



SLOVENSKI STANDARD
SIST EN 50023:1998

01-februar-1998

Low-voltage switchgear and controlgear for industrial use - Mounting rails - Top hat rails 75 mm wide for snap-on mounting of equipment

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Industrielle Niederspannung-Schaltgeräte - Tragschienen - Hutschienen 75 mm breit zur Schnappbefestigung von Geräten

Appareillage industriel à basse tension - Profilés supports - Profilés chapeau de largeur 75 mm pour la fixation d'appareils encliquetables

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Ta slovenski standard je istoveten z: EN 50023:1977

ICS:

29.130.20	Nizkonapetostne stikalne in krmilne naprave	Low voltage switchgear and controlgear
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SIST EN 50023:1998

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 50 023

Edition 1
July 1977

UDC 621.316.54 : 621.3.027.2 : 62-218-423.9

Key words: electrical switchgear and controlgear — industrial use — domestic use — mounting rail — mounting of equipment — snap-on mounting — top hat rail — steel rail — dimensional standardization — 75 mm wide (top hat rail)

English version

Low voltage switchgear and controlgear for industrial use

Mounting rails

Top hat rails 75 mm wide for snap-on mounting of equipment

Profilés supports. Appareillage industriel à basse tension. Profilés chapeau de largeur 75 mm pour la fixation d'appareils encliquetables

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

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REPUBLIKA SLOVENIJA
MINISTRSTVO ZA ZNANOST IN TEHNOLOGIJO
Urad RS za standardizacijo in meroslovje
LJUBLJANA

SIST.....EN 50023.....

PREVZET PO METODI RAZGLASITVE

-01- 1998

CENELEC

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

General Secretariat: rue Bréderode, 2, B-1000 Brussels

This European Standard has been prepared by CENELEC Technical Committee 17X.

1. General

To ensure the universal utilization of snap-on mounting of equipment, it is appropriate to standardize certain types of rail. Two types of top hat rail, both 35 mm wide, are specified in the standard EN 50 022. This standard specifies a top hat rail 75 mm wide for the mounting of equipment that is too large or too heavy for either 35 mm top hat rail.

2. Scope

This standard specifies 75 mm wide steel top hat rails for the snap-on mounting of equipment.

3. Dimensions

The dimensions of the top hat rail are given in figure 1.

These dimensions apply over the whole length of the top hat rail, but shall not be verified anywhere less than 25 mm from the ends.

Dimensions in millimetres

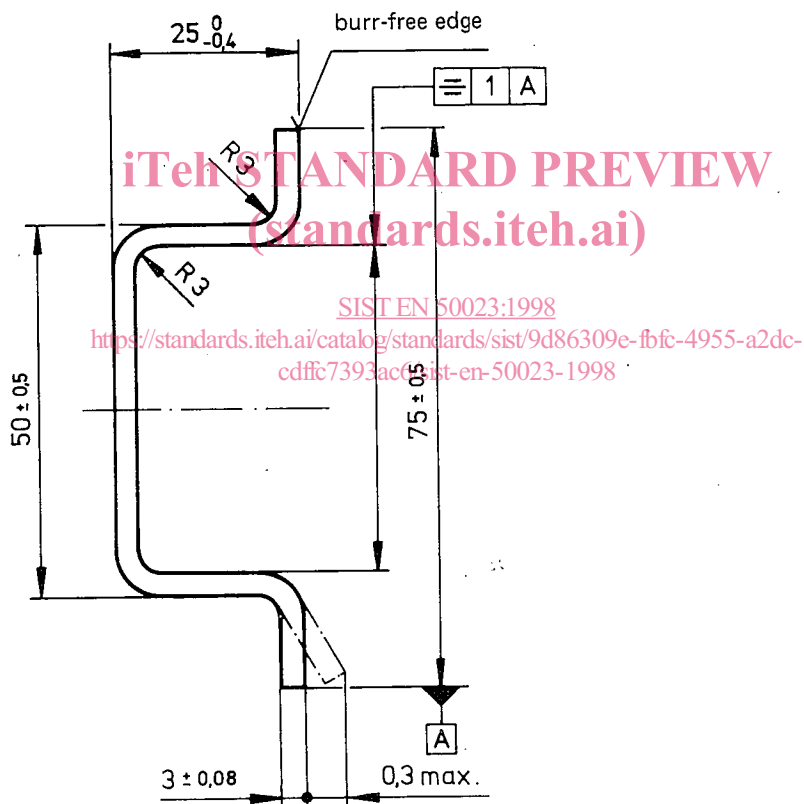


Figure 1. Top hat rail 75 mm wide

4. Designation

The designation of a 75 mm wide top hat rail, 25 mm high :
top hat rail EN 50 023 – 75 x 25

5. Material

The material used shall be :

- cold rolled carbon steel sheet;
- skin passed after annealing;
- bright surface finish;
- tensile strength between 320 N/mm² and 420 N/mm²;
- elongation at least 30 %;
- 180° bend tested longitudinally and transversely with regard to the direction of rolling.

