer STD 86628042	86629828	MS -24/ MS-43		Contact Materials Engineering
Non-CNH Colors				
Gehl Red STD 86628042	86544595	GR	≥90 / NA	RAL 841 GL 3001
Gehl Gray STD 86628042	86544596	GG	≥90 / NA	Munsell 7.5YR3 5
Miller Ag Bag Blue STD 86628042	48134827		≥90 @ 60°	CNH Restricted Application ⁽⁴⁾
Miller Nitro Red STD 86628042	48134839		≥90 @ 60°	Contact Materials Engineering
Miller Gloss Black STD 86628042	48134840		≥90 @ 60°	Contact Materials Engineering
Sumitomo Red STD 86628042	87047471	LinkBelt	≥90 @ 60°	RAL 841 GL 3013
Sumitomo Gray STD 86628042	87047472	LinkBelt	≥90 @ 60°	RAL 841 GL 7044
Sunbelt Rental Green 86628042	86587683		≥90 @ 60°	RAL Design Series – 150-50-60
Special Order Colors				
WT 0069 Vancouver WHITE 86628042	86837096	WT 0069		Contact Materials Engineering
WT 0619 New port WHITE 86628042	86837097	WT 0619		RAL 841 GL 9001
WT 5638 Virginia ORANGE 86628042	86837098	WT 5638		RAL 841 GL 2000
WT 5651 Colorado ORANGE 86628042	86837099	WT 5651		RAL 841 GL 2010
YELLOW STD 86628042 (Industrial Yellow)	86505488	M 5771A		Contact Materials Engineering
WT 6020 Alabama YELLOW 86628042	86837100	WT 6020		Contact Materials Engineering
WT 6113 Carolina YELLOW 86628042	86837101	WT 6113		RAL 841 GL 1037
WT 6642 Airport YELLOW 86628042	86837102	WT 6642		RAL Design Series – 085-80-60
NY Yellow 86628042 (New York Yellow)	86639766	217223 (PPG)		Contact Materials Engineering
WT 6675 SB YELLOW 86628042	86837125	WT 6675		Contact Materials Engineering
WT 6684 School Bus Yellow 86628042	85805527	WT 6684		Contact Materials Engineering
26280 Lincoln GREY 86628042	86837103	26280		Contact Materials Engineering
WT 5185 Kansas ORANGE 86628042	86837104	WT 5185		RAL 841 GL 2002
Bright YELLOW STD 86628042 (NH Bright Yellow)	86572648			Contact Materials Engineering
WT 7600 Lime YELLOW 86628042	86837105	WT 7600		RAL Design Series – 095-80-70
WT 6695 NC Yellow STD 86628042	85805526	WT 6695		RAL 841 GL 1023
White STD 86628042	85805524	RAL9010		RAL 841 GL 9010
WT 0071 New York WHITE STD 86628042	86837927	WT 0071		RAL 841 GL 1001
Orange RAL2004 STD 86628042	87324880	RAL2004	≥90 @ 60°	RAL 841 GL 2004
WT 3029 Desert Brown STD 86628042	47368294	WT 3029		Contact Materials Engineering
Indiana Yellow STD 86628042	47395709		≥90 @ 60°	Contact Materials Engineering
Illinois Orange STC 86628042	47395882		≥90 @ 60°	Contact Materials Engineering
Alaska School Bus Yellow STC 86628042	47395883		≥90 @ 60°	Contact Materials Engineering

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- (3) See Section 5.2-5.5 for explanation of the method for obtaining Color Standards
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The colors in Table 2 are only applicable for use with decals.

