DIN EN ISO 683-1:2018-09 (E)

Heat-treatable steels, alloy steels and free-cutting steels - Part 1: Non-alloy steels for quenching and tempering (ISO 683-1:2016)

Contents

Page

European foreword ... **4**

Foreword ... **6**

1 Scope ... **7**

2 Normative references ... **8**

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

4 Classification and designation ... **9**
4.1 Classification ... 9
4.2 Designation ... 9

5 Information to be supplied by the purchaser ... **9**
5.1 Mandatory information ... 9
5.2 Options and/or supplementary or special requirements ... 4
5.3 Ordering example ... 4

6 Manufacturing process ... **10**
6.1 General ... 10
6.2 Deoxidation ... 11
6.3 Heat-treatment condition and surface condition at delivery ... 11
6.3.1 Normal condition at delivery ... 11
6.3.2 Particular heat-treatment condition ... 11
6.3.3 Particular surface conditions ... 11
6.4 Traceability of the cast ... 11

7 Requirements ... **11**
7.1 Chemical composition, mechanical properties and hardenability ... 11
7.1.1 General ... 11
7.1.2 Chemical composition ... 11
7.1.3 Mechanical properties ... 11
7.1.4 Hardenability ... 12
7.1.5 Surface hardness ... 12
7.2 Machinability ... 12
7.3 Cold shearability ... 12
7.4 Grain size ... 12
7.5 Non-metallic inclusions ... 13
7.5.1 Microscopic inclusions ... 13
7.5.2 Macroscopic inclusions ... 13
7.6 Internal soundness ... 13
7.7 Surface quality ... 13
7.8 Decarburization ... 13
7.9 Shape, dimensions and tolerances ... 14

8 Inspection ... **14**
8.1 Testing procedures and types of documents ... 14
8.2 Frequency of testing ... 14
8.3 Specific inspection and testing ... 14
8.3.1 Verification of the hardenability, hardness and mechanical properties ... 14
8.3.2 Visual and dimensional inspection ... 15

9 Test methods **15**
9.1 Chemical analysis 15
9.2 Mechanical tests 15
9.2.1 Tensile test 15
9.2.2 Impact test 15
9.3 Hardness and hardenability tests 15
9.3.1 Hardness in treatment conditions +A and +S 15
9.3.2 Verification of hardenability 15
9.3.3 Surface hardness 15
9.4 Retests 16
10 Marking **16**
Annex A (normative) **Ruling sections for mechanical properties** **36**
Annex B (normative) **Supplementary or special requirements** **40**
Annex C (informative) **Designation of steels given in this part of ISO 683 and of comparable grades covered in various designation systems** **42**
Annex D (informative) **Dimensional standards applicable to products complying with this part of ISO 683** **44**
Bibliography **45**