International Standard

ISO 16881-1

Cranes — Design calculation for wheel/rail contacts and associated trolley track supporting structure —

Part 1: General

Appareils de levage à charge suspendue — Calcul de conception des contacts galets/rails et de la structure porteuse du chariot de roulement —

Partie 1: Généralités

Second edition
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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.

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*, Subcommittee SC 10, *Design principles and requirements*.

This second edition cancels and replaces the first edition (ISO 16881-1:2005), which has been technically revised.

The main changes are as follows:

— improvements were made to Annex B (local stresses);

— tables were added to Annex C to cover American, Chinese, and Japanese steels.

A list of all parts in the ISO 16881 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.

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Introduction

This document establishes requirements and gives guidance and design rules that reflect the state of the art in crane machine design. The rules represent good design practice that ensures that essential safety requirements are met and that the components have an adequate service life. Deviation from these rules can increase risk or reduce service life. However, new technical innovations and materials provide solutions that result in equal or improved safety and durability.

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Cranes — Design calculation for wheel/rail contacts and associated trolley track supporting structure —

Part 1: General

1 Scope

This document specifies requirements for selecting the size of iron or steel wheels. It also presents formulae to determine local stresses in crane structures due to the effects of wheel loads.

This document covers requirements for steel and cast-iron wheels. It applies to metallic contacts only.

This document does not apply to roller bearings.

This document is used together with the classification of the ISO 4301 series and the loads and load combinations of the ISO 8686 series.

This document is based on the limit state method (see ISO 8686-1).

This document is for design purposes only. It is not a guarantee of actual performance.

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 (all parts), *Cranes — Classification*

ISO 4302, *Cranes — Wind load assessment*

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

ISO 6506-1, *Metallic materials — Brinell hardness test — Part 1: Test method*

ISO 8686 (all parts), *Cranes — Design principles for loads and load combinations*

ISO 11031, *Cranes — Principles for seismically resistant design*

ISO 12100, *Safety of machinery — General principles for design — Risk assessment and risk reduction*

ISO 12488-1, *Cranes — Tolerances for wheels and travel and traversing tracks — Part 1: General*

ISO 20332, *Cranes — Proof of competence of steel structures*

3 Terms and definitions

3.1 General

For the purposes of this document, the terms and definitions given in ISO 4306-1, ISO 12100 and the following apply.

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