SAMSON TECHNICAL BULLETIN

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How Long is a Piece of Rope?

Several standards are available as references for measured lengths of testing samples, but do not include a method for determining a length for storing or shipping:

- **CI 1500-02, *International Standard: Test Methods for Fiber Rope***
- **ISO 2307:2005, *Fiber Ropes: Determination of Certain Physical and Mechanical Properties***
- **ASTM 4268, *Standard Test Methods for Testing Fiber Ropes***

These standards refer to measuring length under a low load or reference tension when measuring rope length for test calculations. However, CI-1500 states that "Because of the soft, flexible nature of fiber rope, reproducible measurements of diameter, circumference, and length cannot be made on the untensioned rope."

The following is a list of the common difficulties of rope length determination in the field:

- **Availability of a flat surface to lay the rope straight for measuring**
- **The ability to tension the rope**
- **The material is flexible and soft, which may cause variation**
- **No standardized method for measuring rope length**
- **Using an inadequate and/or inconsistent type of measuring device**
- **The availability of a measuring device**
- **The position of the measuring device at the starting and ending points of the rope**
- **The method by which the measuring device is used**
- **The rope's length may change as it is used**

Controlled tensioning system.

Tension rope with hand force and measure to reduce the variability in length.

The Difference in Measuring Length on Tensioned and Untensioned Rope

The greatest difference can be seen in the length of the measured rope when comparing it at a tensioned and untensioned state. Tests have shown an approximate 2% difference in length is found with 12-strand AmSteel®-Blue when tension is used during measurement compared to an untensioned rope. Greater variability was seen with untensioned measurements, with as much as 2% of the same rope's length but when tensioned that difference dropped to 0.5%. The amount of variation seen between tensioned and untensioned ropes will also be affected by the material and construction of each rope.

Necessary Rope Measuring Procedures:

- **Supply constant, even tension (no more than 10 lb is needed) to all diameter ropes.**
- **Tension can be added simply by winding the rope in an S shape around two horizontal or vertical bars that will create the needed tension.**
- **A controlled tensioning system can also be used as described in the Technical Bulletin *Rope Measurement Recommendations*.**
- **When no tensioning device is available, laying the rope to the complete required length on a flat surface, and tensioning it with hand force while measuring the full length will reduce the variability and difference in length.**

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