

# INTERNATIONAL STANDARD

# ISO 7465

Second edition  
1997-09-15

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## Passenger lifts and service lifts — Guide rails for lifts and counterweights — T-type

*Ascenseurs et monte-charge — Guides de cabine et de contrepoids —  
Profils en T*

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ISO 7465:1997

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Reference number  
ISO 7465:1997(E)

## 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 7465 was prepared by Technical Committee ISO/TC 178, *Lifts, escalators, passenger conveyors*.

This second edition cancels and replaces the first edition (ISO 7465:1983), which has been technically revised.

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# Passenger lifts and service lifts — Guide rails for lifts and counterweights — T-type

## 1 Scope

This International Standard specifies the grades and quality, the dimensional characteristics and tolerances, and the surface finish of standardized guide rails and their fishplates.

The dimensional tolerances include the tolerances on shape and dimensions, straightness, twisting and perpendicularity defects.

In addition, this International Standard defines a designation system for guide rails.

This International Standard is applicable to guide rails used in passenger lifts and service lift installations to provide guiding for the car and the counterweight.

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## 2 Normative references

ISO 7465:1997

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The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard 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 468:1982, *Surface roughness — Parameters, their values and general rules for specifying requirements*.

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

ISO 1302:1992, *Technical drawings — Method of indicating surface texture on drawings*.

## 3 Definitions

For the purposes of this International Standard, the following definitions apply:

**3.1 guide rails:** Components which provide guiding for the car or the counterweight, if there is one.

**3.2 fishplate:** Piece of steel used to connect the guides.

## 4 Symbols and units (see also figure 1)

The following symbols and corresponding units of measurement are used in this International Standard.

