

BS EN 14502-1:2010



BSI Standards Publication

Cranes — Equipment for the lifting of persons

Part 1: Suspended baskets

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee MHE/3/11, Crane safety and testing.

A list of organizations represented on this committee can be obtained on request to its secretary.

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pour le levage de personnes - Partie 1: Nacelles
suspendues

Krane - Einrichtungen zum Heben von Personen - Teil 1:
Hängende Personenaufnahmemittel

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Foreword

This document (EN 14502-1:2010) has been prepared by Technical Committee CEN/TC 147 “Cranes - 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of an identical text or by endorsement, at the latest by November 2010, and conflicting national standards shall be withdrawn at the latest by November 2010.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 14502-1:2005.

This European Standard is the first part of EN 14502. The other part is as follows:

EN 14502-2, *Cranes — Equipment for the lifting of persons — Part 2: Elevating control stations.*

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, Croatia, 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 deals with suspended basket for use in lifting operation of persons with machinery which is not designated for lifting of persons.

The use of such suspended basket is not covered by Machinery Directive 2006/42/EC but by the regulations which apply to the user.

Care is necessary as the regulations which apply to the user are not the same in the various countries of the European Union. The national regulations are based on Directive 2009/104/EC, which gives minimum requirements.

The lifting of persons with machines not designed for that purpose is dealt with in annex II, article 3.1.2 of that directive, which prescribes:

"Persons may be lifted only by means of work equipment and accessories provided for this purpose.

Without prejudice to Article 5 of Directive 89/391/EEC, exceptionally, work equipment which is not specifically designed for the purpose of lifting persons may be used to this effect, provided appropriate action has been taken to ensure safety in accordance with national legislation and/or practice laying down appropriate supervision.

While workers are on work equipment designed for lifting loads the control position must be manned at all times. Persons being lifted must have reliable means of communication. In the event of danger, there must be reliable means of evacuating them."

The national legislation and/or practice, referred to in the second paragraph of section 3.1.2, may set out the conditions under which such exceptional use is permitted, the measures that must be taken to ensure the safety of the operation and technical requirements for the equipment used.

Such obligations apply to the users, but they also have implications for persons placing the equipment used for this purpose on the market in the country concerned since they must take account of the relevant legislation.

This standard is a technical document to help the designer of suspended baskets used with machines not designed for lifting of persons.

This standard was not prepared under a mandate given to CEN by the European Commission and cannot be considered as a means of conforming the Essential Requirements of the New Approach Machinery Directive 2006/42/EC.

1 Scope

This European Standard applies to baskets suspended on cranes.

This European Standard does not cover the controls for the movement of the basket.

This European Standard is not applicable to:

- lifts for crane drivers;
- moveable cabins.

This European Standard deals with all significant hazards, hazardous situations and events relevant to suspended baskets, when used as intended and under conditions foreseen by the manufacturer (see Clause 4).

The significant hazards covered by this document are identified in Clause 4.

This European Standard is not applicable to suspended baskets which are manufactured before the date of publication by CEN.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 795, *Protection against falls from a height — Anchor devices — Requirements and testing*

EN 818-4, *Short link chain for lifting purposes — Safety — Part 4: Chain slings — Grade 8*

EN 13411-1, *Terminations for steel wire ropes — Safety — Part 1: Thimbles for steel wire rope slings*

EN 13411-2, *Terminations for steel wire ropes — Safety — Part 2: Splicing of eyes for wire rope slings*

EN 13411-3, *Terminations for steel wire ropes — Safety — Part 3: Ferrules and ferrule-securing*

EN 13414-1, *Steel wire rope slings — Safety — Part 1: Slings for general lifting service*

EN 13586:2004+ A1:2008, *Cranes — Access*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

suspended basket

arrangement designed for the lifting of persons by a crane

4 List of significant hazards

Table 1 contains all the significant hazards, hazardous situations and events, as far as they are dealt with in this document, identified by risk assessment as significant for this type of suspended basket and which require action to eliminate or reduce the risk.

Table 1 — List of significant hazards, hazardous situations and hazardous events

Hazards	Relevant clause(s) in this standard
Inadequacy of the mechanical strength	5.2, 5.3
Crushing hazard	5.6
Impact hazard	5.6
Contact of persons with parts which have become live under faulty conditions (indirect contact)	7.4
Unhealthy postures or excessive effort	5.1
Neglected use of personal protection equipment	5.8
Falling or ejected objects or fluids	5.1.4
Slip, trip and fall of persons (related to machinery)	5.4, 5.5, 5.6
Inadequate holding devices/accessories	5.3
Collision of more than one machine	7.2
Electrical hazards from lightning	7.1
Inadequate mechanical strength – inadequate working coefficients	5.2, 5.3
Falling of persons from person carrier	5.5, 5.6, 5.8

5 Safety requirements and/or protective measures

5.1 General requirements

5.1.1 Suspended baskets shall conform to the safety requirements and/or protective measures of 5.1.

5.1.2 Suspended baskets shall be manufactured from material specified as being incombustible.

5.1.3 Those parts of the suspended basket where persons are intended to stand shall have a minimum free standing height of 2 m.

