Using the API Color-Symbol System to Identify Equipment, Vehicles, and Transfer Points for Petroleum Fuels and Related Products at Dispensing and Storage Facilities and Distribution Terminals

API RECOMMENDED PRACTICE 1637
PROPOSED FOURTH EDITION, XXXXXX 2019

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Introduction

This edition of RP 1637 includes the addition of color-symbols for renewable fuels and petroleum/renewable fuel blends at dispensing facilities and distribution terminals, as well as diesel exhaust fluid (DEF). The previous edition introduced color-symbols for oxygenated and alcohol-based fuels, used oil, and monitoring or observation well identification (as established in API Recommended Practice 1615). As a result, the color-symbol system has been updated to reflect these changes.
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Using the API Color-Symbol System to Identify Equipment, Vehicles, and Transfer Points for Petroleum Fuels and Related Products at Dispensing and Storage Facilities and Distribution Terminals

1 Scope and Purpose

1.1 Scope

This recommended practice standardizes a system for identifying, with colors and symbols, transfer points and equipment for loading and unloading of petroleum fuels and related products.

1.2 Purpose

1.2.1 This recommended practice establishes a uniform and easy-to-understand identification system that facilitates petroleum industry operations. Such a system helps prevent mixing of multiple products, as set forth in Section 1.3, Included Products.

1.2.2 The principal purpose of this color-symbol system is to clearly identify critical equipment to help prevent errors in product handling. Personnel who handle products should be familiar with any identification and color-symbol system used to designate products.

1.3 System Design

1.3.1 This recommended practice describes a color-symbol system that facilitates easy identification of products by means of colors, symbols and/or graphics, and text designations. The following additional measures may be used to implement this system:

1) Charts may be used to identify permanent locations of products at a facility (e.g. storage tank, loading arm, etc.).

2) Stencils, decals, or metal or plastic tags may be used to identify product names on equipment.

1.3.2 Names or product code numbers are helpful when a program is initiated, but these should be used as secondary means of identification. Many names contain words common to other products, which can result in incorrect identification; for example, unleaded products may be super unleaded, regular unleaded, or either of these with an extender such as ethanol. Company names and product code numbers may be used wherever they are needed to supplement the color-symbol system.

1.4 Included Products

The following products are covered by this recommended practice.

1.4.1 Gasoline

1.4.1.1 Gasoline containing 100 % by volume hydrocarbon is sometimes referred to as “E0,” “conventional fuel” or “recreational fuel.”

1.4.1.2 Gasoline containing up to 10% by volume ethanol. Gasoline grades may be identified with the terminology referenced in NIST Handbook 130, Table 1 of the Uniform Fuels and Automotive Lubricants Regulations, often referred to as regular, midgrade and premium.

1.4.1.3 Gasoline containing up to 12.5 % to 16.0 % isobutyl alcohol.
1.4.2 Racing Fuels

1.4.2.1 Racing fuel containing 100% by volume hydrocarbon.

1.4.2.2 Racing fuel containing up to 10% by volume ethanol.

1.4.3 Ethanol Blends

1.4.3.1 Gasoline containing greater than 10% by volume ethanol. This includes E15 and E85.

1.4.3.2 Racing fuel containing greater than 10% by volume ethanol.

1.4.4 Diesel Fuel

1.4.4.1 On-road diesel (ULSD) containing up to 5% biodiesel including premium diesel fuel.

1.4.4.2 On-road diesel containing greater than 5% by volume biodiesel.

1.4.4.3 Off-road diesel (dyed red) containing up to 5% biodiesel.

1.4.4.4 Off-road diesel containing greater than 5% by volume biodiesel.

1.4.4.5 Biodiesel including B100/B99.9.

1.4.4.6 Renewable diesel - Biomass based hydrocarbon fuel replacement for diesel fuel.

1.4.5 Diesel Exhaust Fluid (DEF)

1.4.5.1 Automotive-grade DEF (also referred to as AUS 32, ARLA32).

1.4.5.2 Marine-grade DEF (also referred to as AUS 40).

1.4.6 Fuel Oil/Heating Fuel

1.4.6.1 No. 1 fuel/heating oil.

1.4.6.2 No. 2 fuel/heating oil.

1.4.6.3 Bio fuel oil.

1.4.6.4 Kerosene (includes up to 5% bio content).

1.4.7 Other

1.4.7.1 Used oil.

1.4.7.2 Observation/monitoring wells.

1.4.7.3 Vapor recovery (stage 1 only).

1.4.7.4 Denatured ethanol.
1.5 Excluded Products

The color-symbol system described in this recommended practice does not cover aviation fuels. Color-symbol systems for aviation fuels are described in EI Standard 1 1542.

