



SLOVENSKI STANDARD
SIST EN 1495:1999

01-april-1999

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Lifting platforms - Mast climbing work platforms

Hebebühnen - Mastgeführte Kletterbühnen

Matériels de mise a niveau - Plates-formes de travail se déplaçant le long de mât(s)

Ta slovenski standard je istoveten z: EN 1495:1997

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ICS:

53.020.99 Druga dvigalna oprema Other lifting equipment

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EUROPEAN STANDARD

EN 1495

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 1997

ICS 53.020.99

Descriptors: platforms, safety requirements, accident prevention, hazards, lists, stability, mechanical strength, computation, loads: forces, structural members, tests, utilization, name plates

English version

Lifting platforms - Mast climbing work platforms

Matériels de mise à niveau - Plates-formes de travail se déplaçant le long de mât(s)

Hebebühnen - Mastgeführte Kletterbühnen

This European Standard was approved by CEN on 21 April 1997.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 98 "Lifting platforms", the secretariat of which is held by DIN.

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 March 1998, and conflicting national standards shall be withdrawn at the latest by March 1998.

This European Standard 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).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this standard.

It is a type C- standard related to safety for Mast Climbing Work Platforms.

This is the first edition of this European Standard.

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

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0 Introduction

This standard is one of a series of standards produced by CEN/TC 98 as part of the CEN/CENELEC programme of work to produce machinery safety standards. EN 414 (Safety of machinery-Rules for the drafting and presentation of safety standards) has been used as a guide in the preparation of this standard.

This standard has been prepared to be a harmonized standard to provide one means of conforming with the essential safety requirements of the Machinery Directive.

The extent to which hazards are covered is indicated in the scope of this standard. In addition, lifting equipment shall comply as appropriate with EN 292 for hazards which are not covered by this standard.

1 Scope

1.1 This standard specifies the special safety requirements for Mast Climbing Work Platforms (MCWP) which are temporarily installed and are manually or power operated and which are designed to be used by one or more persons from which to carry out work. The vertical moving components (work platform) are also used to move those same persons and their equipment and materials to and from a single boarding point. These restrictions differentiate MCWPs from Builder's hoists.

The standard can also be used for permanently installed MCWP.

1.2 This standard is applicable to work platforms elevated by rack and pinion and guided by and moving along their supporting masts, where the masts may or may not require lateral restraint from separate supporting structures.

1.3 This standard is applicable to any combination of the following alternatives:

- one or more masts
- mast tied or untied
- mast of fixed or variable length
- masts vertical or inclined between 0° and 30° to the vertical
- masts which are standing or hanging
- movable or static base (chassis, or base frame)
- manually or power operated elevation
- towed or self powered ground travel on site, excluding road traffic regulation requirements
- driven using electric, pneumatic or hydraulic motors

1.4 This standard identifies the hazards arising during the various phases in the life of such equipment and describes methods for the elimination or reduction of these hazards and for the use of safe working practices.

1.5 This standard does not specify the requirements for dealing with the hazards involved in the manoeuvring, erection or dismantling, fixing or removing of any materials or equipment which are not part of the Mast Climbing Work Platform (MCWP). Neither does it deal with the handling of specific hazardous materials.

1.6 This standard does not specify the requirements for delivering persons and materials to fixed landing levels. Such equipment is referred to as lifts or hoists and are dealt with by other standards.

1.7 This standard does not include Mobile Elevating Work Platforms (MEWPs) according to prEN 280, Suspended access equipment according to prEN 1808 or Lifting tables according to prEN 1494.

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 (Amendment 1:1995)
EN 294:1992	Safety of machinery - Safety distances to prevent danger zones being reached by the upper limbs.
EN 349:1993	Safety of machinery - Minimum gaps to avoid crushing of parts of the human body
EN 418:1992	Safety of machinery - Emergency stop equipment, functional aspects - Principles for design
EN 614-1:1995	Safety of machinery - Ergonomic design principles - Part 1: Terminology and general principles
EN 953:1997	Safety of machinery - General requirements for the design and construction of guards (fixed, movable)