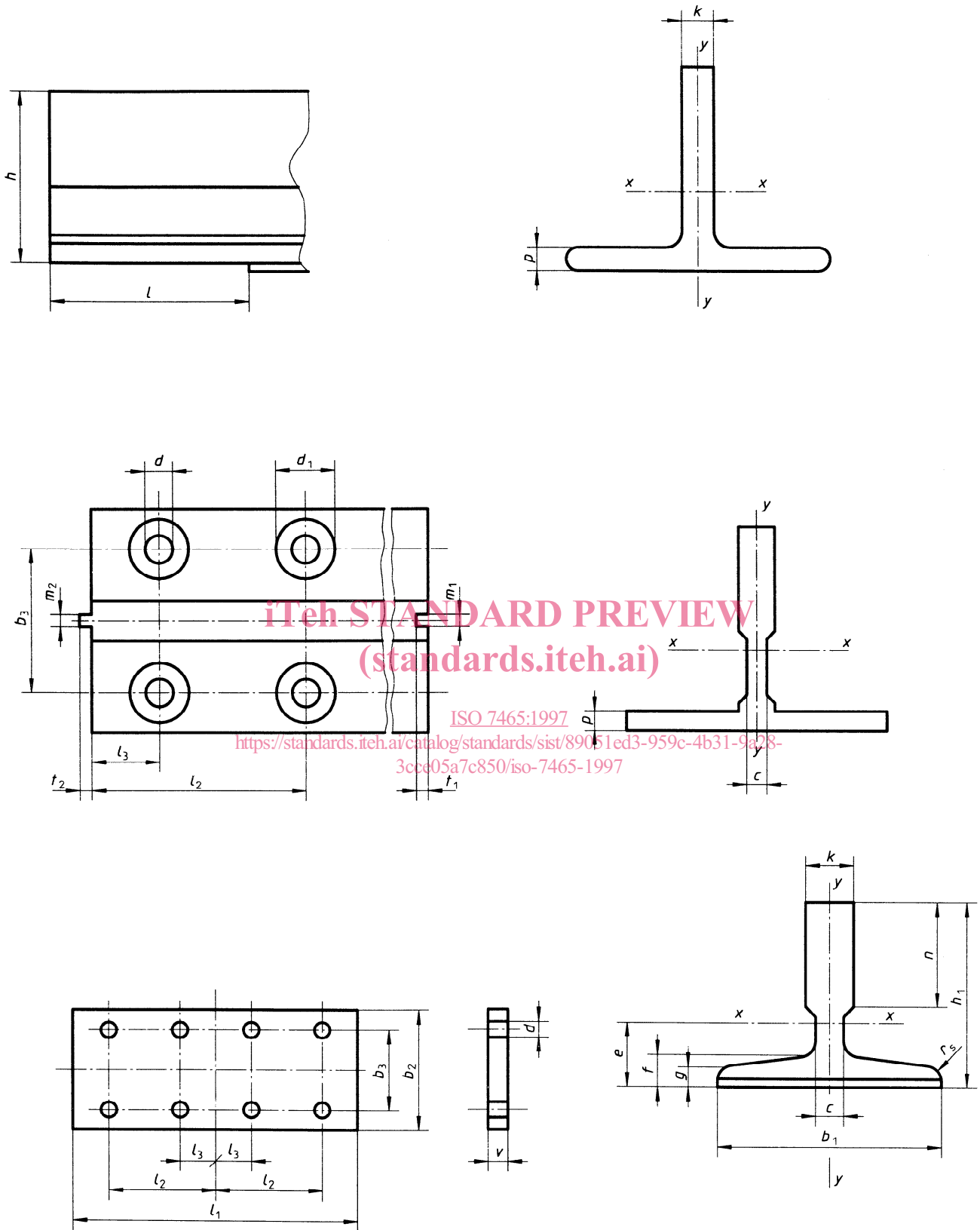
Symbols	Dimension	Units
$b_1$	Guide width	mm
$b_2$	Fishplate width	mm
$b_3$	Distance between the axes of the holes (in the transverse direction of the guide)	mm
$c$	Width of the part that connects the foot to the blade	mm
$d$	Hole diameter	mm
$d_1$	Countersinking diameter	mm
$e$	Distance from the rear surface to the centre of gravity	cm
$f$	Foot depth at its connection with the blade	mm
$g$	Foot depth at its extremity in a transverse plane	mm
$h$	Guide height at the level of the machined surface for the location of the fishplate	mm
$h_1$	Guide height	mm
$I_{xx}$	Moment of inertia of the cross-sectional area of the guide related to the x-x axis	cm <sup>4</sup>
$I_{yy}$	Moment of inertia of the cross-sectional area of the guide related to the y-y axis	cm <sup>4</sup>
$i_{xx}$	Radius of gyration corresponding to the x-x axis	cm
$i_{yy}$	Radius of gyration corresponding to the y-y axis	cm
$k$	Blade width	mm
$l$	Machined surface length for the location of the fishplate	mm
$l_1$	Fishplate length	mm
$l_2$	Distance, in the guide longitudinal direction, between the axis of the holes farthest from the end of the guide and this end; and distance, in the fishplate longitudinal direction, between the axis of the holes farthest from the transverse axis of the fishplate and this axis	mm
$l_3$	Distance, in the guide longitudinal direction, between the axis of the holes nearest to the end of the guide and this end; and distance, in the fishplate longitudinal direction, between the axis of the holes nearest to the transverse axis of the fishplate and this axis	mm
$l_x, l_y$	Machining sub-length for the location of the fishplate	mm
$m_1$	Width of the keyway for the junction of the guides	mm
$m_2$	Width of the key for the junction of the guides	mm

$n$	Blade height	mm
$p$	Foot depth (in the case of a flat foot)	mm
$q_1$	Linear density for a finished guide rail	kg/m
$q_2$	Mass of a finished fishplate	kg
$Ra$	Roughness (see ISO 468)	m
$r_s$	Foot radius	mm
$S$	Cross-sectional area of the guide	cm <sup>2</sup>
$t_1$	Depth of the keyway for the junction of the guides	mm
$t_2$	Length of the key for the junction of the guides	mm
$v$	Fishplate thickness (when machined)	mm
$V_{\text{basic}}$	Fishplate thickness (when not machined)	mm
$W_{xx}$	Cross-sectional area modulus related to the x-x axis	cm <sup>3</sup>
$W_{yy}$	Cross-sectional area modulus related to the y-y axis	cm <sup>3</sup>

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NOTE — For cold-drawn guides, the dimension  $h$  is identical to the dimension  $h_1$ .