5.1.4 When the suspended basket is designed to be used in situations where falling objects can be a hazard, the basket shall be provided with a roof. Any aperture in the roof of the basket shall have dimensions which shall not allow a sphere with a diameter of 20 mm to pass through.

As a minimum the roof of the basket shall be able to withstand the impact of a steel ball weighing 7 kg, falling from a height of 2 m, without plastic deformations exceeding 50 mm.

5.1.5 Suspended baskets shall be protected against corrosion.

5.2 Strength calculations

When calculating the rated capacity of the suspended basket the weight of each person shall be taken as at least 80 kg plus at least 40 kg of equipment for each person. The loading considered shall be increased with a factor of at least 2 when used in the design calculation.

5.3 Load lifting attachments

5.3.1 Suspended baskets shall be attached to the crane hook with flexible load lifting attachment(s) consisting of steel wire rope slings or chain slings complying with EN 13414-1 or EN 818-4 respectively but with an enhanced safety factor of at least:

- a) $8 \times$ (weight of basket + rated capacity) for chains; and
- b) $10 \times$ (weight of basket + rated capacity) for steel wire ropes including the end termination.

NOTE Examples of suspended baskets and flexible load lifting attachments are shown in Figures 1 to 3.

Load lifting attachment(s) shall be fitted to the basket in such a way that they can only be removed with tools. This requirement does not apply to baskets intended for use on Container Handling cranes with a spreader where the twist locks are both mechanically blocked and controlled by an electrical switch manually operated by personnel in the basket.

