Using the API Color-Symbol System to Mark Equipment and Vehicles for Product Identification at Gasoline Dispensing Facilities and Distribution Terminals

API RECOMMENDED PRACTICE 1637
THIRD EDITION, JULY 2006

ERRATA, JANUARY 2007

REAFFIRMED, MAY 2012

AMERICAN PETROLEUM INSTITUTE

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Downstream Segment

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SECTION 1—GENERAL

1.1 PURPOSE OF THE SYSTEM

1.1.1 This recommended practice describes a system for marking equipment used to store and handle bulk petroleum, alcohol-blended petroleum and biodiesel products. The marking system described in this recommended practice does not cover aviation fuels. Marking systems for aviation fuels are described in API/IP Standard 1542, *Identification Markings for Dedicated Aviation Fuel Manufacturing and Distribution Facilities, Airport Storage and Mobile Fuelling Equipment.*

1.1.2 A uniform and easily understood identification system facilitates petroleum industry operations. Such a system helps to prevent mixing of multiple products, particularly gasoline with distillates, different grades of unleaded gasoline, gasoline containing alcohol or alcohol containing gasoline versus neat (undiluted) gasoline and distillates containing different sulfur contents.

1.1.3 The principal purpose of a marking system is to identify product transfer points for tank-truck loading and unloading at distribution terminals and retail outlets, and to prevent errors in product handling. Personnel who handle products may make the mistake of "cross-dumping" (commingling) products because these personnel rely on memory rather than on written records.

Gasoline blended to a required Reid Vapor Pressure (RVP) should always remain segregated from gasoline containing alcohol or alcohol containing gasoline as there is a potential for the commingling of the alcohol blend with the neat gasoline. This may result in a violation of volatility limits imposed on gasoline in certain areas of the country.

Ultra low sulfur distillates may be contaminated by higher level distillates and should be handled appropriately to prevent contamination. Increased risk of contamination could also be associated with truck transport from the terminal and at retail outlets. API Recommended Practice 1007, *Loading and Unloading of MC 306/DOT 406 Cargo Tank Motor Vehicles* provides guidelines for preventing contamination.

1.1.4 Personnel who handle products should be trained in and familiar with any identification system used to designate products.

1.2 SUPPORT OF THE SYSTEM

1.2.1 The equipment marking color-symbol system described in this recommended practice facilitates easy identification of products by means of colors, symbols and alphanumeric designations. The following additional measures are recommended to support the system:

a. Providing charts to identify permanent locations of products at a facility (e.g. storage tank, loading arm, etc.).
b. Using stencils, decals, or metal or plastic tags to identify product names on equipment.

1.2.2 The marking system should be the primary means of identification. 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 should be used wherever they are needed to supplement the marking system.

1.3 REFERENCED PUBLICATIONS

The following standards, codes, and specifications are cited herein:

API

RP 1615	*Installation of Underground Petroleum Storage Systems*
API/IP 1542	*Identification Markings for Dedicated Aviation Fuel Manufacturing and Distribution Facilities, Airport Storage and Mobile Fuelling Equipment*
RP 1007	*Loading and Unloading of MC 306/DOT 406 Cargo Tank Motor Vehicles*

EPA[1]

Used Oil Management Standards (40 Code of Federal Regulations, Section 279)

SECTION 2—ELEMENTS OF THE SYSTEM

2.1 GENERAL (SEE FIGURE 1)

2.1.1 The majority of colors used in this equipment marking color-symbol system remain unchanged from those found in the Second Edition (September 1995). The third edition reflects the industry's changing needs as a result of the introduction of ultra low sulfur distillates. The previous version included additions to address handling and safety requirements for oxygenated and alcohol-based fuels and slop or waste oil. Additionally, monitoring or observation well identification (as established in API Recommended Practice 1615) is included here to complete the reference. Only easily distinguishable colors are used; this system does not attempt to define color shades.

2.1.2 In the equipment marking color-symbol system, a circle outline represents a gasoline product, a hexagon outline represents a distillate-based product and an elongated pentagon represents an alcohol-blended product.

2.1.3 Superimposed crosses, bars and alpha-numeric designations for product names are used to further distinguish products.

2.1.4 Vapor-recovery connections and manholes are marked with orange circles. The gasoline symbol, the circle, is used because the principal environmental concern is with gasoline vapors.