2 Normative References

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any addenda) applies.

AMS Standard 595A², Colors Used in Government Procurement

API RP 1615, Installation of Underground Petroleum Storage Systems

40 CFR³, Part 279, Standards for the Management of Used Oil

NIST Handbook 130, Uniform Laws and Regulations in the Areas of Legal Metrology and Fuel Quality

3 Color-Symbol System

3.1 General (See Figure 1)

For this color-symbol system easily distinguishable colors are used; this system attempts to define color shades, using the Aerospace Material Specification-Standard 595A (AMS 595A COLOR Standard) - formerly Federal Standard 595C colors, to provide consistency in product identification. AMS 595A COLOR Standard colors are used as a reference only. Superimposed alphanumeric designations for product names are used to further distinguish products. See Figure 1, Equipment Color-Symbol System Table, which includes visual examples and lists the color and symbol designations for each product including the AMS Standard 595A colors and symbol descriptions. AMS 595A Standard referenced colors or equivalent shall be used for this color-symbol system.

3.2 Gasoline E10

The color-symbol system does not attempt to classify all the gasoline manufactured by all the companies that operate refineries. The color-symbol system provides for three grades of E10 gasoline as follows:

a) Regular (less than or equal to 87 AKI octane): White and a collar or permanent label that states “Regular E10 Gasoline”.

b) Midgrade (87 to 89 AKI octane): Blue (AMS-STD 15056) and a collar or permanent label that states “Midgrade E10 Gasoline”.

c) Premium (90 to 95 AKI octane): Red (AMS-STD 21105) and a collar or permanent label that states “Premium E10 Gasoline”.

3.3 Gasoline E0

The color-symbol system provides for three E0 gasoline grades as follows:

---

¹ Energy Institute, 61 New Cavendish Street, London W1G 7AR UK, info@energyinst.org
² Published by SAE International, available online from https://saemobilus.sae.org/content/AMSSTD595A
3.4 Gasoline with Alternative Blends

The color-symbol system provides for isobutanol blend fuels as follows:

Isobutanol blend fuels (12.5 \% to 16\% isobutyl alcohol): Blue (AMS-STD 15056) background and yellow (AMS-STD 23655) lettering “IB”, centered and legible, and a collar or permanent label that states “Isobutanol Blend Midgrade Gasoline”.

3.5 Racing Fuel

The color-symbol system provides for two racing fuels as follows:

a) E0 Racing fuels: Pink (AMS-STD 31638) background with a black “0” (centered and legible) and a collar or permanent label that states “Regular Racing Fuel”.

b) E10 Racing fuels (containing up to 10\% ethanol): Pink (AMS-STD 31638) background and a collar or permanent label that states “E10 Racing Fuel”.

3.6 Ethanol Blends

The color-symbol system provides for ethanol blended fuel containing greater than 10 volume percent ethanol as follows:

a) E15 (15\% ethanol): Copper (AMS-STD 10075) background with black lettering “E15” and a collar or permanent label that states “E15 Regular, Midgrade or Premium Fuel”.

b) Other Grades: Copper (AMS-STD 10075) background with a black “EXX,” where “XX” is the ethanol percentage and a collar or permanent label that states “EXX Regular, Midgrade or Premium Fuel”.

c) E85 (85\% ethanol): Copper (AMS-STD 10075) background with black lettering “E85” and a collar or permanent label that states “E85 Fuel”.

