
International Standard



7465

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

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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Descriptors : lifts, rails, specifications, dimensions, dimensional tolerances.

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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 developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been authorized 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 7465 was developed by Technical Committee ISO/TC 178, *Lifts, escalators and passenger conveyors*, and was circulated to the member bodies in October 1981.

It has been approved by the member bodies of the following countries :

Austria	Germany, F.R.	Spain
Belgium	Hungary	Sweden
Czechoslovakia	Ireland	Switzerland
Denmark	Italy	United Kingdom
Egypt, Arab Rep. of	Korea, Dem. P. Rep. of	USSR
Finland	Poland	
France	South Africa, Rep. of	

The member bodies of the following countries expressed disapproval of the document on technical grounds :

Canada
USA

Passenger lifts and service lifts – Guide rails for lifts and counterweights – T-type

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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.

2 Field of application

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

It does not deal with guide rails used in high performance installations where inertias are generally higher than those supported by the heavier guides covered by this International Standard.

3 References

ISO 468, *Surface roughness – Parameters, their values and general rules for specifying requirements.*

ISO 630, *Structural steels.*

ISO 1302, *Technical drawings – Method of indicating surface texture on drawings.*

4 Definitions

For the purpose of this International Standard, the following definitions apply.

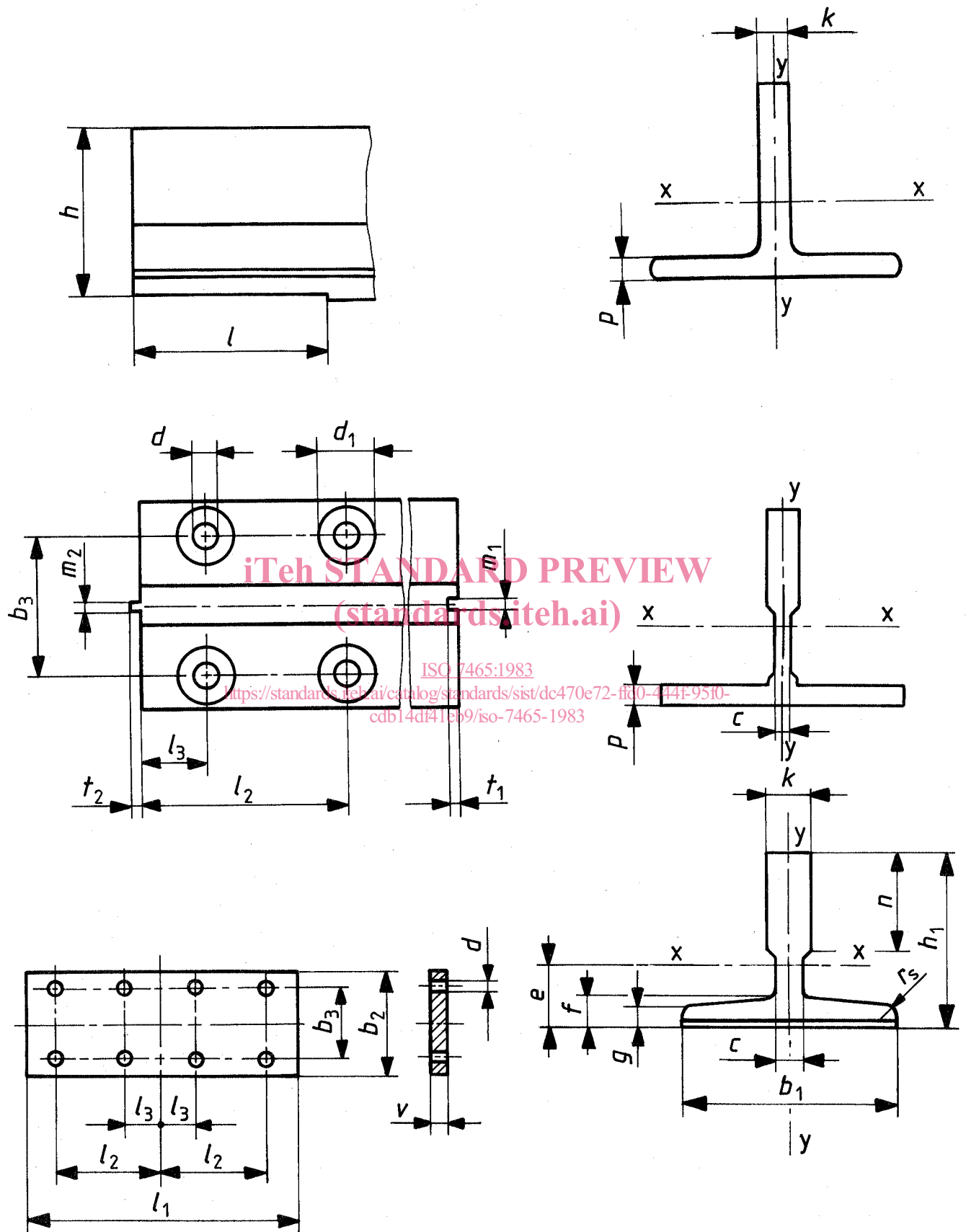
4.1 guide rails : Components which provide guiding for the car or the counterweight, if there is one.

