

DIN EN 12819:2010-04 (E)

LPG equipment and accessories - Inspection and requalification of LPG tanks greater than 13 m<(hoch)3>

Contents		Page
Foreword		4
Introduction		5
1	Scope	6
2	Normative references	6
3	Terms and definitions	6
4	Safety	7
4.1	Safety precautions	7
4.2	Unsafe conditions	7
4.3	Leaks	7
5	Written scheme	8
6	Tank inspection and requalification	8
6.1	Routine inspection	8
6.2	Periodic inspection	9
6.3	Requalification	9
6.3.1	Requalification of overground LPG tanks	9
6.3.2	Requalification of underground LPG tanks	9
6.3.3	Commissioning	9
7	Inspection of tank and tank fittings	9
7.1	Tank	9
7.2	Tank fittings and immediate pipework	10
7.3	Valve cover	10
7.4	Bonding	10
7.5	Pressure relief valves	10
7.6	Pressure gauges	10
7.7	Contents gauges	11
7.8	Shut-off valves	11
7.9	Studs, bolts, nuts, and washers	11
7.10	Emergency valves	11
7.11	Gaskets	11
7.12	Pressure switch	11
7.13	Temperature gauge	11
7.14	Remotely operated valves	11
7.15	Corrosion protection system	11
7.16	Piers and foundations	11
8	Competence	11
8.1	Routine inspection	12
8.2	Periodic inspection	12
8.3	Requalification	12
9	Records	12
9.1	Tank data	12
9.2	Test reports	12

Annex A (informative) Visual inspection	13
A.1 Internal and external visual inspections	13
A.2 Inspection techniques	13
A.2.1 External visual inspection	13
A.2.2 Internal visual inspection	13
A.2.3 Records	13
A.3 Additional inspection	14
Annex B (informative) Hydraulic pressure test	15
Annex C (normative) Acoustic emission testing	16
C.1 Scope	16
C.2 Testing procedure	16
C.3 Instrumentation	16
C.3.1 Sensors	16
C.3.2 Acquisition and evaluation system	16
C.4 Testing	16
C.4.1 Test instruction	16
C.4.2 Safety precautions	17
C.5 Sensor location	17
C.5.1 Above ground tanks	17
C.5.2 Underground or mounded tanks	17
C.5.3 Pressurisation	19
C.6 Data evaluation and analysis	19
C.6.1 Evaluation criteria	19
C.6.2 Real time control and stop criteria	21
C.6.3 Post test analysis	21
C.6.4 Tank grading	21
C.7 Data storage and reporting	22
Annex D (informative) Ultrasonic thickness test	23
D.1 General	23
D.2 Apparatus setting	23
D.3 Control measurement	23
D.4 Shell thickness measurements	23
D.5 End thickness measurements	23
D.6 Interpretation	23
D.7 Rejection criteria	24
Annex E (informative) Monitoring cathodic protection with sacrificial anodes for underground tanks	25
E.1 General	25
E.2 Records	25
E.3 Procedure	25
E.4 Measurement of the galvanic current	25
E.5 Measurement of the potential difference of the tank to the reference electrode	25
E.6 Results	26
Annex F (informative) Monitoring cathodic protection by impressed current for underground tanks	27
F.1 General	27
F.2 Apparatus	27
F.3 Conditions	27
F.4 Isolation resistance of the coating	27
F.4.1 Procedure	27
F.4.2 Calculation	28
F.5 Results	28

F.6	Checking intervals	28
Annex G (informative)	Example of a test report	29
Annex H (informative)	A-deviations	30
Bibliography		31