

ISO 11119-1:2020 (E)

Gas cylinders — Design, construction and testing of refillable composite gas cylinders and tubes — Part 1: Hoop wrapped fibre reinforced composite gas cylinders and tubes up to 450 l

Contents

	Foreword
	Introduction
1	Scope
2	Normative references
3	Terms and definitions
4	Symbols
5	Inspection and testing
6	Materials
6.1	Liner materials
6.2	Composite materials
7	Design and manufacture
7.1	General
7.2	Design submission
7.3	Manufacturing
8	Type approval procedure
8.1	General requirements
8.2	Prototype tests
8.3	New design
8.4	Design variants
8.5	Type approval test procedures and criteria
8.5.1	Proof pressure test
8.5.1.1	Procedure
8.5.1.2	Criteria
8.5.2	Hydraulic volumetric expansion test
8.5.2.1	Procedure
8.5.2.2	Criteria
8.5.3	Liner burst test
8.5.3.1	Procedure
8.5.3.2	Criteria
8.5.4	Cylinder burst test
8.5.4.1	Procedure
8.5.4.2	Criteria
8.5.5	Ambient cycle test
8.5.5.1	For cylinders with test pressure equal to or greater than 60 bar
8.5.5.1.1	General
8.5.5.1.2	Procedure
8.5.5.1.3	Criteria
8.5.5.2	For cylinders with test pressure less than 60 bar
8.5.5.2.1	Procedure
8.5.5.2.2	Criteria
8.5.6	Environmental cycle test
8.5.6.1	General
8.5.6.2	Procedure

- 8.5.6.3 Criteria
 - 8.5.7 High velocity impact (gunfire) test
 - 8.5.7.1 General
 - 8.5.7.2 Procedure
 - 8.5.7.3 Criteria
 - 8.5.8 Fire resistance test
 - 8.5.8.1 General
 - 8.5.8.2 Procedure
 - 8.5.8.2.1 General
 - 8.5.8.2.2 Horizontal test
 - 8.5.8.2.3 Vertical test
 - 8.5.8.3 Criteria
 - 8.5.9 Salt water immersion test
 - 8.5.9.1 General
 - 8.5.9.2 Procedure
 - 8.5.9.3 Criteria
 - 8.5.10 Torque test
 - 8.5.10.1 General
 - 8.5.10.2 Procedure
 - 8.5.10.3 Criteria
 - 8.5.11 Environmentally assisted stress rupture test
 - 8.5.11.1 Procedure
 - 8.5.11.2 Criteria
 - 8.5.12 Drop test
 - 8.5.12.1 General
 - 8.5.12.2 Procedure
 - 8.5.12.3 Criteria
 - 8.5.13 Resin shear strength
 - 8.5.14 Glass transition temperature
 - 8.6 Failure of type approval tests
- 9 Batch inspection and testing
- 9.1 Liner
 - 9.2 Failure of liner batch tests
 - 9.3 Overwrap materials
 - 9.4 Composite cylinder
 - 9.5 Cylinder failure during type approval or batch testing
- 10 Cylinder marking
- 10.1 General
 - 10.2 Additional markings
- Annex A (informative) Examples of design approval certificate
- Annex B (informative) Specimen test reports
- Annex C (informative) Test report for equivalency
- Annex D (informative) Standardized test requirements for thermally activated pressure relief devices
- D.1 General
 - D.2 Cylinder test
 - D.2.1 Cylinder set-up
 - D.2.2 Fire source
 - D.2.3 Temperature and pressure measurements
 - D.2.4 General test requirements
 - D.2.5 Test options
 - D.2.5.1 Option A — Controlled release of pressure
 - D.2.5.2 Option B — Fire test until rupture
 - D.3 PRD test
 - D.4 Vent test
 - D.5 System assessment
 - D.5.1 Qualification limit envelope
 - D.5.2 Service limit envelope
 - D.5.3 Acceptable results