INTERNATIONAL STANDARD

ISO 10245-5

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Cranes — Limiting and indicating devices —

Part 5:
Overhead travelling and portal bridge cranes

Appareils de levage à charge suspendue — Dispositifs limiteurs et indicateurs —

Partie 5: Ponts roulants et ponts portiques

Reference number
ISO 10245-5:1995(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 10245-5 was prepared by Technical Committee ISO/TC 96, *Cranes*, Subcommittee SC 9, *Bridge and gantry 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 5:
Overhead travelling and portal bridge cranes

1 Scope

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

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

ISO 8686-1:1989, *Cranes — Design principles for loads and load combinations — Part 1: General.*

ISO 10245-1:1994, *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 apply.

4 Rated capacity limiter

4.1 Cranes shall be fitted with a rated capacity limiter, if

— there is a hazard of overturning;

— the crane is likely to handle unpredictable loads, which can result in overloading of the mechanisms and structures.

4.2 The rated capacity limiter shall allow the rated load and lifting devices to be accelerated upwards with the design mean acceleration a. Normally the limiter can be adjusted and blocked to the appropriate value during tests with the rated load. For serially manufactured hoisting winches, it may be adequate to set the rated capacity limiter during workshop tests, taking into account provisions for elasticity of the bridges on which the winches are being used.

4.3 It may be necessary to fit a system to the limiter to prevent it from sensing dynamic loads during operation.

4.4 The rated capacity limit setting Q_L shall meet the following ratios:

$$1+\frac{a}{g}<\frac{Q_L}{Q_{GL}}<\varphi_2$$

where

a is the design mean acceleration for hoisting;

g is the acceleration due to gravity;

Q_L is the rated capacity limit setting for the hoist medium (rope, chain, etc.);

Q_{GL} is the gross load, comprising hoist medium, fixed load-lifting attachment and the rated load (rated load = non-fixed load-lifting attachment + payload);

φ_2 is the amplifying factor used in the proof of competence calculation of the crane in accordance with ISO 8686-1:1989, subclause 6.1.2.2.1.

4.5 In special cases in which the rated capacity of the bridge or gantry crane in certain reaches and load positions is limited to values lower than the rated load of the hoisting mechanism, the rated capacity limiting system shall stop any movement that is bringing the system out of design limits.

4.6 In a crane where two or more hoisting mechanisms are in operation in tandem, rated capacity limiters, working in conjunction with related motion limiters, when activated by an overload, shall override the controls of all motions causing the overload condition.

5 Rated capacity indicator

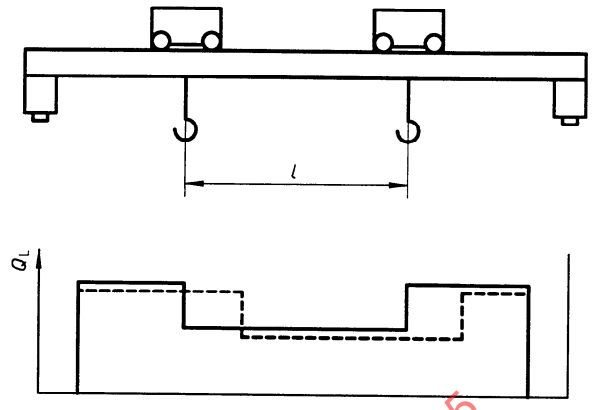
5.1 Cranes shall be fitted with a rated capacity indicator when the rated capacity of the crane depends on the position of the load.

A rated capacity indicator should also be provided when it is considered to have essential effect on improving crane control and safety.