3.7 Diesel Fuel

The color-symbol system provides for diesel fuels as follows:

a) On-road (ULSD) <5\% biodiesel: Yellow (AMS-STD 23655) and a collar or permanent label that states “On-road ULSD <5\% Biodiesel”.

b) On-road (ULSD) >5\% biodiesel: Yellow (AMS-STD 23655) background with black symbols EXX where “XX” is the biodiesel % and a collar or permanent label that states “On-road (ULSD) XX \% Biodiesel”.

c) Off-road (dyed red) <5\% biodiesel: Yellow (AMS-STD 23655) background with red (AMS-STD 21105) symbols “OFF” and a collar or permanent label that states “Off-Road (dyed red) <5\% Biodiesel”.

a) Regular (less than or equal to 87 AKI octane): White with a black “0” and a collar or permanent label that states “Regular E0 Gasoline”.

b) Midgrade (87 to 89 AKI octane): Blue (AMS-STD 15056) with a white “0” and a collar or permanent label that states “Midgrade E0 Gasoline”.

c) Premium (90 to 95 AKI octane): Red (AMS-STD 21105) with a white “0” and a collar or permanent label that states “Premium E0 Gasoline”.

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d) Off-road (dyed red) > 5% biodiesel: Yellow (AMS-STD 23655) background with the red (AMS-STD 21105) symbols “OFF” and the black symbol “B” followed by “2 digit %” i.e. “B15” and a collar or permanent label that states “Off-road (dyed red) XX% Biodiesel”.

e) Biodiesel – B100/B99.9: Light blue (AMS-STD 35450) background and a collar or permanent label that states “Biodiesel-B100/B99.9”.

f) Renewable diesel: Turquoise (AMS-STD 27769) background and a collar or permanent label that states “Renewable Diesel”.

3.8 Diesel Exhaust Fluid

The color-symbol system provides for diesel exhaust fluids as follows:

a) Automotive-grade DEF (also referred to as AUS 32, ARLA32): Cobalt blue (AMS-STD 35056) and a collar or permanent label that states “DEF” or “AUS 32”, or “ARLA32”)

b) Marine-grade DEF (AUS 40): Cobalt blue (AMS-STD 35056) background with a white “M” and a collar or permanent label that states “Marine-DEF” or “AUS 40”.

3.9 Fuel Oil/ Heating Fuels

The color-symbol system provides for fuel oils and heating fuels as follows:

a) No. 1 fuel oil: Dark green (AMS-STD 14062) background with a black “1” and a collar or permanent label that states “No. 1 Fuel Oil”.

b) No. 2 fuel oil: Dark green (AMS-STD 14062) background with a black “2” and a collar or permanent label that states “No. 1 Fuel Oil”.

c) Bio fuel oil: Dark green (AMS-STD 14062) background with a black “BXX-X,” where “XX” is the biofuel % and “X” is the fuel grade 1 or 2 and a collar or permanent label that states “XX% No. X Bio Fuel Oil”.

d) Kerosene: Brown (AMS-STD 10049) background and a collar or permanent label that states “Kerosene”.

3.10 Used Oil

U.S. EPA’s Used Oil Management Standards (40 Code of Federal Regulations, Section 279) provide additional labeling requirements for used oil storage at generator, transfer, or processing and refining facilities. The color-symbol system provides for used oils as follows:

a) Used oil: Light gray (AMS-STD 16473) background and a collar or permanent label that states “Used Oil”.

3.11 Observation/Monitoring Wells

Consistent with API Recommended Practice 1615, the color-symbol system provides for monitoring or observation wells as follows:

a) Monitoring or observation wells: Black equilateral triangle on a white background.

3.12 Vapor Recovery

The color-symbol system provides for vapor-recovery connections and manholes as follows:
a) Vapor-recovery connections and manholes: Orange (AMS-STD 38903) background and a permanent label that states “Vapor Recovery”.

3.13 Denatured Ethanol

The color-symbol system provides for denatured Ethanol as follows:

a) Purple (AMS-STD 17100) background and a permanent label that states, “Denatured Ethanol”.

