

DIN 18800-4:2008-11 (E)

Steel structures - Part 4: Stability - Safety against buckling of shells

Contents		Page
Foreword		3
1	General	4
1.1	Scope and field of application	4
1.2	Normative references	4
1.3	Terms and definitions	5
1.4	Common notation	5
1.5	Basic considerations	8
2	Procedure for analysis of safety against buckling	8
3	Imperfections	12
4	Cylindrical shells of constant wall thickness	15
4.1	Notation and conditions of support	15
4.2	Ideal buckling stresses	19
4.2.1	Axial compression	19
4.2.2	Hoop compression	22
4.2.3	Shear	23
4.3	Actual buckling stresses	24
4.4	Action-effects	25
4.5	Stress combinations	27
4.5.1	Axial compression with coexistent hoop compression and shear	27
4.5.2	Axial compression with coexistent hoop tension due to internal pressure	29
5	Cylinders with courses of incremental wall thickness	30
5.1	Notation and conditions of support	30
5.2	Design offset	31
5.3	Ideal buckling stresses	32
5.3.1	Axial compression	32
5.3.2	Hoop compression	32
5.4	Actual buckling stresses	35
5.5	Action-effects	36
5.6	Stress combinations	37
5.6.1	Axial compression with coexistent hoop compression	37
5.6.2	Axial compression with coexistent hoop tension due to internal pressure	38
6	Conical shells of uniform wall thickness	38
6.1	Notation and conditions of support	38
6.2	Ideal buckling stresses	41
6.2.1	Equivalent cylinder	41
6.2.2	Meridional compression	42
6.2.3	Hoop compression	42
6.2.4	Shear	43
6.3	Actual buckling stresses	43
6.4	Action-effects	44
6.5	Stress combinations	45
6.5.1	Meridional compression with coexistent hoop compression and shear	45
6.5.2	Meridional compression with coexistent hoop tension due to internal pressure	46
7	Spherical shells of uniform wall thickness	46
7.1	Notation and conditions of support	46

7.2	Ideal buckling stresses	49
7.3	Actual buckling stresses	50
7.4	Action-effects	50
7.5	Stress combinations	50
Bibliography		51