DIN ISO 4309:2021-08 (E)

Cranes - Wire ropes - Care and maintenance , inspection and discard (ISO 4309:2017)

Contents

Page

National foreword ... **4**

Foreword ... **6**

Introduction ... **7**

1 Scope ... **8**

2 Normative references ... **9**

3 Terms and definitions ... **9**

4 Care and maintenance ... **11**
4.1 General ... 11
4.2 Rope replacement ... 11
4.3 Offloading and storing the rope ... 13
4.4 Condition of the rope prior to installation ... 13
4.5 Installing the rope ... 14
4.6 Running-in the new rope ... 17
4.7 Maintaining the rope ... 18
4.8 Maintenance of rope-related parts of the crane ... 18

5 Inspection ... **19**
5.1 General ... 19
5.2 Daily visual inspections ... 19
5.3 Periodic inspections ... 19
5.3.1 General ... 19
5.3.2 Frequency ... 20
5.3.3 Extent of inspection ... 20
5.3.4 Inspection at, or in the vicinity of, a termination ... 21
5.3.5 Inspection record ... 21
5.4 Inspection following an incident ... 22
5.5 Inspection following period with crane out of operation ... 22
5.6 Inspection by magnetic rope test method ... 22

6 Discard criteria ... **22**
6.1 General ... 22
6.2 Visible broken wires ... 23
6.2.1 Criteria for visible broken wires ... 23
6.2.2 Use of Tables 3 and 4 and rope category number ... 23
6.2.3 Wire breaks other than those resulting from service ... 23
6.2.4 Single-layer and parallel-closed ropes ... 24
6.2.5 Rotation-resistant ropes ... 26
6.3 Magnetic rope test (MRT) ... 26
6.4 Decrease in rope diameter ... 27
6.4.1 Uniform decrease along the rope ... 27
6.4.2 Calculation to determine actual uniform decrease in diameter and expression as percentage of nominal rope diameter ... 28
6.4.3 Local decrease ... 28

6.5 Fracture of strands 28
6.6 Corrosion 28
6.7 Deformation and damage 29
6.7.1 General 29
6.7.2 Waviness 29
6.7.3 Basket deformation 30
6.7.4 Core or strand protrusion or distortion 30
6.7.5 Protruding wires in loops 30
6.7.6 Local increase in rope diameter 30
6.7.7 Flattened portion 30
6.7.8 Kink or tightened loop 31
6.7.9 Bend in rope 31
6.7.10 Damage due to heat or electric arcing 31

Annex A (normative) **Key areas requiring particularly close inspection** **32**

Annex B (informative) **Typical modes of deterioration** **34**

Annex C (informative) **Discard criteria for MRT** **44**

Annex D (informative) **Internal examination of rope by use of clamps** **46**

Annex E (informative) **Typical examples of inspection records** **49**

Annex F (informative) **Useful information on rope deterioration and discard criteria** **52**

Annex G (informative) **Combined effect assessment of rope condition and severity rating — One method** **55**

Annex H (informative) **Examples of cross-sections of ropes and corresponding rope category number (RCN)** **58**

Annex I (informative) **External corrosion** **64**

Bibliography **66**