

# ISO 683-1:2012-09 (E)

## Heat-treatable steels, alloy steels and free-cutting steels - Part 1: Non-alloy steels for quenching and tempering

---

| <b>Contents</b>   | <b>Page</b> |
|---|-------------|
| Foreword .....  | iv          |
| 1 Scope .....   | 1           |
| 2 Normative references .....  | 1           |
| 3 Terms and definitions .....   | 2           |
| 4 Classification and designation .....  | 3           |
| 4.1 Classification .....  | 3           |
| 4.2 Designation .....   | 3           |
| 5 Information to be supplied by the purchaser .....   | 3           |
| 5.1 Mandatory information .....   | 3           |
| 5.2 Options and/or supplementary or special requirements .....  | 3           |
| 6 Manufacturing process .....   | 4           |
| 6.1 General .....   | 4           |
| 6.2 Deoxidation .....   | 4           |
| 6.3 Heat-treatment condition and surface condition at delivery .....  | 4           |
| 6.4 Traceability of the cast .....  | 5           |
| 7 Requirements .....  | 5           |
| 7.1 Chemical composition, mechanical properties and hardenability .....   | 5           |
| 7.2 Machinability .....   | 6           |
| 7.3 Cold shearability .....   | 6           |
| 7.4 Grain size .....  | 6           |
| 7.5 Non-metallic inclusions .....   | 6           |
| 7.6 Internal soundness .....  | 6           |
| 7.7 Surface quality .....   | 6           |
| 7.8 Decarburization .....   | 7           |
| 7.9 Shape, dimensions and tolerances .....  | 7           |
| 8 Inspection .....  | 7           |
| 8.1 Testing procedures and types of documents .....   | 7           |
| 8.2 Frequency of testing .....  | 8           |
| 8.3 Specific inspection and testing .....   | 8           |
| 9 Test methods .....  | 8           |
| 9.1 Chemical analysis .....   | 8           |
| 9.2 Mechanical tests .....  | 8           |
| 9.3 Hardness and hardenability tests .....  | 9           |
| 9.4 Retests .....   | 9           |
| 10 Marking .....  | 9           |
| Annex A (normative) Ruling sections for mechanical properties .....   | 31          |
| Annex B (normative) Supplementary or special requirements .....   | 34          |
| Annex C (informative) Designation of steels given in this part of ISO 683 and of comparable grades covered in various designation systems ..... | 36          |
| Annex D (informative) Dimensional standards applicable to products complying with this part of ISO 683 .....                                    | 38          |
| Bibliography .....  | 39          |