BRITISH STANDARD

BS EN
10034:1993

Structural steel I and H sections — Tolerances on shape and dimensions

The European Standard EN 10034:1993 has the status of a British Standard

UDC 669.14.018.29-423.1:621.753.1

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This British Standard, having been prepared under the direction of the Iron and Steel Standards Policy Committee, was published under the authority of the Standards Board and comes into effect on 15 December 1993

The following BSI references relate to the work on this standard:
Committee reference ISM/13
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Contents

National foreword

This British Standard has been prepared under the direction of the Iron and Steel Standards Policy Committee and is the English language version of EN 10034:1993, *Structural steel I and H sections — Tolerances on shape and dimensions*, published by the European Committee for Standardization (CEN).

This British Standard, together with BS 4-1:1993, published simultaneously with this standard, supersedes BS 4-1:1980, which is withdrawn.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 8, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 10034

September 1993

UDC 669.14.018.29-423.1:621.753.1

Descriptors: Iron and steel products, I beams, structural steels, dimensional tolerances, form tolerances

English version

Structural steel I and H sections — Tolerances on shape and dimensions

Poutrelles I et H en acier de construction — Tolerances de formes et de dimensions

I- und H-Profile aus Baustahl — Grenzabmaße und Formtoleranzen

This European Standard was approved by CEN on 1993-08-30. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

Ref. No. EN 10034:1993 E

Foreword

This European Standard has been prepared by ECISS/TC11 Sections: Tolerances and Dimensions; the Secretariat of which is held by BSI.

The discussions within ECISS/TC11 were based on Euronorm 34-62 *Broad flanged beams with parallel sides. Rolling tolerances*

and

Euronorm 44-63 *Hot rolled IPE joists. Rolling tolerances*

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at least by March 1994, and conflicting national standards shall be withdrawn at the latest by March 1994.

According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

Contents

1 Scope

This European Standard specifies tolerances on shape dimensions and mass of structural steel I and H sections. These requirements do not apply to I and H sections rolled from stainless steel. These requirements do not apply to taper flange sections.

NOTE Until a European Standard for dimensions of I and H beams is published Euronorm 19 and Euronorm 53 or corresponding national standards may be used.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 10079, *Definition of steel products*.

Euronorm 19:1957, *IPE beams, parallel flanged beams*.

Euronorm 53:1962, *Wide flange beams with parallel flanges*.

3 Definitions

For the purpose of this European Standard, the definitions in EN 10079 apply.

4 Rolling tolerances for structural steel I and H sections

4.1 Section height *(h)*

The deviation from nominal on section height measured at the centre line of web thickness shall be within the tolerance given in Table 1.

4.2 Flange width *(b)*

The deviation from nominal on flange width shall be within the tolerance given in Table 1.

4.3 Web thickness *(s)*

The deviation from nominal on web thickness measured at the mid-point of dimension h shall be within the tolerance given in Table 1.

4.4 Flange thickness *(t)*

The deviation from nominal on flange thickness measured at the quarter flange width point shall be within the tolerance given in Table 1.

4.5 Out-of-squareness *($k + k'$)*

The out-of-squareness of the section shall not exceed the maximum given in Table 2.

4.6 Web off-centre *(e)*

The mid-thickness of the web shall not deviate from the mid-width position on the flange by more than the distance *(e)* given in Table 2.

4.7 Straightness *(q_{xx} or q_{yy})*

The straightness shall comply with the requirements given in Table 3.

5 Tolerance on mass

The deviation from the nominal mass of a batch or a piece shall not exceed ± 4.0 %.

The mass deviation is the difference between the actual mass of the batch or piece and the calculated mass.

The calculated mass shall be determined using a density of 7,85 kg/dm^3.

