

DIN EN ISO 23936-4:2025-02 (E)

Oil and gas industries including lower carbon energy - Non-metallic materials in contact with media related to oil and gas production - Part 4: Fiber-reinforced composite materials (ISO 23936-4:2024); English version EN ISO 23936-4:2024

Contents

Page

Foreword.....	v
Introduction.....	vi
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions and abbreviated terms.....	3
3.1 Terms and definitions.....	3
3.2 Abbreviated terms.....	4
4 Technical requirements.....	5
4.1 General requirements.....	5
4.2 Cautionary remarks.....	7
4.3 Traceability.....	7
4.4 Test specimen identification.....	7
4.5 Validation of conformity.....	9
4.6 Quality control for fabrication of laminated test plates.....	10
4.6.1 General.....	10
4.6.2 Quality control for fabrication of plates.....	10
4.7 Test specimen preparation, quality control and identification.....	12
4.7.1 Preparation of test specimens.....	12
4.7.2 Quality control of specimen preparation.....	12
5 Level 1 – Material property characterization.....	12
5.1 General.....	12
5.2 Reporting.....	14
6 Level 2 - Material stability (short-term).....	14
6.1 General.....	14
6.2 Test criteria.....	14
6.2.1 General.....	14
6.2.2 Exposure temperature.....	15
6.2.3 Exposure durations.....	15
6.2.4 Test fluids.....	15
6.2.5 Property test methods.....	15
6.2.6 Threshold criteria.....	15
6.3 Preconditioning considerations.....	16
6.4 Reporting.....	16
7 Level 3 – Material stability (accelerated).....	16
7.1 General.....	16
7.2 Exposure temperatures.....	17
7.3 Exposure durations.....	17
7.4 Exposure fluids.....	18
7.5 Initial swelling.....	18
7.6 Property test methods.....	18
7.7 Threshold criteria.....	18
7.8 Preconditioning considerations.....	18
7.9 Evaluation of data for Level 3.....	19
7.10 Reporting.....	19

8	Level 4 – Material stability (long-term)	20
8.1	General requirements for Level 4 evaluation.....	20
8.2	Exposure temperatures.....	20
8.3	Exposure durations.....	20
8.4	Exposure fluids.....	20
8.5	Initial swelling.....	20
8.6	Property test methods.....	20
8.7	Guidance for selection of Level 4 test methods.....	21
8.8	Preconditioning considerations.....	21
8.9	Evaluation of data for Level 4.....	21
8.10	Threshold baseline.....	21
8.11	Threshold criteria for composites.....	22
Annex A	(normative) Test media, conditions, equipment and procedures for ageing of composite materials	23
Annex B	(normative) Fabrication of laminated plates	40
Annex C	(normative) Specimen extraction from laminated plates	45
Annex D	(normative) Quality control and documentation of laminate and thermoplastic UD-tape	49
Annex E	(informative) Considerations for short-term thermomechanical evaluation and qualification	53
Annex F	(informative) Selecting elevated temperatures for accelerated tests	54
Bibliography	56