

International Standard



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Steel wire ropes — Spliced eye terminations for slings

Câbles en acier — Œils épissés pour élingues

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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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 8794 was prepared by Technical Committee ISO/TC 105, *Steel wire ropes*.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

Steel wire ropes — Spliced eye terminations for slings

1 Scope and field of application

This International Standard specifies minimum requirements for spliced eye terminations for wire rope slings.

Prototype tests covering the type acceptance of splice methods are also specified in this International Standard.

2 References

ISO 2408, *Steel wire ropes for general purposes — Characteristics*.

ISO 7531, *Wire rope slings for general purposes — Characteristics and specifications*.¹⁾

3 Definitions

3.1 spliced eye terminations (hand-spliced): Loop or eye at the end of a rope made by tucking the ends of the strands back into the main body of the rope.

3.2 tuck: Single reeving of a strand to be spliced under a specified number of strands in the wire rope.

4 Types of wire ropes

All ropes specified in ISO 7531 are suitable for provision of spliced eye terminations.

5 Splicing operation

The splice shall have at least five tucks for each strand, at least three of them with the whole strand. The splicing method is specified in the annex.

NOTES

1 Depending on the rope size, rope construction and the splicing method, more tucks per strand than given above may be necessary.

2 To get a smooth run-out of the splice, it may be advantageous to make the last tuck or the last two tucks with the half of the wires cut out of the strands.

3 Certain national and international conventions exist for regulating the types of spliced eye terminations to be used in specific applications, e.g. dock works. Account should be taken of such regulations when this International Standard is applied.

The hand-splicing operation shall only be carried out by qualified splicers. The supplier shall be responsible for ensuring that splicers are properly trained and qualified.

The wire ends of the spliced strands should be covered with a suitable serving at the option of the purchaser.

6 Design requirements of the spliced eye termination

The design breaking strength of a spliced eye termination shall be at least 70 % of the minimum breaking force of the respective wire rope.

If a steel core is spliced with at least three tucks with the strands, it may be considered as a load-bearing part of the rope.

7 Prototype tests

Samples of splices for each rope size shall have passed the tests described in 7.1 and 7.2.

7.1 Tensile test to destruction

Two tests shall be carried out on each size of fibre-cored and steel-cored wire rope for which the splicing method is recommended.

The rope constructions used for test shall be 6 × 19 and 6 × 36 up to and including a nominal rope diameter of 14 mm and 6 × 36 for nominal rope diameters above 14 mm.

A spliced eye termination shall be formed without a thimble at each end of each test piece. The minimum distance between the tails of the splices shall be 30 times the nominal rope diameter. The force shall be applied by means of round pins having a suitable diameter, threaded through the eye termination. Not more than 60 % of the minimum breaking force of the

1) At present at the stage of draft.

rope as specified in ISO 2408 shall be applied quickly; thereafter stress shall be applied steadily at a rate of not more than 10 MPa/s until the actual breaking load is reached.

The assembly shall have passed the prototype tensile test if the breaking force of both samples is in excess of 70 % of the minimum breaking force of the rope.

7.2 Durability

The tests shall be carried out on three rope sizes which shall represent, respectively, the smallest, middle and largest of those sizes for which the system is recommended.

The rope used for these tests shall have the following characteristics:

- construction: from either the 6 × 19 or 6 × 36 group;
- tensile grade: 1 770 N/mm²;
- fibre main core.

The tests shall be carried out on two assemblies of each size selected. The assemblies shall have a spliced eye termination at each end, and shall be fitted with solid thimbles. The length of clear rope between the tails of the splices shall be as for the prototype tensile test (see 7.1).

The tests shall be carried out in a tensile fatigue machine which shall be capable of producing substantially the same stress pattern at both the fixed and moving ends.

Each assembly shall be subject to a cyclic tension along the rope axis from 15 to 30 % of the minimum breaking force of the rope as specified in ISO 2408.

The machine frequency shall not exceed 15 kHz.

To comply with this International Standard each of the six assemblies selected for prototype tests shall withstand 20 000 cycles after which the breaking force of the assembly shall not be less than 70 % of the minimum breaking force of the rope.

Annex

Splicing method

(This annex forms an integral part of the standard.)

