# DIN EN ISO 13383-1:2016-11 (E)

**Fine ceramics (advanced ceramics, advanced technical ceramics) - Microstructural characterization - Part 1: Determination of grain size and size distribution (ISO 13383-1:2012)**

## Contents

Page


**European foreword** ... **3**

**Foreword** ... **4**

**1 Scope** ... **5**

**2 Normative references** ... **5**

**3 Terms and definitions** ... **5**

**4 Significance and use** ... **7**

**5 Apparatus** ... **8**
5.1 Sectioning equipment ... 8
5.2 Mounting equipment ... 8
5.3 Grinding and polishing equipment ... 8
5.4 Etching equipment ... 8
5.5 Microscope ... 8
5.6 Calibrated rule or scale ... 9
5.7 Circle template ... 9

**6 Test piece preparation** ... **9**
6.1 Sampling ... 9
6.2 Cutting ... 9
6.3 Mounting ... 9
6.4 Grinding and polishing ... 9
6.5 Etching ... 10

**7 Photomicrography** ... **10**
7.1 General aspects ... 10
7.2 Optical microscopy ... 10
7.3 Scanning electron microscopy ... 10
7.4 Calibration micrographs ... 11

**8 Measurement of micrographs** ... **11**
8.1 General ... 11
8.2 Method A1 ... 12
8.3 Method A2 ... 12
8.4 Method B ... 12
8.5 Use of automatic or semi-automatic image analysis for methods A and B ... 13

**9 Calculation of results** ... **14**
9.1 Method A1 ... 14
9.2 Method A2 ... 14
9.3 Method B ... 14

**10 Interferences and uncertainties** ... **15**

**11 Test report** ... **16**

**Annex A** (informative) **Grinding and polishing procedures** ..... **18**
**Annex B** (informative) **Etching procedures** ..... **20**
**Annex C** (informative) **Setting Köhler illumination in an optical microscope** ..... **22**
**Annex D** (informative) **Round-robin verification of Method A1** ..... **23**
**Annex E** (informative) **Round-robin verification of Method B** ..... **24**
**Annex F** (informative) **Grain size distribution measurement** ..... **25**
**Annex G** (informative) **Results sheet: Grain size in accordance with ISO 13383-1** ..... **26**
**Bibliography** ..... **27**