DIN EN ISO 18119:2024-12 (E)

Gas cylinders - Seamless steel and seamless aluminium-alloy gas cylinders and tubes - Periodic inspection and testing (ISO 18119:2018 + Amd 1:2021 + Amd 2:2024)

Contents

Page

European foreword 5
[A1⟩ European foreword to Amendment A1 ⟨A1] 6
[A2⟩ European foreword to Amendment A2 ⟨A2] 7
Foreword 8
[A1⟩ Foreword to Amendment A1 ⟨A1] 9
[A2⟩ Foreword to Amendment A2 ⟨A2] 10
Introduction 11
1 Scope 12
2 Normative references 12
3 Terms and definitions 12
4 Abbreviated terms and symbols 13
5 Intervals between periodic inspections and tests 14
6 List of procedures for periodic inspections and tests 14
7 Identification of cylinder and preparation for inspection and tests 15
8 Depressurization and de-valving procedures 15
8.1 General 15
8.2 Cylinders requiring de-valving 16
8.3 Cylinders not requiring de-valving 16
8.4 Cylinders requiring shot blasting 16
9 External visual inspection 16
9.1 Preparation 16
9.2 Inspection procedure 17
10 Inspection of cylinder neck 17
10.1 Cylinder-to-valve threads 17
10.2 Other neck surfaces 20
10.3 Damaged internal neck threads 20
10.4 Neckring and collar attachment 20
11 Check of internal condition 20
11.1 General 20
11.2 Internal visual inspection 21
11.2.1 Preparation 21
11.2.2 Inspection requirements 21
11.2.3 Cylinders with footrings 22
11.2.4 Cylinders with internal coatings 22
12 Supplementary tests 22
12.1 General 22
12.2 Additional test for seamless aluminium-alloy cylinders possibly subjected to heat damage 22
12.3 Hammer test on cylinders with footrings 23

13 Cylinder repairs 23
14 Pressure test or UT 23
14.1 General 23
14.2 Proof pressure test 24
14.2.1 General 24
14.2.2 Test equipment 24
14.2.3 Test criteria 24
14.2.4 Acceptance criteria 25
14.3 Hydraulic volumetric expansion test 25
14.4 UT 25
14.4.1 General 25
14.4.2 Requirements 25
14.4.3 Calibration 30
14.4.4 Performing the examination 34
14.4.5 Interpretation of results 35
14.4.6 Records 36
15 Inspection of valve and other accessories 36
16 Replacement of cylinder parts 37
17 Final operations 37
17.1 Drying, cleaning and painting 37
17.1.1 Drying and cleaning 37
17.1.2 Painting and coating 37
17.2 Re-valving of the cylinder 38
17.3 Check of cylinder tare 38
17.4 Retest marking 39
17.4.1 General 39
17.4.2 Stamping 39
17.5 Reference to next periodic inspection and test date 39
17.6 Identification of contents 39
17.7 Records 39
18 Rejection and rendering cylinder unserviceable 40
18.1 General 40
18.2 Cylinders with a valve attached 40
18.3 Cylinders with no valves attached 40
Annex A (informative) Periodic inspection and test periods 41
Annex B (normative) Description, evaluation of defects and conditions for rejection of seamless steel and seamless aluminium-alloy cylinders at the time of periodic inspection 42
B.1 General 42
B.2 Physical or material defects 42
B.3 Corrosion 44
B.3.1 General 44
B.3.2 Types of corrosion 44
B.3.3 Technical basis for establishing maximum allowable imperfection sizes by UT 48
B.4 Neck and shoulder cracks 51
B.4.1 General 51
B.4.2 Neck cracks 51
B.4.3 Shoulder cracks 51
Annex C (informative) [A1] List of gases corrosive to steel cylinder material [A1] 53
Annex D (informative) Volumetric expansion testing of cylinders 54
D.1 General 54
D.2 Test equipment 54

D.3 Water jacket volumetric expansion test 54
D.3.1 General 54
D.3.2 Water jacket volumetric expansion test — Levelling burette method 55
D.3.3 Water jacket volumetric expansion test — Fixed burette method 56
D.4 Non-water jacket volumetric expansion test 56
D.4.1 General 56
D.4.2 Requirement for testing 58
D.4.3 Test method 58
D.4.4 Calculation of compressibility of water 59
D.4.5 Calculation example 61

Annex E (informative) Test date rings for cylinders 62

Annex F (informative) Cleaning of seamless aluminium-alloy cylinders 63
F.1 Internal 63
F.2 External 63

Bibliography 64