ISO 21971:2019-12 (E)

Fine ceramics (advanced ceramics, advanced technical ceramics) - Mechanical properti es of ceramic composites at ambient temperature in air atmospheric pressure - De termination of hoop tensile properties of tubes

Contents

Page

Foreword v

1 Scope 1

2 Normative references 1

3 Termsanddefinitions 1

4 Principle 3

5 Apparatus 4
5.1 Pressurizing system 4
5.2 Test specimen gripping and end closure 4
5.3 Strain measurement 5
5.3.1 General 5
5.3.2 Strain gauges 5
5.3.3 Digital image correlation 5
5.4 Pressure and data recording systems 6
5.5 Measurement of dimensions 6

6 Tubular test specimen 7
6.1 Specimen specifications 7
6.1.1 General 7
6.1.2 Dimension 7
6.1.3 Geometry 7
6.1.4 Tolerances and variability 8
6.2 Specimen preparation 8
6.2.1 General 8
6.2.2 As-fabricated 8
6.2.3 Application-matched machining 9
6.2.4 Customary practices 9
6.2.5 Standard procedure 9
6.3 Test count and test specimens sampling 9

7 Test procedure 9
7.1 General 9
7.2 Test mode and rates 9
7.3 Testing technique 10
7.3.1 Measurement of test specimen dimensions 10
7.3.2 Instrumentation of test specimen 10
7.3.3 Setting-up of strain measurement means 10
7.3.4 Measurements 11
7.3.5 Post-test analyses 12
7.4 Test validity 12

8 Calculation of results 12
8.1 Test specimen origin 12
8.2 Hoop tensile stress and strain 12
8.3 Hoop tensile strength and corresponding strain 13

8.4 Proportionality ratio or pseudo-elastic modulus in circumferential direction 14
8.4.1 Stress-strain curves with a linear region 14
8.4.2 Nonlinear stress-strain curves 14
8.5 Poisson's ratio (optional) 15
8.6 Statistics 15

9 Test report 15
9.1 General 15
9.2 Testing information 15
9.3 Test specimen and material 16
9.3.1 Tubular test specimen drawing or reference 16

9.3.2 Description of the test material 16
9.4 Equipment and test parameters 16
9.5 Test results 16

Bibliography 18