

# INTERNATIONAL STANDARD

# ISO 4309

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**AMENDMENT 1**  
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## Cranes — Wire ropes — Care, maintenance, installation, examination and discard

### AMENDMENT 1

*Appareils de levage à charge suspendue — Câbles — Entretien,  
maintenance, installation, examen et dépose*  
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ISO 4309:2004/Amd 1:2008

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## Foreword

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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.

Amendment 1 to ISO 4309:2004 was prepared by Technical Committee ISO/TC 96, *Cranes*, Subcommittee SC 3, *Selection of wire ropes*.

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# Cranes — Wire ropes — Care, maintenance, installation, examination and discard

## AMENDMENT 1

Page 8, Table 1

Insert amended table.

**Table 1 — Number of wire breaks, reached or exceeded, of visible broken wires occurring in single-layer and parallel-closed ropes, signalling discard of rope**

Rope category number  RCN (see Annex E)	Total number of load-bearing wires in the outer layer of strands in the rope <sup>a</sup>  <i>n</i>	Number of visible broken wires <sup>b</sup>					
		Sections of rope working in steel sheaves and/or spooling on a single-layer coiling drum  (wire breaks randomly distributed)				Sections of rope spooling on a multi-layer coiling drum <sup>c</sup>	
		Classes M1 to M4 or class unknown <sup>d</sup>				All classes	
		Ordinary lay		Lang lay		Ordinary lay and Lang lay	
		Over a length of $6d^e$	Over a length of $30d^e$	Over a length of $6d^e$	Over a length of $30d^e$	Over a length of $6d^e$	Over a length of $30d^e$
01	$n \leq 50$	2	4	1	2	4	8
02	$51 \leq n \leq 75$	3	6	2	3	6	12
03	$76 \leq n \leq 100$	4	8	2	4	8	16
04	$101 \leq n \leq 120$	5	10	2	5	10	20
05	$121 \leq n \leq 140$	6	11	3	6	12	22
06	$141 \leq n \leq 160$	6	13	3	6	12	26
07	$161 \leq n \leq 180$	7	14	4	7	14	28
08	$181 \leq n \leq 200$	8	16	4	8	16	32
09	$201 \leq n \leq 220$	9	18	4	9	18	36
10	$221 \leq n \leq 240$	10	19	5	10	20	38
11	$241 \leq n \leq 260$	10	21	5	10	20	42
12	$261 \leq n \leq 280$	11	22	6	11	22	44
13	$281 \leq n \leq 300$	12	24	6	12	24	48
	$n > 300$	$0,04n$	$0,08n$	$0,02n$	$0,04n$	$0,08n$	$0,16n$

NOTE 1 Ropes having outer strands of Seale construction where the number of wires in each strand is 19 or less (e.g.  $6 \times 19$  Seale) are placed in the table two rows above that row in which the construction would normally be placed based on the number of load-bearing wires in the outer layer of strands.

NOTE 2 Above values for sections of rope spooling on a multi-layer coiling drum may also apply to other sections of the rope working in sheaves that are exclusively made of a polymer material or have a polymer material lining. They do NOT apply to ropes working in sheaves that are exclusively made of a polymer material or have a polymer material lining in combination with single-layer coiling.

<sup>a</sup> For the purposes of this International Standard, filler wires are not regarded as load-bearing wires and are not included in the values of *n*.

<sup>b</sup> A broken wire will have two ends (counted as one wire).

<sup>c</sup> The values apply to deterioration that occurs at the cross-over zones and interference between wraps due to fleet angle effects (and not to those sections of rope that only work in sheaves and do not spool on the drum).

<sup>d</sup> Twice the number of broken wires listed may be applied to ropes on mechanisms whose classification is known to be M5 to M8. See ISO 4308-1

<sup>e</sup> *d* = nominal diameter of rope.

Insert amended table.

**Table 2 — Number of wire breaks, reached or exceeded, of visible broken wires occurring in rotation-resistant rope, signalling discard of rope**

Rope category number  RCN (see Annex E)	Number of outer strands and total number of load-bearing wires in the outer layer of strands in the rope <sup>a</sup>  <i>n</i>	Number of visible broken wires <sup>b</sup>			
		Sections of rope working in steel sheaves and/or spooling on a single-layer coiling drum		Sections of rope spooling on a multi-layer coiling drum <sup>c</sup>	
		Over a length of $6d^d$	Over a length of $30d^d$	Over a length of $6d^d$	Over a length of $30d^d$
21	4 strands $n \leq 100$	2	4	2	4
	3 or 4 strands $n \geq 100$	2	4	4	8
	At least 11 outer strands				
23-1	$76 \leq n \leq 100$	2	4	4	8
23-2	$101 \leq n \leq 120$	2	4	5	10
23-3	$121 \leq n \leq 140$	2	4	6	11
24	$141 \leq n \leq 160$	3	6	6	13
25	$161 \leq n \leq 180$	4	7	7	14
26	$181 \leq n \leq 200$	4	8	8	16
27	$201 \leq n \leq 220$	4	9	9	18
28	$221 \leq n \leq 240$	5	10	10	19
29	$241 \leq n \leq 260$	5	10	10	21
30	$261 \leq n \leq 280$	6	11	11	22
31	$281 \leq n \leq 300$	6	12	12	24
	$n > 300$	6	12	12	24

NOTE 1 Ropes having outer strands of Seale construction where the number of wires in each strand is 19 or less (e.g. 18 × 19 Seale-WSC) are placed in the table two rows above that row in which the construction would normally be placed based on the number of wires in the outer layer of strands.

NOTE 2 Above values for sections of rope spooling on a multi-layer coiling drum may also apply to other sections of the rope working in sheaves that are exclusively made of a polymer material or have a polymer material lining. They do NOT apply to ropes working in sheaves that are exclusively made of a polymer material or have a polymer material lining in combination with single-layer coiling.

<sup>a</sup> For the purposes of this International Standard, filler wires are not regarded as load-bearing wires and are not included in the values of *n*.

<sup>b</sup> A broken wire will have two ends (*counted as one*).

<sup>c</sup> The values apply to deterioration that occurs at the cross-over zones and interference between wraps due to fleet angle effects (*and not to those sections of rope that only work in sheaves and do not spool on the drum*).

<sup>d</sup> *d* = nominal diameter of rope.

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