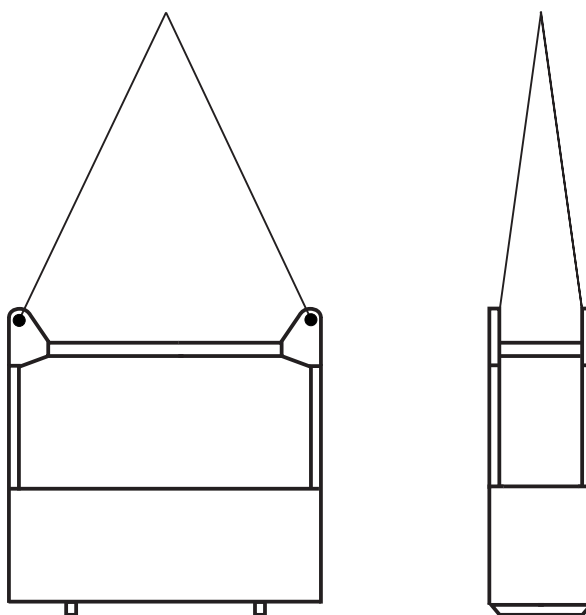


Figure 1 — Suspended basket of 2 m length or shorter

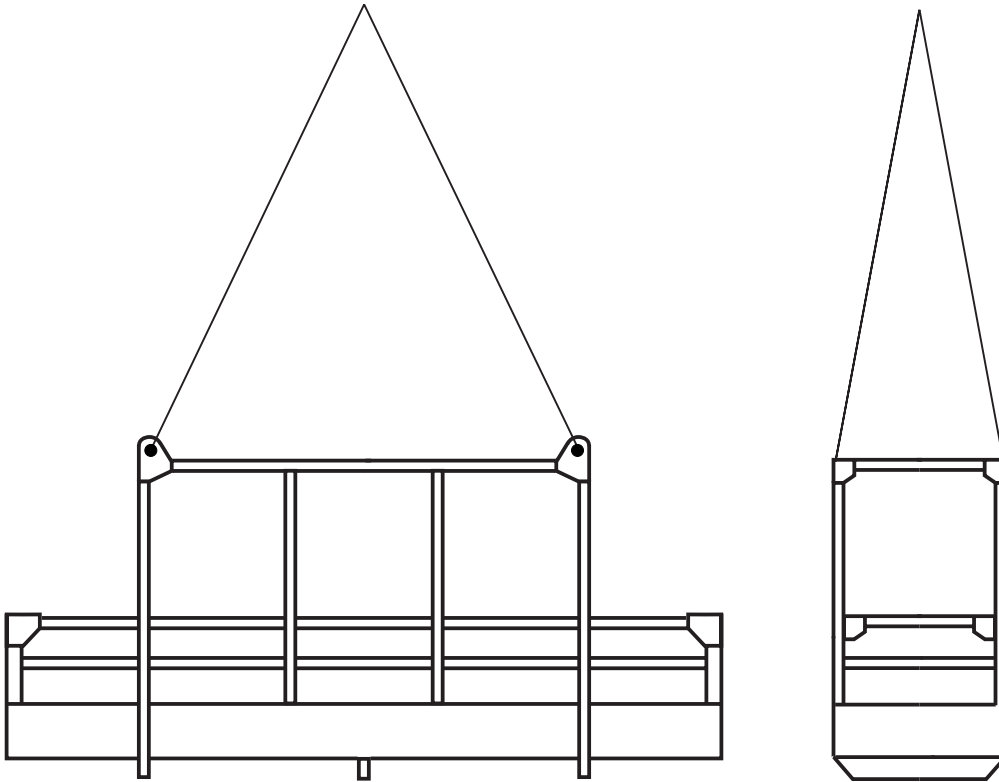


Figure 2 — Suspended basket longer than 2 m

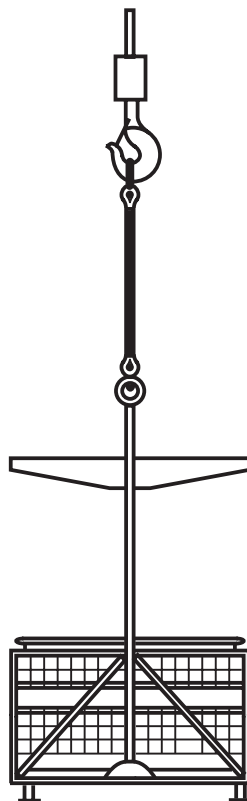


Figure 3 — Suspended basket with single suspension

5.6 Side guarding

5.6.1 Suspended baskets shall have on each side both side protection and a recessed hand rail.

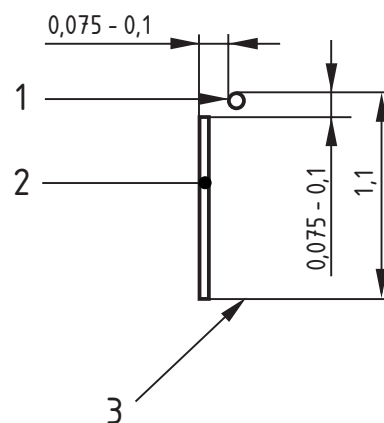
a) The side protection shall have the following characteristics:

- 1) enclosed up to a height of at least 0,5 m so that a sphere of 20 mm cannot pass through;
- 2) the top of the enclosure shall be fitted with a guard rail;
- 3) if the guard rail is lower than 1 m above the floor, another guard rail shall be provided at 1 m;

b) The hand rail shall have the following characteristics:

- 1) at least 16 mm and not more than 40 mm diameter;
- 2) be located 0,075 m to 0,1 m inside and 0,075 m to 0,1 m above the upper edge of the side protection (see Figure 5);
- 3) shall be able to withstand point loads of 500 N per person at distances of 0,5 m in the most unfavourable positions and in the most unfavourable direction without permanent deformation.

Dimensions in metres



Key

- 1 Handrail
- 2 Side protection
- 3 Floor

Figure 5 — Side protection general

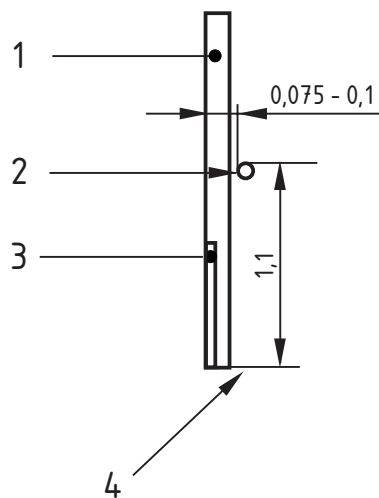
5.6.2 If the suspended basket is equipped with rigid corner posts up to a height of at least 2 m, each side of the basket shall have:

a) a side protection with the following characteristics:

- 1) it shall be enclosed up to a height of at least 0,5 m so that a sphere of 20 mm cannot pass through;

- 2) the top of the enclosure shall be fitted with a guard rail;
 - 3) if the guard rail is lower than 0,75 m above the floor, another guard rail shall be provided between 0,75 m and 1 m;
- b) a hand rail of at least 16 mm and not more than 40 mm diameter. To avoid crushing hands it shall be located 1,1 m above the floor and 0,075 m to 0,1 m inside the side protection (see Figure 6);
- c) the handrail shall be able to withstand point loads of 500 N per person at distances of 0,5 m in the most unfavourable positions and in the most unfavourable direction without permanent deformation.

