

**2012 Guideline for
Assignment of Refrigerant
Container Colors**



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and Refrigeration Institute**

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IMPORTANT

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Note:

This standard supersedes AHRI Guideline N-2008.

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ASSIGNMENT OF REFRIGERANT CONTAINER COLORS

Section 1. Purpose

1.1 Purpose. The purpose of this guideline is to establish assignment of refrigerant container colors; definitions; basic considerations for developing the color guideline; and assignment criteria.

1.1.1 Intent. This guideline is intended for the guidance of the industry, including manufacturers, engineers, installers, contractors and users.

1.1.2 Review and Amendment. This guideline is subject to review and amendment as technology advances.

Section 2. Scope

2.1 Scope. This guideline provides a means by which colors can be assigned to refrigerant containers for Refrigerants currently in use or newly developed Refrigerants, provided the Refrigerant is used in significant quantities as defined in this guideline. Colors should not be relied upon exclusively to determine the type of Refrigerant in the container.

This guideline also recommends a container color for Refrigerants that are not produced in sufficient quantities to qualify for their own individual color.

2.2 Exclusions. This guideline does not cover container colors for recovered and recycled Refrigerants, which are covered in AHRI Guideline K, *Containers for Recovered Fluorocarbon Refrigerants*.

Section 3. Definitions

All terms in this document follow the standard industry definitions in the current edition of *ASHRAE Terminology of Heating, Ventilation, Air Conditioning, and Refrigeration* unless otherwise defined in this section.

3.1 Refrigerants. Refrigerants for purposes of this guideline include single component refrigerants, zeotropes and azeotropes.

3.1.1 Flammable Refrigerants. Those Refrigerants that receive a flammability rating of 2 or 3 in ANSI/ASHRAE Standard 34, *Designation and Safety Classifications of Refrigerants* with Addenda.

3.1.2 High Pressure Refrigerants. Those Refrigerants meeting the definition of a compressed gas. The gas should have a minimum cylinder service pressure exceeding 500 psig.

3.1.3 Liquid Refrigerants. Those Refrigerants with a normal boiling point greater than 68°F. These products normally are packaged in drums.

3.1.4 Low Pressure Refrigerants. Those Refrigerants meeting the definition of a “compressed gas.” The gas should have a minimum cylinder service pressure not exceeding 500 psig.

3.2 "Should." "Should" is used to indicate provisions which are not mandatory but which are desirable as good practice.

Section 4. Basic Considerations for Developing the Color Guideline

4.1 The color guideline is not a substitute for reading cylinder labels and markings.

4.2 Refrigerants are grouped in four classes in order to create more color opportunities within readily identifiable container styles and to clearly differentiate Flammable Refrigerants.

Class I: Liquid Refrigerants.

Class II: Low Pressure Refrigerants.

Class III: High Pressure Refrigerants.

Class IV: Flammable Refrigerants.

- 4.3 The color guideline should allow for the addition of new Refrigerants in each of the above classes.
- 4.4 Color codes only need to be differentiated within a class. Consideration should be given to the application before assigning colors to the Refrigerant.
- 4.5 Colors should be distinguishable from each other.
- 4.6 The color guideline should be standard industry-wide.
- 4.7 Color option should minimize container painting costs.
- 4.8 A red band on the shoulder or top of the container should designate flammable compounds, or mixtures that could become flammable in the event of a leak.
- 4.9 Refrigerants that are not produced in sufficient quantities to qualify for their own individual color should be painted light green gray (PMS 413).