Note: Used oil is identified by a purple square. White lettering may be used to supplement the marking system.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.

2.1.5 Consistent with API Recommended Practice 1615, monitoring or observation wells are identified with a black equilateral triangle on a white background.

2.2 GASOLINE

2.2.1 All gasoline is identified with a circular marking. The marking system does not attempt to classify all the gasoline manufactured by all the companies that operate refineries. At least five grades of unleaded gasoline are marketed under such names as super premium, premium, mid-regular, regular, and sub-regular. In addition, octane can vary by geographical location, season of the year, and refinery batch. The marking system provides for three grades of unleaded gasoline. The gasoline with the highest octane is marked red, the one with the lowest octane is marked white, and any intermediate grade is marked blue. This arrangement may present a problem in cases in which product is exchanged between two companies, where one company markets three grades of leaded gasoline and the other markets only two. In such cases, product names, octane ratings, or brand code numbers should be used to supplement the marking system. The white crosses on red and blue backgrounds and the black cross on the white background were originally added to identify unleaded gasoline.

2.2.2 Also critical in the transfer of bulk gasoline is the differentiation of neat gasoline from gasoline containing oxygenates. This is of particular concern where there are volatility limitations or restrictions regarding the use of such extenders or oxygenates. Most areas require the notation of such oxygenated gasoline in transfer or shipping documents. It is an option for the operator to use the appropriate gasoline symbol surrounded by a white circle for high grade and middle grade and a black circle for low grade to indicate gasoline containing extenders or oxygenates. 07

2.3 DISTILLATES

2.3.1 All distillates are identified with a hexagonal marking. For low sulfur distillate identification, diesel is yellow, No. 1 fuel oil is purple with a yellow horizontal stripe, No. 2 fuel oil is green, and kerosene is brown. Grades of diesel fuel and kerosene and grades of fuel oil beyond Nos. 1 and 2 are not identified. Individual companies may want to use other means of identification to label these products (see 1.2.2).

2.3.2 A blue horizontal stripe is added to the low-sulfur distillate color-code symbols identified in 2.3.1 to identify high-sulfur distillates.

[1]Environmental Protection Agency, U.S. Government Printing Office, Washington, D.C.

2.3.3 A black letter "U" is added to the low-sulfur distillate color-code symbols identities in 2.3.1 to identify ultra low sulfur distillates. This applies to ultra low sulfur diesel (ULSD) and ultra low sulfur kerosene.

2.4 BIODIESEL

2.4.1 Biodiesel shall utilize bronze hexagonal symbol with an outer yellow band. The inner hexagon is marked with black or white lettering designating the biodiesel blend (e.g., B2, B5 or B20).

2.5 ALCOHOL-BASED FUELS

2.5.1 Alcohol-based fuels are primarily composed of alcohol with some amount of gasoline blended into the product. Where an alcohol based product is offered for sale in addition to the three primary gasoline grades, the background color shall be bronze. Black or white lettering (with company names or product codes) shall be used to further identify the product. For example, ethanol containing 15 volume percent gasoline would be labeled "E-85."

SECTION 3—APPLICATION OF THE SYSTEM

3.1 GENERAL

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

3.1.2 This permanent marking 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 marking color-symbol system to points of product transfer such as loading racks.

3.2 GASOLINE DISPENSING FACILITIES

3.2.1 Fillboxes and fillbox covers shall be clearly identified (see Figure 2). When fillboxes and fillbox covers are identified by means of the marking system, at least one fixed component of the fillbox itself shall be labeled to avoid commingling accidents that might result from mismatching of fillboxes and their covers. The following labeling methods are recommended:

a. Painting or placing a decal on the top of the cover and on the rim of the fillbox.
b. Attaching a tag securely to the fillpipe adapter.
c. Screwing a tag onto the fillbox rim.
d. Fitting a plastic or fiberglass insert inside the rim of the fillbox.

3.2.2 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. There is, however, no reason not to adapt the marking system to identify dispensers.

3.3 DISTRIBUTION TERMINALS

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

3.3.2 Storage tanks should be identified by means of this marking system. Labels can help prevent product commingling and afford rapid product recognition.

3.4 DELIVERY VEHICLES

Delivery vehicles are the most important link in the distribution system and are most susceptible to loading and unloading errors. By identifying faucet valves with marking system tags or placards, operators can readily match the valves with similarly labeled loading and unloading facilities.

