
**Steel wire ropes — Pulling eyes
for rope installation — Types and
minimum requirements**

*Câbles en acier — Oeils de tirage pour les installations en câble —
Types et exigences minimales*

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. www.iso.org/directives

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 105, *Steel wire ropes*.

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Introduction

This International Standard was developed in response to a worldwide demand for an International Standard identifying the different types of pulling eyes which are used to facilitate the installing and re-reeving of ropes on a machine.

Such pulling eyes, sometimes referred to as becketts, are often used when another rope is required to pull the new rope into place.

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Steel wire ropes — Pulling eyes for rope installation — Types and minimum requirements

1 Scope

This International Standard identifies the different types of pulling eyes prepared at, or attached to, a steel wire rope end for connection to another rope when installing a new rope or re-reeving an existing rope on a machine.

This International Standard also specifies the minimum requirements for pulling eyes, including their geometry, strength, maximum line pull to which the pulling eye is intended to be subjected and information for use to be provided by the manufacturer.

The pulling eyes covered by this International Standard are not intended to be subjected to a load when the machine performs a service operation.

This International Standard applies to those pulling eyes prepared at, or attached to, ends of steel wire ropes conforming to ISO 2408 and ISO 10425.

This International Standard does not apply to steel wire ropes with fibre cores.

This International Standard does not cover those separate end connection accessories, which slide over the end of a rope and comprise an eye- and tubular-type braided rope, often referred to as a “wire rope stocking” or “cable sock”.

2 Normative references

[ISO 16841:2014](#)

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The following documents, in whole or in part, are normatively referenced in this document and are indispensable to its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 17893 and the following apply.

3.1 pulling eye

end preparation or end attachment in the form of a loop or eye to facilitate installation or re-reeving of a steel wire rope on a machine

3.2 flexible-type pulling eye

end preparation or end attachment in the form of a loop or eye, made from components of rope

EXAMPLE Individual strands or core, or tapered outer strands, reduced by removing some of the constituent wires

Note 1 to entry: Pulling eyes made from the centre strand of the core have limited load capacity.

3.3

rigid-type pulling eye

end preparation or end attachment in the form of a loop or eye, made by welding a component, such as a pad eye, modified eyebolt or chain link to the end of a stranded rope

3.4

semi-rigid-type pulling eye

end preparation or end attachment in the form of a loop or eye, comprising looped short length of smaller diameter wire rope secured in two opposing gussets between outer strands of the larger parent rope by a swaged ferrule

3.5

single use pulling eye

end preparation or end attachment in the form of a loop or eye located on the drum end of the rope for the purposes of installation and subsequent removal of the rope following a single service life

3.6

multiple use pulling eye

end preparation or end attachment in the form of a loop or eye, fitted to rope intended to experience multiple service life

EXAMPLE Installation and/or multiple re-reeving or end for ending the rope

4 Requirements

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4.1 General

The manufacturer shall prepare detailed manufacturing instructions for each type of pulling eye that they intend to produce. These instructions shall, at least, as applicable to the type of pulling eye, include the following aspects:

- the rope types and diameters for which the pulling eye type is suitable;
- method for preparing the rope end;
- matching the pad eye, modified eyebolt or chain link to the rope;
- method for welding component to the rope;
- method for forming the eye or loop;
- method for preparing the tapered section;
- inspection criteria.

The manufacturer's instructions shall be supported by a written declaration stating that the system has passed the type testing requirements of [4.3](#).

Pulling eyes shall be made in accordance with the manufacturer's instructions.

In the case of the welded components attached to the rope end, the welding shall be performed by a qualified person.

Qualification procedure shall be performed as defined in [4.5](#).

Requalification is not required, provided a minimum of three component welds are made during any 12-month period.

4.2 Geometry

4.2.1 Flexible-type pulling eye made from the centre strand of the core

The dimensions of the eye or loop shall be such that it shall be possible for its shape to change sufficiently enough to pass the completed pulling eye through an aperture of equivalent size to the diameter of the rope which is to be installed.

The internal length of the eye or loop, as manufactured, shall be at least three times the diameter of the rope.

An illustration of such a completed pulling eye is given in [Figure 1](#).



Figure 1 — Completed flexible pulling eye made from the centre strand of the core

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4.2.2 Flexible-type pulling eye made from the steel core itself

The internal length of the eye or loop, as manufactured, shall be at least five times the diameter of the rope.

An illustration of such a completed pulling eye is given in [Figure 2](#).

NOTE It is not usually possible for a pulling eye made from the steel core itself to be passed through an aperture of equivalent size to the diameter of the rope.



Figure 2 — Completed flexible pulling eye made from the steel core itself