Section 5. Assignment Criteria

- 5.1 The Refrigerant manufacturer should notify AHRI of its intent to use a color not previously assigned for that Refrigerant class to a new Refrigerant they plan to commercialize within six months. The manufacturer requesting a specific PMS color assignment for that new Refrigerant should also provide a corresponding RAL K5 classic number. If the manufacturer does request a specific PMS color and or RAL K5 classic number, AHRI will assign them.
- 5.2 In order to retain assignment of the color, the manufacturer should furnish confirmation to AHRI that:
 - 5.2.1 A Refrigerant number has been published in ANSI/ASHRAE Standard 34, *Designation and Safety Classifications of Refrigerants* with Addenda.
 - 5.2.2 There have been commercial sales and will be continued offering of the Refrigerant within one year of assignment.
 - 5.2.3 There have been commercial sales of at least 100,000 lbs. per year for Class I and Class II Refrigerants or 2,000 lbs. per year for Class III Refrigerants within two years of assignment. Commercial sales of Class IV Refrigerants should be consistent with commercial volumes which would be required if it were a non-flammable Refrigerant.
- 5.3 If the manufacturer who originally requested and obtained the use of a color falls below the levels established in Section 5.2, that manufacturer should notify AHRI. At that point, AHRI will survey all manufacturers to determine whether a composite volume of all the manufacturers supports continued use of the color and meets the criteria in Section 5.2. If not, the color should be provisionally returned to the color pool with a five year period allowed for clearing existing inventories.
- 5.4 In the case where a color has been provisionally returned to the color pool, the manufacturer should package new production in a generic Refrigerant color using a label to indicate the previously assigned color.
 - 5.4.1 In the event a color is provisionally returned to the color pool, AHRI will notify all AHRI member companies and then disseminate that information to the "trade press" through an AHRI press release and other appropriate measures.
 - 5.4.2 When a color has been provisionally returned to the color pool, notification has been made, and if the total sales volume falls below the criteria established in Section 5.2.3, then the color by vote of AHRI will be returned to the pool of unassigned colors.

Table 1. Refrigerant Container Color & Class

REFRIGERANT COLORS	PMS #	11	12	13	13B1	14	2	23	113	114	116	123	124	125	134a	236fa	245fa	401A	401B	401C	402A
White	NONE		II																		
Orange	021	I																			
Yellow	109																				
Yellow - Brown (Mustard)	124					III													II		
Yellow - Orange	128																				
Cream	156																				
Pinkish-Red (Coral)	177				III														II		
Red (DOT Red)	185	FOR FLAMMABLE REFRIGERANT IDENTIFICATION WHEN USED WITH PRIMARY CONTAINER COLOR																			
Maroon	194																	II			
Medium Purple (Purple)	248																				
Light Purple (Lavender)	251																				
Dark Purple (Violet)	266								I												
Royal Blue	286																				
Wedge Wood Blue	292																				
Dark Blue (Navy)	302									II											
Blue-Green (Teal)	326																				
Deep Green (DOT Green)	335												II								
Light Green	352						II														
Green	354																				
Lime Green	368																				
Green-Yellow -White	373																				
Green-Yellow	375																				
Yellow -Green (Lime)	381																				
Green-Brown (Olive)	385																				
Dark Grey (Battleship)	424										III					II					
Light Blue-Grey	428							III				I									
Light Brown (Sand)	461																				II
Medium Brown (Tan)	465													II							
Dark Brown (Chocolate)	450																				
Medium Brown (Brown)	471																				
Rose	507																				
Blue Jay	2727																				
Light Blue (Sky)	2975			III											II						
Medium Blue (Blue)	2995																				
Deep Blue	3015																				
Blue-Green (Aqua)	3268																				II
Green-Blue (Jungle Green)	3405																				
Beige	4545																				

PMS = Pantone® Matching System, an international printing, publishing and packaging color language.

CLASS I LIQUIDS

Normal boiling point greater than 68F. These products are normally packaged in drums.

CLASS II LIQUIDS

Low Pressure Refrigerants: These Refrigerants meeting the definition of a "compressed gas. The gas should have a minimum cylinder service pressure not exceeding 500 psig.

Table 1. Refrigerant Container Color & Class (continued)																				PMS #									
402B	403B	404A	407A	407B	407C	407D	407F	408A	409A	410A	411A	411B	413A	414A	414B	416A	417A	422A	422D	423A	427A	437A	438A	500	502	503	507A	508B	
																													NONE
		II																											021
																									II				109
																													124
																		II											128
				II																									156
																													177
FOR FLAMMABLE REFRIGERANT IDENTIFICATION WHEN USED WITH PRIMARY CONTAINER COLOR																													
																													185
																													194
								II																					248
II																										II			251
											IV																		266
																							II						286
																						II							292
																											III		302
											IV																II		326
																													335
																													352
																	II												354
		II																											368
							II																						373
																						II							375
																	II												381
II																													385
																													424
																													428
																													461
									II																				465
						II																							450
					II																								471
										II																			507
																								II					2727
															II														2995
											II																		3015
																										III			3268
																						II							3405
												II																	4545
CLASS III LIQUIDS																													
High pressure Refrigerants: These Refrigerants meeting the definition of a compressed gas.																													
The gas should have a minimum cylinder service pressure exceeding 500 psig.																													
CLASS IV LIQUIDS																													
Flammable Refrigerants.																													