4 System Application

4.1 General

4.1.1 Equipment should be marked with one large symbol or several small ones. Bands shall be used for rounded surfaces, such as on pipelines and loading arms fill or other access points. Fill or access points are circular or rectangular steel or composite covers that provide access to grade level or aboveground connections such as fill pipes, vapor recovery and observation or monitoring wells. Access points can also be referred to as fill boxes, manholes or curb boxes and include spill containers, vapor recovery manholes, observation well manholes, and monitoring well manholes.

4.1.2 Symbols should be placed directly on flat areas or put on tags or placards securely attached to the equipment or access pipe. A sign similar to that shown in Figure 1 should be placed at strategic locations for easy reference.

4.1.3 This color-symbol system has limited application to refineries, because products and other materials flowing through piping and tankage change frequently. Companies may, however, elect to apply the equipment color-symbol system to points of product transfer such as loading racks.

4.2 Storage and Distribution Terminals

Tank truck, tank-car, and marine loading and unloading facilities shall be identified by means of this system (see Figure 3). Color symbols should be as close as possible to the point of product transfer.

Storage tanks should be identified by means of this color-symbol system. Use of the color-symbol system can help prevent product commingling and afford rapid product recognition.

4.3 Delivery Vehicles

Delivery vehicles are the most important link in the distribution system and are most susceptible to loading and unloading errors. Delivery vehicle loading and unloading connections shall use tags according to this color-symbol system so that operators can readily match the vehicle connection with similarly labeled loading and unloading connections at the facility.

4.4 Dispensing Facilities

4.4.1 A grade level and aboveground fill or access point shall be clearly identified. When a fill or access point is identified by means of the color-symbol system, where a cover or lid can be removed, at least one fixed component of the fill or access point shall be marked to avoid commingling accidents that might result from mismatching of covers. It
is recommended the fill or access point be repainted on an annual or as needed basis due to paint fading or new equipment being installed. The following color-symbol system methods are recommended:

a) painting the fill or access point cover and paint on the rim of the Fill or Access Point (Figure 2a); or

b) painting the fill or access point cover and placing a collar or permanent label in or around the Fill or Access Point that states the name or description of the product such as “Regular E10 gasoline” (Figure 2b); or

c) painting the fill or access point cover and fitting a plastic or fiberglass insert inside the rim of the fill or access point (Figure 2c).

4.4.2 For delivery connections that are in a shared fill or access point, the color-symbol system should be as close as possible to the point of product transfer. Product dispensers do not have to be included in this identification program, since individual companies prefer to use their own colors and symbols when relating to the general public.

