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Proof of competence of hydraulic cylinders in crane applications

*Vérification d'aptitude des vérins hydrauliques pour appareils de
levage*



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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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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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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 96, *Cranes*, Subcommittee SC 10, *Design principles and requirements*.

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.

Proof of competence of hydraulic cylinders in crane applications

1 Scope

This document applies to hydraulic cylinders that are part of the load carrying structure of cranes. It is intended to be used together with the ISO 8686 series and ISO 20332, and as such they specify general conditions, requirements and methods to prevent mechanical hazards of hydraulic cylinders, by design and theoretical verification.

This document does not apply to hydraulic piping, hoses, connectors and valves used with the cylinders, or cylinders made from other material than (carbon) steel.

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 148-1, *Metallic materials — Charpy pendulum impact test — Part 1: Test method*

ISO 683-1, *Heat-treatable steels, alloy steels and free-cutting steels — Part 1: Non-alloy steels for quenching and tempering*

ISO 683-2, *Heat-treatable steels, alloy steels and free-cutting steels — Part 2: Alloy steels for quenching and tempering*

ISO 724, *ISO general-purpose metric screw threads — Basic dimensions*

ISO 5817:2014, *Welding — Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) — Quality levels for imperfections*

ISO 8492, *Metallic materials — Tube — Flattening test*

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

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

ISO 20332:2016, *Cranes — Proof of competence of steel structures*

EN 10277:2018, *Bright steel products — Technical delivery conditions — Part 2: Steels for general engineering purposes*

EN 10297-1, *Seamless circular steel tubes for mechanical and general engineering purposes — Technical delivery conditions — Part 1: Non-alloy and alloy steel tubes*

EN 10305-1, *Steel tubes for precision applications — Technical delivery conditions — Part 1: Seamless cold drawn tubes*

EN 10305-2, *Steel tubes for precision applications — Technical delivery conditions — Part 2: Welded cold drawn tubes*

3 Terms and definitions

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