INTERNATIONAL STANDARD

ISO 11660-3

Second edition
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Cranes — Access, guards and restraints —

Part 3: Tower cranes

Appareils de levage à charge suspendue — Moyens d'accès, dispositifs de protection et de retenue —

Partie 3: Grues à tour

Reference number
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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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

ISO 11660-3 was prepared by Technical Committee ISO/TC 96, *Cranes*, Subcommittee SC 7, *Tower cranes*.

This second edition cancels and replaces the first edition (ISO 11660-3:1999), which has been technically revised.

ISO 11660 consists of the following parts, under the general title *Cranes — Access, guards and restraints*:

— *Part 1: General*

— *Part 2: Mobile cranes*

— *Part 3: Tower cranes*

— *Part 5: Bridge and gantry cranes*

Cranes — Access, guards and restraints —

Part 3:
Tower cranes

1 Scope

This part of ISO 11660 establishes the particular requirements relating to access, guards and restraints for tower cranes as defined in ISO 4306-3.

ISO 11660-1 establishes the general requirements for access to control stations and other areas of cranes as defined in ISO 4306-1, during normal operations, maintenance, inspection, erection and dismantling. It also deals with guards and restraints in general, concerning the protection of persons on or near the crane with regard to moving parts, falling objects or live parts.

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.

ISO 11660-1:2008, *Cranes — Access, guards and restraints — Part 1: General*

ISO 13852, *Safety of machinery — Safety distances to prevent danger zones being reached by the upper limbs*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 11660-1 apply.

4 Access

4.1 General

All control stations and all other parts of the crane requiring inspection or regular maintenance shall be accessible by means of stairs, ladders, gangways and landings.

In order to carry out erection or dismantling operations, inspection, routine maintenance or replacement of parts located above the ground, the tower crane, including the jib, shall be provided with support equipment such as hand rails, hand grips, platforms, safety equipment, etc. to ensure the safety of personnel and to allow them access to places of work.

4.2 Requirements

4.2.1 General design requirements for access

4.2.1.1 Compliance with ISO 11660-1

The design requirements for access shall comply with the clauses/subclauses of ISO 11660-1:2008 specified in Table 1, as completed by the corresponding subclauses of this part of ISO 11660 specified in the same table.

Table 1 — Design requirements for access

Applicable clause/subclause in ISO 11660-1:2008	Topic	As completed by applicable clause in this part of ISO 11660
5.8	Crushing hazard between moving parts	4.2.1.2
6	Stairs	4.2.1.3
7	Rung ladders	4.2.1.4
9	Manholes and hatched apertures	4.2.1.5

4.2.1.2 Crushing hazard between moving parts

Where persons could be present between moving parts, a safety distance of at least 0,5 m shall be observed. Where such a distance cannot be obtained, guards (when possible) and warning notices shall be fitted.

4.2.1.3 Stairs

In addition to the dimensions given in ISO 11660-1, the recommended dimensions for steps are as follows:

— rise: 200 mm;

— clear width: 500 mm.

4.2.1.4 Rung ladders

For all types of tower cranes, the first flight of ladder may be no greater than 10 m.

In addition, for self-erecting cranes, the following applies.

— Flights of type 1 ladders shall be positioned in such a way as to prevent persons from falling more than 10 m.

— Type 1 ladders shall have rest platforms at least every 10 m.

— Evacuation of an elevating control station in the event of power failure, etc. shall be possible by alternative means of egress. When a ladder is used for this purpose, the dimensions defined in ISO 11660-1 are not applicable. With reference to ISO 11660-1:2008, Table 4, the step width, m, may be reduced to 0,2 m, and the distance between the centre line of the rung and vertical surface, d, may be reduced to 0,1 m, allowing the use of the rung at least by one foot.

4.2.1.5 Manholes and hatch apertures

If the crane construction does not allow larger dimensions:

— for type 1 access in accordance with ISO 11660-1:2008, the minimum dimensions for effective hatch apertures shall be (0,55 × 0,55) m for top-slewing cranes and (0,50 × 0,50) m for self-erecting cranes;

— for type 2 access in accordance with ISO 11660-1:2008, the minimum dimensions for effective hatch apertures shall be (0,50 × 0,40) m.

4.2.2 Access provided in a horizontal jib

4.2.2.1 General

If it is not possible to lower the jib to the ground to carry out a visual inspection of it, a basket fixed to the trolley shall be provided. In addition, a walkway incorporating the following shall be fixed along the jib to reach the mechanism(s):

— side protection, or

— personal protective device against the falls.