5.0 Bibliography


[2] EL-1542, Identification markings for dedicated aviation fuel manufacturing and distribution facilities, airport storage and mobile fuelling equipment
<table>
<thead>
<tr>
<th>Product Category</th>
<th>Product Subcategory</th>
<th>Designation</th>
<th>Color</th>
<th>Symbol</th>
<th>Description</th>
<th>AMS #</th>
</tr>
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<tbody>
<tr>
<td>Gasoline</td>
<td>Regular</td>
<td>Regular</td>
<td>White</td>
<td>Black 0</td>
<td>White with a Black 0 and a collar or permanent label that states “Regular E0 gasoline”.</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Midgrade</td>
<td>Midgrade</td>
<td>Blue</td>
<td>White 0</td>
<td>Blue with white zero and a collar or permanent label that states “Midgrade E0 gasoline”.</td>
<td>AMS-STD 15056</td>
</tr>
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<td></td>
<td>Premium</td>
<td>Premium</td>
<td>Red</td>
<td>White 0</td>
<td>Red with white zero and a collar or permanent label that states “Premium E0 gasoline”.</td>
<td>AMS-STD 21105</td>
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<td>E0/ conventional/ recreational fuel</td>
<td>Regular</td>
<td>Regular</td>
<td>White</td>
<td>None</td>
<td>White and a collar or permanent label that states “Regular E10 gasoline”.</td>
<td>N/A</td>
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<td></td>
<td>Midgrade</td>
<td>Midgrade</td>
<td>Blue</td>
<td>None</td>
<td>Blue and a collar or permanent label that states “Midgrade E10 gasoline”.</td>
<td>AMS-STD 15056</td>
</tr>
<tr>
<td></td>
<td>Premium</td>
<td>Premium</td>
<td>Red</td>
<td>None</td>
<td>Red and a collar or permanent label that states “Premium E10 gasoline”.</td>
<td>AMS-STD 21105</td>
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<td>Isobutanol blend</td>
<td>Isobutanol</td>
<td>Blue</td>
<td>Yellow IB</td>
<td>“IB” yellow lettering on blue background and a collar or permanent label that states “Isobutanol Blend midgrade gasoline”</td>
<td>AMS-STD 15056</td>
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<tr>
<td></td>
<td>Isobutanol blend</td>
<td>Isobutanol</td>
<td>Blue</td>
<td>Yellow IB</td>
<td>“IB” yellow lettering on blue background and a collar or permanent label that states “Isobutanol Blend midgrade gasoline”</td>
<td>AMS-STD 23655</td>
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<tr>
<td></td>
<td>Racing Fuel</td>
<td>Racing Fuel</td>
<td>Pink</td>
<td>Black 0</td>
<td>Hot Pink with Black 0 and a collar or permanent label that states “Regular Racing Fuel”</td>
<td>AMS-STD 31638</td>
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<td></td>
<td>Racing Fuel</td>
<td>Racing Fuel</td>
<td>Pink</td>
<td>None</td>
<td>Hot Pink and a collar or permanent label that states “E10 Racing Fuel”</td>
<td>AMS-STD 31638</td>
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Figure 1—Equipment Color-Symbol System
<table>
<thead>
<tr>
<th>Product Category</th>
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<th>Color</th>
<th>Symbol</th>
<th>Description</th>
<th>AMS #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol Blends</td>
<td>E15</td>
<td>E15</td>
<td>Copper</td>
<td>E15-Black “E15”</td>
<td>E15-Copper with black E15 and a collar or permanent label that states “E15”.</td>
<td>AMS-STD 10075</td>
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<tr>
<td></td>
<td>&gt;15% Ethanol</td>
<td>EXX</td>
<td>Copper</td>
<td>Black “EXX”</td>
<td>Copper with a black EXX where “XX” is the E%, e.g., E20 and a collar or permanent label that states “EXX”.</td>
<td>AMS-STD 10075</td>
</tr>
<tr>
<td></td>
<td>E85</td>
<td>E85</td>
<td>Copper</td>
<td>Black “E85”</td>
<td>Copper with black E85 and a collar or permanent label that states “E85 fuel”.</td>
<td>AMS-STD 10075</td>
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<td>Diesel</td>
<td>On-road (ULSD) &lt;5% Biodiesel</td>
<td>Yellow</td>
<td>None</td>
<td></td>
<td>Yellow and a collar or permanent label that states “On-Road ULSD &lt;5% biodiesel”.</td>
<td>AMS-STD 23655</td>
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<tr>
<td></td>
<td>On-road (ULSD) &gt;5% Biodiesel</td>
<td>Yellow</td>
<td>Black “BXX”</td>
<td></td>
<td>Various grades: Yellow with a black EXX where “XX” is the biodiesel %, e.g., B15 and a collar or permanent label that states “On-Road (ULSD) XX % Biodiesel”.</td>
