



Standard Test Methods for Performance of Commercial Kitchen Ventilation Systems¹

This standard is issued under the fixed designation F 1704; 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.

1. Scope

1.1 These test methods cover the performance evaluation of exhaust hoods with commercial cooking appliances and associated replacement air configurations. The scope of these test methods include:

1.1.1 Characterization of capture and containment performance of hood, appliance(s), and replacement air system during cooking and non-cooking conditions;

1.1.2 Determination of appliance heat gain to space derived from the measurement and calculation of appliance energy consumption, energy exhausted, and energy to food, based on a system energy balance;

1.1.3 Parametric evaluation of operational or design variations in appliances, hoods, or supply air.

1.2 These test methods are contained in the sections indicated as follows:

	Sections
Test Method to Determine Threshold of Capture and Containment	8
Test Method to Determine Heat Gain to Space	16

1.3 The values stated in inch-pound units are to be regarded as the 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:

F 1275 Test Method for the Performance of Griddles²

F 1361 Test Method for the Performance of Open Deep Fat Fryers²

F 1484 Test Method for the Performance of Steam Cookers²

F 1496 Test Method for the Performance of Convection Ovens²

F 1521 Test Method for the Performance of Range Tops²

F 1605 Test Method for Performance of Double-Sided Griddles²

F 1639 Test Method for Performance of Combination Ovens²

F 1695 Test Method for Performance of Underfired Broilers²

F 1785 Test Method for Performance of Steam Kettles²

F 1787 Test Method for Performance of Rotisserie²

F 1817 Test Method for the Performance of Conveyor Ovens²

2.2 NFPA Standard:³

NFPA 96 Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations

2.3 ASHRAE Standards:⁴

“A Field Test Method for Determining Exhaust Rates in Grease Hoods for Commercial Kitchens,” *ASHRAE Transactions*, Vol 100, Part 2, 1994

ASHRAE Guideline 2-1986 (RA90) Engineering Analysis of Experimental Data

2.4 ANSI Standards:⁵

ANSI/ASHRAE 51 and ANSI/AMCA 210 Laboratory Method of Testing Fans for Rating

2.5 ICC Standards:⁶

International Mechanical Code

NOTE 1—The replacement air and exhaust system terms and their definitions are consistent with terminology used by the American Society of Heating, Refrigeration, and Air Conditioning Engineers, see Ref (1).⁷ Where there are references to cooking appliances, an attempt has been made to be consistent with terminology used in the test methods for commercial cooking appliances. For each energy rate defined as follows, there is a corresponding energy consumption that is equal to the average energy rate multiplied by elapsed time. Electric energy and rates are expressed in W, kW, and kWh. Gas Energy consumption quantities and

¹ These test methods are under the jurisdiction of ASTM Committee F-26 on Food Service Equipment and are the direct responsibility of Subcommittee F26.06 on Productivity and Energy Protocol.

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² *Annual Book of ASTM Standards*, Vol 15.07.

³ Available from National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269-9101.

⁴ Available from American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc., 1791 Tullie Circle, NE, Atlanta, GA 30329.

⁵ Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.

⁶ Available from International Code Council, 5203 Leesburg Pike, Suite 708, Falls Church, VA 22041.

⁷ The boldface numbers in parentheses refer to the list of references at the end of these test methods.