
Steel structures —

Part 1: Materials and design

Structures en acier —

Partie 1: Matériaux et conception

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CONTENTS	Page
1 SCOPE	1
2 NORMATIVE REFERENCES	1
3 DEFINITIONS AND SYMBOLS	2
3.1 <u>Definitions</u>	2
3.2 <u>List of symbols</u>	5
4 DOCUMENTATION OF THE DESIGN	11
4.1 <u>Calculations</u>	11
4.2 <u>Testing</u>	11
4.3 <u>Documentation</u>	11
5 BASIC DESIGN PRINCIPLES	11
5.1 <u>Objectives and general recommendations</u>	11
5.2 <u>Limit states</u>	12
5.3 <u>Design situations and member resistance</u>	12
5.3.1 General	12
5.3.2 Design situations	12
5.3.3 Member resistance	13
6 BASIC VARIABLES	13
6.1 <u>General</u>	13
6.2 <u>Actions</u>	13
6.2.1 General	13
6.2.2 Design value	14
6.3 <u>Materials</u>	14
6.3.1 General	14
6.3.2 Structural steels	14
6.3.3 Connecting devices	14
6.3.4 Testing and inspection of materials	15
6.4 <u>Geometrical parameters</u>	15
6.5 <u>Design value of resistance</u>	15

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	Page
7 ANALYSIS OF STRUCTURES	15
7.1 <u>General</u>	15
7.2 <u>Structural behaviour</u>	16
7.3 <u>Methods of analysis</u>	16
7.3.1 General	16
7.3.2 Elastic analysis	16
7.3.3 Elastic-plastic analysis	16
7.3.4 Plastic analysis	16
8 ULTIMATE LIMIT STATES	17
8.1 <u>Member design</u>	17
8.1.1 General	17
8.1.2 Cross-sectional resistance	17
8.1.3 Member stability	17
8.2 <u>Resistance of members</u>	18
8.2.1 Member strength	18
8.3 <u>Classification of cross sections</u>	18
8.3.1 General	18
8.3.2 Definitions of classes	18
8.3.3 Maximum width-thickness ratios of elements subjected to compression and/or bending	19
8.4 <u>Flexural buckling</u>	19
8.4.1 Effective buckling length	19
8.4.2 Slenderness	19
8.4.3 Compression resistance	20
8.4.4 Buckling strength f_c	20
8.4.5 Compression members subjected to moments	20
8.4.6 Buckling of built-up members	21
8.5 <u>Torsional and lateral torsional buckling</u>	21
8.5.1 Torsional buckling	21
8.5.2 Lateral torsional buckling	21
8.5.3 Buckling strengths f_{cT} and f_{cL}	21
8.5.4 Bracing of beams, girders and trusses	22
8.6 <u>Buckling of plates</u>	22
8.6.1 General	22
8.6.2 Uniaxial force or in-plane moment	22
8.6.3 Shear resistance of webs	23
8.6.4 Combined forces	23
8.6.5 Webs or panels subdivided by stiffeners	23

	Page
8.7	<u>Connections, general requirements</u> 24
8.8	<u>Bolted connections</u> 25
8.8.1	General 25
8.8.2	Bolting details 25
8.8.3	Strength of connections with bolts and rivets 26
8.8.4	Slip coefficients 26
8.8.5	Deduction for holes 26
8.8.6	Length of connection 27
8.9	<u>Welded connections</u> 27
8.9.1	Scope 27
8.9.2	General requirements 28
8.9.3	Types of welds 29
8.9.4	Design assumptions 29
8.9.5	Design provisions 30
8.9.6	Complete joint penetration groove welds in butt and tee joints 30
8.9.7	Fillet welds 32
8.9.8	Plug and slot welds 34
8.10	<u>Joints in contact bearing</u> 34
9	SERVICEABILITY LIMIT STATES 34
10	FATIGUE 35
10.1	<u>Scope</u> 35
10.1.1	General 35
10.1.2	Limitations 35
10.1.3	Situations in which no fatigue assessment is required 35
10.2	<u>Fatigue assessment procedures</u> 35
10.2.1	Fatigue assessment based on nominal stress range 36
10.2.2	Fatigue assessment based on a geometric stress range 37
10.3	<u>Fatigue loading</u> 37
10.4	<u>Fatigue stress spectra</u> 37
10.4.1	Stress calculation 37
10.4.2	Design stress range spectrum 38
10.5	<u>Fatigue strength</u> 38
10.5.1	Definition of fatigue strength curves for classified structural details 39
10.5.2	Definition of reference fatigue strength curves for non-classified details 39
10.6	<u>Fatigue strength modifications</u> 39
10.7	<u>Partial safety factors</u> 39