<td>AMS-STD 23655</td>
</tr>
<tr>
<td></td>
<td>Off-road (dyed red) &lt;5% Biodiesel</td>
<td>Yellow</td>
<td>Red “OFF”</td>
<td></td>
<td>Yellow with red OFF and a collar or permanent label that states “Off-Road (dyed red) &lt;5% Biodiesel”.</td>
<td>AMS-STD 23655</td>
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<tr>
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<td>Off-road (dyed red) &gt; 5% Biodiesel</td>
<td>Yellow</td>
<td>Red “OFF”</td>
<td>Various Black “BXX”</td>
<td>Yellow with red OFF and a black EXX where “XX” is the biodiesel %, e.g., B15 and a collar or permanent label that states “Off-Road (dyed red) XX% Biodiesel”.</td>
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<td>Light Blue</td>
<td>None</td>
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<td>Light blue and a collar or permanent label that states “Biodiesel - B100/B99.9”.</td>
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<td>Renewable Diesel</td>
<td>Turquoise</td>
<td>None</td>
<td></td>
<td>Neon green and a collar or permanent label that states “Renewable Diesel”.</td>
<td>AMS-STD 27769</td>
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Figure 1—Equipment Color-Symbol System (continued)
<table>
<thead>
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<th>Product Category</th>
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<th>Symbol</th>
<th>Description</th>
<th>AMS #</th>
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</thead>
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<td>Automotive-grade DEF (AUS 32, ARLA32)</td>
<td></td>
<td>Cobalt Blue</td>
<td>None</td>
<td>Cobalt blue and a permanent collar or label the states “DEF” or “AUS 32”, “ARLA32”, or “Adblue”).</td>
<td>AMS-STD 35056</td>
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<tr>
<td></td>
<td>Marine-grade DEF (AUS 40)</td>
<td>M</td>
<td>Cobalt Blue</td>
<td>White “M”</td>
<td>Cobalt blue and a permanent collar or label the states “Marine-DEF” or “AUS 40”.</td>
<td>AMS-STD 35056</td>
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<td>No. 1</td>
<td>1</td>
<td>Dark Green</td>
<td>Black “1”</td>
<td>Dark Green with black 1 and a collar or permanent label that states “No. 1 Fuel Oil”.</td>
<td>AMS-STD 14062</td>
</tr>
<tr>
<td></td>
<td>No. 2</td>
<td>2</td>
<td>Dark Green</td>
<td>Black “2”</td>
<td>Dark green with black 2 and a collar or permanent label that states “No. 2 Fuel Oil”.</td>
<td>AMS-STD 14062</td>
</tr>
<tr>
<td></td>
<td>Bio Fuel Oil</td>
<td>BXX-X</td>
<td>Dark Green</td>
<td>Various Grades: Black “B” followed by “2 digit %” and a 1 or 2 for fuel grade i.e. B15-1</td>
<td>Dark green with a black BXX-X where “XX” is the biofuel % and “X” is the fuel grade 1 or 2 and a collar or permanent label that states “XX% No. X Bio Fuel Oil”.</td>
<td>AMS-STD 14062</td>
</tr>
<tr>
<td></td>
<td>Kerosene</td>
<td></td>
<td>Brown</td>
<td>None</td>
<td>Brown and a collar or permanent label that states “Kerosene”</td>
<td>AMS-STD 10049</td>
</tr>
<tr>
<td></td>
<td>Used oil</td>
<td></td>
<td>Light gray</td>
<td>None</td>
<td>Light gray and a collar or permanent label that states, “Used Oil”.</td>
<td>AMS-STD 16473</td>
</tr>
<tr>
<td>Other</td>
<td>Observation/Monitoring Wells</td>
<td></td>
<td>White</td>
<td>Black triangle</td>
<td>White with a black triangle in center.</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>Vapor Recovery</td>
<td></td>
<td>Orange</td>
<td>None</td>
<td>Orange and a collar or permanent label that states, “Vapor Recovery”.</td>
<td>AMS-STD 38903</td>
</tr>
<tr>
<td></td>
<td>Denatured Ethanol</td>
<td></td>
<td>Purple</td>
<td>None</td>
<td>Purple and a collar or permanent label that states, “Neat Ethanol”.</td>
<td>AMS-STD 17100</td>
</tr>
</tbody>
</table>

Figure 1—Equipment Color-Symbol System (continued)
**Figure 2a—Painting the Fill or Access Point Cover and Painting the Rim of the Fill or Access Point**

- **Premium E10 ≤ 10% ethanol** with color extending from lid to apron.
- **Regular E10 ≤ 10% ethanol** with color extending from lid to apron.
Figure 2b—Painting the Fill or Access Point Cover and Placing a Collar or Permanent Label in or Around the Fill or Access Point
Figure 2c— Fitting a plastic or fiberglass insert inside the rim of the fill or access point

Figure 3—Examples of Application of the System to Tankage and Piping at Distribution Terminals