INTERNATIONAL STANDARD

ISO 10721-1

First edition
1997-02-01

Steel structures —

Part 1:
Materials and design

Structures en acier —

Partie 1: Matériaux et conception

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Reference number
ISO 10721-1:1997(E)

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X.400 c=ch; a=400net; p=iso; o=isocs; s=central

Printed in Switzerland

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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.

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.

International Standard ISO 10721-1 was prepared by Technical Committee ISO/TC 167, *Steel and aluminium structures*, Subcommittee SC 1, *Steel: Material and design*.

ISO 10721 consists of the following parts under the general title *Steel and aluminium structures*:

— Part 1: Materials and design

— Part 2: Fabrication and erection

Annexes A and B of this part of ISO 10721 are for information only.

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Introduction

This part of ISO 10721 establishes a common basis for drafting national standards for the use of materials in steel structures and for their design, in order to ensure adequate and consistent measures regarding safety and serviceability.

Annex A of this part of ISO 10721 contains noncompulsory recommendations which may be used as guidelines for practical design.

The specific and numerical requirements for the completion of structures which are optimal with respect to the state of a country's economy, development and general values should be given in the national codes of the country.

The design rules given concern limit-state verifications for comparing the effects of actions or combinations of actions with the strength (resistance) of the structure and its components.

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Steel structures —

Part 1:
Materials and design

1 Scope

This part of ISO 10721 establishes the principles and general rules for the use of steel materials and design of steel structures in buildings.

NOTE 1 The degree of reliability should be as specified in national codes. In the establishment of design safety factors, due consideration should also be given to ISO 10721-2 for fabrication of steel structures.

This part of ISO 10721 is also applicable to bridges, off-shore and other civil engineering and related structures, but for such structures it may be necessary to consider other requirements.

This part of ISO 10721 does not cover the special requirements for steel structures in corrosive environments beyond normal atmospheric conditions and corrosion protection with regard to fatigue design.

This part of ISO 10721 does not cover the special requirements of seismic design.

For welded connections and for structures subject to fatigue, special considerations regarding the scope of this document are presented in 8.9 and 10.1 respectively.

NOTE 2 Rules and recommendations regarding composite steel and concrete structures and fire safety of steel structures will subsequently be issued as separate International Standards.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 10721. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 10721 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 630:1995, *Structural steel — Plates, wide flats, bars, sections and profiles.*

ISO 898:1988–1994, *Mechanical properties of fasteners* (all parts).

ISO 2394: –[1], *General principles on reliability of structures.*

ISO 3989: –[2], *Bases for design of structures — Notations — General symbols.*

ISO 4753:1983, *Fasteners — Ends of parts with external metric ISO thread.*

ISO 4951:1979, *High yield strength steel bars and sections*

ISO 6892: –[3], *Metallic materials — Tensile testing at ambient temperature.*

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1) To be published. (Revision of ISO 2394:1986)

2) To be published. (Revision of ISO 3898:1987)

3) To be published. (Revision of ISO 6892:1984, replacing ISO 82:1974)

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3 DEFINITIONS AND SYMBOLS

For the purposes of this part of ISO 10721, the following definitions and symbols apply.

3.1 Definitions

Limit states:	The states beyond which the structure no longer satisfies the design requirements.
Ultimate limit state:	The limit states corresponding to the maximum load carrying resistance (safety related).
Serviceability limit state:	The limit states related to normal use (often related to function).
Specified life:	The time the structure is to be used under the given design assumptions.
Direct action:	One or a set of concentrated or distributed forces acting on the structure, such as selfweight, imposed specified actions, wind, etc.
Indirect action:	The cause of imposed or constrained deformations in the structure, such as temperature effects, settlements, creep etc.
Nominal action:	The numerical value of an action either defined by the authorities or by the contract documents. When this value corresponds to a specified probability to be exceeded within a specified reference time, it is called characteristic action, and it is calculated in accordance with ISO 2394.
Design action:	Actions used in calculations. The design action is the nominal action multiplied by its partial safety factor γ_f, or it is the combination of nominal actions, each multiplied by its partial safety factor γ_f for the relevant limit state.

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