EN 954-1:1996	Safety of machinery - Safety related parts of control systems - Part 1: General principles for design.
EN 982:1996	Safety of machinery - safety requirements for fluid power systems and components - Hydraulics
EN 60065: 1993	Safety requirements for mains operated electronic and related apparatus for household and similar general use
EN 60204-1:1992	Safety of machinery - Electrical equipment of machines - Part 1: General requirements.
EN 60529:1992	Degrees of protection provided by enclosures (IP-code).
EN 60947-5-1:1991	Low-voltage switchgear and controlgear - Part 5: Control circuit devices and switching elements. Section 1 - Electromechanical control circuit devices and switching elements
ISO 4301-1:1986	Cranes and lifting appliances - Classification - Part 1:General
ISO 4302:1989	Cranes - Wind load assessment
ISO 6336-1	Calculation of load capacity of spur and helical gears - Part 1: Basic principles, introduction and general influence factors
ISO 6336-2	Calculation of the load capacity of spur and helical gears - Part 2: Calculation of surface durability (pitting)
ISO 6336-3	Calculation of the load capacity of spur and helical gears - Part 3: Calculation of tooth strength
ISO 6336-5	Calculation of the load capacity of spur and helical gears - Part 5: Strength and quality of materials
ISO 8686-1:1989	Cranes - Design principles for loads and load combinations - Part 1:General

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3 Definitions

For the purposes of this standard the following definitions apply:

NOTE The terms which are used in this standard, with reference to the definitions below, are indicated in figures 1 and 2.

3.1 rated load: The loads for which the MCWP has been designed for in normal operation as stated in the load diagram.

3.2 load diagram: A notice displayed on the work platform showing the permitted number of persons and the weight and distribution of materials for the particular configuration.

3.3 rated speed: The vertical or horizontal speed for which the MCWP has been designed.

3.4 transfer: Any horizontal movement of the MCWP from one position to another on the same working site.

3.5 transfer condition: The configuration of the MCWP in which the MCWP is moved from one position to another on the same working site and any limitation on the weather and the load or persons on the MCWP.

3.6 transport: Any movement of the MCWP outside the boundaries of the working site.

3.7 transport condition: The configuration of the MCWP in which the MCWP is moved outside the boundaries of the working site (for example road transport).

3.8 transfer and transport interlocks: Any design features on the MCWP which prevent unsafe transfer or transportation.

3.9 base frame: The part of the MCWP which provides support for the mast and elevating assembly.

3.10 chassis: The part of the MCWP which provides mobility and support for the mast and elevating assembly.

3.11 rail mounted chassis: A chassis designed to transmit horizontal as well as vertical forces to the ground via rails.

3.12 outriggers: Supports at the base frame level used to maintain or increase the stability of the MCWP within specified conditions. They may also be used for levelling.

3.13 outrigger beam: That part of an outrigger assembly which moves in a substantially horizontal plane and may be powered or operated manually.

3.14 mast: A structure that supports and guides the platform.

3.15 mast, fixed length: A mast whose length is fixed and cannot be varied, even by the attachment of further mast sections.

3.16 mast, variable length: A mast whose length can be varied by the attachment of successive lengths of prepared sections.

3.17 guides: The parts of the mast, which provide guiding for the work platform.

3.18 mast tie: The anchorage system used to provide lateral restraint to the mast from the building or other structure.

3.19 work platform: The vertical travelling part of the installation upon which the persons, equipment and materials are carried and from which work is carried out. This is as opposed to the MCWP, which refers to the whole of the installation, *inter alia* work platform, mast, mast ties, base and chassis. The work platform includes the main platform and any platform extension.

3.20 available platform area: The area of the work platform measured at the work platform floor level.

3.21 main platform: That part of the work platform which is built up using primary structural elements.

3.22 platform extensions: Those additional parts of the work platform which are built up using secondary structural elements, whose support and location is dependent upon the main platform. They are used to extend the main work platform, usually along its longitudinal working edge. They may form irregular shapes which conform with the work site. They may also extend at a level just above or below the main platform level.

3.23 multilevel work platforms: Multilevel work platforms consist of two or more work platforms travelling on the same mast or an additional working level attached to and totally supported by a work platform. (For illustration see annex B)

3.24 counter roller: A roller used to counter - react the gear meshing separation forces between a rack and pinion.

3.25 automatic brake: A device to decelerate and stop moving parts in case of interruption of the power supply.

3.26 buffer: A resilient stop at the end of the travel, comprising a means of arresting using fluids, springs or similar means.