6 Tolerance on length

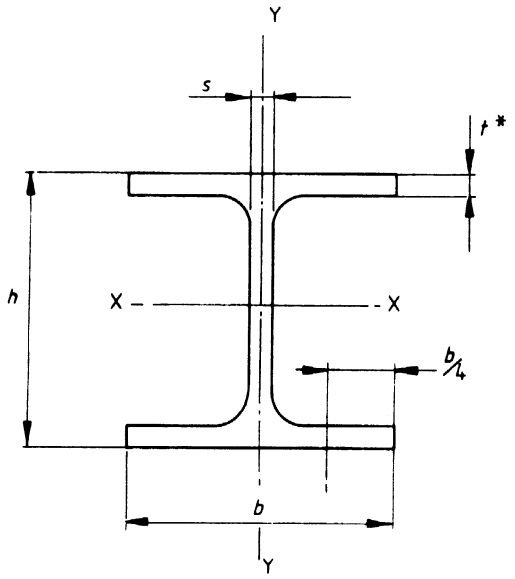
The sections shall be cut to ordered lengths to tolerances of:

a) ± 50 mm; or

b) + 100 mm where minimum lengths are requested.

L represents the longest useable length of the section assuming that the ends of the section have ben cut square (see Figure 1).

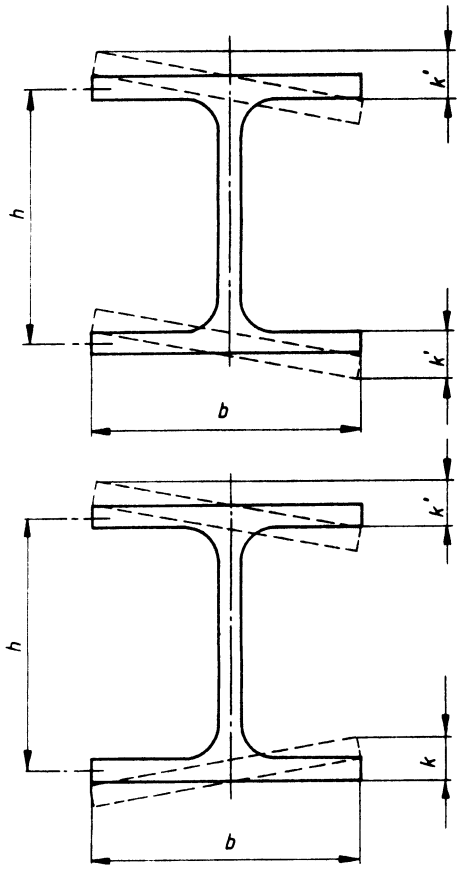
Table 1 — Dimensional tolerances for structural steel I and H sections

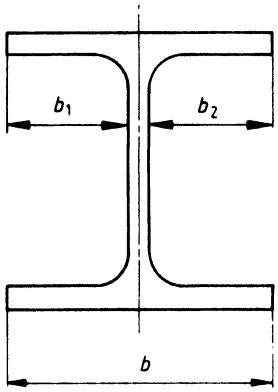


* t is measured at $b/4$ (see clause 4.4.)

Section height h		Flange width b		Web thickness s		Flange thickness t	
height	tolerance	width	tolerance	thickness	tolerance	thickness	tolerance
mm	mm	mm	mm	mm	mm	mm	mm
$h \leq 180$	+ 3,0 − 2,0	$b \leq 110$	+ 4,0 − 1,0	$s < 7$	± 0,7	$t < 6{,}5$	+ 1,5 − 0,5
$180 < h \leq 400$	+ 4,0 − 2,0	$110 < b \leq 210$	+ 4,0 − 2,0	$7 \leq s < 10$	± 1,0	$6{,}5 \leq t < 10$	+ 2,0 − 1,0
$400 < h \leq 700$	+ 5,0 − 3,0	$210 < b \leq 325$	+ 4,0 − 4,0	$10 \leq s < 20$	± 1,5	$10 \leq t < 20$	+ 2,5 − 1,5
$h > 700$	+ 5,0 − 5,0	$b > 325$	+ 6,0 − 5,0	$20 \leq s < 40$	± 2,0	$20 \leq t < 30$	+ 2,5 − 2,0
				$40 \leq s < 60$	± 2,5	$30 \leq t < 40$	+ 2,5 − 2,5
				$s \geq 60$	± 3,0	$40 \leq t < 60$	+ 3,0 − 3,0
						$t \geq 60$	+ 4,0 − 4,0

