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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

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Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



DRAFT International Standard

ISO/DIS 657-1

Hot-rolled steel sections — Dimensions, sectional properties and tolerances —

Part 1: Angles, channels and beams

Profilés en acier laminés à chaud —

Partie 1: Cornières à ailes égales — Dimensions

ICS: 77.140.70

ISO/TC 17/SC 3

Secretariat: **AFNOR**

Voting begins on:
2025-06-27

Voting terminates on:
2025-09-19

This document is circulated as received from the committee secretariat.

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Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Dimensions, shape, mass and tolerances	2
4.1 Dimensions and Expression	2
4.2 Tolerances on dimension and shape	2
4.3 Tolerances on length	7
4.4 Mass and tolerances	7
5 Surface condition	7
Annex A (normative) Sectional dimensions, sectional area, nominal mass and sectional properties	8
Annex B (informative) Formulas for the calculation of sectional properties	21
Annex C (informative) Calculation formulas of section area	27
Bibliography	28

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 17, Steel, Subcommittee SC 3, Steels for structural steel.

This first edition of ISO 657-1 cancels and replaces ISO 657-1:1989, ISO 657-2:1989, ISO 657-5:1976, ISO 657-11:1980, ISO 657-15:1980, which has been technically revised.

In addition to the change in number, the main changes compared with ISO 657 series are as follows:

- revised designation of section steels;
- revised tolerance of section steels;
- revised sectional properties of section steels;
- added requirements of surface conditions.

A list of all parts in the ISO 657 series can be found on the ISO website.

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.

Hot-rolled steel sections — Dimensions, sectional properties and tolerances —

Part 1: Angles, channels and beams

1 Scope

This document specifies requirements for dimensions, sectional properties and tolerances for hot-rolled sections as below:

- a) equal angle LE (L section);
- b) unequal angle LU (L section);
- c) sloping flange channel US (U section);
- d) sloping flange I beam IS(I section).

This document applies to, but is not limited to, steel grades defined in all parts of ISO 630.

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 630-1, *Structural steels — Part 1: General technical delivery conditions for hot-rolled products*

ISO 630-2, *Structural steels — Part 2: Technical delivery conditions for structural steels for general purposes*

ISO 630-3, *Structural steels — Part 3: Technical delivery conditions for fine-grain structural steels*

ISO 630-4, *Structural steels — Part 4: Technical delivery conditions for high yield strength quenched and tempered structural steel plates and wide flats*

ISO 630-5, *Structural steels — Part 5: Technical delivery conditions for structural steels with improved atmospheric corrosion resistance*

ISO 630-6, *Structural steels — Part 6: Technical delivery conditions for seismic-proof improved structural steels for building*

ISO 6929, *Steel products — Vocabulary*

ISO 20723, *Structural steels — Surface condition of hot-rolled sections — Delivery requirements*

3 Terms and definitions

For the purpose of this documents, the terms and definitions given in ISO 6929 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at <https://www.iso.org/obp>

— IEC Electropedia: available at <https://www.electropedia.org/>

4 Dimensions, shape, mass and tolerances

4.1 Dimensions and Expression

4.1.1 Profiles of section steel are shown in [Figure 1](#) to [Figure 4](#).

4.1.2 The sectional area and the unit mass of steel sections obtained in terms of the standard sectional dimension are given in [Table A.1](#) to [Table A.4](#) of [Annex A](#). If agreed between the purchaser and manufacturer, other dimensional tables may be used, e.g., GB/T 706, JIS G 3192, EN 10056-1 and EN 10365.

Besides the sectional area and the unit mass, [Table A.1](#) to [Table A.4](#) of [Annex A](#) show the moment of inertia, radius of inertia, modulus of section and center of gravity distance calculated by electronic devices or software for reference. For the purpose of facilitating learning and communication, [Annex B](#) provides the calculation formulas based on EN 10056-1 and EN 10365 for reference purposes only.

4.1.3 The designation of the hot-rolled equal and unequal leg angles, taper flange I-sections and taper flange U sections shall comprise:

- a) the number of this document;
- b) the letter for equal angle LE (L section) or unequal angle LU (L section) or sloping flange channel US (U section) or sloping flange beam IS (I-section)
- c) height and width (in mm);
- d) the leg length h or b (in mm) and if necessary, the thickness, web and/or flange thickness t (in mm);
- e) reference to the material standard (e.g. ISO 630-2);
- f) steel name (e.g. S355D).

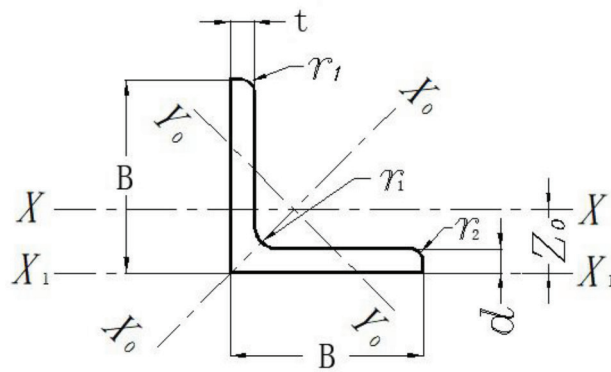
Example of designation for an unequal angle with long leg width $B_L=25$ mm and short leg width $B_s=16$ mm and leg thickness of 3 mm made from steel grade S355D as specified in ISO 630-2:

ISO 657-1- LU 25 × 16 × 3 – ISO 630-2 – S355D

4.2 Tolerances on dimension and shape

4.1.2 The tolerances on section steel shall comply with the requirements in [Table 1](#) and [Table 2](#). If agreed between the purchaser and the manufacturer, other tolerances on dimension and shape may be used, e.g., GB/T 706, JIS G 3192, EN 10024, EN 10056-2 and EN 10279.

