

ASTM METHOD D6377-16 PROPOSED BALLOT CHANGES

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WHY ARE CHANGES ARE NEEDED?

- The current method must be reproducible by all users at any location
- The current method may be ambiguous in how sample integrity is maintained, e.g. definitions and flashing/outgassing cautions
- The current method should incorporate the latest testing procedures, e.g. MPC, VLE
- The current method should incorporate the Sandia National Laboratories “DOE/DOT Crude Oil Characterization Research Study, Task 2 Test Report on Evaluating Crude Oil Sampling and Analysis Methods”
- The current method should incorporate the CCQTA “Vapor Pressure Best Practice – Factors Affecting Vapor Pressure and the Recommended Sampling and Testing Methodologies.”

PROPOSED BALLOT CHANGES

- 1) Inclusion of statement that current instrumentation accuracy is limited when $V/L = 0.02$ to 4. (Added statement to Note 1, Section 1)
 - *The current precision of the method is limited to vapor-liquid ratios of 0.02 and 4.*
- 2) Inclusion of reference documents D7975 and D8009 (Added references to methods in Section 2)
 - *D7975 Standard Test Method for Determination of Vapor Pressure of Crude Oil: VPCRx-F(T_m °C) (Manual Expansion Field Method)*
 - *D8009 Standard Practice for Manual Piston Cylinder Sampling for Volatile Crude Oils, Condensates, and Liquid Petroleum Products*

PROPOSED BALLOT CHANGES

3) Include in Definitions, “Live Crude” and “Dead Crude” (Revised definitions in Section 3)

- 3.2.1 dead crude oil, n—crude oil with sufficiently low vapor pressure that, when exposed to normal atmospheric pressure at room temperature, does not result in boiling of the sample.
- 3.2.1.1 Discussion—these crudes will have vapor pressures below atmospheric pressure at room temperature.
- 3.2.1.2 Discussion—crude oil is normally considered “live” until the vapor pressure can be established using Test Methods D6377 or D7975. Sampling and handling of dead crude oils can usually be performed without concern in open, non-pressurized sample containers, such as cans, bottles and other atmospheric containers as described in Practice D4057.

PROPOSED BALLOT CHANGES

3) Include in Definitions, “Live Crude” and “Dead Crude” (Revised definitions in Section 3)

- 3.2.2 live crude oil, n—crude oil with sufficiently high vapor pressure that it would boil if exposed to normal atmospheric pressure at room temperature.
- 3.2.2.1 Discussion—Sampling and handling of samples of live crude oils will necessitate the use of the closed sample container to maintain sample integrity and preclude the use of open sample containers, such as cans, bottles and other atmospheric containers.
- 3.2.2.2 Discussion—samples and bulk storage (tank) liquids may or may not appear to boil visibly (rolling) but vaporization (off-gassing) is occurring.

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- 4) D6377 Summary of the method (Added phrase in Section 12.7)
 - ...and apply heat to the sealed cell.
- 5) Include protocol for introduction of a High VP Sample by Aspiration (Added Caution note after Section 8.3.3)
 - Caution: If the sample flashes or outgases in the inlet line, either before or after any inlet filter or regulator, then liquid volume to the cell is reduced and measured vapor pressure is falsely low. If flashing or outgassing occurs, results are no longer valid under D6377.

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- 6) Inclusion of new Appendix X3 for ASTM D6377 – Vapor Pressure of Crude Oil versus Vapor/Liquid (V/L) Ratio
 - X3.1 For several purposes, for example, to check an unknown sample for the presence of light hydrocarbon components (methane, ethane propane, butane) and fixed gases (Air, O2, N2 etc.) ...
- 7) Inclusion of New Definition for Sealed Sample Cylinder to be inclusive of both floating piston cylinder and manual piston cylinder
 - 3.1.3 sealed sample cylinder, n-- a vapor and liquid tight ("sealed") sample cylinder that can be connected directly to a sample point to obtain a liquid sample without any vapor loss, and without exposure of the sample to the atmosphere, such as D3700 Floating Piston Cylinder (FPC), D7975 Field VPCRF,x(T m), or D8009 Manual Piston Cylinder (MPC).

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8) Replacement of “floating piston cylinder” with “sealed sample cylinder”

- Replacement occurs in Sections 8.2.1, 8.3.2, 12.1.1, and 12.1.4.

9) Inclusion of cautionary note in Note 6 that standard sampling procedures D7975 and D8009 Manual Piston Cylinders were developed after the program to determine the precision of the methods.

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10) Inclusion of cautionary procedure for manual piston cylinder use in Section 12.3.

- *For manual piston cylinders, check for liquid filled by pushing on the piston rod. If the rod is not solid it indicates that some vapor is in the sample chamber. Add additional pressure to the precharge side while rocking the cylinder (using the vapor bubble for effective mixing) until the rod is again firm and the sample homogeneous.*

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Questions?

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Thank You!

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