DIN EN ISO 643:2020-06 (E)

Steels - Micrographic determination of the apparent grain size (ISO 643:2019, Corrected version 2 020-03)

Contents

Page

European foreword ... **3**

Foreword ... **4**

1 Scope ... **5**

2 Normative references ... **5**

3 Terms and definitions ... **5**
3.1 Grains ... 5
3.2 General ... 6

4 Symbols ... **6**

5 Principle ... **7**

6 Selection and preparation of the specimen ... **8**
6.1 Test location ... 8
6.2 Revealing ferritic grain boundaries ... 9
6.3 Revealing austenitic and prior-austenitic grain boundaries ... 9
6.3.1 General ... 9
6.3.2 "Bechet-Beaujard" method by etching with aqueous saturated picric acid solution ... 9
6.3.3 "Kohn" method by controlled oxidation ... 10
6.3.4 "McQuaid-Ehn" method by carburization at 925 °C ... 11
6.3.5 Proeutectoid ferrite method ... 12
6.3.6 Bainite or gradient-quench method ... 13
6.3.7 Sensitization of austenitic stainless and manganese steels ... 13
6.3.8 Other methods for revealing prior-austenitic grain boundaries ... 13

7 Characterization of grain size ... **14**
7.1 Characterization by an index ... 14
7.1.1 Formulae ... 14
7.1.2 Assessment by comparison with standard grain size charts ... 14
7.1.3 Planimetric method ... 15
7.1.4 Estimation of the index ... 15
7.2 Characterization by the intercept method ... 15
7.2.1 Linear intercept segment method ... 15
7.2.2 Circular intercept segment method ... 16
7.2.3 Assessment of results ... 17

8 Test report ... **18**

Annex A (informative) **Summary of methods for revealing ferritic, austenitic or prior-austenitic grain boundaries in steels** ... **19**

Annex B (normative) **Evaluation method** ... **20**

Bibliography ... **25**