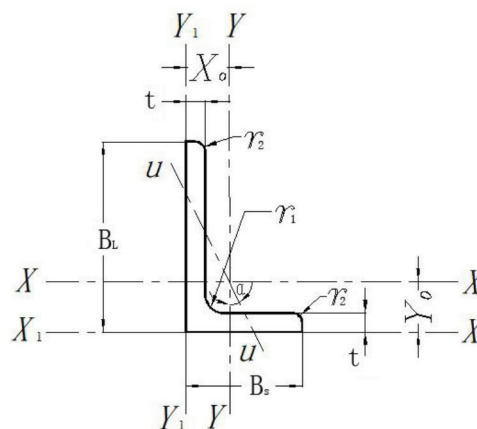
4.2.2 The out-of-square and web flatness for the sloping flange I beams and the sloping flange channels, and the top corner for the angles shall be checked at a distance to the end not less than 750 mm.



Key

- B leg width
- t leg thickness
- r_1 root radius
- r_2 toe root radius
- Z_0 distance to center of gravity

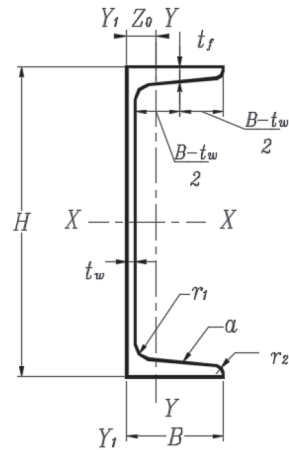
Figure 1 — Profile of equal leg angles



Key

- B_L long leg width
- B_S short leg width
- t leg thickness
- r_1 root radius
- r_2 toe root radius
- X_0 distance to center of gravity
- Y_0 distance to center of gravity

Figure 2 — Profile of unequal-leg angles

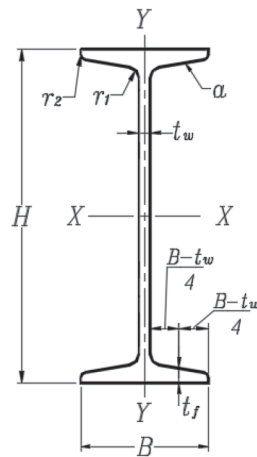


Key

- H height
- B width
- t_w web thickness
- t_f flange middle thickness
- r_1 root radius
- r_2 toe root radius
- Z_0 distance to center of gravity
- α flange taper, $\tan\alpha=1/10$.

NOTE The different degree of slope will result in different sectional area and section area.

Figure 3 — Profile of sloping flange channels



Key

- H height
- B width
- t_w web thickness
- t_f flange middle thickness

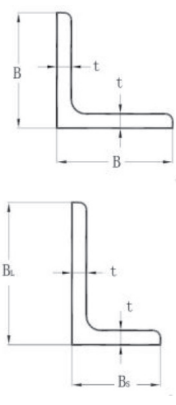
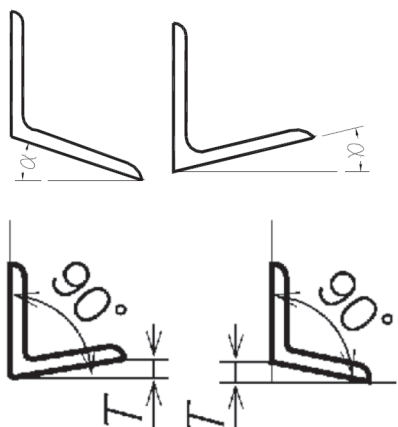
r_1 root radius
 r_2 toe root radius
 α flange taper, $\tan\alpha=1/6$.

NOTE The different degree of slope will result in different sectional area and section area.

Figure 4 — Profile of sloping flange I beams

Table 1 — Tolerances on dimensions and shape of angles steel

Dimensions in millimetres

Dimensions and shape			Tolerance		Diagram
			Equal leg angles	Unequal-leg angles	
Leg Width (B,B _L or B _S)	B ^a ≤56		±0,8	±0,8	
	56<B ^a ≤90		±1,2	±1,5	
	90<B ^a ≤140		±1,8	±2,0	
	140<B ^a ≤200		±2,5	±2,5	
	B ^a >200		±3,5	±3,5	
Leg Thick- ness (t)	B ^a <130	t<5	±0,6		
		5≤t<10	±0,7		
		10≤t<15	±0,8		
		t≥15	±1,0		
	B ^a ≥130	t<5	±0,7		
		5≤t<10	±0,8		
		10≤t<15	±1,0		
		15≤t<25	±1,2		
		t≥25	±1,5		
Out-of-square (α or T)			α≤50' or T≤2,5 %B ^a		
Straightness			≤ 3 mm/m ≤ 0,30 % of total length		Apply to camber and sweep

NOTE The dimensions and shapes shall be measured according to the above digrams shown in this table.

^a For unequal angles steel, it shall be *applicable to* the longer side width B_L.

NOTE The dimensions and shapes shall be measured according to the above diagrams shown in this table.

^a For unequal angles steel, it shall be *applicable* to the longer side width B_L .