TABLE 2: CNH COLOR DESIGNATIONS (Specific to Decals Only)

Color Description	Part Number	ID Code (Reference)	Gloss ⁽¹⁾ 60°/20°	Color Standard-Source / Unique Spec Number ⁽²⁾
Decal Only Colors				
Brushed Chrome STD 86628042	86631901		≥125 @ 60°	Contact Materials Engineering
Frosted Chrome STD 86628042	90450604			Contact Materials Engineering
Mirror Chrome STD 86628042	87037572			Contact Materials Engineering
Vent Gray STD 86628042	90450612		≥70 @ 60°	Contact Materials Engineering
Dark Red STD 86628042	90450606		≥70 @ 60°	Contact Materials Engineering
Light Red STD 86628042	90450609		≥70 @ 60°	Contact Materials Engineering
Dark Yellow STD 86628042	90450610		≥70 @ 60°	Contact Materials Engineering
Light Yellow STD 86628042	90450611		≥70 @ 60°	Contact Materials Engineering
White Reflective STD 86628042	86632227		≥90 / NA	Contact Materials Engineering
CNH Tri-Stripe White STD 86628042	48034860			Contact Materials Engineering

(1) For decals consult part drawings to verify proper gloss level.

(2) See Section 5.2-5.5 for explanation of the method for obtaining Color Standards

5.0 COLOR CONTROL, SOURCES, DISTRIBUTION

5.1 COLOR PANEL CONTROL

5.1.1 The responsibility for CNH color panels (color masters and color standards) shall be with the CNH Industrial Materials Engineering group. They have worldwide responsibility for the manufacture, color matching, inventory, distribution, and tracking of CNH color panels. See Diagram 1, which illustrates the basic steps involved in new and ongoing color control and provides contact information to request CNH color control panels.

5.1.2 The color masters and color standard panels shall be of minimum size of 50 X 100 mm (2 X 4 inches). The panel can be made of steel, plastic, durable paper, or cardboard. Panels shall be large enough to provide enough viewing area to compare the color of the color panel to an actual CNH Industrial product to determine if there is a visual color match. These panels may also be measured with a color spectrophotometer and be used as a standard reference. Color panels shall be stored in an enclosure to protect the panel from abrasion or excessive exposure to light. Freezer storage -20°C(-4°F) of color panels to prevent deterioration is recommended.

5.1.3 The color components of the color control panel shall be in a resin base, which minimizes the loss of the gloss, and shall maintain the color for an extended period. This resin base shall be primarily in the form of paint. A mixture of predetermined pigments shall be blended into the resin base to create the color coating of the panel. The resin base and pigment combination shall have an aging durability of at least 2.0 years exposure in Florida and shall meet or exceed applicable performance Class 3 requirements. Color panels shall have a life expectancy of 5 years from the time of manufacture and shall be replaced or re-certified at the time of expiration. Color panels that are re-certified will obtain a time extension of no more than 2 years from the previous expiration date.

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5.1.4 The color panel shall duplicate a gloss level as determined from the initial color sample. The deviation in gloss on the color panel shall be less than $\pm 3\%$. Color panels are evaluated for acceptance by comparison to the color electronic centroid. Color master panels shall have a Delta E of 0.200 or less from the original color centroid. Color standard panels shall have a Delta E of 0.200 to 0.400 from the original color centroid. Color is measured in D 65 light, 10° observer, specular UV component included, large area of view and aperture on CIE Lab coordinates. Gloss is excluded from this reading.

5.2 CNH COLOR PANELS

5.2.1 CNH color panels are developed and available for primary brand identity colors and limited unique colors including certain metallic colors. Colors with CNH color panels are identified in Table 1 column 5 with the "CNH" code. All other colors in Table 1 are controlled with industry standard color systems as indicated in column 5.

5.2.2 The CNH Industrial Materials Engineering group will maintain a library of CNH color panels and has sole responsibility for the distribution of these color panels to authorized personnel upon request.

5.2.3 CNH color panels are available through, the Color Engineer, CNH Industrial Materials Engineering group, see Diagram 1. The Color Engineer is responsible to control and track the distribution of all CNH color panels. Remote locations may be established to assist with distribution of CNH color panels.

5.3. INDUSTRY COLOR STANDARDS

Industry color standard codes for secondary CNH colors are identified in Table 1 column 5. These colors will be compared to the designated industry standard for color match and control in CNH Industrial applications. Industry color standards used are RAL, Federal and Munsell. CNH Industrial facilities, groups and suppliers must purchase these industry standards for color control. Information to obtain these designated color standards in Table 1 is available over the internet from the following sources. Contact CNH Industrial Materials Engineering for assistance if necessary.

