

DIN EN 12817:2010-06 (E)

LPG Equipment and accessories - Inspection and requalification of LPG tanks up to and including 1 3 m<(hoch)3>

Contents		Page
Foreword		5
Introduction		6
1	Scope	7
2	Normative references	7
3	Terms and definitions	7
4	Safety	8
4.1	Safety precautions	8
4.2	Unsafe conditions	8
4.3	Leaks	8
5	Written scheme	9
6	Tank inspection and requalification	9
6.1	Routine inspection	9
6.2	Periodic inspection	10
6.3	Requalification	10
6.3.1	Requalification for overground LPG tanks	10
6.3.2	Requalification for underground LPG tanks	10
6.3.3	Commissioning	11
7	Inspection of tank and tank fittings	11
7.1	Tank	11
7.2	Tank fittings and immediate pipework	11
7.3	Valve cover	12
7.4	Bonding	12
7.5	Pressure relief valve	12
7.6	Pressure gauge	12
7.7	Contents gauges	12
7.8	Shut-off valves	12
7.9	Studs, bolts, nuts, and washers	13
7.10	Corrosion protection system	13
7.11	Piers and foundations for overground tanks	13
8	Competence	13
8.1	Routine inspection	13
8.2	Periodic inspection	13
8.3	Requalification	13
9	Records	13
9.1	Tank data	13
9.2	Reports	14
Annex A (informative)	Visual inspection	15
A.1	Internal and external visual inspections	15
A.2	Inspection techniques	15

A.2.1	External visual inspection	15
A.2.2	Internal visual inspection	15
A.3	Records	15
A.4	Additional inspection	16
Annex B (informative) Hydraulic pressure test		17
Annex C (normative) Acoustic emission testing		18
C.1	Scope	18
C.2	Testing procedure	18
C.3	Instrumentation	18
C.3.1	Sensors	18
C.3.2	Acquisition and evaluation system	18
C.4	Testing	18
C.4.1	Test instruction	18
C.4.2	Safety precautions	19
C.4.3	Sensor location	19
C.4.4	Pressurisation	20
C.5	Data evaluation and analysis	21
C.5.1	Evaluation criteria	21
C.5.2	Real time control and stop criteria	21
C.5.3	Post analysis	21
C.5.4	Vessel grading	22
C.6	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) Assessment of tanks by sampling		25
E.1	General	25
E.2	Homogeneous batch	25
E.3	Selection of samples	25
E.4	Sample selection	26
E.5	Inspection period	26
E.6	Presentation of results and decisions	26
E.7	Pass criteria	26
E.8	Example calculation of a sample	26
Annex F (informative) External monitoring by camera for underground tanks		28
F.1	General	28
F.2	Inspection procedure	28
F.3	Interpretation of results	28
F.4	Records	28
Annex G (informative) Monitoring cathodic protection with sacrificial anodes for underground tanks		29
G.1	General	29
G.2	Records	29
G.3	Procedure	29
G.4	Measurement of the galvanic current	29
G.5	Measurement of the potential difference of the tank to the reference electrode	29

G.6	Results	30
Annex H (informative) Monitoring cathodic protection by impressed current for underground tanks		
	31
H.1	General	31
H.2	Apparatus	31
H.3	Conditions	31
H.4	Isolation resistance of the coating	31
H.4.1	Procedure	31
H.4.2	Calculation	32
H.5	Results	32
H.6	Checking intervals	32
Annex I (informative) Corrosion monitoring by moisture and condensation detection for underground tanks		
		33
I.1	General	33
I.2	Equipment characteristics	33
I.3	Monitoring	33
I.4	Interpretation	33
Annex J (informative) Example of an inspection and requalification report		34
Annex K (informative) A-deviations		35
Bibliography		36