

SINGAPORE STANDARD

Steel wire ropes for hoisting

– Part 3 : Code of practice for the care, inspection
and maintenance of steel wire ropes for hoisting



Published by

Enterprise
Singapore

SS 595 : Part 3 : 2014
(ICS 53.020.30)

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ISBN 978-981-4557-38-2

This Singapore Standard was approved by the General Engineering and Safety Standards Committee on behalf of the Singapore Standards Council on 30 June 2014.

First published, 2014

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National Foreword

This Singapore Standard was prepared by the Working Group appointed by the Technical Committee on Safety and Health Involving the Use of Equipment under the direction of the General Engineering and Safety Standards Committee.

The review of SS 297 : 1996 – ‘Specification for steel wire ropes for hoisting’ and CP 35 : 1996 – ‘Code of practice for the selection, care and maintenance of steel wire ropes for hoisting’, resulted in the development of a new Singapore Standard, SS 595, which consists of the following three parts, under the general title ‘Steel wire ropes for hoisting’:

- Part 1 : Specification for steel wire ropes (Modified adoption of ISO 2408 : 2004)
- Part 2 : Specification for the selection of wire ropes (Identical adoption of ISO 4308-1 : 2003)
- Part 3 : Code of practice for the care, inspection and maintenance of steel wire ropes for hoisting (Modified adoption of ISO 4309 : 2010)

SS 595 is intended to replace SS 297 and CP 35.

This part of SS 595 is a modified adoption of ISO 4309 : 2010 – ‘Cranes – Wire ropes – Care and maintenance, inspection and discard’, published by the International Organization for Standardization.

The modifications are given as follows:

Clause	Modifications
4.3 and 4.7	<i>Add</i> “Refer to Annex ZA – Lubrication.”
5.1	<i>Add</i> “Refer to also Annex ZB – Inspection.”
	Explanation: To suit local requirements and the needs of the industry.

Annex ZA provides information on the lubrication of wire ropes whilst Annex ZB stipulates the important points to be noted in the inspection and the non-destructive testing of wire ropes.

Attention is drawn to the following:

1. Where the words ‘this International Standard’ appear, they should be interpreted as ‘this part of SS 595’.
2. The comma has been used throughout as a decimal marker in ISO 4309, whereas in Singapore Standards it is a practice to use a full-point on the baseline as the decimal marker.
3. The reference to International Standards shall be replaced by the following Singapore Standards:

International Standard	Corresponding Singapore Standard
ISO 4308-1	SS 595 : Part 2

In preparing this standard, reference was also made to the following publications:

1. EN 12385-3 : 2004 Steel wire ropes. Safety. Information for use and maintenance.
2. Wire Rope Users Manual, Fourth Edition, Wire Rope Technical Board.

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Acknowledgement is made for the use of information from the above publications.

Attention is drawn to the possibility that some of the elements of this Singapore Standard may be the subject of patent rights. Enterprise Singapore shall not be held responsible for identifying any or all of such patent rights.

NOTE

1. *Singapore Standards (SSs) and Technical References (TRs) are reviewed periodically to keep abreast of technical changes, technological developments and industry practices. The changes are documented through the issue of either amendments or revisions.*
2. *An SS or TR is voluntary in nature except when it is made mandatory by a regulatory authority. It can also be cited in contracts making its application a business necessity. Users are advised to assess and determine whether the SS or TR is suitable for their intended use or purpose. If required, they should refer to the relevant professionals or experts for advice on the use of the document. Enterprise Singapore shall not be liable for any damages whether directly or indirectly suffered by anyone or any organisation as a result of the use of any SS or TR.*
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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 4309 was prepared by Technical Committee ISO/TC 96, *Cranes*, Subcommittee SC 3, *Selection of wire ropes*.

This fourth edition cancels and replaces the third edition (ISO 4309:2004), which has been technically revised. It also incorporates the Amendment ISO 4309:2004/Amd.1:2008.

Introduction

A wire rope on a crane is regarded as an expendable component, requiring replacement when the results of inspection indicate that its condition has diminished to the point where further use would be unwise from a safety standpoint.

By following well-established principles, such as those detailed in this International Standard, along with any additional specific instructions provided by the manufacturer of the crane or hoist and/or by the manufacturer of the rope, this point should never be exceeded.

In addition to encompassing the guidance on storage, handling, installation and maintenance, which was first introduced in the last revision, this International Standard also provides discard criteria for those running ropes which are subjected to multi-layer spooling, where both field experience and testing demonstrate that deterioration is significantly greater at the cross-over zones on the drum, than at any other section of rope in the system.

It also provides more realistic discard criteria covering decrease in rope diameter and corrosion, and gives one method for assessing the combined effect of deterioration at any position in the rope.

When correctly applied, the discard criteria given in this International Standard are aimed at retaining an adequate safety margin. Failure to recognize them can be extremely harmful, dangerous and damaging.

To assist those who are responsible for “care and maintenance” as distinct from those who are responsible for “inspection and discard”, the procedures are conveniently separated.

Steel wire ropes for hoisting – Part 3 : Code of practice for the care, inspection and maintenance of steel wire ropes for hoisting

1 Scope

This International Standard establishes general principles for the care and maintenance, and inspection and discard of steel wire ropes used on cranes and hoists.

This International Standard is applicable to those ropes used on the following types of cranes, the majority of which are defined in ISO 4306-1:

- a) cable and portal cable cranes;
- b) cantilever cranes (pillar jib, wall or walking);
- c) deck cranes;
- d) derrick and guy derrick cranes;
- e) derrick cranes with rigid bracing;
- f) floating cranes;
- g) mobile cranes;
- h) overhead travelling cranes;
- i) portal or semi-portal bridge cranes;
- j) portal or semi-portal cranes;
- k) railway cranes;
- l) tower cranes;
- m) offshore cranes, i.e. cranes mounted on a fixed structure supported by the sea bed or on a floating unit supported by buoyancy forces.

This International Standard applies to rope on cranes used for hook, grabbing, magnet, ladle, excavator or stacking duties, whether operated manually, electrically or hydraulically.

This International Standard also applies to rope used on hoists and hoist blocks.

In view of the fact that the exclusive use of synthetic sheaves or metal sheaves incorporating synthetic linings is not recommended when single-layer spooling at the drum, due to the inevitability of wire breaks occurring internally in large numbers before there is any visible evidence of any wire breaks or signs of substantial wear on the periphery of the rope, no discard criteria are given for this combination.

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