4.2 fishplate : Piece of steel used to connect the guides.

5 Symbols and units (see figure 1)

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

Symbol	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 connecting part of 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 xx axis	cm ⁴			
I_{yy}	Moment of inertia of the cross-sectional area of the guide related to the yy axis	cm ⁴			
i_{xx}	Radius of gyration corresponding to the xx axis	cm			
i_{yy}	Radius of gyration corresponding to the yy 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 farthest holes from the end of the guide and this end	mm
				and	
				Distance, in the fishplate longitudinal direction, between the axis of the farthest holes from the transverse axis of the fishplate and this axis	mm
			l_3	Distance, in the guide longitudinal direction, between the axis of the nearest holes from the end of the guide and this end	mm
				and	
				Distance, in the fishplate longitudinal direction, between the axis of the nearest holes from the transverse axis of the fishplate and this axis	mm
			l_x	Machining sub-length for the location of the fishplate	mm
			l_y		
			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
			r_s	Foot radius	mm
			S	Cross-sectional area of the guide	cm ²
			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	mm
			W_{xx}	Cross-sectional area modulus related to the xx axis	cm ³
			W_{yy}	Cross-sectional area modulus related to the yy axis	cm ³



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

Figure 1 — Dimension symbols

6 Manufacture and material

6.1 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 used shall be at least 370 N/mm² and not more than 520 N/mm². 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.

6.2 Fishplates

The steel grade shall be the same as for the guide rails (see 6.1).

7 Dimensional characteristics and tolerances

7.1 Guide rails

7.1.1 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 ± 2 mm.

7.1.2 Machined surface for the location of the fishplate
(see figures 2 and 3)

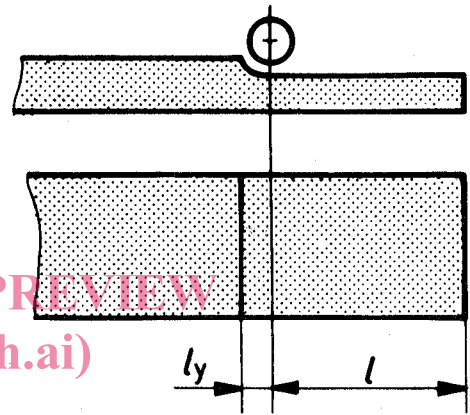
Depending on the machining method, three cases can occur :

a) Case 1 – Cross horizontal milling :

$$l = \left(\frac{l_1}{2} + 3 \right) + \underset{0}{\overset{3}{\text{mm}}} \text{ (no sub-length)}$$

b) Case 2 – Vertical milling :

$$l = \left(\frac{l_1}{2} + 3 \right) + \underset{0}{\overset{3}{\text{mm}}} \text{ (sub-length : } l_y = 10 \text{ max.)}$$



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Figure 2 – Machined surface – Cases 1 and 2

Table 1 – Technical characteristics

Designation A = Cold drawn B = Machined	S	q ₁	e	I _{xx}	W _{xx}	i _{xx}	I _{yy}	W _{yy}	i _{yy}
	cm ²	kg/m	cm	cm ⁴	cm ³	cm	cm ⁴	cm ³	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	2,09	59,60	14,50	1,95	52,50	11,80	1,83
T 90/A-B	17,00	13,30	2,65	101,20	20,80	2,44	51,50	11,40	1,74
T 125/A-B	22,9	18,00	2,43	151,10	26,20	2,57	156,60	25,10	2,52
T 127-1/B	22,50	17,80	2,70	187,00	30,00	2,86	151,00	24,00	2,65
T 127-2/A-B	28,9	22,70	2,46	200,00	31,00	2,63	234,00	36,80	2,85

