

# DIN EN ISO 20323:2021-11 (E)

Fine ceramics (advanced ceramics, advanced technical ceramics) - Mechanical properties of ceramic composites at ambient temperature in air atmospheric pressure - Determination of tensile properties of tubes (ISO 20323:2018)

---

<b>Contents</b>		<b>Page</b>
European foreword .....		3
Foreword .....		4
<b>1</b>	<b>Scope</b> .....	<b>5</b>
<b>2</b>	<b>Normative references</b> .....	<b>5</b>
<b>3</b>	<b>Terms and definitions</b> .....	<b>5</b>
<b>4</b>	<b>Principle</b> .....	<b>8</b>
<b>5</b>	<b>Apparatus</b> .....	<b>8</b>
<b>6</b>	<b>Tubular test specimens</b> .....	<b>12</b>
6.1	Specimen specifications .....	12
6.1.1	General .....	12
6.1.2	Dimension .....	12
6.1.3	Geometry .....	12
6.1.4	Tolerances and variability .....	13
6.2	Specimen preparation .....	13
6.2.1	General .....	13
6.2.2	As-fabricated .....	14
6.2.3	Application-matched machining .....	14
6.2.4	Customary practices .....	14
6.2.5	Standard procedure .....	14
6.3	End collars .....	14
6.4	Test count and test specimens sampling .....	16
<b>7</b>	<b>Test procedure</b> .....	<b>16</b>
7.1	General .....	16
7.2	Test mode and rates .....	16
7.3	Testing technique .....	17
7.3.1	Measurement of test specimen dimensions .....	17
7.3.2	Instrumentation of test specimen .....	17
7.3.3	Test specimen mounting .....	17
7.3.4	Setting-up of strain measurement means .....	17
7.3.5	Measurements .....	18
7.3.6	Post-test analyses .....	19
7.4	Test validity .....	19
<b>8</b>	<b>Calculation of results</b> .....	<b>19</b>
8.1	Test specimen origin .....	19
8.2	Engineering stress and strain .....	20
8.3	Tensile strength .....	21
8.4	Strain at maximum tensile force .....	21
8.5	Proportionality ratio or pseudo-elastic modulus, elastic modulus .....	22
8.5.1	Stress-strain curves with a linear region .....	22
8.5.2	Nonlinear stress-strain curves .....	23
8.6	Poisson's ratio (optional) .....	23
8.7	Statistics .....	23
<b>9</b>	<b>Test report</b> .....	<b>24</b>
9.1	General .....	24
9.2	Testing information .....	24
9.3	Test specimen and material .....	24
9.4	Equipment and test parameters .....	25
9.5	Test results .....	25
<b>Annex A</b> (informative) <b>Gripping devices and load train couplers</b> .....		<b>26</b>
<b>Annex B</b> (informative) <b>Test specimen geometries</b> .....		<b>31</b>
<b>Bibliography</b> .....		<b>32</b>