SLOVENSKI STANDARD
SIST EN 12077-2:1999+A1:2008

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Varnost dvigal (žerjavov) - Zahteve za zdravje in varnost - 2. del: Naprave za omejevanje in zaznavanje

Cranes safety - Requirements for health and safety - Part 2: Limiting and indicating devices

Sicherheit von Kranen - Gesundheits- und Sicherheitsanforderungen - Teil 2: Begrenzungs- und Anzeigeeinrichtungen

Sécurité des appareils de levage à charge suspendue - Prescriptions relatives à l'hygiène et à la sécurité - Partie 2: Dispositifs limiteurs et indicateurs

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English Version

Cranes safety - Requirements for health and safety - Part 2: Limiting and indicating devices

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

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Foreword

This document (EN 12077-2:1998+A1:2008) has been prepared by Technical Committee CEN/TC 147 “Canes - Safety”, the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2008, and conflicting national standards shall be withdrawn at the latest by October 2008.

This document supersedes EN 12077-2:1998.

This document includes Amendment 1, approved by CEN on 2008-03-04.

The start and finish of text introduced or altered by amendment is indicated in the text by tags ⟩A1⟨ ⟨A1⟩.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

⟩A1⟨ For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document. ⟨A1⟩

This European Standard is one Part of EN 12077. Other Parts are as follows:

Part 1: Controls and control stations
Part 3: Guarding
Part 4: Access
Part 5-1: Lifting of persons with suspended baskets
Part 5-2: Lifting of persons with moveable cabins
Part 5-3: Lifting of persons with platforms attached to the jib
Part 5-4: Lifting of persons with spreader beams

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

This European Standard is a harmonized standard to provide one means for limiting and indicating devices for cranes to conform to the essential health and safety requirements of the Machinery Directive, as amended.

This European Standard is a type C standard as stated in ENV 1070: 1993.

The machinery concerned and the extent to which hazards are covered are indicated in the scope of this standard.

1 Scope

This European Standard specifies general requirements for the application and operating parameters of limiting and indicating devices installed on powered cranes.

NOTE Specific requirements for particular types of crane are given in the appropriate European Standard for the particular crane type.

This European Standard does not cover erection, dismantling operations, or changing the configuration of a crane.

The significant hazards covered by this European Standard are identified in clause 4.

This European Standard is applicable to cranes which are manufactured after the date of approval by CEN of this standard.

2 Normative references

This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to, or revisions of, any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 292-1:1991, Safety of machinery - Basic concepts - General principles for design - Part 1: Basic terminology, methodology

EN 292-2:1991, Safety of machinery - Basic concepts - General principles for design - Part 2: Technical principles and specifications

EN 292-2:1991/A1:1995, Safety of machinery - Basic concepts - General principles for design - Part 2: Technical principles and specifications

EN 954-1, Safety of machinery - Safety related parts of control systems - Part 1: General principles for design

EN 60204-1:1992, Safety of machinery - Electrical equipment of machines - Part 1: General requirements

EN 61310-1:1995, Safety of machinery - Indication, marking and actuation - Part 1: Requirements for visual, auditory and tactile signals

ENV 1070:1993, Safety of machinery - Terminology

3 Definitions

For the purposes of this standard, the definitions given in ENV 1070:1993 and the following definitions apply:

3.1
anti-collision device
Device to prevent a fixed load lifting attachment and cranes or parts of cranes from colliding when they are manoeuvred simultaneously in the same space.

NOTE A working space limiter can perform the function of an anti-collision device in certain applications.

3.2
configuration
The combination of structural members, counterweights, support or outrigger position, hook block reeving and similar items assembled, positioned and erected according to manufacturers' instructions and ready for operation.

3.3
continuous warning
Warning that is given visually by either a flashing or uninterrupted light, or audibly by either a pulsing or uninterrupted sound, and persists throughout the time the condition being indicated exists.

3.4
control station position limiter
Device to prevent movement of the control station beyond specified limits, on a crane having a control station that can be moved by powered movement to different positions.

3.5
crane
Machine for cyclic lifting or cyclic lifting and handling of loads suspended on hooks or other load handling devices, whether manufactured to an individual design, in series or from prefabricated components.

NOTE "Suspended" can include additional means fitted to prevent swinging, rotation of the load etc.

3.6
derricking limiter
Device to prevent the raising or lowering of a jib, fly jib, "A-frame" or mast beyond specified limits.

3.7
hoisting limiter
Device to either prevent the fixed load lifting attachment from being raised such that it inadvertently strikes the crane structure, or a device to prevent any other specified upper limitation of the load lifting attachment from being exceeded.

3.8
indicator
Device which provides warnings and/or data to facilitate the competent control of the crane within its design parameters.

3.9
lowering limiter
Device to ensure that the minimum engagement of the lifting medium is maintained at all times during operation, e.g. the minimum number of turns of rope on the hoist drum, or mechanical device to prevent the chain from running out of engagement with the driving mechanism.

3.10
motion limiter
Device which restricts a crane motion or initiates the stopping of the motion. (See examples in 5.6.1.1).