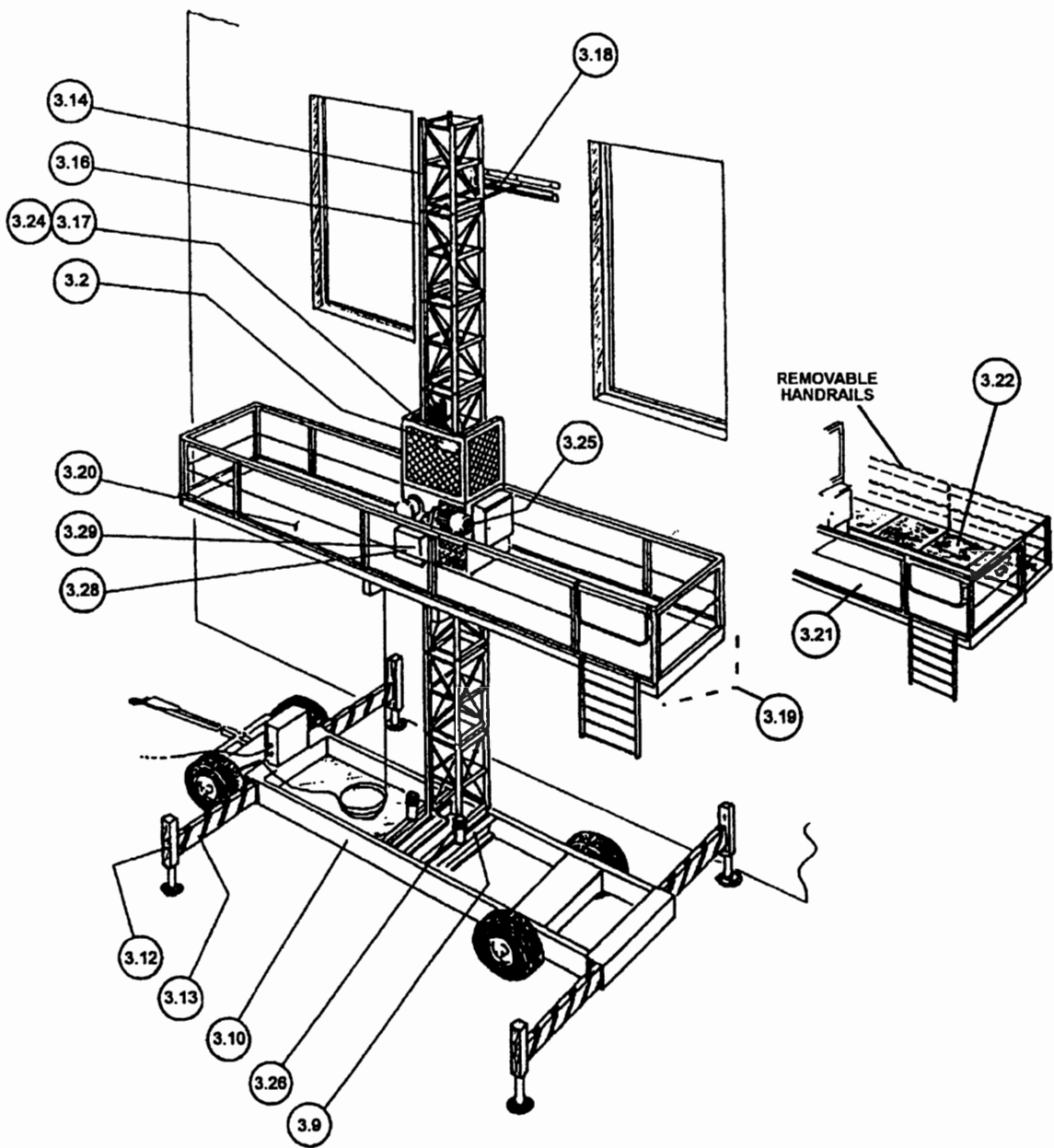
3.27 overspeed: Any speed above rated speed.

3.28 safety gear: A mechanical device for stopping and maintaining the work platform stationary on the mast in the event of overspeed.

3.29 overspeed governor: A device which, when the work platform attains a predetermined speed above rated speed, causes the safety gear to be applied.

