ISO 20975-1:2023-01 (E)

Fibre-reinforced plastic composites - Determination of laminate through-thickness properties - Part 1: Direct tension and compression tests

Contents

Page

Foreword ..... **v**

Introduction ..... **vi**

1 Scope **1**

2 Normative references **1**

3 Terms and definitions **2**

4 Principle **4**

5 Apparatus **4**

5.1 Test machine 4

5.1.1 General 4

5.1.2 Indicators for load and strain 5

5.2 Strain gauges and strain acquisition 5

5.3 Micrometer 5

5.4 Loading fixtures 5

5.4.1 General 5

5.4.2 Method A - Tension loading 5

5.4.3 Method B - Compression loading 5

6 Test specimens **6**

6.1 Shape and dimensions 6

6.1.1 Type I specimens 6

6.1.2 Type II specimens 7

6.1.3 Type III specimens 8

6.1.4 Non-standard test specimens 9

6.2 Preparation of test specimens 10

6.2.1 General 10

6.2.2 Parallelism 10

6.2.3 Application of end-loading blocks for Method A — Tension only 10

6.3 Checking 10

7 Test specimens **10**

8 Conditioning **11**

9 Test procedure **11**

9.1 Test atmosphere 11

9.2 Specimen dimensions 11

9.3 Specimen preparation Method A — Tension only 11

9.4 Strain recording 11

9.5 Specimen alignment 11

9.5.1 Method A – Tension 11

9.5.2 Method B – Compression 12

9.6 Testing speed, *v* 12

9.7 Data collection 12

9.8 Maximum load 12

9.9 Failure mode 12

9.10 Test acceptance 12

10 Expression of results **12**
10.1 Method A — Tension 12
10.1.1 Tensile strength 12
10.1.2 Modulus of elasticity (chord) in tension 13
10.1.3 Tensile failure strain 14
10.2 Method B — Compression 14
10.2.1 Compressive strength 14
10.2.2 Modulus of elasticity (chord) in compression 15
10.2.3 Compressive failure strain 15
10.3 Poisson's ratio – Methods A and B 15
10.4 Statistical analysis 16
11 Precision **16**
12 Test report **16**
Annex A (informative) **Precision data** **17**
Bibliography **19**