	Page
10.7.1 Partial safety factors for fatigue loading	39
10.7.2 Partial safety factors for fatigue strength	40
10.7.3 Values of the partial safety factors	40
 Annex A	 41
A.6 BASIC VARIABLES	41
A.6.3 <u>Materials</u>	41
A.6.3.2 Structural steel	41
A.7 ANALYSIS OF STRUCTURES	41
A.7.1 <u>General</u>	41
A.7.2 <u>Structural behaviour</u>	41
A.7.3 <u>Methods of analysis</u>	41
A.7.3.2 Elastic analysis	41
A.7.3.4 Plastic analysis	42
A.8 ULTIMATE LIMIT STATE	42
A.8.2 <u>Resistance of structural members</u>	42
A.8.3 <u>Classification of cross sections</u>	45
A.8.3.1 General	45
A.8.3.2 Definitions of classes	46
A.8.3.3 Maximum width-thickness ratios of elements subjected to compression and/or bending	46
A.8.4 <u>Flexural buckling</u>	48
A.8.4.1 Effective length	48
A.8.4.2 Slenderness	48
A.8.4.3 Compression resistance	48
A.8.4.4 Determination of f_c	48
A.8.4.5 Compression members subjected to moments	52
A.8.4.6 Buckling of built-up members	56
A.8.5 <u>Torsional and lateral torsional buckling</u>	57
A.8.5.3 Buckling strengths f_{CT} and f_{CL}	57
A.8.5.4 Bracing of beams, girders and trusses	60
A.8.6 <u>Buckling of plates</u>	61
A.8.6.1 General	61
A.8.6.2 Plates subjected to uniaxial force or in-plane moment	61
A.8.6.3 Shear resistance of webs	65
A.8.6.4 A combination of forces	67
A.8.6.5 Webs or panels subdivided by stiffeners	70

	Page
A.8.8 <u>Bolted connections</u>	73
A.8.8.2 Bolting details	73
A.8.8.3 Strength of connections with bolts and rivets	74
A.8.8.4 Slip coefficients	76
A.8.8.6 Length of connection	77
A.8.9 <u>Welded connections</u>	77
A.8.9.2 General requirements	77
A.8.9.4 Design assumptions	77
A.8.9.5 Design provisions	77
A.8.9.6 Groove welds in butt and tee joints	78
A.8.9.7 Fillet welds	78
A.10 FATIGUE	79
A.10.1 <u>Scope</u>	79
A.10.1.3 Situations in which no fatigue assessment is required	79
A.10.2 <u>Fatigue assessment procedures</u>	80
A.10.2.1 Fatigue assessment based on nominal stress range	80
A.10.2.2 Fatigue assessment based on a geometric stress range	80
A.10.3 <u>Fatigue loading</u>	80
A.10.4 <u>Fatigue stress spectra</u>	81
A.10.4.2 Design stress range spectrum	81
A.10.5 <u>Fatigue strength</u>	81
A.10.5.1 Definition of fatigue strength curves for classified constructional details	84
A.10.5.2 Definition of reference fatigue strength curves for non-classified details	105
A.10.6 <u>Fatigue strength modifications</u>	105
A.10.6.1 Influence of mean stress level in non-welded or stress relieved welded details	105
A.10.6.2 Influence of thickness	105
A.10.7 <u>Partial safety factors</u>	105
A.10.7.3 Values of partial factors	105
Annex B (Reference publications)	107

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.

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.

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*.

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)

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_i , or it is the combination of nominal actions, each multiplied by its partial safety factor γ_i for the relevant limit state.