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Cranes -- Limiting and indicating devices -- Part 1: General

Appareils de levage à charge suspendue -- Limiteurs et indicateurs -- Partie 1:
Généralités

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INTERNATIONAL STANDARD

ISO
10245-1

First edition
1994-08-01

Cranes — Limiting and indicating devices —

Part 1:

General

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Appareils de levage à charge suspendue — Limiteurs et indicateurs —

Partie 1: Généralités

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Reference number
ISO 10245-1:1994(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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.

International Standard ISO 10245-1 was prepared by Technical Committee ISO/TC 96, *Cranes*, Subcommittee SC 8, *Jib cranes*.

ISO 10245 consists of the following parts, under the general title *Cranes — Limiting and indicating devices*:

- Part 1: *General*
- Part 2: *Mobile cranes*
- Part 3: *Tower cranes*
- Part 4: *Jib cranes*
- Part 5: *Overhead travelling and portal bridge cranes*

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Cranes — Limiting and indicating devices —

Part 1: General

1 Scope

This part of ISO 10245 specifies general requirements for limiting and indicating devices for lifting appliances that are applicable to loads and motions, performance and environment. These devices restrict operation and/or provide the driver or other persons with operational information.

The extent to which devices are required and specific requirements for particular types of lifting appliance are given in the other parts of ISO 10245.

It is emphasized that safe and reliable operation of limiters and indicators relies upon regular inspection and maintenance.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this part of ISO 10245. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this part of ISO 10245 are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 4306-1:1990, *Cranes — Vocabulary — Part 1: General*.

3 Definitions

For the purposes of this part of ISO 10245, the following definitions apply.

3.1 limiting device: Device which initiates stopping or restricting crane motion or function. The majority of these devices will operate automatically when the respective motion or function reaches its limiting position. [ISO 4306-1:1990]

3.2 indicating device: Device which provides the crane driver with acoustic and/or visual data for competent control of the crane within its operating parameters. [ISO 4306-1:1990]

3.3 rated capacity: As defined for the particular type of crane.

NOTE 1 Rated capacity may also be referred to as Safe Working Load.

3.4 rated capacity limiter: Device that automatically prevents the crane from handling loads in excess of its rated capacity by more than a specified value.

3.5 rated capacity indicator: Device that automatically provides acoustic and/or visual warnings.

4 Rated capacity limiter

4.1 General

The rated capacity limiter, where fitted, shall take account continuously of any variations in the rated capacity arising from the configuration of the crane and/or the position of the load. The rated capacity limiter shall not require any manual resetting or adjustment during the lifting cycle of the appliance (i.e. the performance of the rated capacity limiter shall be maintained from the time the load is lifted to the time

it is set down, without any manual resetting or adjustment).

4.2 Operating requirements

The rated capacity limiter shall operate to override the controls of the crane when the load on the appliance exceeds the rated capacity,

- a) to prevent any motion that will increase the overload condition; and
- b) to prevent any motion that will lift the load.

The rated capacity limiter shall not prevent the driver returning the controls to the "off" position and re-starting motions that reduce the overload and/or lower the load without increasing the overload.

4.3 Setting of the rated capacity limiter

The rated capacity limiter shall be set to override the crane controls at a value as specified in the parts of ISO 10245 covering the particular type of crane.

5 Rated capacity indicator

5.1 General

The rated capacity indicator, where fitted, shall take into account the configuration of the crane and/or the position of the load in the same way as for the rated capacity limiter (see 4.1) and to warn

- a) the driver visually and/or acoustically of the approach to the rated capacity of the appliance; and
- b) drivers and/or persons in the vicinity of the crane, visually and/or acoustically, when the rated capacity is being exceeded.

5.2 Setting of the rated capacity indicator

The rated capacity indicator shall be set at values to give the warnings specified in 5.1 and as specified in the parts of ISO 10245 covering the particular type of crane.

6 Motion- and performance-limiting devices

Consideration shall be given to the fitting of limiting devices as defined in ISO 4306-1 where appropriate.

6.1 Motion limiters

Any motion which has a restriction of movement in the design of the crane shall be provided with a motion limiter. Subclauses 6.1.1 to 6.1.9 give examples of motion limiters which may be required.

6.1.1 Hoisting limiter, to prevent any part of the hook block from coming into contact with the fixed structure of the crane or other designated limits.

6.1.2 Lowering limiter, to ensure that the minimum specified number of turns of rope always remains on the drum.

6.1.3 Slewing limiters, to ensure that the crane's superstructure is not slewed beyond the design limits.

6.1.4 Crane-travelling limiter, to prevent approaches to the ends of the track or contact with fixed or moving obstructions.

6.1.5 Grab-traversing limiter, to prevent approaches to the ends of the track.

6.1.6 Derricking limiter, to ensure that the jib is not derricked "out" or "in" beyond the design limits.

6.1.7 Slack rope limiter, to stop the motion in the event of the rope becoming slack during operation.

6.1.8 Jib-telescoping limiter, to prevent the jib telescoping "out" or "in" beyond the design limits.

6.1.9 Movable cabin limiter, to prevent approaches to the ends of the track.

NOTE 2 In the case of hydraulic systems, the extent of travel of operating cylinders or, alternatively, mechanical stops may be considered as meeting this requirement but it may be necessary to fit pressure relief valves to prevent parts of the crane being overloaded.

In most other cases the motion limiters should be coupled to the crane controls to prevent continuation of this motion of the crane.

6.1.10 Each motion-limiting device, where fitted, shall be mounted positionally to take into account the stopping distance necessary for that motion. The devices shall not prevent the crane controls being reset to move motions away from the extent of their limits. Where movement of the jib or boom, or a telescoping movement, can further endanger a hoist motion that has reached its upper hoist limit, an interlock should be provided to ensure that these movements cannot

be made before the hoist block has been lowered to a safe position.

6.2 Performance limiters

Subclauses 6.2.1 to 6.2.9 give examples of cases where performance limiters may be required.

6.2.1 Hoisting-speed limiter, to ensure that the speed of operation remains within the design limits.

6.2.2 Lowering-speed limiter, to ensure that the speed of operation remains within the design limits.

6.2.3 Slewing-speed limiter, to ensure that the speed of operation remains within the design limits.

6.2.4 Crane-travelling speed limiter, to ensure that the speed of operation remains within the design limits.

6.2.5 Crab-traversing speed limiter, to ensure that the speed of operation remains within the design limits.

6.2.6 Derricking-speed limiter, to ensure that the speed of operation remains within the design limits.

6.2.7 Pressure relief valves in hydraulic systems, to ensure operation in accordance with the design limits.

6.2.8 Rope-winding/unwinding limiters, to ensure that the number of rope turns on the drum is within the design limits.

6.2.9 Skew limiter, to ensure that the crane when travelling does not skew beyond the design limits.

7 Motion- and performance-indicating devices

Consideration shall be given to the fitting of motion- and performance-indicating devices as defined in ISO 4306-1, where appropriate. Subclauses 7.1 to 7.6 give examples of motion- and performance-indicating devices which may be required.

7.1 Radius indicator, to indicate the horizontal distance between the centreline of the crane and the centreline of the suspended load.

7.2 Jib angle indicator, to indicate the angle of the jib to the horizontal at any operating position.

7.3 Skew indicator, to indicate the amount of skew.

7.4 Crane slope indicator, to indicate the verticality of the crane.

7.5 Drum rotation indicator, to indicate the direction of the rotation of the drum.

7.6 Slack rope indicator, to indicate the amount of slack in the rope.

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