Table 2 — Dimensions of guide rails

Dimensions in millimetres

Designation A = Cold drawn B = Machined	b_1	h_1	h	k	n	c	g	f	p	r_s	m_1	m_2	t_1	t_2
	Tolerances													
	± 0,5			± 0,15					± 0,5					
T 45/A	45	45		5		*			5	1				
T 50/A	50	50		5		*			5	1				
	Tolerances													
	± 1,5		± 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	3,00	2,95	3,50	3,00
A	70	65		9	34	6	—	—	7	1,5	3,00	2,95	3,50	3,00
T 70-2/A	70	70		8	62	8			8	1,5	3,00	2,95	3,50	3,00
T 75-1/A	75	55		9	30	7,5	4	5,8		3	3,00	2,95	3,50	3,00
/A	75	55		9	30	7,5			4,9	1,5	3,00	2,95	3,50	3,00
T 75-2/A	75	62		9	30	7	7	9		3	3,00	2,95	3,50	3,00
/A	75	62		9	30	7			8	1,5	3,00	2,95	3,50	3,00
T 75-3/A	75	62		10	30	8	7	9		3	3,00	2,95	3,50	3,00
/A	75	62		10	30	8			7,5	1,5	3,00	2,95	3,50	3,00
/B	75	62	61	10	30	8			7,5	1,5	3,00	2,95	3,50	3,00
T 82/A	82,5	68,25		9	25,4	7,5	6	8,25		3	3,00	2,95	3,50	3,00
/A	82,5	68,25		9	25,4	7,5			7	3	3,00	2,95	3,50	3,00
/B	82,5	68,25	66,6	9	25,4	7,5	6	8,25		3	3,00	2,95	3,50	3,00
T 89/A	89	62		15,88	33,4	9,5	7,9	11,1		3	6,40	6,37	7,14	6,35
/A	89	62		15,88	33,4	9,5			9	3	6,40	6,37	7,14	6,35
/B	89	62	61	15,88	33,4	9,5	7,9	11,1		3	6,40	6,37	7,14	6,35
T 90/A	90	75		16	42	9	8	10		4	4,00	3,95	4,50	4,00
/A	90	75		16	42	9			9	4	4,00	3,95	4,50	4,00
/B	90	75	74	16	42	9	8	10		4	4,00	3,95	4,50	4,00
T 125/A	125	82		16	42	10	9	12		4	4,00	3,95	4,50	4,00
/A	125	82		16	42	10			10,5	4	4,00	3,95	4,50	4,00
/B	125	82	81	16	42	10	9	12		4	4,00	3,95	4,50	4,00
T 127-1/B	127	88,9	88	15,88	44,5	9,5	7,9	11,1		4	6,40	6,37	7,14	6,35
T 127-2/A	127	88,9		15,88	50,8	9,5	12,7	15,9		5	6,40	6,37	7,14	6,35
/A	127	88,9		15,88	50,8	9,5			14	5	6,40	6,37	7,14	6,35
/B	127	88,9	88	15,88	50,8	9,5	12,7	15,9		5	6,40	6,37	7,14	6,35

* See figure 1 (top right); in this case $c = k$.

c) Case 3 — Longitudinal horizontal milling :

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

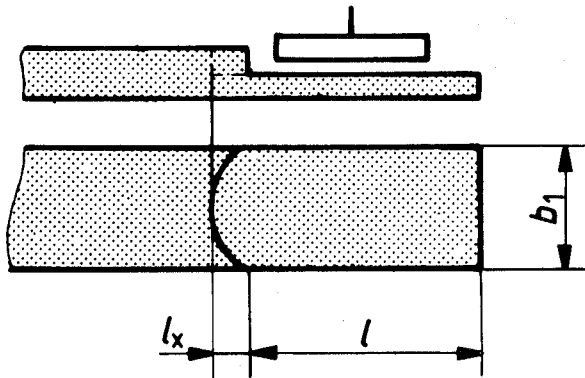


Figure 3 — Machined surface — Case 3

Table 3 — Machining sub-length l_x

b_1 mm	l_x max. mm
70	10
75	10
82	12
89	14
90	14
125	30
127	32

7.1.3 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.