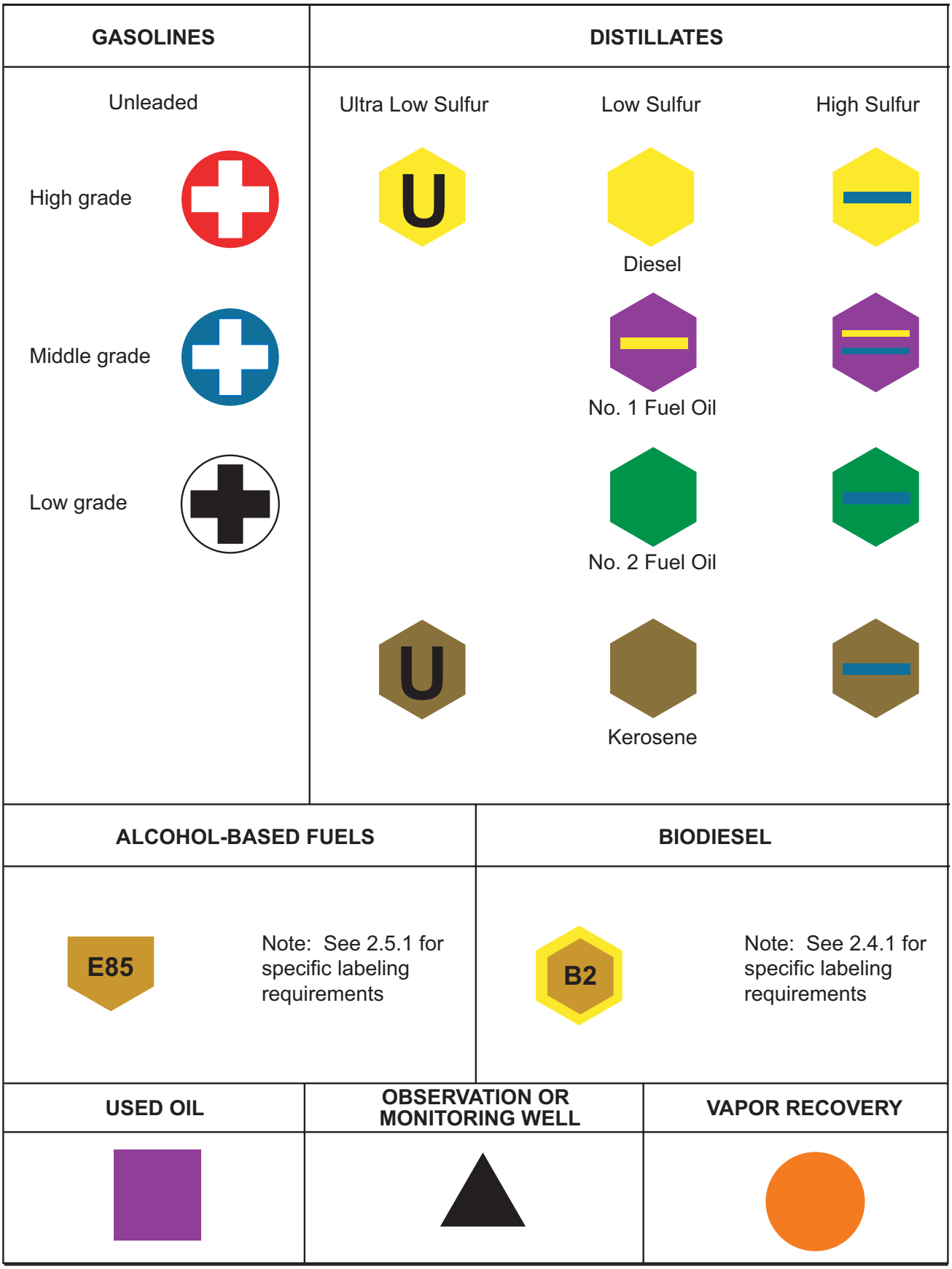

Figure 1—Equipment Marking Color-Symbol System

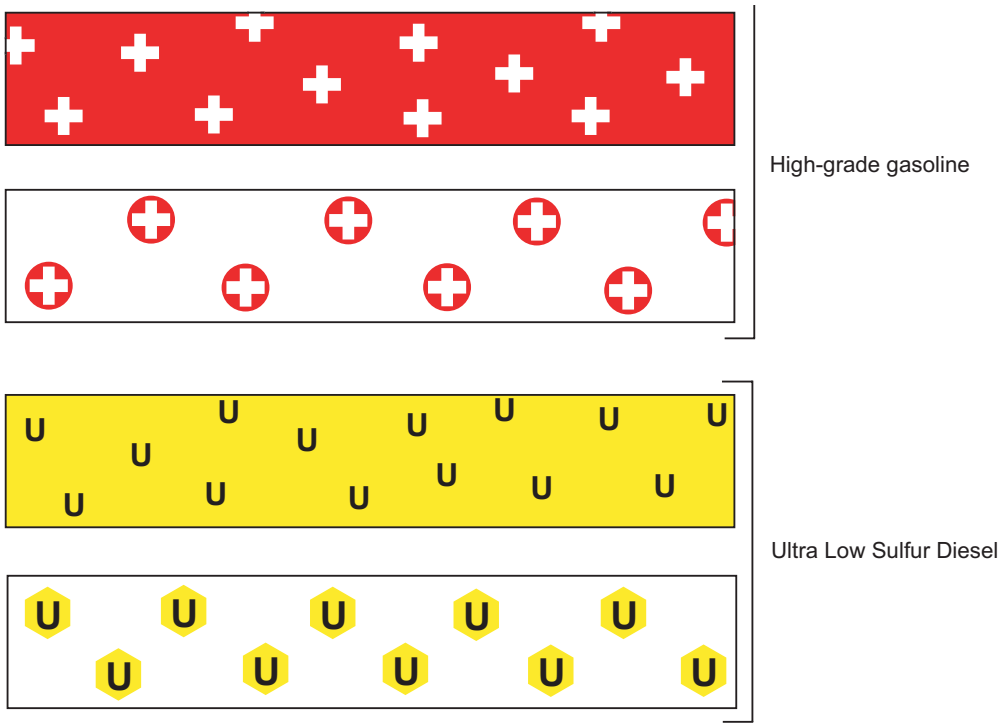

Figure 2—Examples of Identiication for Fillbox Inserts at Service Stations

