



Designation: F 2116 – 01

Standard Specification for Low Stretch and Static Kernmantle Life Safety Rope¹

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1. Scope

1.1 This specification covers the general characteristics of low stretch or static kernmantle ropes used for rescue applications, whatever their constituent material. This specification does not apply to dynamic rope intended for lead climbing.

1.2 This specification covers small diameter sizes commonly used in life safety applications. These include sizes 7 to 16 mm ($\frac{9}{32}$ to $\frac{5}{8}$ in.).

1.3 The values stated in SI units shall be considered as standard. Values in inch-pound units are included for reference.

1.4 In the event of any conflict between the text of this specification and any references cited, the text of this specification takes preference.

1.5 This specification may involve hazardous materials, operations, and equipment. *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 1740 Guide for Inspection of Nylon, Polyester, or Nylon/Polyester Blend Kernmantle Rope²

2.2 Cordage Institute Standards:

CI 1801-98³

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *diameter*—actual rope diameter as determined in accordance with Section 9.1 of CI 1801-98.

3.1.2 *kernmantle*—a rope design consisting of two elements: an interior core (kern) and an outer sheath (mantle).

3.1.2.1 *core*—interior (kern) of a kernmantle rope. Core may be of any continuous construction including parallel strands, twisted strands, braided strands, or braided.

3.1.2.2 *sheath*—outer cover (mantle) of a kernmantle rope.

¹ This specification is under the jurisdiction of ASTM Committee F32 on Search and Rescue and is the direct responsibility of Subcommittee F32.01 on Equipment, Testing, and Maintenance.

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² *Annual Book of ASTM Standards*, Vol 13.01.

³ Available from Cordage Institute, 994 Old Eagle Rd., Suite 1019, Wayne, PA 19087-1866.

3.1.3 *knotability*—a value used to determine the ability of a life safety rope to hold a knot.

3.1.4 *life safety rope*—a rope which is mandated, supplied, or used, or a combination thereof, to support or protect a human life.

3.1.5 *low stretch rope*—a rope with an elongation greater than 6 % and less than 10 % at 10 % of its minimum breaking strength.

3.1.6 *minimum breaking strength*—for the purposes of low stretch or static kernmantle rope, the minimum breaking strength shall be a value three standard deviations below the mean of the maximum force applied to five or more specimens before failure as determined in Section 9.2 of CI 1801-98.

3.1.7 *static rope*—a rope with a maximum elongation of 6 % at 10 % of its minimum breaking strength.

4. Material

4.1 The rope shall be fabricated from continuous filament heat and light-resistant material of industrial, high tenacity grade.

4.2 Material used in the construction of life rescue rope shall be sufficient to produce a rope which meets the physical properties and performance requirements of this specification.

5. Fiber Finish

5.1 The rope maker shall certify that any finish used on the rope shall not reduce the performance of the rope below the specifications in this specification.

6. Construction

6.1 The construction shall be sufficient to produce a rope which meets or exceeds the physical properties and performance requirements of this specification.

6.2 Strand interchange (braider) splices shall not be allowed.

6.3 Core splices shall not be allowed.

7. Performance Requirements

7.1 Diameter:

7.1.1 For the purposes of this specification, rope diameter is considered to be the actual diameter of the rope as determined in Section 9.1 of CI 1801-98.

7.1.2 The diameter reported shall be within 5 % of the actual diameter.