Figure 1 — Dimension symbols

## 5 Manufacture and materials

### 5.1 Guide rails

Guide rails may be cold-drawn or machined. In this International Standard, the manufacturing process for each type of guide is indicated by the letter A for cold-drawn and B for machined.

The strength of the steel raw material used shall be at least 370 N/mm<sup>2</sup> and not more than 520 N/mm<sup>2</sup>. For this purpose, it is recommended to use steel grade Fe 360 B for cold-drawn guides and steel grade Fe 430 B for machined guides, in accordance with ISO 630.

### 5.2 Fishplate

The steel grade shall be the same as for the guide rails (see 5.1).

## 6 Dimensional characteristics and tolerances

### 6.1 Guide rails

#### 6.1.1 Dimensions

See tables 1 and 2.

Guide rails with other dimensions can be delivered on specific agreement between the manufacturer and the customer.

The length of the guide shall be indicated in millimetres with a tolerance of  $\pm 2$  mm; it is recommended to supply in bars of 5 000 mm length.

#### 6.1.2 Machined surface for the location of the fishplate

Depending on the machining method, three cases can occur.

##### 6.1.2.1 Case 1 — Cross horizontal milling

See figure 2.

$$l = \left( \frac{l_1}{2} + 3 \right) {}^+3_0 \text{ mm (no sub-length)}$$

##### 6.1.2.2 Case 2 — Vertical milling

See figure 2.

$$l = \left( \frac{l_1}{2} + 3 \right) {}^+3_0 \text{ mm (sub-length: } l_y = 10 \text{ mm max.)}$$

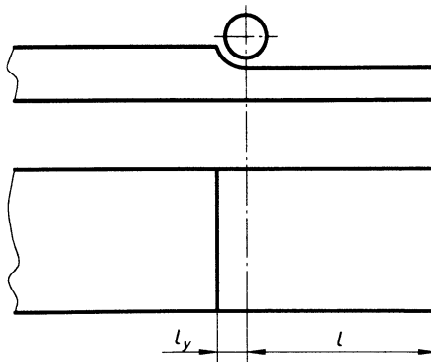


Figure 2 — Machined surface — Cases 1 and 2

6.1.2.3 Case 3 — Longitudinal horizontal milling

See figure 3. The machining sub-length is given in table 3.

