ISO 16770:2019 (E)

Plastics — Determination of environmental stress cracking (ESC) of polyethylene — Full-notch creep test (FNCT)

Contents

Foreword

Introduction

1 Scope

2 Normative references

3 Terms and definitions

4 Principle

5 Apparatus

6 Test specimens

- 6.1 General
- 6.2 Test specimens geometry
- 6.3 Test specimen preparation
- 6.3.1 General
- 6.3.2 Test specimens machined from compression moulded sheets
- 6.3.3 Test specimens machined from injection-moulded type 1A multipurpose test specimen
- 6.3.4 Test specimens machined from finished products
- 6.4 Test specimen notching
- 6.5 Conditioning of the test specimens

7 Test environment

- 7.1 General
- 7.2 Recommended test environment
- 7.2.1 Test environment No. 1
- 7.2.2 Test environment No. 2
- 7.3 Other test environments

8 Test procedure

- 8.1 Selection of detergent, reference tensile stress and test temperature
- 8.2 Number of test specimens to be tested
- 8.3 Calculation of the test load
- 8.4 Application of the load to the test specimen
- 8.5 Removing individual specimens from a chamber
- 8.6 Measurement of the ligament area after failure

9 Expression of results

- 9.1 Calculation of the actual tensile stress
- 9.2 Calculation of time to failure at the reference tensile stress

10 Precision

11 Test report

Annex A (informative) Precision statement

- A.1 General
- A.1.1 Reproducibility for Type A test specimen (10 mm × 10 mm cross-section)
- A.1.2 Reproducibility for type B test specimen (6 mm × 6 mm cross-section)
- A.2 Statistical evaluation

A.2.1 Concept of r
A.2.2 Statistical properties
A.2.3 Statistical parameters for Type A test specimen
A.2.4 Statistical parameters for Type B test specimen

Annex B (informative) Example of a recommended test report for FNCT determination

Annex C (informative) Practical examples of fracture surfaces and corresponding definition of failure mode

C.1 Type of failures (schematically)
C.2 Material A — PE-HD grade for sheet extrusion
C.3 Material B — PE-HD grade for injection moulding
C.4 Material C — PE-HD grade for blow moulding (container application)

Page count: 25