- RAL Color Standards
North America: www.dorncolor.com
Rest of World: <https://www.ral-umwelt.de/>
- Federal Color Standards
All locations: www.fed-std-595.com
- Munsell Colors
All locations: www.xrite.com/top_munsell.aspx?action=products&CategoryID=22&Type=Parent

5.4 COLORS WITH NO INDUSTRY STANDARD

Where "Contact Materials Engineering" is indicated for a color in Table 1 column 5, no industry color standard or CNH color master is readily available. For these colors contact CNH Industrial Materials Engineering for assistance.

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5.5 CNH COLOR MASTER PROCESS

5.5.1 After receiving the original color sample, the CNH Industrial Materials Engineering group shall determine the electronic color centroid, assign a color control part number and submit a color sample to the manufacturer of the CNH color master. The manufacturer shall measure the original color master and develop the color formula within the criteria specified in section 5.1. The color shall be blended so that the color variation shall be less than 0.20 Delta E from top to bottom or from side to side. Visible metamerism is not permitted for a color sample when observed under CIE Illuminant light sources: D65, daylight; A-10, incandescent; and F02-10, (CWF) cool white fluorescent. After the product has been produced, the CNH color master standards shall be submitted to CNH Industrial Materials Engineering group for evaluation.

5.5.2 CNH Industrial Materials Engineering shall evaluate the prepared CNH color master standards. If approval is granted, the approval shall be provided in writing and a copy retained with a CNH color master for future reference.

5.5.3 For the manufacture of future batches of CNH color masters it is recommended that the color match should be in the same color quadrant as the original color master batch. Future batches shall be within 0.20 Delta E of the original CNH color master centroid.

5.5.4 A label shall be affixed to the backside of the prepared color master and color standard panels and shall contain information similar to that seen in Figure 2. All CNH color panels shall have serial numbers for identification and record keeping.

COLOR MASTER				
	Centroid	Color Chip	Difference	
Wheat	L* 43.660	43.610	-0.060	
PN: 86614422	a* 1.270	1.300	0.030	
SN: 42200176	b* 5.370	5.300	-0.070	
Gloss:	N/A	Delta E*	0.100	
Measurement System: CIE LAB D65/10* included, Spherical				
Production Date:	10/30/2013	Expiration Date:	10/30/2018	
Product Code:	PPG SPU76120			
CNH Industrial 200 George C. Delp Rd. New Holland Pa. 17557-0903				


COLOR STANDARD				
	Centroid	Color Chip	Difference	
Wheat	L* 43.660	43.870	0.210	
PN: 86614422	a* 1.270	1.250	-0.020	
SN: 42200177	b* 5.370	5.370	0.000	
Gloss:	N/A	Delta E*	0.210	
Measurement System: CIE LAB D65/10* included, Spherical				
Production Date:	10/30/2013	Expiration Date:	10/30/2018	
Product Code:	PPG SPU76120			
CNH Industrial 200 George C. Delp Rd. New Holland Pa. 17557-0903				

FIGURE 2: Label Types for Color Master and Color Standard Panels

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5.6 PRODUCTION COLOR APPROVAL

5.6.1 Color verification of initial batches shall be performed on all colored parts, whether painted or integrally colored (e.g. Plastic). For a painted part, hide shall be determined prior to having any color check. After hide is determined, then the thickness of paint to provide hide plus 1.0 mils (0.001 inches), (0.0254 mm) shall be applied to the color test panel and both visual and spectrophotometer color shall be evaluated.

5.6.2 Labeled Color Master or Standard panels provided by CNH Industrial Materials Engineering, or Industry Standards are the only allowable standards to be used for color development, matching, or verification for both numeric and visual evaluation.

DIAGRAM 1
CNH Industrial COLOR CONTROL FLOW DIAGRAM