3.30 competent person: A person having such practical and theoretical knowledge and such experience of that MCWP as is necessary to carry out the function satisfactorily.

3.31 user (user organisation): The person or organisation which has direct control over the MCWP use.



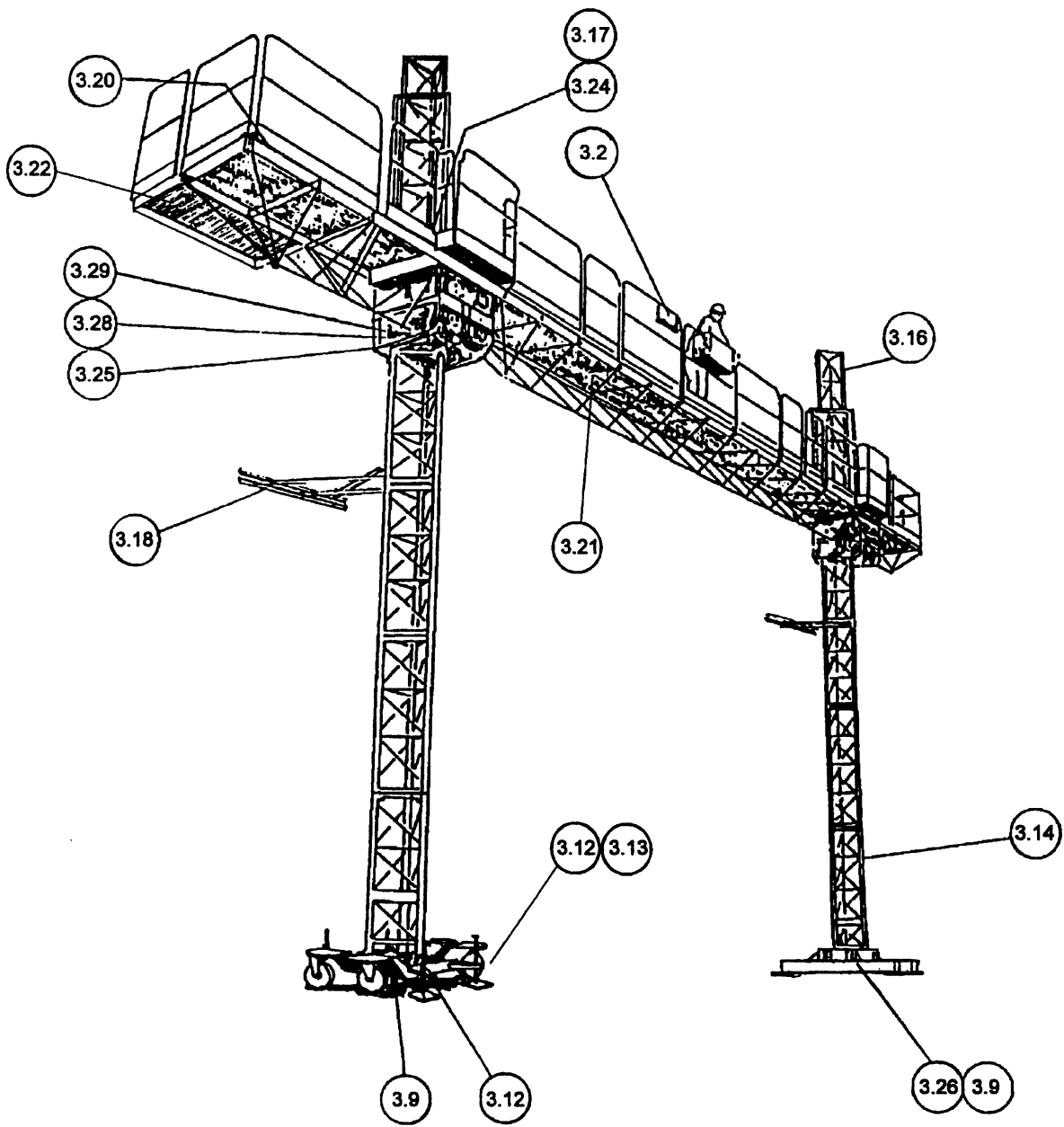
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Figure 1: TYPICAL SINGLE MAST MCWP



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Figure 2: TYPICAL TWIN MAST MCWP

4 List of hazards

The list of hazards according to the following tables are based on EN 292 parts 1 and 2 and Directive 89/392/EEC as amended by 91/368/EEC and 93/44/EEC.

