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International Standard



4301/1

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Cranes and lifting appliances — Classification — Part 1 : General

Grues et appareils de levage — Classification — Partie 1 : Généralités

Second edition — 1986-06-15

UDC 621.87-18

Ref. No. ISO 4301/1-1986 (E)

Descriptors : handling equipment, lifting equipment, cranes (hoists), classification.

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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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 4301/1 was prepared by Technical Committee ISO/TC 96, *Cranes, lifting appliances and related equipment*.

This second edition cancels and replaces the first edition (ISO 4301-1980), of which it constitutes a minor revision.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

Cranes and lifting appliances — Classification — Part 1 : General

0 Introduction

Cranes play a part in the handling of materials by raising and moving loads the mass of which is within their nominal capacity. There may, however, be wide variations in the duty, both for a single crane type, for example overhead travelling cranes, and between different crane types, for example between a builder's tower crane and a heavy-lift dockside crane. The design of the crane has to take account of conditions of service, in order to reach an appropriate level of safety and useful life which is in line with the purchaser's requirements. Classification is the system used to provide a means of establishing rational bases for the design of structures and machinery. It also serves as a reference framework between purchaser and manufacturer, by the use of which a particular appliance may be matched to the service for which it is required.

Classification, as defined in this part of ISO 4301, considers only the operating conditions which are independent of the type of crane and the way it is driven. Future International Standards will define which parts of the classification range are applicable to the various types of lifting appliances (i.e. overhead cranes, mobile cranes, tower cranes, hoists, etc.).

This part of ISO 4301 is one of a series covering classification of cranes and lifting appliances. The series will consist of the following parts :

- Part 1 : General.
- Part 2 : Mobile cranes.
- Part 3 : Tower cranes.
- Part 4 : Portal and pedestal cranes.
- Part 5 : Overhead travelling and portal bridge cranes.

1 Scope and field of application

This part of ISO 4301 establishes a general classification of cranes based on the number of operating cycles to be carried out during the expected life of the crane and a load spectrum factor which represents a nominal state of loading.

This part of ISO 4301 does not imply that the same method of stress calculation or testing will apply to all types of lifting appliances which come within the scope of ISO/TC 96.

2 Use of classification

Classification has two applications in practice, which although related can be regarded as separate objectives.

2.1 Classification of the appliance as a whole

The classification is first applied by the purchaser and the manufacturer of a crane, between whom agreement is necessary on the duty of the crane. The classification thus agreed constitutes the overall classification of the crane as a whole; it is intended for contractual and technical reference purposes and not for design purposes. The method of determining this classification is set out in clause 3.

2.2 Classification for design

The second purpose of classification is to provide a basis for the designer of the crane to build up his analysis of the design and to verify that it is capable of achieving the desired life under the estimated conditions of service specified for the particular application. As a person skilled in crane technology, the designer takes the estimated load spectrum data, either provided by the purchaser or predetermined by the manufacturer (as is the case in the design of serial equipment), and incorporates it into the assumptions on which his analysis is based, having regard to all other factors which influence the proportioning of components.

A load spectrum estimate form on which the appropriate data can be listed will be developed in a future International Standard.

3 Group classification of the crane as a whole

The two factors to be taken into consideration for the purposes of determining the group to which a crane belongs are the class of utilization and the state of loading.

3.1 Class of utilization

The user expects a certain number of operating cycles from the crane during its useful life, and this number of cycles is one basic parameter of classification. In certain specific tasks for which lifting appliances are used, for example bulk unloading by grab, the number of cycles can readily be derived from a knowledge of the total number of working hours and the