$$l = \left( \frac{l_1}{2} + 3 \right) {}^{+3}_0 \text{ mm}$$

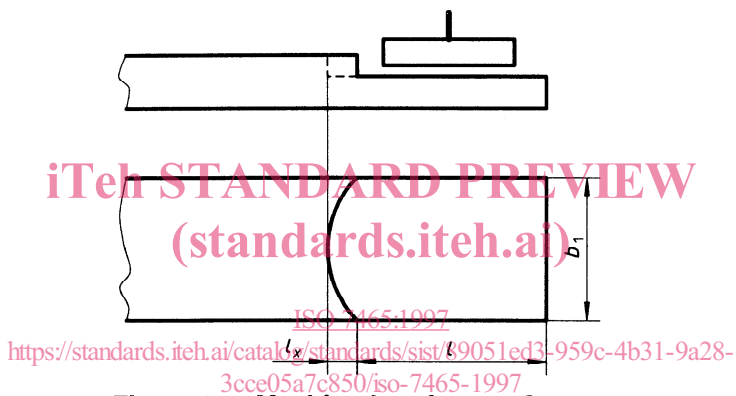


Figure 3 — Machined surface — Case 3

Table 1 — Technical characteristics of guide rails

Designation <sup>1)</sup>	S cm <sup>2</sup>	q <sub>1</sub> kg/m	e cm	I <sub>xx</sub> cm <sup>4</sup>	W <sub>xx</sub> cm <sup>3</sup>	i <sub>xx</sub> cm	I <sub>yy</sub> cm <sup>4</sup>	W <sub>yy</sub> cm <sup>3</sup>	i <sub>yy</sub> cm
T 45/A	4,25	3,34	1,31	8,08	2,53	1,38	3,84	1,71	0,95
T 50/A	4,75	3,73	1,43	11,24	3,15	1,54	5,25	2,10	1,05
T 70-1/A	9,51	7,47	2,04	41,3	9,24	2,09	18,65	5,35	1,40
T 70-2/A	10,52	8,26	2,02	47,43	9,63	2,12	23,13	6,61	1,48
T 75-1/A	7,98	6,26	1,76	24,60	6,58	1,76	15,60	4,17	1,40
T 75-2/A	10,12	7,95	1,81	37,32	8,49	1,92	26,12	6,97	1,61
T 75-3/A-B	10,99	8,63	1,86	40,35	9,29	1,92	26,49	7,06	1,55
T 82/A-B	10,9	8,55	1,98	49,4	10,20	2,13	30,50	7,40	1,67
T 89/A-B	15,70	12,30	2,02	59,52	14,25	1,95	52,4	11,8	1,83
T 90/A-B	17,25	13,55	2,61	102,0	20,87	2,43	52,6	11,8	1,75
T 125/A-B	22,83	17,90	2,43	151,0	26,20	2,57	159	25,4	2,64
T 127-1/B	22,64	17,77	2,75	186,2	30,4	2,87	148	23,4	2,56
T 127-2/A-B	28,63	22,48	2,47	198,4	30,9	2,63	230	36,2	2,83
T 140-1/B	35,20	27,60	3,24	404	53,4	3,39	310	44,3	2,97
T 140-2/B	43,22	33,92	3,47	457	68,0	3,25	358	51,2	2,88
T 140-3/B	58,57	46,0	4,38	953	114,6	4,03	486	69,4	2,88