Tables 1.1, 1.2 and 1.3 show the hazards which have been identified and where the corresponding requirements have been formulated in this standard in order to limit the risk or reduce these hazards in each situation.

A hazard which is not applicable or is not significant and for which, therefore, no requirements are formulated, is shown in the relevant clauses column as NA (not applicable).

Table 1.1: List of hazards (part 1)

HAZARDS	RELEVANT CLAUSES IN THIS STANDARD
1 Mechanical hazards	
1.1 Crushing	5.2.1.3; 5.3.2; 5.4.1
1.2 Shearing	5.2.1.3; 5.3.2; 5.4.1;
1.3 Cutting or severing	5.3.2; 5.4.1;
1.4 Entanglement	5.4.1
1.5 Drawing-in or trapping	5.2.1.3; 5.3.2; 5.4.1
1.6 Impact	5.4.4
1.7 Stabbing or puncture	NA
1.8 Friction or abrasion	NA
1.9 High pressure fluid ejection	5.9.7; 5.9.8; 5.9.9; 5.9.10
1.10 Ejection of parts	5.2.1.4; 5.2.1.5
1.11 Loss of stability	5.1.5; 5.2.2.4; 5.2.5.5
1.12 Slip, trip and fall	5.2.2.1; 5.3.1
2 Electrical hazards	
2.1 Electrical contact	5.8; 7.1.2.7
2.2 Electrostatic phenomena	NA
2.3 Thermal radiation	NA
2.4 External influences	5.7.15 Annex C
3 Thermal hazards	Relevant but not dealt with
4 Hazards generated by noise	Relevant but not dealt with
5 Hazards generated by vibration	5.1.2.3.2;
6 Hazards generated by radiation	NA
7 Hazards generated by materials and substances processed, used or exhausted by machinery	
7.1 Contact with or inhalation of harmful fluids, gases, mists, fumes and dusts	5.9;
7.2 Fire or explosion	NA
7.3 Biological and microbiological	NA
8 Hazards generated by neglecting ergonomic principles in machine design	

(continued)

Table 1.1: List of hazards (part 1) (concluded)

8.1	Unhealthy postures or excessive effort	5.2.1.6; 5.2.5.2; 5.6.2; 5.12; 5.12.8
8.2	Inadequate consideration of human hand/arm or foot/leg anatomy	NA
8.4	Inadequate area lighting	7.1.2.6
8.5	Mental overload or underload, stress	NA
8.6	Human error	5.2.2.1; 5.12
9	Hazard combinations	5.1.1.1; 5.1.1.2; 5.1.3
10	Hazards caused by failure of energy supply, breaking down of machinery parts and other functional disorders	5.1
10.1	Failure of energy supply	5.2.2.1; 5.6; 5.8.1.4; 5.12.7
10.2	Unexpected ejection of machine parts or fluids	5.9.7; 5.9.8; 5.9.9; 5.9.10
10.3	Failure or malfunction of control system	5.2.1.5
10.4	Errors of fitting	5.1.5.1.5
10.5	Overtum, unexpected loss of machine stability	5.1.1.2; 5.1.5; 5.7
11	Hazards caused by missing and/or incorrectly positioned safety	
8.3	Neglected use of personal protection equipment related measures/means	5.12.8; 7.1.2.7; 7.1.2.12
11.1	Guards	5.2.1.3; 5.3.2; 5.4.1; 7.1.2.1.2; 7.1.2.6; 7.1.2.9; 7.2.2
11.2	Safety related (protection) devices	5.7
11.3	Starting and stopping devices	5.1.1; 5.3.4.9; 5.12
11.4	Safety signs and signals	5.2.2.7; 7.1.2.9
11.5	Information or warning devices	7.1.2.9
11.6	Energy supply disconnecting devices	5.2.1.2; 5.8.1.2
11.7	Emergency devices	5.5; 5.6
11.8	Feeding/removal means of work pieces	NA
11.9	Essential equipment and accessories for safe adjusting and/or maintaining	5.2.3.1; 5.4.2.10
11.10	Equipment evacuating gases	SIST EN 1495:1999 NA

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