
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

First edition — 1983-02-15

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UDC 621.86.078.1

Ref. No. ISO 7465-1983 (E)

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

Price based on 9 pages

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

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 |

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 :

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

- b) Case 2 – Vertical milling :

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

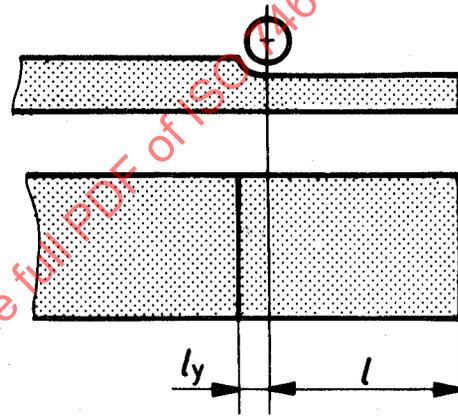


Figure 2 – Machined surface – Cases 1 and 2

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 | 9 | | 3 | 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 :

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

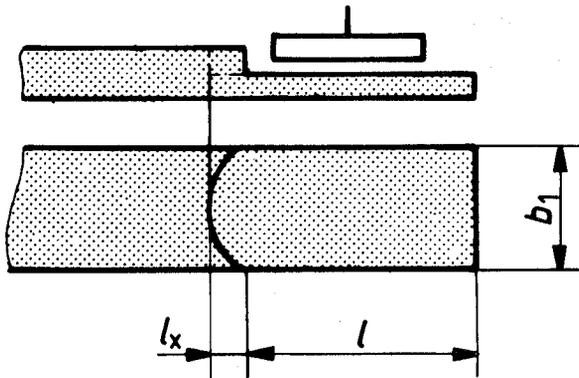


Figure 3 — Machined surface — Case 3

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.

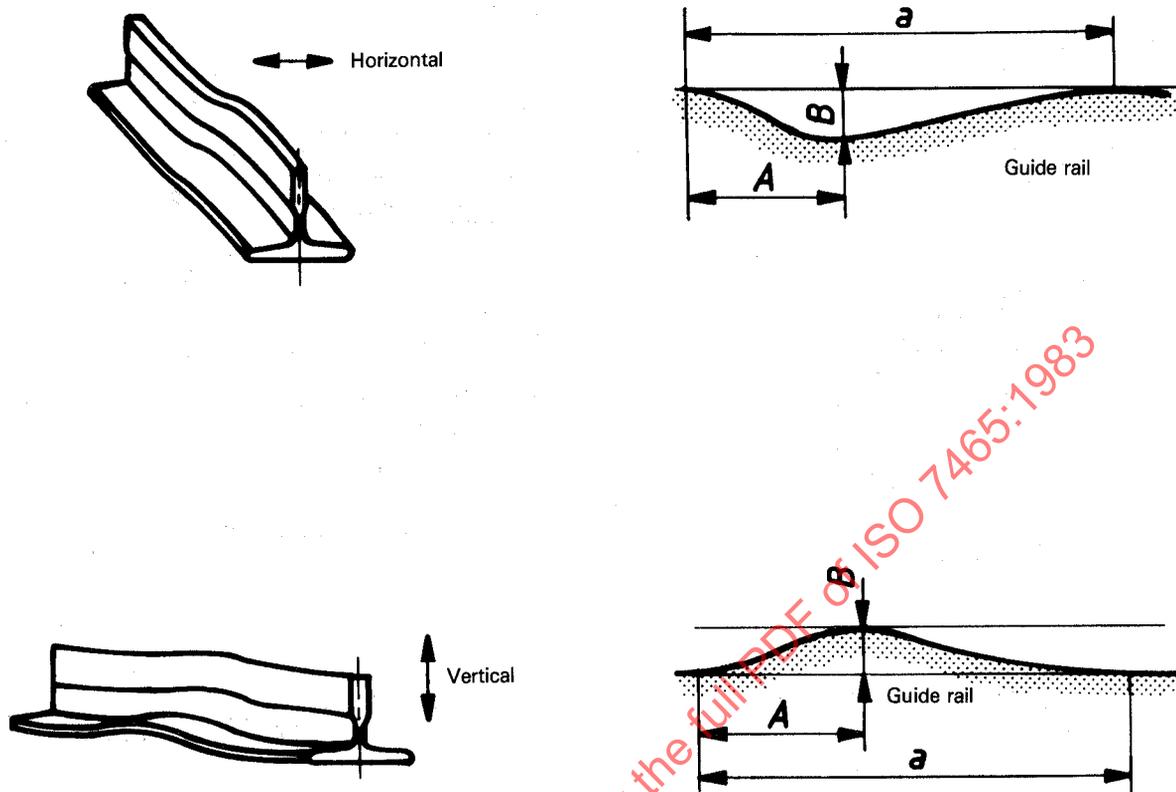


Figure 4 — Straightness

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 |