

ISO 23703:2022-01 (E)

Microbeam analysis - Guidelines for misorientation analysis to assess mechanical damage of austenitic stainless steel by electron backscatter diffraction (EBSD)

| Contents | Page |
|---|-----------|
| Foreword..... | iv |
| Introduction..... | v |
| 1 Scope..... | 1 |
| 2 Normative references..... | 1 |
| 3 Terms and definitions..... | 1 |
| 4 Abbreviated terms..... | 4 |
| 5 Equipment for EBSD measurement..... | 4 |
| 6 Preparation..... | 4 |
| 6.1 Calibration..... | 4 |
| 6.2 Specimen preparation..... | 5 |
| 7 Measurement procedures..... | 6 |
| 7.1 Setting SEM operating conditions..... | 6 |
| 7.1.1 Accelerating voltage..... | 6 |
| 7.1.2 Probe current..... | 6 |
| 7.1.3 Magnification observation..... | 6 |
| 7.1.4 Working distance..... | 6 |
| 7.1.5 Focus..... | 6 |
| 7.2 Setting the EBSD measurement conditions..... | 6 |
| 7.2.1 Background correction..... | 6 |
| 7.2.2 Binning..... | 7 |
| 7.2.3 Pattern averaging..... | 7 |
| 7.2.4 Hough transform..... | 7 |
| 7.2.5 Measurement area..... | 7 |
| 7.2.6 Step size..... | 7 |
| 7.2.7 Scanning grid..... | 8 |
| 8 Calculation of misorientation..... | 8 |
| 8.1 Defining grains..... | 8 |
| 8.1.1 General..... | 8 |
| 8.1.2 Setting the misorientation to define grains..... | 8 |
| 8.1.3 Setting of minimum grain size..... | 8 |
| 8.1.4 Caution..... | 8 |
| 8.2 Data screening..... | 8 |
| 8.2.1 Evaluation of reliability of measured data..... | 8 |
| 8.2.2 Treatment of blank pixels..... | 9 |
| 8.3 Calculation of misorientation parameters..... | 9 |
| 9 Material damage assessment..... | 11 |
| 9.1 General..... | 11 |
| 9.2 Misorientation parameter for qualitative assessments..... | 12 |
| 9.3 Misorientation parameter for quantitative assessments..... | 12 |
| 10 Report..... | 12 |
| Annex A (informative) Round robin crystal orientation measurement for damage assessment..... | 15 |
| Bibliography..... | 25 |