BRITISH STANDARD

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Incorporating Technical Corrigendum No. 1

Cranes — Limiting and indicating devices —

Part 4: Jib cranes

ICS 53.020.20

British Standards

National foreword

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The UK participation in its preparation was entrusted to Technical Committee MHE/3, Cranes and derricks, which has the responsibility to:

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— monitor related international and European developments and promulgate them in the UK.

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Summary of pages

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INTERNATIONAL STANDARD

ISO 10245-4

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Cranes — Limiting and indicating devices —

Part 4: Jib cranes

Appareils de levage à charge suspendue — Limiteurs et indicateurs —

Partie 4: Grues à flèche

Reference number
ISO 10245-4:2004(E)

Foreword

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ISO 10245-4 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*

Introduction

This International Standard establishes requirements and gives guidance and design rules that reflect the present state of art in the field of crane machine design. The rules given represent good design practice that ensures fulfilment of essential safety requirements and adequate service life of components. Deviation from these rules normally leads to increased risks or reduction of service life, but it is acknowledged that new technical innovations, materials, etc. may enable new solutions that result in equal or improved safety and durability.

Cranes — Limiting and indicating devices —

Part 4:
Jib 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 jib-type cranes as defined in ISO 4306-1, other than offshore, tower, mobile and railway cranes, which are covered in the other parts of ISO 10245. The general requirements for limiting and indicating devices for cranes are given in ISO 10245-1:1994.

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

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

ISO 8686-4:2005, *Cranes — Design principles for loads and load combinations — Part 4: Jib cranes*

ISO 10245-1:1994, *Cranes — Limiting and indicating devices — Part 1: General*

3 Terms and definitions

For the purposes of this document, the definitions given in ISO 10245-1 apply.

4 Rated capacity limiters and indicators

4.1 General requirements for jib cranes

Rated capacity limiters and indicators shall be provided on all cranes having a rated capacity of 1 t or above, or an overturning moment of greater than 40 000 N·m due to the load.

NOTE For rope or chain hoists for which the rated capacity does not vary with the position of the load, a rated capacity indicator is not required.

4.2 Rated capacity limiters — Performance and specific requirements

4.2.1 The rated capacity limiter shall meet the requirements of ISO 10245-1:1994, 4.1, and shall operate in accordance with the requirements stated in ISO 10245-1:1994, 4.2.

4.2.2 The rated capacity limiter, once actuated, shall continuously override the controls concerned until the overload has been removed and the relevant control lever has been returned to the neutral position.

4.2.3 It may be necessary to fit a system to the limiter to prevent it from sensing dynamic loads during operation. The rated capacity limiter should allow the rated load and lifting devices to be accelerated upwards with the design mean acceleration.

NOTE Normally, the limiter can be adjusted and set to the appropriate value during tests with the rated load. For serially manufactured hoisting winches, it might be adequate to set the rated capacity limiter during workshop tests, taking into account provisions for the elasticity of the jib on which the winches are to be used.

4.2.4 The rated capacity limit setting, Q_L, shall meet the limitations specified in Equation (1):

$$1+\frac{a}{g}\leqslant\frac{Q_L}{Q_{GL}}\leqslant\phi_2 \qquad (1)$$

where

a is the design mean acceleration for hoisting;

g is the acceleration due to gravity;

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

ϕ_2 is either the amplifying factor used in the proof-of-competence calculation for the crane in accordance with ISO 8686-1:1989, 6.1.2.2.1, or a factor chosen within the following limits:

— $\leqslant$ 1,1 for indirect-acting capacity limiters, using sensors and which switch off the energy supply;

— $\leqslant$ 1,6 for direct-acting capacity limiters, e.g. friction torque limiters, usually associated with power-driven chain hoists.

4.3 Rated capacity indicators — Performance and specific requirements

4.3.1 The rated capacity indicator shall meet the requirements of ISO 10245-1:1994, 5.1.

4.3.2 The rated capacity indicator shall give a continuous visual and/or audible warning to the crane driver whenever the load approaches the rated capacity. In general, the warning signal should be given when 90 % to 95 % of the rated capacity is reached.

4.3.3 Warnings for both the approach to rated capacity (in cases where it is required) and for exceeding the rated capacity shall be continuous. There shall be a clear difference between the warning for the approach and the warning for overload.

Visual warnings should be one colour for the approach and another colour for overload. Audible warnings should be heard by those to be warned above the general background noise of the site operation. The warning sounds should be clearly identifiable and not liable to confusion with other common sounds.

5 Motion- and performance-limiting devices

5.1 Motion limiters

5.1.1 Motion limiters shall operate according to ISO 10245-1:1994, 6.1.10. In most cases, the motion-limiting device should be coupled to the crane controls to prevent any further endangering movement.

NOTE In the case of hydraulic systems, the extent of travel of operating cylinders or, alternatively, mechanical stops will meet this requirement, but it might be necessary to fit pressure-relief valves to prevent overloading parts of the crane.

5.1.2 Any crane motion that has a restriction of movement in the design of the crane shall be provided with a motion limiter(s); see 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	—	—	▲	—	X[a]
Hoisting, high risk application	—	—	▲	—	▲
Lowering	—	—	▲	—	—
Travelling					
$V_{CT} < 0{,}63$ m/s	▲	○	○	○	—
$V_{CT} \geqslant 0{,}63$ m/s	▲	■	■	■	—
Traversing					
$V_{CT} < 0{,}80$ m/s	▲	○	○	○	—
$V_{CT} \geqslant 0{,}80$ m/s	▲	■	■	■	—
Slew[b]	▲	○	○	○	—
Luff	○	○	▲	—	—
Telescoping	▲	○	○	—	—

Definition of symbols:

▲ = required;

X = recommended;

○ = at least one additional type of motion limiter recommended;

■ = at least one additional type of motion limiter required. For higher velocities and/or masses (kinetic energies), more than one additional type of motion limiter may be required.

[a] A torque limiter may replace the motion limiter.

[b] Apply only when the slew angle is restricted and power driven.

5.1.3 Accelerations applied to the structures due to the action of limiters shall be consistent with those used in the crane design.

5.2 Performance limiters

Performance limiters, in accordance with ISO 10245-1:1994, 6.2, should be provided.

6 Motion- and performance-indicating devices

6.1 Motion- and performance-indicating devices shall conform to ISO 10245-1:1994, Clause 7.

6.2 For those cranes where the rated capacity varies with radius, a radius indicator or boom-angle indicator shall be fitted.

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