INTERNATIONAL STANDARD

ISO 20501

Second edition
2019-03

Fine ceramics (advanced ceramics, advanced technical ceramics) — Weibull statistics for strength data

Céramiques techniques — Analyse statistique de Weibull des données de résistance à la rupture

Reference number
ISO 20501:2019(E)

© ISO 2019

COPYRIGHT PROTECTED DOCUMENT

© ISO 2019

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword ... **iv**
Introduction ... **v**
1 Scope ... **1**
2 Normative references ... **1**
3 Terms and definitions ... **1**
3.1 Defect populations ... 1
3.2 Mechanical testing ... 3
3.3 Statistical terms ... 3
3.4 Weibull distributions ... 4
4 Symbols ... **5**
5 Significance and use ... **6**
6 Method A: maximum likelihood parameter estimators for single flaw populations ... **7**
6.1 General ... 7
6.2 Censored data ... 8
6.3 Likelihood functions ... 8
6.4 Bias correction ... 8
6.5 Confidence intervals ... 10
7 Method B: maximum likelihood parameter estimators for competing flaw populations ... **13**
7.1 General ... 13
7.2 Censored data ... 14
7.3 Likelihood functions ... 14
8 Procedure ... **15**
8.1 Outlying observations ... 15
8.2 Fractography ... 15
8.3 Graphical representation ... 16
9 Test report ... **18**
Annex A (informative) **Converting to material-specific strength distribution parameters** ... **19**
Annex B (informative) **Illustrative examples** ... **21**
Annex C (informative) **Test specimens with unidentified fracture origin** ... **28**
Annex D (informative) **Fortran program** ... **31**
Bibliography ... **36**

© ISO 2019 – All rights reserved