
Cranes — Wire ropes — Care and maintenance, inspection and discard

*Appareils de levage à charge suspendue — Câbles en acier —
Entretien et maintenance, inspection et dépose*





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Contents

	Page
Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	2
3 Terms and definitions	2
4 Care and maintenance	4
4.1 General	4
4.2 Rope replacement	4
4.3 Offloading and storing the rope	6
4.4 Condition of the rope prior to installation	6
4.5 Installing the rope	7
4.6 Running-in the new rope	10
4.7 Maintaining the rope	11
4.8 Maintenance of rope-related parts of the crane	11
5 Inspection	12
5.1 General	12
5.2 Daily visual inspections	12
5.3 Periodic inspections	12
5.3.1 General	12
5.3.2 Frequency	13
5.3.3 Extent of inspection	13
5.3.4 Inspection at, or in the vicinity of, a termination	14
5.3.5 Inspection record	14
5.4 Inspection following an incident	15
5.5 Inspection following period with crane out of operation	15
5.6 Inspection by magnetic rope test method	15
6 Discard criteria	15
6.1 General	15
6.2 Visible broken wires	16
6.2.1 Criteria for visible broken wires	16
6.2.2 Use of Tables 3 and 4 and rope category number	16
6.2.3 Wire breaks other than those resulting from service	16
6.2.4 Single-layer and parallel-closed ropes	17
6.2.5 Rotation-resistant ropes	19
6.3 Magnetic rope test (MRT)	19
6.4 Decrease in rope diameter	20
6.4.1 Uniform decrease along the rope	20
6.4.2 Calculation to determine actual uniform decrease in diameter and expression as percentage of nominal rope diameter	21
6.4.3 Local decrease	21
6.5 Fracture of strands	21
6.6 Corrosion	21
6.7 Deformation and damage	22
6.7.1 General	22
6.7.2 Waviness	22
6.7.3 Basket deformation	23
6.7.4 Core or strand protrusion or distortion	23
6.7.5 Protruding wires in loops	23
6.7.6 Local increase in rope diameter	23
6.7.7 Flattened portion	23
6.7.8 Kink or tightened loop	24
6.7.9 Bend in rope	24

6.7.10 Damage due to heat or electric arcing.....	24
Annex A (normative) Key areas requiring particularly close inspection.....	25
Annex B (informative) Typical modes of deterioration.....	27
Annex C (informative) Discard criteria for MRT.....	37
Annex D (informative) Internal examination of rope by use of clamps	39
Annex E (informative) Typical examples of inspection records.....	42
Annex F (informative) Useful information on rope deterioration and discard criteria.....	45
Annex G (informative) Combined effect assessment of rope condition and severity rating — One method.....	48
Annex H (informative) Examples of cross-sections of ropes and corresponding rope category number (RCN).....	51
Annex I (informative) External corrosion.....	57
Bibliography	59

Foreword

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This document was prepared by Technical Committee ISO/TC 96, *Cranes*, Subcommittee SC 3, *Ropes*.

This fifth edition cancels and replaces the fourth edition (ISO 4309:2010), which has been technically revised and contains the following changes:

- magnetic rope test (MRT) methodology and discard criteria are introduced, as an aid to the internal inspection of wire ropes;
- guidance is given on when to use magnetic rope testing and how to combine its results with other inspection results;
- an example of an MRT report is provided.

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 might be unsafe.

By following well-established principles such as those detailed in this document, 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.

When correctly applied, the discard criteria given in this document 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.

Cranes — Wire ropes — Care and maintenance, inspection and discard

1 Scope

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

In addition to guidance on storage, handling, installation and maintenance, this document 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 crossover zones on the drum than at any other section of rope in the system.

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

This document 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 document applies to rope on cranes, winches and hoists used for hook, grabbing, magnet, ladle, excavator or stacking duties, whether operated manually, electrically or hydraulically.

It also applies to rope used on hoists and hoist blocks.

NOTE 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.