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Cranes — Limiting and indicating devices —

Part 2: **Mobile cranes** **(standards.iteh.ai)**

ISO 10245-2:1994
Appareils de levage à charge suspendue — Limiteurs et indicateurs —
Partie 2: Grues mobiles
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Foreword

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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 10245-2 was prepared by Technical Committee ISO/TC 96, *Cranes*, Subcommittee SC 6, *Mobile 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 2: Mobile cranes

1 Scope

1.1 This part of ISO 10245 specifies the requirements for devices which limit and/or indicate the loads, motions, performance and environment of mobile cranes. The general requirements for limiting and indicating devices for cranes are given in ISO 10245-1.

1.2 This part of ISO 10245 applies to all mobile cranes as defined in ISO 4306-2. See 4.1 and also 4.2.

NOTE 1 Some basic machine types within this scope are convertible for use in excavating work and other applications not considered to be lifting service. The requirements of this part of ISO 10245 are applicable only to such machines when used as lifting cranes.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 10245. At the time of publication, the editions indicated were 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 editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 2374:1983, *Lifting appliances — Range of maximum capacities for basic models*.

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

ISO 4306-2:—¹⁾, *Cranes — Vocabulary — Part 2: Mobile cranes*.

ISO 9926-1:1990, *Cranes — Training of drivers — Part 1: General*.

ISO 10245-1:—²⁾, *Cranes — Limiting and indicating devices — Part 1: General*.

3 Definitions

For the purposes of this part of ISO 10245, the definitions given in ISO 10245-1 and the following definitions apply.

3.1 rated capacity: Maximum gross load (ISO 4306-1, 6.1.7) that applies to a given crane condition.

3.2 anti-two-block device: Device which, when activated, disengages all functions whose movement can cause any part of the lower load block or hook assembly to come into contact with the upper load block, boom or jib point sheave assembly(ies).

3.3 two-block damage prevention device: Device which, when activated, reduces the wire rope pull caused by contact of the lower load block or hook

1) To be published. (Revision of ISO 4306-2:1985)

2) To be published.

assembly and upper load block, boom or jib point sheave assembly(ies).

The pull should be reduced such that contact will not cause damage to the machine and well-maintained wire rope. It should have a feature which prevents the hook block or hook assembly from rotating to a position which would cause rigging to disengage from the hook.

4 General

4.1 This part of ISO 10245 applies to all new mobile cranes manufactured one year after publication of this part of ISO 10245. It is not the intent of this part of ISO 10245 to require retrofitting of existing equipment. It is intended, however, that when an item is being modified its performance requirement shall be reviewed relative to this part of ISO 10245. If the performance differs substantially, the need to meet the current requirement shall be evaluated by a qualified person selected by the owner (user) and consequent recommended changes shall be made by the owner (user) within one year.

4.2 Devices described within this part of ISO 10245 shall be applied according to table 1. The ton limits specified in table 1 relate to the maximum capacity of the crane (see ISO 2374). Table 1 does not apply to all situations that may be encountered, such as high winds. Application of the devices shall be carried out in the manner required for safe operation of the crane, taking into account the type of crane and its intended use.

4.3 All devices with readouts shall be readable from the operator's station.

5 Rated capacity limiter

5.1 General

The rated capacity limiter shall meet the requirements of ISO 10245-1:—, 4.1, and shall operate in accordance with the requirements stated in ISO 10245-1:—, 4.2.

5.2 Setting

The rated capacity limiter shall be set to override the crane controls at values between 100 % and 110 % of the rated capacities of the crane.

NOTE 2 Rated capacities referred to in 5.2 do not take into consideration adverse operating conditions, e.g. high winds, multilift operation, etc.

6 Rated capacity indicator

6.1 The rated capacity indicator shall warn the operator both visually and acoustically whenever the load on the crane exceeds $(92 \pm 5 \%)$ of the rated capacity.

6.2 The rated capacity indicator shall warn persons acoustically, and where practical visually, in the vicinity of the crane whenever the rated capacity limiter overrides the crane controls (see 5.2).

7 Load indicator

7.1 The load indicator shall measure and display the net load being lifted.

7.2 The load indicating system shall be compatible with the maximum capacity of the crane, as specified by the crane manufacturer.

7.3 The accuracy of the load indicating system shall be such that the indicated load is between 100 % and 110 % of the actual load.

8 Motion limiters

8.1 Operating requirements

Motion limiters shall operate according to ISO 10245-1:—, 6.1.10.

In most cases, the motion limiting devices should be coupled to the crane controls to prevent any such further movement of the crane.

NOTE 3 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 overloading of parts of the crane.

8.2 Types of hoisting limiter

Hoisting limiters shall consist of either an anti-two-block device or a two-block damage prevention device (see 3.2 and 3.3).

8.3 Lowering limiter

The lowering limiter shall meet the requirements of ISO 10245-1:—, 6.1.2 and 6.2.8.

8.4 Derrick limiter

The device shall be provided with suitable adjustments for obtaining the specified luffing boom and luffing jib angles. Where necessary, the device shall be provided with means for the operator to bypass the limiter to permit momentary re-engagement of the boom or jib derricking power for the purpose of unloading locking devices.

8.5 Attachment backstops

The backstop shall be designed to absorb all the energy imparted to it by the luffing boom or luffing jib upon sudden release of all rated loads due to failure of the load line or rigging. The backstop shall provide energy-absorbing resistance to the upward and rearward movement of the boom or jib for the last 5° of angular movement about the boom or jib pin.

