

DIN EN 13135:2018-08 (E)

Cranes - Safety - Design - Requirements for equipment (includes Amendment :2018)

Contents		Page
European foreword		4
Introduction		5
1	Scope	6
2	Normative references	6
3	Terms and definitions	8
4	List of significant hazards	11
5	Safety requirements and/or protective measures	14
5.1	General	14
5.2	Electrical equipment	14
5.2.1	General	14
5.2.2	Physical environment and operating conditions	15
5.2.3	Electrical supply	15
5.2.4	Protection against electric shock by direct contact	15
5.2.5	Control circuits and control functions	15
5.2.6	Operator interface and mounted control devices	16
5.2.7	Power driven motions	16
5.2.8	Selection of motors	16
5.3	Mechanical equipment	25
5.3.1	General	25
5.3.2	Clutches and couplings	25
5.3.3	Brakes	25
5.3.4	Gear drives	28
5.3.5	Wheels on rails	29
5.3.6	Rope systems	30
5.3.7	Chain systems	33
5.3.8	Belt systems	34
5.3.9	Adjustment rods	36
5.3.10	Compensating means	36
5.4	Structures associated with mechanical equipment	36
5.4.1	Structures	36
5.4.2	Structural equipment	37
5.5	Fluid power systems	38
5.5.1	Controls and control devices of fluid power systems	38
5.5.2	Protective measures	38
5.5.3	Overload testing	39
5.5.4	Hydraulic equipment	39
5.5.5	Pneumatic equipment	42
5.6	Fixed load lifting attachments	43
5.6.1	General	43
5.6.2	Hooks	44
5.7	Equipment for safeguarding	45
5.7.1	General	45
5.7.2	Safety related functions of control systems	46
5.7.3	Measures to decrease the consequences of loss of drive power	46
5.7.4	Safety devices to prevent overrunning of movements	46
5.7.5	Derailment safety device	47

5.7.6	Provisions to prevent tipping	48
5.7.7	Storm-locking	48
5.7.8	Anti-collision device	49
5.8	Environmental effects	49
5.8.1	Protection against weakening of material	49
5.8.2	Temperature	49
5.9	High risk applications	50
5.9.1	General	50
5.9.2	Decreasing of the probability of occurrence of harm	50
5.9.3	Additional requirements for the transportation of hot molten metal	52
6	Verification of the safety requirements and/or protective measures	56
7	Information for use	60
7.1	General	60
7.2	Instructions for operation in special situations	60
7.3	Instructions for installation and maintenance	60
7.4	Maintenance instructions in the case of high risk applications	61
7.5	Marking	61
Annex A (informative) Selection of a suitable set of crane standards for a given application		63
Annex B (informative) Design of rail wheel flanges		65
Annex C (informative) Guidance on rope systems		68
Annex D (informative) Specification of endurance of equipment		69
D.1	Basic approach	69
D.2	Examples of application	70
D.2.1	Roller bearing	70
D.2.2	Lifting attachment, fixed or non-fixed	70
D.2.3	Turnbuckle	71
D.2.4	Electromechanical component	71
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC		72
Bibliography		73