



Standard Practice for Evaluating Activity of Clay Elements Using a Side-Stream Sensor¹

This standard is issued under the fixed designation D5000; 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.

INTRODUCTION

Calcined clay is a widely used adsorptive medium for removing polar contaminants and additives from petroleum fluids. In refineries, clay is installed in large bed-type vessels to refine products such as lubricants or aviation turbine fuel. In the field, clay is usually used in canister or bag type elements installed as a bank of elements in a vessel to remove traces of contaminants, particularly from non-additive jet fuel immediately before delivery to an airport.

1. Scope*

1.1 This practice describes a field procedure to determine whether the useful life of the clay has been exceeded in canister or bag-type clay elements that are installed in ground filtration units of aviation fuel handling systems.

1.2 The field procedure utilizes the apparatus of Test Method [D3948](#) to periodically test a small clay capsule installed in a sidestream around a clay treatment vessel that receives a fixed ratio of the same fuel that flows through the clay elements in the vessel.

1.3 The values stated in SI units are to be regarded as standard. The values given in parentheses are for information only.

1.4 *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.*

2. Referenced Documents

2.1 *ASTM Standards:*²

[D3948](#) Test Method for Determining Water Separation

¹ This practice is under the jurisdiction of ASTM Committee [D02](#) on Petroleum Products and Lubricants and is the direct responsibility of Subcommittee [D02.J0](#) on Aviation Fuels.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[Characteristics of Aviation Turbine Fuels by Portable Separometer](#)

3. Terminology

3.1 *Definitions:*

3.1.1 *surfactants*—surface active molecular species that exhibit both water soluble and oil soluble properties, and affect the physical behavior at the interface between water and oil phases by forming emulsions or changing the wetting characteristics of solid surfaces exposed to water and oil.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *active limit*—the Micro-Separometer (MSEP) rating by Test Method [D3948](#) of the effluent from a clay monitor that represents low surfactant content and therefore continued activity of the clay for adsorption.

3.2.2 *clay*—a naturally occurring mineral, largely hydrous aluminum silicate, calcined at high temperature to remove water and volatile matter, used in granular form as an adsorptive media for removing polar compounds that are present in many hydrocarbon fluids.

3.2.3 *clay treatment*—a process for exposing fuels and blending components at ambient temperatures to granulated calcined clay in order to remove polar impurities such as surfactants.

3.2.4 *deactivation of clay media*—results when adsorptive surfaces are no longer capable of adsorbing polar species and improving the quality of the feed stream.

3.2.5 *deactive limit*—the MSEP rating by Test Method [D3948](#) of the effluent from a clay monitor that represents high surfactant content and therefore the deactivation of the clay for adsorption.

*A Summary of Changes section appears at the end of this standard.