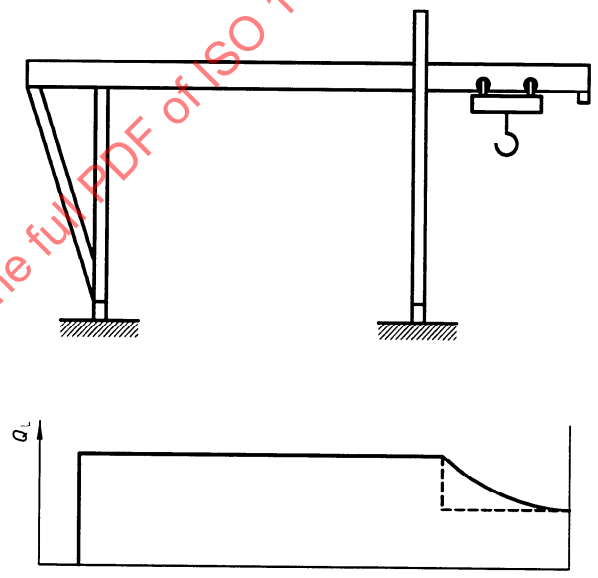
The rated capacity indicator shall indicate to the crane driver and, when appropriate, to those in the vicinity of the crane, when the rated capacity has been reached and/or the rated capacity limiter has overridden the controls.

5.2 In cranes for which the rated capacity depends on the location of the crab (see figure 1) and in cases described in 4.6, the rated capacity indicator shall give a continuous visual and/or acoustic warning to the crane driver whenever the load approaches the rated capacity. The setting of the signal actuator depends on the type of use of the crane. In general, the warning signal should be given when 90 % to 95 % of the rated capacity is reached.

5.3 Acoustic warnings shall be sufficiently loud to be heard by those to be warned above the general background noise of the site of operation. The warning sound should be clearly identifiable and not liable to confusion with other common sounds.



a) A minimum distance l between two crabs is required in order to use the full rated capacity of the crabs. With a shorter distance the rated capacity is reduced (mainly in order to reduce bridge weight and keep wheel loads within allowable limits).



b) The rated capacity is limited on a cantilever of the crane (e.g. due to stability, corner load or strength of the beam).

Figure 1 — Examples of cases where the rated capacity of a bridge or gantry crane is limited

6 Motion- and performance-limiting devices

6.1 Motion limiters

6.1.1 Any crane motion which has a restriction of movement in the design of the crane shall be provided with a motion limiter. Guidance for the application of the most common types of motion limiters for usual crane motions is given in table 1.

Table 1 — Selection of motion limiters

Motion	Type of motion limiter				
	End stop	Buffer	Cut-out limit switch	Slow-down device	Back-up limit switch
Hoisting, in general			▲		× [1]
Hoisting, high risk applications			▲		▲
Lowering			▲		
Travelling					
$v_{Lt} < 0{,}63$ m/s	▲	○	○	○	
$v_{Lt} \geqslant 0{,}63$ m/s	▲	■	■	■	
Traversing					
$v_{Ct} < 0{,}80$ m/s	▲	○	○	○	
$v_{Ct} \geqslant 0{,}80$ m/s	▲	■	■	■	
Trolley slewing [2]	▲	○	○		
Hook slewing [2]	▲	○ [1]	○ [1]		
Boom hoisting	▲	×	▲	×	

NOTE — ▲ = required; × = recommended; ○ = at least one type of motion limiter recommended; ■ = at least one type of motion limiter required [3].

1) A torque limiter may replace the motion limiter indicated in this table.
2) Apply only when the slewing angle is restricted.
3) For higher velocities and/or masses (kinetic energies), more than one type of motion limiter may be required.

6.1.2 Accelerations applied to the structures due to the action of limiters shall be taken into account in design.

6.1.3 The motion limiters shall be designed so that the maximum acceleration to which the crane driver is subject is less than 4 m/s^2.

6.1.4 When there is a possibility of collision of two cranes, this shall be taken into account in the design of the motion limiters.

6.2 Performance limiters

Performance limiters should be provided based upon application requirements which include crane control and safety.

7 Motion- and performance-indicating devices

Motion- and performance-indicating devices, in accordance with ISO 10245-1, should be provided based upon application requirements which include crane control and safety.

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