



Standard Test Method for Measurement of Cut Resistance to Chain Saw in Lower Body (Legs) Protective Clothing¹

This standard is issued under the fixed designation F 1414; 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 reappraisal. A superscript epsilon (ε) indicates an editorial change since the last revision or reappraisal.

1. Scope

1.1 This test method measures cut resistance of garments and devices worn to protect the lower (legs) body when operating a chain saw.

1.2 This test method may be used to test for compliance to minimum performance requirements in established safety standards.

1.2.1 By agreement between the purchaser and the supplier, or as required by established safety standards, it will be decided if this test method will be used to determine one or both of the following: (1) chain speed 50 (CS50), and (2) success/failure (jamming/chain stop) at specified chain speed.

1.3 This test method may be used to determine levels of protection for areas of coverage as stipulated in established safety standards.

1.4 The values stated in SI units or in inch-pound shall be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system must be used independently of the other, without combining values in any way.

1.5 *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 Documents²

2.1 The following documents, form a part of this specification to the extent referenced herein:

2.2 *ASTM Standards:*

D123 Terminology Relating to Textiles³

D1056 Specification for Flexible Cellular Materials—Sponge or Expanded Rubber⁴

D1776 Practice for Conditioning Textiles for Testing³

¹ This test method is under the jurisdiction of ASTM Committee F-23 on Protective Clothing and is the direct responsibility of Subcommittee F23.20 on Physical Properties.

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² See Section 15 for additional references.

³ *Annual Book of ASTM Standards*, Vol 07.01.

⁴ *Annual Book of ASTM Standards*, Vol 08.01.

F1494 Terminology Relating to Protective Clothing⁵

2.3 *AATCC Test Methods:*

AATCC 96 Dimensional Changes in Laundering of Woven and Knitted Fabrics, except Wool⁶

AATCC 158 Dimensional Changes on Drycleaning in Perchloroethylene: Machine Method⁶

2.4 *Military Standards:*

MIL-STD-105 Sampling Procedures and Tables for Inspection by Attributes⁷

MIL-C-12369 Cloth, Ballistic, Nylon⁷

2.5 *Federal Standard:*

FS 5100-86 Type II, Cloth, Duck, Nylon, Polyurethane Coated⁷

3. Terminology

3.1 *Definitions:*

3.1.1 *chain saw, n*—a portable power operated tool used for cutting wood which has cutters linked in a chain.

3.1.2 *chain speed 50 (CS50), n*—for chain saw protection, the mean velocity at which cut through occurs.

3.1.2.1 *Discussion*—This value establishes the relationship between the probability of cutting through the protective clothing (or foot protective device) and the speed of the saw chain. For lower chain speeds, the probability of cut through approaches zero, while for higher chain speeds, the probability of cut through approaches one.

3.1.3 *chain stop, n*—the resulting action when a material clogs (jams) the drive sprocket or slows the speed sufficiently to prevent advancement of the chain saw.

3.1.4 *cut resistance, n*—in chain saw testing, the ability of a material, while in contact with the linked cutters, to resist cut through of the cutters of a moving saw chain independent of either jamming or chain stop.

3.1.5 *cut-through, n*—for chain saw cut resistance, the action of a running chain saw after complete breakthrough of either a protective garment or protective device.

⁵ *Annual Book of ASTM Standards*, Vol 11.03.

⁶ Available from American Association of Textile Chemists and Colorists, PO Box 12215, Research Triangle Park, NC 27709-2215.

⁷ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.