7.1.4 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.

a) Guide rail blade :

1) in the longitudinal direction :

- machined guide rails : N7, i.e. $R_a = 1,6 \mu\text{m}$
- cold drawn guide rails : between N8 and N9, i.e. $3,2 \mu\text{m} \leq R_a \leq 6,3 \mu\text{m}$

2) in the transverse direction :

- machined and cold drawn guide rails : between N8 and N9, i.e. $3,2 \mu\text{m} \leq R_a \leq 6,3 \mu\text{m}$

b) Foot rear surface of machined guide rails : N9, i.e. $R_a = 6,3 \mu\text{m}$

7.1.5 Straightness and twisting

7.1.5.1 Straightness (see figure 4)

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

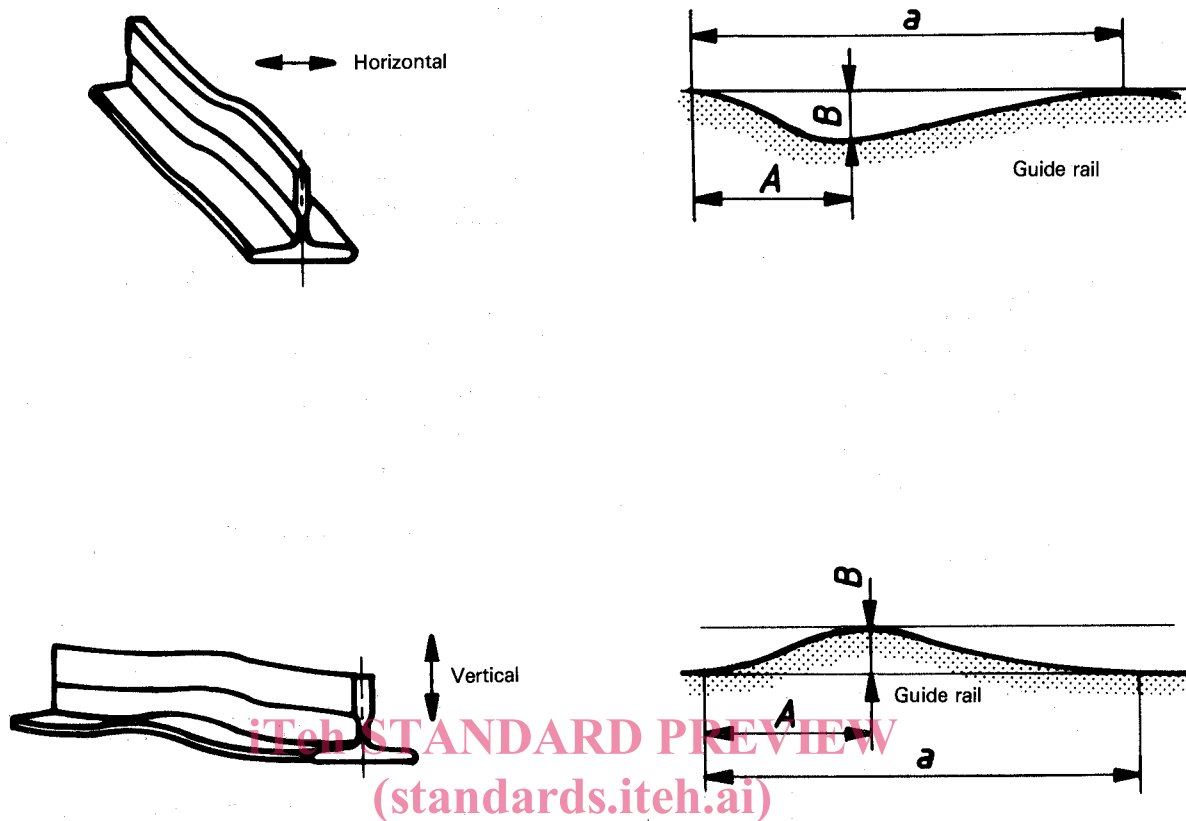
A is the shortest length between the reference point and the measuring point,

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 deflexion 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.



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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