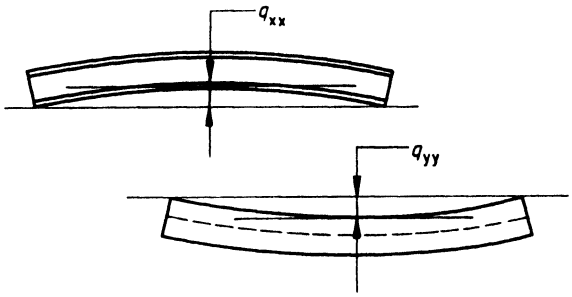
Table 2 — Tolerances on out-of-square and web off-centre of structural steel I and H sections





Out-of-square $k + k'$		**Web off-centre** e where $e = \frac{b_1 - b_2}{2}$	
flange width b mm	**tolerance** mm	**flange width** b mm	**tolerance** mm
$b \leq 110$	1,5	Where $t < 40$	
$b > 110$	2 % of b	$b \leq 110$	2,5
	(max 6,5 mm)	$110 < b \leq 325$	3,5
		$b > 325$	5,0
		Where $t \geq 40$	
		$110 < b \leq 325$	5,0
		$b > 325$	8,0

Table 3 — Tolerances on straightness of structural steel I and H sections



Section height h	Tolerance on straightness q_{xx} and q_{yy} on length L
mm	%
$80 < h < 180$	0,30 L
$180 < h \leq 360$	0,15 L
$h > 360$	0,1 L

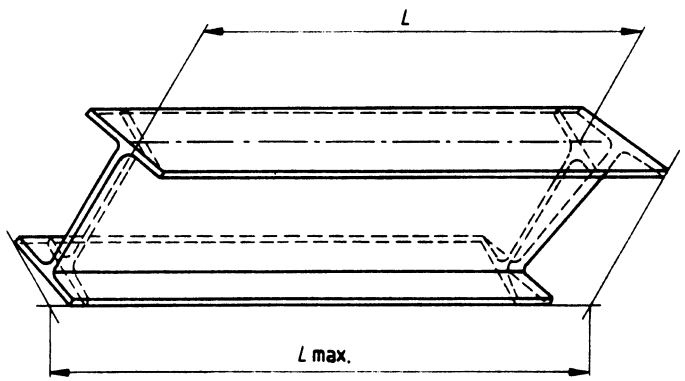


Figure 1 — Measurement of length L on I and H steel sections

Annex A (informative)
Straightness measurement

Straightness measurement requires a reference straight edge from which deviations in section straightness are measured. A taut string line is an acceptable straight edge provided that deviations in the horizontal plan only are measured.

Measurement is carried out as follows:

for q_{xx}:

The beam is laid in the H position on a flat surface and the string is taken along the outside of the centre of the flange width between the two ends of the unconstrained section.

for q_{yy}:

The beam is laid in the I position on a flat surface and the string is taken along the flange tip between the two ends of the unconstrained section.

blank

National annex NA (informative)

Committees responsible

The United Kingdom participation in the preparation of this European Standard was entrusted by the Iron and Steel Standards Policy Committee (ISM/-) to Technical Committee ISM/13 upon which the following bodies were represented:

BEAMA Ltd.

British Constructional Steelwork Association Ltd.

British Steel Industry

National Association of Steel Stockholders

National annex NB (informative)

Cross-references

Publication referred to	Corresponding British Standard
Euronorm 19 Euronorm 53	BS 4 *Structural steel sections* Part 1:1993 *Specification for hot-rolled sections*
EN 10079:1992	BS EN 10079:1993 *Definition of steel products*

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