

Contents

Page

European foreword.....	4
1 Scope.....	6
2 Normative references.....	6
3 Terms, definitions and symbols.....	7
3.1 Terms and definitions	7
3.2 Symbols.....	8
4 Materials.....	9
4.1 General.....	9
4.2 Compatibility.....	9
5 Design.....	10
5.1 General.....	10
5.2 Minimum shell thickness	10
5.3 Reduction of shell thickness.....	10
5.4 Protection of the shell	11
5.5 Protection of equipment.....	11
5.6 Other design requirements	12
6 Calculation.....	12
6.1 General.....	12
6.1.1 General.....	12
6.1.2 Calculation scheme for the wall thickness of metallic pressure tanks of RID/ADR Chapter 6.8	12
6.1.3 Calculation scheme for the wall thickness of metallic portable pressure tanks of RID/ADR Chapter 6.7	13
6.2 Design criteria.....	14
6.3 Calculation for internal pressure	16
6.3.1 General.....	16
6.3.2 Wall thickness of the cylindrical section	16
6.3.3 Wall thickness of ends.....	17
6.3.4 Wall thickness of conical sections.....	21
6.3.5 Openings and reinforcements.....	23
6.3.6 Manhole covers	30
6.3.7 Flanges, joints, bolts.....	35
6.4 Calculation for external pressure	37
6.4.1 General.....	37
6.4.2 Tanks, where external over pressure is part of operating conditions	37
6.4.3 Tanks, where external over pressure is not part of operating conditions.....	37
6.4.4 Test.....	37
6.5 Tank to frame connection/interface.....	38
7 Construction and manufacturing	38
7.1 General requirements	38
7.2 Cutting.....	38
7.3 Forming.....	39
7.3.1 General.....	39

7.3.2	Cold forming	39
7.3.3	Hot forming.....	39
7.3.4	Ends	40
7.3.5	Heat treatment and normalizing.....	40
7.4	Welding	40
7.4.1	Qualification	40
7.4.2	Welded joints	40
7.4.3	Examination and testing of welds.....	41
7.4.4	Temporary attachments	41
7.5	Manufacturing tolerances	41
7.5.1	Plate alignment	41
7.5.2	Defects of form.....	42
7.5.3	Thickness.....	42
7.5.4	Dished ends.....	42
7.5.5	Cylindrical sections.....	42
8	Repairs.....	43
8.1	General	43
8.2	Repair of surface defects in the parent metal	43
8.3	Repair of weld defects.....	43
Annex A (informative) Sample calculation for tank containers according to RID/ADR Chapter 6.8.....		44
A.1	Introduction	44
A.2	Dimensions, characteristics of materials, operating and testing conditions.....	44
A.3	Calculation according to branch A.....	45
A.4	Calculation according to branch B.....	45
A.5	Calculation according to branch C	46
A.6	Calculation according to branch D	48
A.7	Results	57
Annex B (informative) Explosion pressure shock resistant design of tanks		59
Bibliography		61