Table 2. PMS/RAL Color System			
Refrigerant Color	PMS #	Possible RAL K5 Classic #	RAL Color Description
White			
Orange	21	2004	Pure Orange
Yellow	109	1018	Zinc Yellow
Yellow-Brown (Mustard)	124	1003	Signal Yellow
Yellow-Orange	128	1021	Rape Yellow
Cream	156	1034	Pastel Yellow
Pinkish-Red (Coral)	177	3017	Rose
Red (DOT Red)	185	3020	Traffic Red
Maroon	194	4002	Red Violet
Medium Purple (Purple)	248	4006	Traffic Purple
Light Purple (Lavender)	251	4009	Pastel Violet
Dark Purple (Violet)	266	4007	Purple Violet
Royal Blue	286	5005	Signal Blue
Wedge Wood Blue	292	5012	Light Blue
Dark Blue (Navy)	302	5019	Capri Blue
Blue-Green (Teal)	326	5018	Turquoise Blue
Deep Green (DOT Green)	335	6032	Signal Green
Light Green	352	6019	Pastel Green
Green	354	6001	Emerald Green
Lime Green	368	Note ¹	Note ¹
Green-Yellow-White	373	No match available	No match available
Green-Yellow	375	No match available	No match available
Yellow-Green (Lime)	381	No match available	No match available
Green-Brown (Olive)	385	6003	Olive Green
Dark Grey (Battleship)	424	7023	Concrete Grey
Light Blue-Grey	428	7035	Light Grey
Light Brown (Sand)	461	1002	Sand Yellow
Medium Brown (Tan)	465	1001	Beige
Dark Brown (Chocolate)	450	6014	Yellow Olive
Medium Brown (Brown)	471	8023	Orange Brown
Rose	507	3015	Heather Violet
Blue Jay	2727	5014	Pigeon Blue
Light Blue (Sky)	2975	5012	Light Blue

Table 2. PMS/RAL Color System (continued)			
Refrigerant Color	PMS #	Possible RAL K5 Classic #	RAL Color Description
Medium Blue (Blue)	2995	5015	Sky Blue
Deep Blue	3015	5017	Traffic Blue
Blue-Green (Aqua)	3268	5021	Water Blue
Green-Blue (Jungle Green)	3405	6024	Traffic Green
Beige	4545	8024	Beige Brown
Note 1: No match provided due to conflict with the European Cylinder Gas Identification Standard EN 1089-3. RAL = <i>Reichsausschuß für Lieferbedingungen und Gütesicherung</i> " = State Commission for Delivery Terms and Quality Assurance			

APPENDIX A. REFERENCES – NORMATIVE

None.

APPENDIX B. REFERENCES – INFORMATIVE

B1 Listed here are standards, handbooks and other publications which may provide useful information and background, but are not considered essential. References in this appendix are not considered part of the guideline.

B1.1 AHRI Guideline K-2009, *Containers for Fluorocarbon Refrigerants*, 2005, Air-Conditioning, Heating and Refrigeration Institute, 2111 Wilson Blvd., Ste. 500, Arlington, VA 22201, U.S.A.

B1.2 ANSI/ASHRAE Standard 34-2010, *Designation and Safety Classifications of Refrigerants*, 2007, with Addenda, American Society of Heating, Refrigerating and Air-Conditioning, Inc., 1791 Tullie Circle, N.E., Atlanta, GA 30329, U.S.A.

B1.3 ASHRAE *Terminology of Heating, Ventilation, Air-Conditioning, and Refrigeration*, Second Edition, 1991, American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., 1791 Tullie Circle, N.E., Atlanta, GA 30329, U.S.A.

B1.4 Pantone Color Matching System, Pantone Inc., 590 Commerce Boulevard, Carlstadt, New Jersey 07072-3098, U.S.A.

B1.5 Title 49 CFR, Code of Federal Regulations, October 1, 2001, Office of the Federal Register, National Archives and Records Administration, 800 North Capitol Street, NW, Washington, DC 20402, U.S.A.