



Standard Test Method for Collection and Analysis of Visible Emissions from Candles as They Burn¹

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INTRODUCTION

During the development of this test method with a specially manufactured “standardized” candle, variability of candle burn behavior was observed that introduced a wide statistical variation in the overall test results from a single design. Variability in testing different types of candle products would introduce even greater variability, that is, a pillar candle comprised of 60°C (140°F) melting point wax would not, and would not be expected to, show the same burn behavior as a jar candle comprised of 54.4°C (130°F) melting point wax. It is believed that a significant database of candle burn performance, based on each type of candle and formulation format, would be required before one could determine whether a statistical basis could be developed for pass/fail criteria for visible smoke emissions from candles. This method is intended to provide candle manufacturers a standard procedure to use during the development of candle designs and formulations to compare relative smoking/burn behavior. This method neither implies nor sets a standard level for visible smoke emissions for any candle type or formulation.

1. Scope

1.1 This test method covers the collection and analysis of visible emissions from indoor use candles as they burn.

1.2 The test is to be used to compare relative smoke/burn behavior during development of candle designs and formulations.

1.3 This test method may not be suitable for multiple wick candles; tapers and candles intended to be burned while floating on water commonly known as “floaters.”

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

¹ This test method is under the jurisdiction of ASTM Committee F15 on Consumer Products and is the direct responsibility of Subcommittee F15.45 on Candle Products.

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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.

F1972 Guide for Terminology Relating to Candles and Associated Accessory Items
PS59 Provisional Specification for Fire Safety for Candles

3. Terminology

3.1 See Guide F1972 for definitions of terms not specified in 3.2.

3.2 Definitions:

3.2.1 *burn cycle*—length of time the candle is burned during one test day. For this test, a burn cycle is 4 h (see Provisional Specification PS59).

3.2.2 *burn period*—total time the candle is burned over the duration of the test. For this test, the burn period will be 16 h.

3.2.3 *fuel pool establishment period*—time, 15 min or longer, before each burn cycle that a candle must be burned to establish a normal fuel pool and stable flame.

3.2.4 *molten fuel pool*—portion of the wax or fuel pool of a candle that is in the liquid form when the candle is burning.

3.2.5 *optical densitometer*—instrument used for determining the optical density in the transmittance or reflectance mode.

3.2.6 *top of the candle*—the upper most part of the candle or container.

3.2.7 *visible emissions*—emissions that can be seen once collected on a substrate.