A.1 General

This annex specifies a method for making thimble and loop splices in six stranded steel wire ropes with fibre or steel cores in ordinary lay.

The method described assumes that a thimble is used in the eye of the splice, but the method is the same when a splice is made without a thimble.

A.2 Method

A.2.1 Splices shall be made with five tucks comprising three tucks with full strands and two tucks with reduced strands. All splices shall be made against the lay of the rope; this will be achieved, except for the first series of tucks, by tucking all the strand tails against the lay of the rope.

A.2.2 The tucks shall be taken over one strand and under one strand.

A.2.3 If the rope has a fibre main core, the core shall be tucked complete with the first tail in the first series of tucks and then cut off where it emerges from the rope. If the strands have a fibre core, this shall be left in the strands undisturbed.

A.2.4 If the rope has an independent wire rope core, the core shall be split into three parts, i.e.

- two strands;
- two strands;
- two strands plus core.

These three parts shall be inserted with three alternate tails and tucked with them for three full tucks only.

A.2.5 If the rope has a wire strand core, the core shall be turned in at the first series of tucks and run up complete in the centre of the splice for the full five tucks.

A.2.6 All tucks shall be pulled down hard in line with the centreline of the rope being spliced. To make the tucks tight and short, it may be necessary to beat or work them into position using a tucking spike or hammer.

A.3 Preparation

A.3.1 The thimble shall be gripped in the vice and the rope threaded around it so that the main part of the rope is on the right-hand side and the free end on the left.

A.3.2 The thimble shall be seized at the crown and on both flanks, or secured by a thimble clamp.

A.3.3 The strands of the rope shall then be unlaid. The strand ends of non-preformed ropes shall be securely whipped.

NOTE — The term "whipped" is the traditional and correct term, but the term "seized" is commonly used in the industry.

A.3.4 The configuration of the rope and thimble shall then be as shown in figure 1.

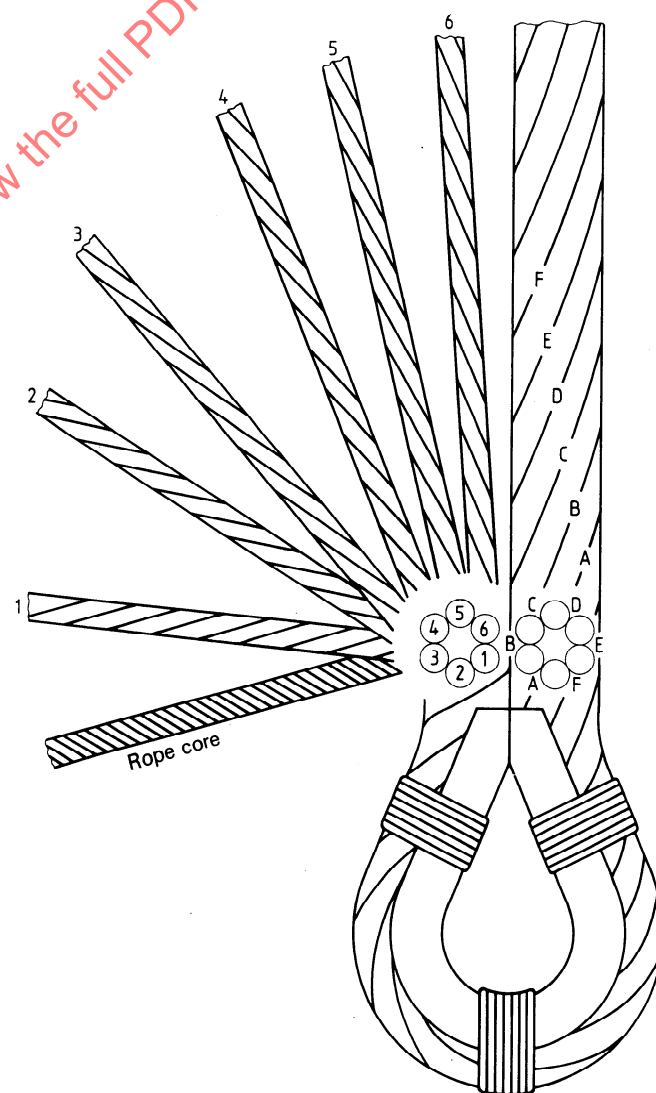


Figure 1 — Configuration of rope and thimble

A.4 Starting the splice

The standard method for starting the splice is as illustrated in figure 2 and detailed in the table.

