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Standard Practice for Filter Membrane Color Ratings of Aviation Turbine Fuels¹

This standard is issued under the fixed designation D 3830; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense. Consult the DoD Index of Specifications and Standards for the specific year of issue which has been adopted by the Department of Defense.

1. Scope

1.1 This practice provides a standard language for the purpose of communicating filter membrane colors when sampling aviation turbine fuels in the field through field monitors. Membrane color may be used for qualitative assessment of contaminant level in fuels or of change in fuel contaminant level at a particular location.

1.1.1 The color rating can be made in the field and does not require stringent laboratory procedures. No quantitative relationship exists between the gravimetric results obtained by Test Method D 2276 and color ratings obtained by this practice.

NOTE 1—If a field monitor is opened for color rating in the field, it cannot also be used for gravimetric results by Test Method D 2276.

1.1.2 This practice is not a substitute for gravimetric procedures to determine particulate contaminant.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* For specific precautionary statements, see Section 7.

2. Referenced Documents

2.1 ASTM Standards:

D 1535 Test Method for Specifying Color by the Munsell System²

D 2276 Test Method for Particulate Contaminant in Aviation Fuel by Line Sampling³

3. Summary of Practice

3.1 A sample of fuel is taken from a flowing line or pipe and passed under line pressure through a field monitor containing a 0.8- μ m test filter membrane. The color on the filter membrane is compared with the ASTM color standards and assigned a rating letter and number.

4. Significance and Use

4.1 The filter membrane color test provides a rapid, simple means of detecting changes in the fuel, or changes in

the mechanical condition of the fueling system upstream of the sampling point. Changes in membrane color over a period of time in a fuel-handling system may be indicative of changes in fuel contaminant level, contaminant type, or the system mechanical condition. While membranes are frequently color rated in the field in the wet condition immediately after sampling, they should preferably be rated in the dry condition because the membrane does not change color in the dry state. Differences between dry and wet ratings on the same membrane often exceed one number and may be as great as five numbers. Thus comparisons based on mixed wet and dry ratings are not significant and should not be made. Similar membrane color ratings from different locations cannot be assumed to indicate the same level of contamination.

NOTE 2—The sample size must be reported with the color rating because smaller samples reduce the sensitivity and the color developed is not necessarily proportional to sample volume.

NOTE 3—Wet color ratings or smaller than recommended sample size, or both, may be of value to a trained observer familiar with local conditions. Only dry color ratings should be reported when color ratings are employed as a communications tool.

5. Apparatus

5.1 *Sampling Point*, a suitable tap in the pipe, line, or fitting to accept the sampling valve connection (5.2.1). If using an existing tap, it may be necessary to use reducing bushings to assure the proper tap size for the sampling connection. Care must be taken in such cases to avoid trapping or generating contaminant. A sampling probe projecting into the fuel stream will aid in guarding against this situation. If a shut-off valve is desired, a stainless steel ball or plug-type valve should be used.

5.2 *Sampling Apparatus*,⁴ as illustrated in Fig. 1 and consisting of the following components:

5.2.1 *Sampling Valve Connection*, designed to meet the following requirements:

5.2.1.1 It shall be mounted in the sampling point and must incorporate a self-sealing quick-action coupling designed to mate with a suitable connection leading to the selector valve of the sampling assembly.

5.2.1.2 It must be completely resistant to fuel and be leakproof up to the maximum working pressures to be encountered.

5.2.1.3 It must have a minimum of internal recesses

¹ This practice is under the jurisdiction of ASTM Committee D-2 on Petroleum Products and Lubricants and is the direct responsibility of Subcommittee D02.J on Aviation Fuels.

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² Annual Book of ASTM Standards, Vol 06.01.

³ Annual Book of ASTM Standards, Vol 05.01.

⁴ A list of approved apparatus may be obtained from ASTM Headquarters. Request RR: D02-1127.