3.11
overturning moment (for the purpose of 5.3.1)
The product of the rated capacity and the reference outreach.

3.12
performance limiter
Device which automatically prevents a design performance characteristic from being exceeded.

3.13
rated capacity
Load that the crane is designed to lift for a given operating condition (e.g. configuration, position of the load).

3.14
rated capacity indicator
Device which gives, within specified tolerance limits, at least a continuous indication that the rated capacity is exceeded, and another continuous indication (on certain crane types - see 5.5.1.2(a)) of the approach to the rated capacity.

3.15
rated capacity limiter
Device that automatically prevents the crane from handling loads in excess of its rated capacity, taking into account the dynamic effects during normal operational use.

3.16
reference outreach
Horizontal distance between a vertical line through the centre of gravity of a load and the corresponding tipping line.

3.17
slack rope limiter
Device to automatically prevent dangers from slack rope situations.

3.18
slewing limiter
Device to prevent slewing beyond specified limits.

3.19
telescoping limiter
Device to prevent the extension or retraction of a member beyond specified limits.

3.20
travelling limiter
Device to prevent all types of movement along rail tracks or runways beyond specified limits.

NOTE Travelling covers terms such as "traversing", "crabbing" and "trolleying".

3.21
working space limiter
Device to prevent a fixed load lifting attachment and/or parts of the crane from entering a prohibited space.

NOTE Working space limitation is often achieved by a combination of different limiters.

4 List of significant hazards

Table 1 shows a list of significant hazardous situations and hazardous events that could result in risks to persons during normal use and foreseeable misuse. It also contains the corresponding cross-references to certain Parts of EN 292, and the relevant clauses in this standard that are necessary to reduce or eliminate the risks associated with those hazards.

Table 1 — List of significant hazards and associated requirements

Hazard		Reference			Relevant clause(s) in this standard
		EN 292-1: 1991	EN 292-2: 1991	Relevant essential health and safety requirement as listed in annex A. of EN 292-2: 1991/A1: 1996	
1	Mechanical hazards caused by the crane and its load				
1.1	Lack of stability	4.2.2	6.2.5	1.3.1	5.2.1b), 5.3.1, 5.3.2, 5.4.1.1 5.4.1.2, 5.4.2.1, 5.4.2.3, 5.6.1.1 5.6.1.2, 5.6.1.5, 5.6.2.1, 5.6.2.2, 5.7.4
1.2	Impact hazard	4.2.1	-	1.3	5.6.1.1, 5.6.1.2, 5.6.1.5, 5.6.2.1, 5.6.2.2, 5.7.4
1.3	Mechanical strength	4.2	3.1, 3.2, 4	1.3, 3	5.2.1b), 5.2.2, 5.2.3, 5.2.6, 5.3.1, 5.3.2, 5.4.1.1, 5.4.1.2, 5.4.2.1, 5.4.2.3, 5.6.1.1, 5.6.1.2, 5.6.1.5, 5.6.2.1, 5.6.2.2, 5.7.4
2	Electrical hazards caused by failure of electrical components and circuits	4.3	3.9	1.5.1, 1.6.3, 3.9	5.2.4, 5.2.5
3	Hazards generated by neglecting ergonomic principles in machinery design				
3.1	Human error/unauthorized actions	4.9	3.6	1.1.2d), 1.2.2, 1.2.5, 1.2.8, 1.5.4, 1.7, 3.6	5.2.7, 5.2.8, 5.3.3, 5.3.4, 5.3.5, 5.3.7, 5.4.1.1, 5.4.2.1, 5.5.1.4, 5.5.2.1, 5.5.2.2, 5.5.2.3, 5.5.2.4, 5.6.1.4, 5.7.2

(continued)

Table 1 — List of significant hazards and associated requirements (Concluded)

Hazard		Reference			Relevant clause(s) in this standard
		EN 292-1: 1991	EN 292-2: 1991	Relevant essential health and safety requirement as listed in annex A. of EN 292-2: 1991/A1: 1996	
4	Hazards caused by missing and/or inadequate and/or incorrectly positioned safety measures				
4.1	Safety signs, signals, information or warnings	-	3.6.7, 5.2, 5.3, 5.4	1.7.0, 1.7.1, 1.7.2, 1.7.3, 1.7.4, 3.6.3, 3.6.7, 4.4.2	5.2.1c), 5.2.7, 5.2.9, 5.3.3, 5.5.1.1, 5.5.1.2, 5.5.1.3, 5.5.1.4, 5.5.2.1, 5.5.2.2, 5.5.2.3, 5.6.1.4, 5.7.1, 5.7.2, 5.7.3, 5.7.4, 7.1, 7.2, 7.3
4.2	Emergency devices/facilities	-	-	6.1.2	5.2.1c), 5.2.9, 5.4.2.2, 5.4.2.3, 5.6.1.3
5	Hazards caused by missing/inadequate facilities for routine test/inspection	-	-	-	5.2.1.4, 5.3.7, 5.5.3
6	Hazards generated by radiation	4.7	-	1.5.1, 1.5.10, 1.5.11	5.2.1d)
7	Hazards from external influences	-	-	-	5.2.1a)