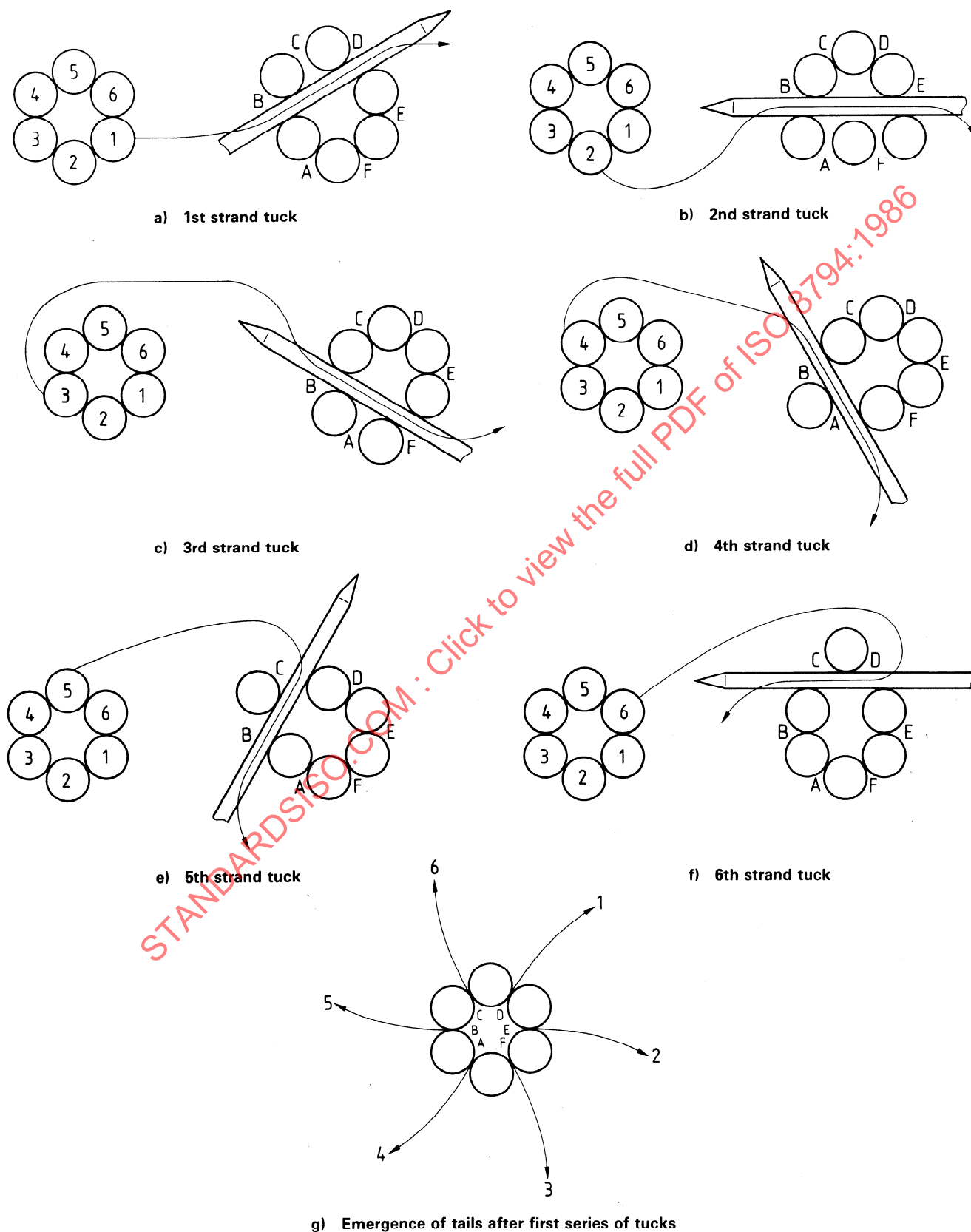


Figure 2 — Standard method for starting the splice