Specification for Wire Rope

API SPECIFICATION 9A
TWENTY-SIXTH EDITION, MAY 2011

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ERRATA 1

Page v, Table of Contents, replace the entry for Annex F with:

Annex F (normative) Calculation of Minimum Breaking Force for Ropes in Accordance with Annex C-Rope Grades 1770, 1960, and 2160

Page 25, Table C.1:

For Nominal Rope Diameter of 28.6 mm, the corresponding equivalent should be 1 $^{1}/_{8}$ in.

Page 44, Annex F, replace the title with:

Calculation of Minimum Breaking Force for Ropes in Accordance with Annex C-Rope Grades 1770, 1960, and 2160

Page 52, Annex J, Section J.1, replace the first sentence with:

Diameters, diameter tolerances, minimum breaking forces and elongation shall be in accordance with Table J.1.

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Upstream Segment

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Suggested revisions are invited and should be submitted to the Standards Department, API, 1220 L Street, NW, Washington, DC 20005, standards@api.org.

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Introduction

This standard was developed in response to worldwide demand for minimum specifications for ropes for use on equipment and machinery associated with the petroleum and natural gas industries.

In recognition of equipment already in use and originally designed to accommodate rope sizes (nominal rope diameters) based on “English” units, some of the more common “converted SI unit” sizes have also been included.

In addition, and in recognition of equipment already in use and designed to operate with ropes having specific rope grades (e.g. IPS), based on “U.S.” wire levels, these grades have also been included in order to give prominence to the required minimum values of breaking force associated with these grades and help to ensure that existing design safety levels are maintained.

Having due regard to size and breaking force for a particular rope class or construction, in some cases it is possible to safely substitute a U.S. customary size and grade with one based solely on SI units and grade, and vice-versa. To assist in this process, this standard gives a size range for each nominal rope diameter and equivalent minimum breaking forces (converted from U.S. customary units) for comparison, although it is recommended that the equipment designer or rope manufacturer (or other competent person) is consulted prior to ordering a substitute rope.

It should also be noted that a particular design of rope may be capable of offering a higher breaking force value than the one specified either in the relevant table in this standard or by the manufacturer in their catalogue. In such cases, a higher minimum breaking force value (or actual breaking force value if the rope has already been manufactured and tested) may be provided by the manufacturer before an order is placed.

Designers of new equipment are encouraged to select ropes having the preferred SI units and grades.

To complement this standard, ISO 17893 covering definitions, designation, and classification has been prepared.

Specification for Wire Rope

1 Scope

This standard specifies the minimum requirements and terms of acceptance for the manufacture and testing of steel wire ropes not exceeding rope grade 2160 for the petroleum and natural gas industries. The following products are covered by this specification:

— wire rope,

— bright- or drawn-galvanized wire rope,

— well-measuring wire, and

— well-measuring strand.

Typical applications include tubing lines, rod hanger lines, sand lines, cable-tool drilling and clean out lines, cable tool casing lines, rotary drilling lines, winch lines, horse head pumping unit lines, torpedo lines, mast-raising lines, guideline tensioner lines, riser tensioner lines, and mooring and anchor lines. Ropes for lifting slings and cranes, and wire for well-measuring and strand for well-servicing, are also included.

The minimum breaking forces for the more common sizes, grades, and constructions of stranded rope are given in tables. However, this standard does not restrict itself to the classes covered by those tables. Other types, such as ropes with compacted strands and compacted (swaged) ropes, may also conform with its requirements. The minimum breaking force values for these ropes are provided by the manufacturer.

For information only, other tables present the minimum breaking forces for large diameter stranded and spiral ropes (i.e. spiral strand and locked coil), while approximate nominal length masses for the more common stranded rope constructions and large diameter stranded and spiral ropes are also given.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 2232:1990 [1], *Round drawn wire for general purpose non-alloy steel wire ropes and for large diameter steel wire ropes—Specifications*

ISO 4345, *Steel wire ropes—Fiber main cores—Specification*

ISO 4346, *Steel wire ropes for general purposes—Lubricants—Basic requirements*

ISO 6892-1, *Metallic materials—Tensile testing—Method of test a room temperature*

ISO 7500-1, *Metallic materials—Verification of static uniaxial testing machines—Part 1: Tension/compression testing machines—Verification and calibration of the force-measuring system*

ISO 7800, *Metallic materials—Wire—Simple torsion test*

ISO 7801, *Metallic materials—Wire—Reverse bend test*

ISO 17893, *Steel wire ropes—Vocabulary, designation and classification*

[1] International Organization for Standardization, 1, ch. de la Voie-Creuse, Case postale 56, CH-1211, Geneva 20, Switzerland, www.iso.org.