When the basket cannot be used during erection/dismantling, repair or maintenance, the use of a personal protective device against the falls shall be possible all along the jib.

4.2.2.2 Walkway

The width of the walkway shall comply with ISO 11660-1:2008, Table 6, type 2.

When the size of the jib is sufficient to walk inside the jib (i.e. the dimension between the walkway and the upper member is equal to or greater than 1,8 m), toe boards shall be provided on each side of the walkway with a minimum height of 0,03 m. When the dimension between the walkway and the upper member is less than 1,8 m, a toe board is provided only on one side (see Figure 1).

Dimensions in metres

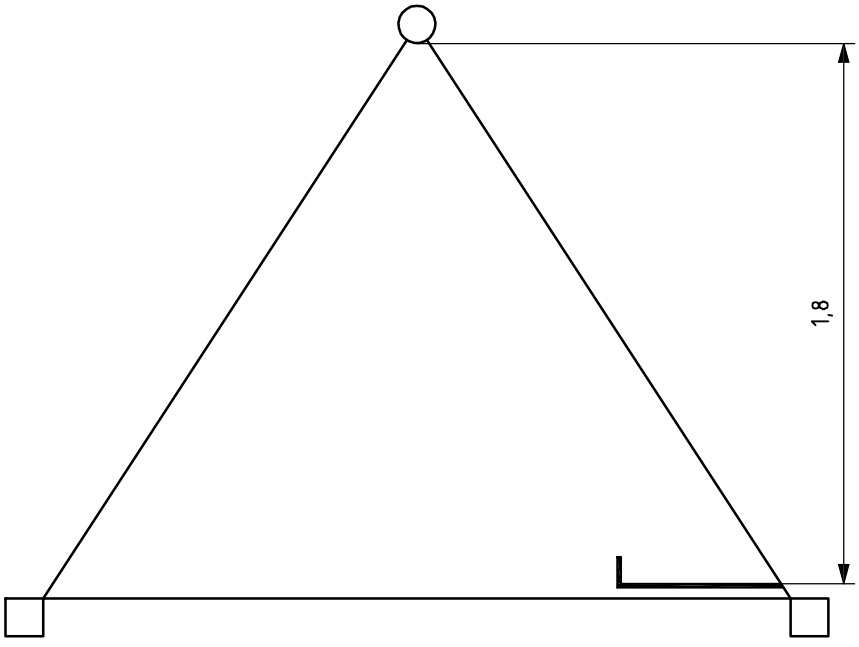

Figure 1 — Walkway with toe board on one side

4.2.2.3 Position of the walkway, handrail and steel wire rope

Manufacturers shall take into consideration the dimension of the jib when determining the position of the walkway, hand rail and steel wire rope.

4.2.2.4 Basket

The minimum dimension of the length/width of the basket shall be (0,50 × 0,35) m.

Manufacturers shall take into consideration the mass and the number of persons when determining the basket.

The side protection shall comply with ISO 11660-1:2008, Table 7, type 2, walkway.

Instructions and markings shall be provided for the use of the basket on the following:

— how to reach the basket;

— the admissible load and number of persons;

— warnings concerning residual risks, e.g. shearing, entanglement.

5 Guarding

5.1 Guards for moving parts

During the access to the control station, moving parts shall be guarded by safety distances as defined in ISO 13852, or by provision of removable or fixed guards.

The guards that may be used on walkways or work platforms shall be designed for this use (see ISO 11660-1).

If the crane construction does not permit such guards, warnings shall be provided, e.g.

— in top slewing cranes, in limited space areas within the connection between slewing ring support, slewing ring and slewing platform;

— in self-erecting cranes, between undercarriage, slewing ring and machinery platform.

5.2 Prevention of crane components from falling

Crane parts such as gears, pulleys, trolley wheels, covers and boxes shall be designed, assembled and fixed in such a way as to prevent them from falling during normal operation.

Covers, guards and access closures shall be fitted with hinges or other means to prevent them from falling.

The trolleys shall be designed such that:

— the wheels will not slip out from the railway in case of rupture of the axis, and

— it shall not be possible for the trolley to fall.

The output gears of the slewing gears shall be provided with covers or another device to prevent them from falling in case of rupture.

Bibliography

[1] ISO 4306-1, *Cranes — Vocabulary — Part 1: General*

[2] ISO 4306-3, *Cranes — Vocabulary — Part 3: Tower cranes*

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