TECHNICAL REPORT

ISO/TR 19961

Second edition
2010-11-01

Cranes — Safety code on mobile cranes

Appareils de levage à charge suspendue — Code de sécurité sur les grues mobiles

Reference number
ISO/TR 19961:2010(E)

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO/TR 19961 was prepared by Technical Committee ISO/TC 96, *Cranes*, Subcommittee SC 6, *Mobile cranes*.

This second edition cancels and replaces the first edition (ISO/TR 19961:2005). Subclauses 4.2, 4.3 and 4.4 have been removed and these sections are now covered under ISO 10972-2. The Bibliography has been updated.

Cranes — Safety code on mobile cranes

1 Scope

This Technical Report provides a guide to International Standards applicable to mobile cranes (crawler cranes, railway cranes, wheel-mounted cranes and any variations thereof that retain the same fundamental characteristics) and a summary of related provisions. Special adaptations of the general types of machine covered, where applicable, also fall within its scope.

NOTE According to the ISO Directives, Part 2, the verbal forms used to identify provisions in an International Standard are

— "shall" or "shall not", used to indicate requirements strictly to be followed in order to conform to the document and from which no deviation is permitted,

— "should" or "should not" for recommendations, indicating that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others, or that a certain course of action is preferred but not necessarily required, or that (in the negative form) a certain possibility or course of action is deprecated but not prohibited, and

— "may" or "need not", used to indicate a course of action permissible within the limits of the document.

2 Purpose

The purpose of this Technical Report is to

a) identify the many International Standards relevant to mobile cranes and their safety (see Bibliography for a complete listing),

b) summarize the content of those documents,

c) promote mobile crane safety by the delineation of these standards, so that the incorporation of their provisions into the design and use of mobile cranes will guard against, and minimize, injury to workers and damage to equipment,

d) facilitate the work of all those working in the field of mobile cranes (designers, supervisors and others either directly or indirectly responsible for the safe use and maintenance of the machines) with a need to consult the current standards relating to mobile cranes, and

e) contribute to further international harmonization of mobile crane standards.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4306-1 and ISO 4306-2 apply.

4 Construction and characteristics

4.1 Load rating

4.1.1 Crane stability (backward/forward)

ISO 4305 specifies the conditions to be taken into consideration when verifying the stability of a mobile crane by calculation, assuming that the crane is operating on a firm and level surface (up to 1 % gradient). It applies to mobile cranes defined in ISO 4306-2 mounted on wheels or crawlers with or without outriggers.

4.1.2 Crane structural competence

ISO 8686-1 establishes general methods for calculating loads and principles to be used to select load combinations for proofs of competence for the structural and mechanical components of cranes. Based on rigid-body kinetic analysis and elasto-static analysis, it expressly permits the use of more advanced methods (calculations or tests) to evaluate the effects of loads and load combinations, and the value of dynamic load factors, where it can be demonstrated that these provide at least equivalent levels of competence.

It provides the general form, content and ranges of parameter values for more specific standards to be developed for individual lifting appliance types.

It provides a framework for agreement on loads and load combinations between a designer or manufacturer and an appliance purchaser for those types of lifting appliances where specific standards do not exist.

ISO 8686-2 applies the principles set forth in ISO 8686-1 to mobile cranes, as defined in ISO 4306-2, and presents loads and load combinations appropriate for use in proof of competence calculations for the steel structures of mobile cranes. It applies to mobile cranes used for normal service and for duty cycle service.

ISO 11662 specifies a test method that provides a systematic, non-destructive procedure for determining the stresses induced in crane structures under specified conditions of static loading through the use of resistance type electronic strain gages and to specify appropriate acceptable criteria for specified loading conditions.

4.1.3 Wind load

ISO 4302 relates to wind loads on cranes. It gives a simplified method of calculation and assumes that the wind can blow horizontally from any direction, that the wind blows at a constant velocity and that there is a static reaction to the loading it applies to the crane structure. It includes built-in allowances for the effects of gusting and for dynamic response.

4.1.4 Crane rating manuals

ISO 11661 specifies a standard presentation or format for mobile crane rated capacities on rated capacity charts. It applies to mobile cranes fitted with booms as defined in ISO 4306-2, when used in lifting mode.

4.2 Mechanisms

ISO 10972-2 establishes requirements specific to the mechanisms of mobile cranes, in addition to the general requirements for cranes given in ISO 10972-1.

These additional requirements concern:

a) the arrangement, features and characteristics of the crane mechanisms, and

b) the minimum requirements for certain mechanism components.