

DIN EN 280:2014-02 (E)

Mobile elevating work platforms - Design calculations - Stability criteria - Construction - Safety - Examinations and tests

Contents	Page
Foreword	4
Introduction	6
1 Scope	7
2 Normative references	8
3 Terms and definitions	9
4 List of hazards	14
5 Safety requirements and/or measures	19
5.1 General	19
5.2 Structural and stability calculations	19
5.2.1 General	19
5.2.2 Loads and forces	19
5.2.3 Determination of loads and forces	19
5.2.4 Stability calculations	21
5.2.5 Structural calculations	23
5.3 Chassis and stabilisers	37
5.3.1 Chassis	37
5.3.2 Stabilisers	41
5.4 Extending structure	42
5.5 Extending structure drive systems	46
5.5.1 General	46
5.5.2 Wire rope drive systems	47
5.5.3 Chain drive systems	49
5.5.4 Lead-screw drive systems	50
5.5.5 Rack and pinion drive systems	50
5.6 Work platform	51
5.7 Controls	54
5.8 Electrical equipment	55
5.9 Hydraulic systems	56
5.10 Hydraulic cylinders	58
5.11 Safety devices	62
6 Verification of the safety requirements and/or measures	64
6.1 Examinations and tests	64
6.1.1 General	64
6.1.2 Design check	64
6.1.3 Manufacturing check	64
6.1.4 Tests	65
6.2 Type tests of MEWPs	70
6.3 Tests before placing on the market	70
7 Information for use	70
7.1 Instruction handbook	70
7.2 Marking	74
Annex A (informative) Use of MEWPs in wind speeds greater than 12,5 m/s (Beaufort-Scale)	76

Annex B (informative) Dynamic factors in stability and structural calculations	77
B.1 Stability calculations	77
B.2 Structural calculations	77
Annex C (normative) Calculation of wire rope drive systems	78
C.1 General	78
C.2 Calculation of wire rope drive systems	78
C.3 Calculation of rope diameters (coefficient c)	79
C.4 Calculation of the diameters of rope drums, rope pulleys and compensating pulleys [coefficient (h1 · h2)]	79
C.5 Efficiency of wire rope drive systems	82
Annex D (informative) Calculation example - Wire rope drive systems	84
D.1 Method used to determine the coefficients and ratios used for 5.5.2 (wire rope drive systems) using the load cycle figures in 5.2.5.3 and operating speeds in 5.4.5	84
D.2 Calculation of the diameters of rope drums, pulleys and static pulleys	87
Annex E (informative) Calculation examples - factor "z", kerb test	90
Annex F (normative) Additional requirements for wireless controls and control systems	92
F.1 General	92
F.2 Control limitation	92
F.3 Stop	92
F.4 Serial data communication	92
F.5 Use of more than one operator control station	93
F.6 Battery-powered operator control stations	93
F.7 Receiver	93
F.8 Warnings	93
F.9 Information for use	93
Annex G (normative) Dimensions of steps and ladders	94
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC	96
Bibliography	97