9 Motion and performance indicators

9.1 Hoisting limit indicator

9.1.1 Operating requirements

The hoisting limit indicator, when activated, shall warn the operator of impending contact of the lower load block or hook assembly with upper load block, boom or jib point sheave assembly(s). The warning shall be both audible and visible to the operator.

9.1.2 Setting

The hoisting limit indicator shall be set to take into account the stopping distance necessary for any motion, e.g. of the hook or telescopic attachment, assuming prudent crane operation.

9.2 Attachment angle indicators

The readout accuracy of angle indicators shall be as follows:

- for boom or jib angles 65° or more from the horizontal, the indicated angle tolerance shall be $\pm 2^\circ$ from the actual boom or jib angle;
- for boom or jib angles less than 65°, the indicated angle tolerance shall be $\pm 3^\circ$ from the actual boom or jib angle.

9.3 Attachment length indicators

The readout accuracy shall have a tolerance of $\pm 2\%$ of the actual jib length.

9.4 Radius indicator

The accuracy of the radius indicator shall be such that when the rated capacity is determined for the radius indicated, the rated capacity shall be within $\pm 5\%$ of that for the actual radius.

9.5 Rope drum rotation indicator

9.5.1 Operating requirements

The device shall indicate rope drum movement by visible, audible or tactile means. It shall also indicate the direction of rope travel when this is not otherwise indicated by the control position.

9.5.2 Indicator sensitivity

The indicator shall be able to detect initial drum rotation producing rope travel of 50 mm.

9.6 Slope indicator

The slope indicator shall indicate out-of-level conditions of the crane that exceed the recommended tolerances given by the crane manufacturer.

9.7 Slew indicator

The indicator shall perform one or all of the following functions:

- acoustic and/or visible warning of motion;
- indication of slewing from one working area to another;
- tracking of the azimuth angle relationship between the superstructure and carrier, to within 1,5°.

9.8 Wind speed indicator

The measuring device shall be fitted in a suitable elevated position on the crane which is exposed to the wind.

The readout shall be fitted in a position clearly visible to the operator from the operating position and it shall be clearly legible.

The device shall provide a continuous display of wind velocity averaged over 5 s.

10 Strength margin

When any component of the devices specified in this part of ISO 10245 is employed in the load-supporting system such that its failure could cause the load to be dropped, its strength margin shall be not less than the minimum strength margin of the other load-supporting members.

11 Inspection

11.1 Prior to daily operation, a check shall be made to ensure that the system functions in accordance with the system manufacturer's written instructions.

Identified system malfunctions shall be corrected, in accordance with the system manufacturer's instructions, prior to the continued usage of the system.

11.2 Every twelve months or more frequently, the system shall be inspected and tested by a qualified person. If calibration is required, it shall be done by a qualified person.

11.3 The crane owner (user) shall maintain a record of the dates and the results of the annual (minimum) or periodic inspections for the crane. Records should be kept where available to appointed personnel.

12 Maintenance

The indicating and limiting devices described in this part of ISO 10245 shall be maintained according to the device manufacturer's written maintenance instructions.

13 Operating instructions and operator training

13.1 The manufacturer shall supply pertinent operating instructions with each limiting and indicating device, including any special limitations or requirements.

13.2 Training of the crane operator shall be conducted according to the requirements of ISO 9926-1 as follows:

Prior to authorization to operate the crane, a check shall be made by a qualified person to ensure that the operator is aware and understands the system manufacturer's written instructions on operation and function.

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Table 1 — Requirements for mobile crane device application

Crane type/ attachment application	Rated capacity limiter	Rated capacity indicator	Load indicator	Radius indicator	Hoisting limiter indicator	Hoisting limiter	Lowering limiter	Drum rotation indicator	Attachment length indicator	Attachment angle indicator	Derrick limiter	Attachment backstop	Slope indicator	Slew indicator	Wind speed indicator ¹⁾
Telescopic boom, lift crane	≥ 3 t (R) < 3 t (O)	R	R	R	R	R	O	O	R	R	R	NA	O	O	O
Fixed length boom, per- sonnel hand- ling	≥ 3 t (R) < 3 t (O)	R	R	R	R	R	O	O	NR	R	R	R	O	O	O
Fixed length boom, lift crane	O ≥ 3 t (R) < 3 t (O)	R	R	R	R	O	O	O	NR	R	R	R	O	O	O
Telescopic boom, lorry loader	≥ 3 t (R) < 3 t (O)	O ²⁾	O ²⁾	O	R ²⁾	R ²⁾	O ²⁾	O ²⁾	R	R	R	NA	O	O	NR
Articulated boom, lorry loader	≥ 3 t (R) < 3 t (O)	O ²⁾	O ²⁾	O	R ²⁾	R ²⁾	O ²⁾	O ²⁾	NA	O	R	NA	O	O	NR
Telescopic boom with luffing jib	≥ 3 t (R) < 3 t (O)	R	R	R	R	R	O	O	R	Boom R Jib R	Boom R Jib R	Boom NA Jib R	O	O	O
Fixed length boom with luffing jib	O ≥ 3 t (R) < 3 t (O)	R	R	R	R	O	O	O	NR	Boom R Jib R	Boom R Jib R	Boom R Jib R	O	O	O
Non-slewing telescopic boom	≥ 3 t (R) < 3 t (O)	R	R	R	R	R	O	O	R	R	R	NA	O	NA	O
Non-slewing fixed length boom	O ≥ 3 t (R) < 3 t (O)	R	R	R	R	O	O	O	NR	R	R	R	O	NA	O

NOTE — R = Required; O = Optional; NR = Not Required; NA = Not Applicable.

1) When load charts are based on wind conditions, a wind speed indicator is required.

2) Applies only when wire rope hoist is fitted to machine.

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