

DIN ISO 13067:2021-08 (E)

Microbeam analysis - Electron backscatter diffraction - Measurement of average grain size (ISO 13067:2020)

| Contents | | Page |
|--|--|-------------|
| National foreword | | 3 |
| National Annex NA (informative) Bibliography | | 4 |
| Foreword | | 5 |
| Introduction | | 6 |
| 1 | Scope | 7 |
| 2 | Normative references | 7 |
| 3 | Terms and definitions | 7 |
| 3.1 | Terminology associated with EBSD measurement of grain size | 8 |
| 3.2 | Terminology associated with grains and grain boundaries determined via EBSD | 10 |
| 3.3 | Terminology associated within grain size measurement | 11 |
| 3.4 | Terminology associated with data correction and uncertainty of EBSD maps | 12 |
| 4 | Equipment for grain sizing by EBSD | 13 |
| 4.1 | Hardware requirements | 13 |
| 4.2 | Software requirements | 13 |
| 5 | Acquiring the map for grain sizing by EBSD | 13 |
| 5.1 | Specimen preparation | 13 |
| 5.2 | Defining specimen axes | 13 |
| 5.3 | Stage positioning and calibration | 14 |
| 5.4 | Linear calibration | 14 |
| 5.5 | Preliminary examination | 14 |
| 5.6 | Choice of step size | 14 |
| 5.7 | Determination of the level of angular accuracy needed [7][8] | 16 |
| 5.8 | Choice of areas to be mapped and map size | 16 |
| 5.9 | Considerations when examining plastically deformed materials | 17 |
| 6 | Analytical procedure | 17 |
| 6.1 | Definition of boundaries | 17 |
| 6.1.1 | Grain boundary angles | 17 |
| 6.1.2 | Handling incomplete boundaries | 18 |
| 6.1.3 | Dealing with special boundaries | 18 |
| 6.2 | Post-acquisition treatment of raw data | 18 |
| 6.3 | Data-cleaning steps | 18 |
| 6.4 | Measurement of sectional grain size | 22 |
| 6.5 | Calculation of average grain size | 22 |
| 6.6 | Representation of data | 23 |
| 7 | Measurement uncertainty | 23 |
| 8 | Reporting of analysis results | 24 |
| Annex A (informative) | Grain size measurement | 26 |
| Annex B (informative) | Reproducibility | 28 |
| Bibliography | | 31 |