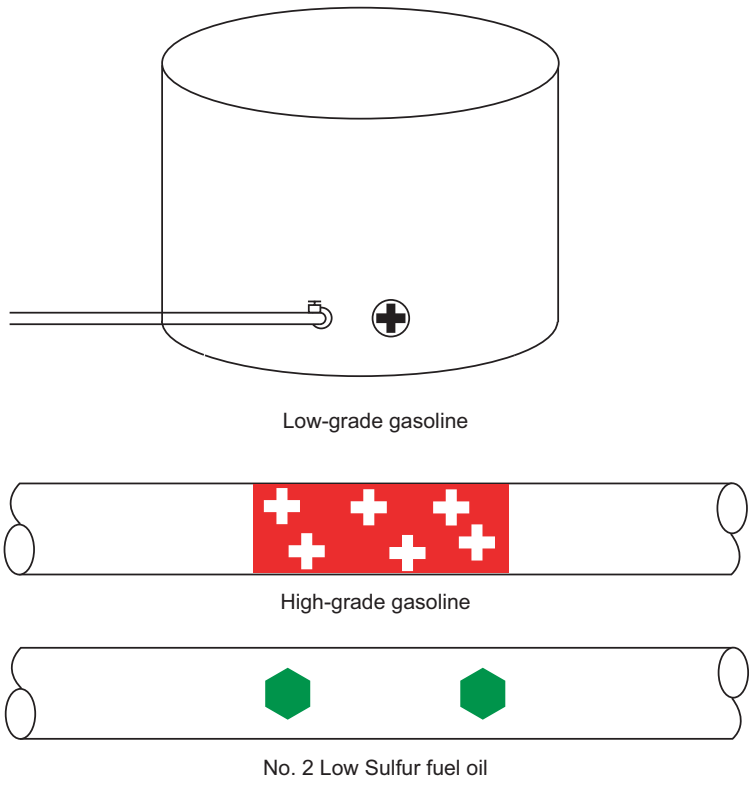

Figure 3—Examples of Application of the System to Tankage and Piping at Distribution Terminals

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