International Standard

ISO 4301-5

Cranes — Classification —

Part 5: Bridge and gantry cranes

Appareils de levage à charge suspendue — Classification —

Partie 5: Portiques et ponts roulants

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 96, Cranes, Sub-Committee SC 9, *Bridge and gantry cranes*.

This second edition cancels and replaces the first edition (ISO 4301-5:1991), which has been technically revised.

The main changes are as follows:

— a new approach for the classification of cranes and mechanisms by introducing the cycle-based classification following ISO 4301-1:2016 for bridge and gantry crane equipment.

A list of all parts in the ISO 4301 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Cranes — Classification —

Part 5: Bridge and gantry cranes

1 Scope

This document establishes a general classification of bridge and gantry cranes and their mechanisms based on the service conditions, mainly expressed by the following:

a) total number of working cycles to be carried out during the specified design life of the crane;

b) the load spectrum factor which presents the relative frequencies of loads to be handled;

c) the average load displacements.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 4301-1, *Cranes — Classification — Part 1: General*

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

ISO 4306-5, *Cranes — Vocabulary — Part 5: Bridge and gantry cranes*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4301-1, ISO 4306-1, ISO 4306-5, and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
powerplant crane
bridge or gantry crane used to carry out construction and maintenance of power generating equipment often requiring precision movements (e.g. removal of armature shaft for electric generator in hydroelectric power station)

4 Symbols and abbreviated terms

The main symbols used in this document are given in Table 1.

Table 1 — Main symbols

Symbol	Description
A	Classes for group classification of the crane as a whole
C_f	Total number of full load cycles
h_{ave}	Average hoist displacement, in metres (m)
Q_p	Class of state of loading
t_{ave}	Average hoist time, in hours (h)
T_f	Total time of use, in hours (h)
U	Class of utilization
v_{ave}	Average hoist speed, in metres per minute (m/min)

5 Group classification

The crane as a whole shall be classified in accordance with ISO 4301-1. The minimum group classification, A, for bridge and gantry cranes as a whole is given in Table 2.

Guidance as to typical classifications of class of utilization and class of loading for bridge and gantry cranes in relation to usage is given in Table 2. Where the total number of cycles C or the load spectrum factor K_p (see ISO 4301-1, 6.3) is not known, the lowest class U or Q_p of the given ranges shall be selected as a minimum.

Table 2 — Classification of bridge and gantry cranes

No.	Usage of crane	Service conditions	Minimum group classification of the crane as a whole, A	Class of Utilization, U	Class of state of loading, Q_p
1	Manually powered crane		A1	U_0 - U_2	Q_p1 - Q_p4
2	Powerplant crane		A1	U_0 - U_2	Q_p0 - Q_p2
3	Maintenance crane		A1	U_1 - U_3	Q_p0 - Q_p2
4	Workshop crane	Limited use for assembly	A1	U_0 - U_2	Q_p0 - Q_p2
		Light use	A2	U_1 - U_3	Q_p0 - Q_p2
		Intermittent use	A3	U_2 - U_5	Q_p1 - Q_p3
		Intensive use	A4	U_5 - U_8	Q_p3 - Q_p5
5	Cranes in storage yards	Intermittent use	A3	U_1 - U_3	Q_p1 - Q_p3
		Intensive use	A6	U_6 - U_8	Q_p3 - Q_p5
6	Scrapyard crane	Light use, hook duty	A3	U_1 - U_3	Q_p1 - Q_p3
		Intensive use, grab or magnet duty	A6	U_6 - U_8	Q_p3 - Q_p5
7	Ship building Crane		A4	U_2 - U_5	Q_p1 - Q_p3
8	Ship unloader		A7	U_6 - U_9	Q_p3 - Q_p5
9	Container handling crane	Terminal Cranes	A5	U_5 - U_7	Q_p2 - Q_p3
		Ship-to-shore	A5	U_6 - U_8	Q_p2 - Q_p3
10	Steelwork crane	Roll changing crane	A2	U_1 - U_3	Q_p3 - Q_p5
		Ladle crane	A7	U_4 - U_6	Q_p3 - Q_p5
		Soaking pit crane	A7	U_4 - U_6	Q_p3 - Q_p5
		Stripper crane	A8	U_6 - U_8	Q_p3 - Q_p5
		Charging crane	A8	U_6 - U_8	Q_p3 - Q_p5
11	Foundry crane		A5	U_3 - U_5	Q_p3 - Q_p5