1) A = Cold-drawn  
B = Machined



Table 2 — Dimensions of guide rails

Dimensions in millimetres

Designation <sup>1)</sup>	$b_1$	$h_1$	$h$	$k$	$n$	$c$	$g$	$f$	$P$	$r_s$	$m_1$	$m_2$	$t_1$	$t_2$
	<b>Tolerances</b>													
	±0,5	±0,2		±0,15					±0,5					
T 45/A	45	45		5		2)			5	1				
T 50/A	50	50		5		2)			5	1				
	<b>Tolerances</b>													
	±1,5	A:±0,10 B:±0,75	±0,1	+0,1 0	+3 0		±0,75		±0,75		+0,06 0	0 -0,06	±0,10	±0,10
T 70-1/A	70	65		9	34	6	6	8		1,5	3	2,95	3,50	3
A	70	65		9	34	6	-	-	7	1,5	3	2,95	3,50	3
T 70-2/A	70	70		8	62	8			8	1,5	3	2,95	3,50	3
T 75-1/A	75	55		9	30	7,5	4	5,8		3	3	2,95	3,50	3
/A	75	55		9	30	7,5			4,9	1,5	3	2,95	3,50	3
T 75-2/A	75	62		9	30	7	7	9		3	3	2,95	3,50	3
/A	75	62		9	30	7			8	1,5	3	2,95	3,50	3
T 75-3/A	75	62		10	30	8	7	9		3	3	2,95	3,50	3
/A	75	62		10	30	8			7,5	1,5	3	2,95	3,50	3
/B	75	62	61	10	30	8	7	9		3	3	2,95	3,50	3
T 82/A	82,5	68,25		9	25,4	7,5	6	8,25		3	3	2,95	3,50	3
/A	82,5	68,25		9	25,4	7,5			7	3	3	2,95	3,50	3
/B	82,5	68,25	66,6	9	25,4	7,5	6	8,25		3	3	2,95	3,50	3
T 89/A	89	62		15,88	33,4	10	7,9	11,1		3	6,40	6,37	7,14	6,35
/A	89	62		15,88	33,4	10			9	3	6,40	6,37	7,14	6,35
/B	89	62	61	15,88	33,4	10	7,9	11,1		3	6,40	6,37	7,14	6,35
T 90/A	90	75		16	42	10	8,465	10		4	6,40	6,37	7,14	6,35
/A	90	75		16	42	10			9	4	6,40	6,37	7,14	6,35
/B	90	75	74	16	42	10	8,465	10		4	6,40	6,37	7,14	6,35
T 125/A	125	82		16	42	10	9	12		4	6,40	6,37	7,14	6,35
/A	125	82		16	42	10			10,5	4	6,40	6,37	7,14	6,35
/B	125	82	81	16	42	10	9	12		4	6,40	6,37	7,14	6,35
T 127-1/B	127	88,9	88	15,88	44,5	10	7,9	11,1		4	6,40	6,37	7,14	6,35
T 127-2/A	127	88,9		15,88	50,8	10	12,7	15,9		5	6,40	6,37	7,14	6,35
/A	127	88,9		15,88	50,8	10			14	5	6,40	6,37	7,14	6,35
/B	127	88,9	88	15,88	50,8	10	12,7	15,9		5	6,40	6,37	7,14	6,35
T 140-1/B	140	108	107	19,0	50,8	12,7	12,7	15,9		5	6,40	6,37	7,14	6,35
T 140-2/B	140	102	101	28,6	50,8	17,5	14,5	17,5		5	6,40	6,37	7,14	6,35
T 140-3/B	140	127	126	31,75	57,2	19	17,5	25,4		5	6,40	6,37	7,14	6,35
1) A = Cold-drawn B = Machined 2) See figure 1 (top right); in this case $c = k$ .														

**Table 3 — Machining sub-length  $l_x$**   
Dimensions in millimetres

$b_1$	$l_{x\max}$
70	10
75	10
82	12
89	14
90	14
125	30
127	32
140	40

### 6.1.3 Blade shape

The blade shall be chamfered or rounded, taking into account the respective values:

- length of the chamfer side: 1 mm max.
- radius: 1 mm max.

### 6.1.4 Surface finish

Guide rails shall have the following surface finishes, as specified in ISO 468 and in accordance with the roughness grades specified in ISO 1302.

#### 6.1.4.1 Guide rail blade

- a) In the longitudinal direction:
- machined guide rails: roughness N7, i.e.  $Ra \leq 1,6 \mu\text{m}$
  - cold-drawn guide rails: roughness between N7 and N9, i.e.  $1,6 \mu\text{m} \leq Ra \leq 6,3 \mu\text{m}$
- b) In the transverse direction:
- machined and cold-drawn guide rails: roughness between N7 and N9, i.e.  $1,6 \mu\text{m} \leq Ra \leq 6,3 \mu\text{m}$

