Specification for Wire Rope

API SPECIFICATION 9A
TWENTY-SEVENTH EDITION, AUGUST 2020
API MONOGRAM PROGRAM EFFECTIVE DATE: FEBRUARY 1, 2021

ADDENDUM 1, MAY 2023
ADDENDUM 2, JULY 2025
(MONOGRAM PROGRAM EFFECTIVE DATE: FEBRUARY 1, 2026)



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Introduction

This standard was developed in response to worldwide demand for minimum specifications for wire 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 wire rope sizes (nominal wire 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 wire ropes having specific wire rope grades (e.g. IPS), based on “U.S.” wire levels, these grades have also been included 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 wire 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 wire rope diameter and equivalent minimum breaking forces (converted from U.S. customary units) for comparison, although it is recommended that the equipment designer or wire rope manufacturer (or other competent person) is consulted prior to ordering a substitute rope.

It should also be noted that a particular design of wire 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 catalog. In such cases, a higher minimum breaking force value (or actual breaking force value if the wire 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 wire ropes having the preferred SI units and grades.

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 for the petroleum and natural gas industries. The following products are covered by this specification:

— 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. Wire 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 wire rope not exceeding 2160 grade and well measuring wire are given in tables. However, this standard does not restrict itself to the classes covered by those tables. Other types, such as wire ropes with compacted strands and compacted (swaged) wire ropes, may also conform with its requirements. The minimum breaking force values for these wire ropes and wire are provided by the manufacturer.

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

ASTM A931, *Standard Test Method for Tension Testing of Wire Ropes and Strand*

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*

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