Dimensions in metres



Key

- 1 Corner post
- 2 Handrail
- 3 Side protection
- 4 Floor

Figure 6 — Side protection for baskets with corner post

5.7 Access and exit

5.7.1 Access to and exit from the basket shall be in accordance with EN 13586 (type 1).

5.7.2 Any door or gate for entering or leaving a working basket shall not open outwards and shall have an automatic catch to prevent it from being opened inadvertently.

5.8 Anchorage for personal protective equipment against fall from a height

Suspended baskets shall be provided with anchorage points in accordance with EN 795 for personal protective equipment.

6 Verification of safety requirements and/or protective measures

Verification of conformity with the safety requirements and/or protective measures (specified in Clause 5) shall be in accordance with Table 2.

Table 2 — Methods to be used to verify conformity with the safety requirements and/or protective measures

Clause number	Method of verification
5.1	Confirm that all relevant items have been addressed
5.1.1	Inspection
5.1.2	Inspection
5.1.3	Inspection
5.1.4	Inspection
5.2	Confirm the existence of a calculation, see also 5.5
5.3.1	Check of the certificate of the non-fixed load lifting attachment
5.3.2	Inspection
5.3.3	Inspection
5.4.1	Inspection
5.4.2	Inspection
5.4.3	Inspection
5.4.4	Inspection and test
5.4.5	Inspection
5.4.6	Inspection
5.5	Test with $1,5 \times$ rated capacity
5.6	Inspection and test
5.7	Inspection and test
5.8	Inspection

7 Instruction manual

7.1 General

The manufacturer of the basket shall provide an instruction manual with the minimum information listed in 7.2 to 7.5.

The manufacturer shall also draw the attention on national legislation which allows, together with particular restriction, the use of such suspended basket.

7.2 Information for the user

The combination of the crane and the suspended basket shall only be operated by people trained in the safe use of the combination, including the operating procedures for egress in case of power supply failure or control failure.

The lifting and supporting shall be made under controlled conditions and under the direction of one appointed person.

A crane driver shall always be present at the normal crane control station when the basket is occupied. Two way communication shall exist between the persons in the basket and the crane driver at all times during the lifting operation.

The required equipment necessary to perform an emergency rescue shall be available throughout the lifting operation.

During operation the employer shall not require the crane driver and signaller to do other work at the same time. During the operation they shall operate only one crane or direct one suspended basket.

Load lifting attachments for suspended baskets shall not be used for any other purpose.

Suspended baskets shall not be used in high winds, storms, ice, snow, fog, sleet, or other adverse weather conditions which could affect the safety of personnel.

Machines which can be operated simultaneously in the same place with risks of collision shall be stopped.

Unintended movement of the basket shall, where possible, be prevented, e.g. by means of guide ropes or anchoring.

The suspended baskets, hook, catch, and fixed load lifting attachment shall be inspected prior to each use.

If suspended baskets are moved through openings, measures shall be taken against entanglement and crushing risks.

7.3 Information for the crane driver

All movements should proceed gently with low speeds.

7.4 Information for the personnel in the basket

In suspended baskets a distribution as symmetrical as possible of the load shall be achieved.

Persons in suspended baskets shall fasten their safety harness onto the anchorages provided. The length of the device between the anchorage points and the harness shall be fixed such that the operator is restrained within the basket at all times. The maximum length shall be indicated in the instruction notice of the manufacturer.

The basket rated capacity shall not be exceeded.

Tools and material carried by personnel shall be secured, in particular against displacement, tipping, and falling out.

Occupants shall keep all parts of the body inside the suspended basket during raising, lowering and positioning, to avoid pinch points.

Occupants shall not stand on or work from the handrail or side protection of the suspended basket or anything in it.

The basket shall be positioned on a firm surface during access and egress.

7.5 Special requirements related to the work from the suspended basket

Any power cables or hoses provided to the basket shall be connected in such a way that they will not interfere with the safe operation of the basket.

Any guide ropes provided to the basket shall be connected in such a way that they will not interfere with the safe operation of the basket.

Power cables or hoses shall not be used as guide ropes.

When electric welding from the basket, special care shall be taken to earth the basket in order to protect the crane and/or its ropes from becoming conductors of electricity.

8 Marking

Suspended baskets shall be fitted with a plate durably marked, with the following information and in visible position:

- a) name and address of the manufacturer or supplier;
- b) year of construction;
- c) type;
- d) identification number;
- e) dead weight of the suspended basket;
- f) rated capacity of the suspended basket and maximum number of persons permitted in it.

Suspended baskets used on cranes shall be painted in a conspicuous colour.

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