#### 6.1.4.2 Foot rear surface of machined guide rails

- roughness N9, i.e.  $Ra = 6,3 \mu\text{m}$

### 6.1.5 Straightness and twisting

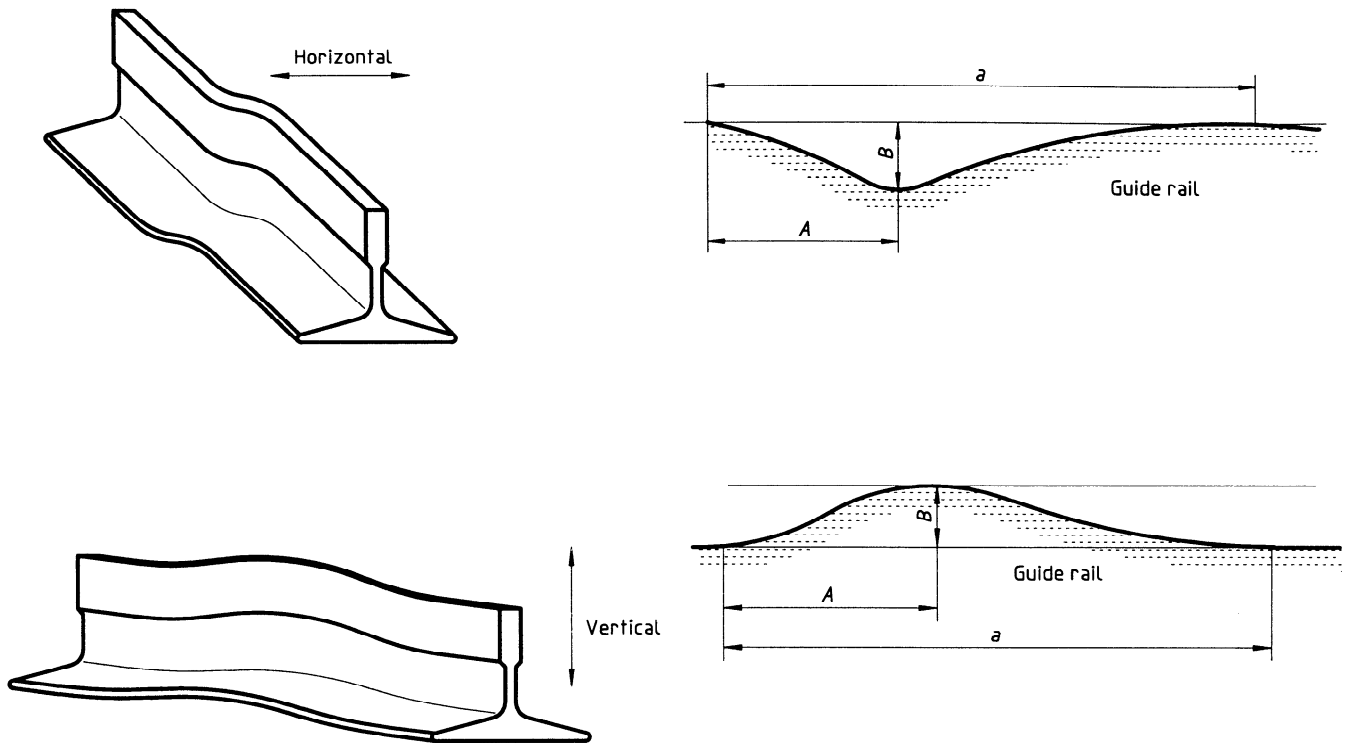
#### 6.1.5.1 Straightness (see figure 4)

The ratio  $B/A$  shall not be greater than the values given in table 4, where:

- $A$  is the shortest length between the reference point and the measuring point;
- $B$  is the maximum distance between the measuring point and the reference plane;
- $a$  is the shortest length inspected, at least equal to 1 m.

The inspection shall be carried out at the works where the finished guide rails are made. If the measurement is made in a non-vertical position, the natural deflection due to the mass of the guide and to the location of the supports shall be disregarded for the values indicated.

NOTE — It is recommended to check that the guide rail has no repetitive wave effect. For this purpose,  $B$  can be measured on a fixed length  $a$  moving along the whole length of the bar.



**Figure 4 — Straightness**  
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**Table 4 — Ratio  $B/A$**

Guide type		$B/A$ max.
Cold-drawn	45 × 45	0,001 6
	50 × 50	
	Others	0,001 4
Machined		0,001 0

### 6.1.5.2 Twisting

The twisting angle  $\gamma$ , measured on a guide rail length of at least 1 m, shall not be greater than the values given in table 5 (see also figure 5).

The inspection shall be carried out at the works where the finished guide rails are made. The measurement may be made with the guide rail vertical or horizontal.