Each country may indicate its corresponding national standard. Other qualities of steel may be used only by agreement between the manufacturer and the user.

6. Finish

The finish shall be zinc-plated and chromated, with a layer thickness of at least 6 µm, except for cut surfaces resulting from cutting to length.

Other finishes may be used by agreement between the manufacturer and the user.

7. Availability

Top hat rails shall be supplied either in manufactured lengths of at least 1 m, or in ready cut lengths.

8. Tolerances on form

The tolerances on form are shown in figure 2, in accordance with ISO/R 1101*.

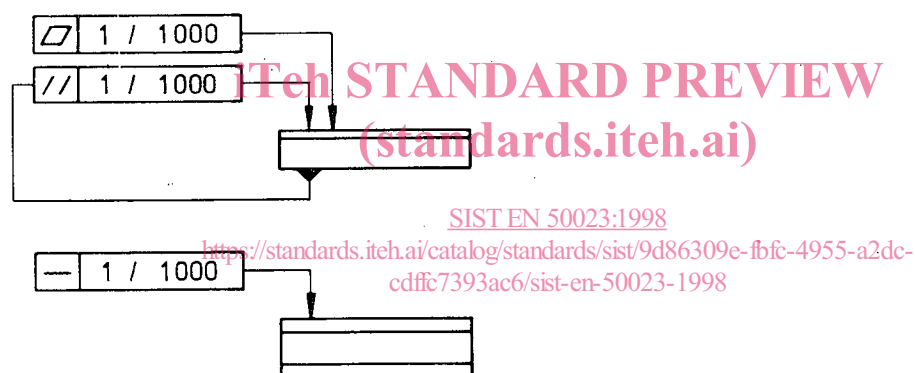


Figure 2. Tolerances on form

*Reference of corresponding national standard (see national appendix B).

Appendix

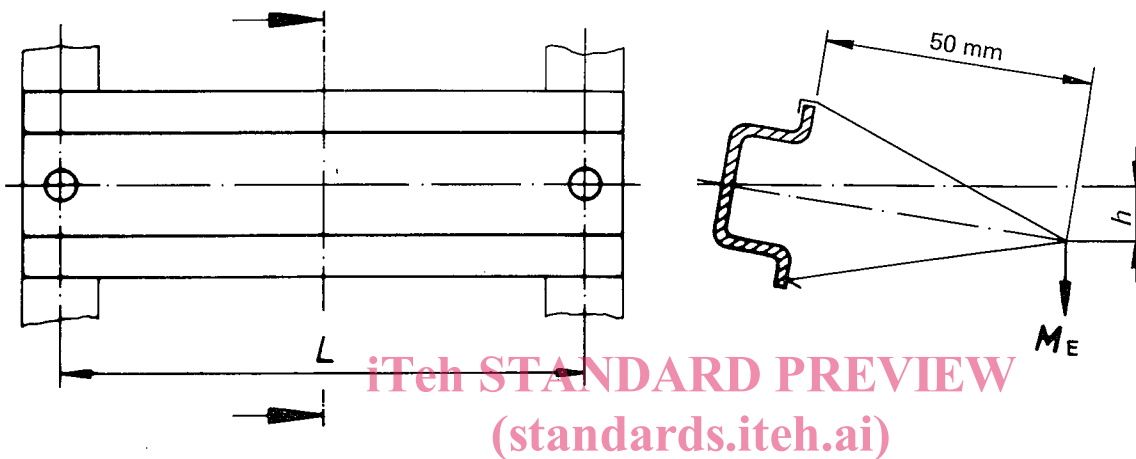
Guidance for the use of top hat rails

To determine the permissible load of rails, correctly used, the twisting deformation is always the most important factor. The sagging stress, on the other hand, is small and can be disregarded.

Research has shown that, as a result of the current practice of fixing rails by means of two screws, a torsion stress $\tau > 50 \text{ N/mm}^2$ can cause a permanent deformation of the rails. The maximum permissible torque for that stress is, independently of the distance between rail fixing points, 16 700 N mm.

For distances between fixing points used in practice, with this force an excessive deformation occurs generally in the middle of the top hat rail.

A method for assessing this deformation is shown in figure 3.



M is the torque due to the force from the equipment mounted on the rail, which equals force times the distance between the centre of gravity and the mounting plane (in N mm) (possibly supplemented to take shocks into account)

M_E is the moment (in N mm) of the equivalent torque acting in the middle of the rail for a number of individual moments M of similar equipment :

$$M_E = \frac{\sum M}{2}$$

J_P is the polar moment of inertia of the rail (in mm^4)

G is the sliding modulus (steel plate 80 000 N/mm^2)

L is the distance between fixing points (in mm)

h is the deflection (in mm) of the rail at 50 mm from the fixing surface of the equipment :

$$h = \frac{M_E \cdot L}{4 \cdot J_P \cdot G} \cdot 50$$

Figure 3. Assessment of deflection of rail

Using this method, the maximum equivalent torque M_E as a function of the distance L between fixing points has been calculated for three values of deflection h , and is shown in figure 4.

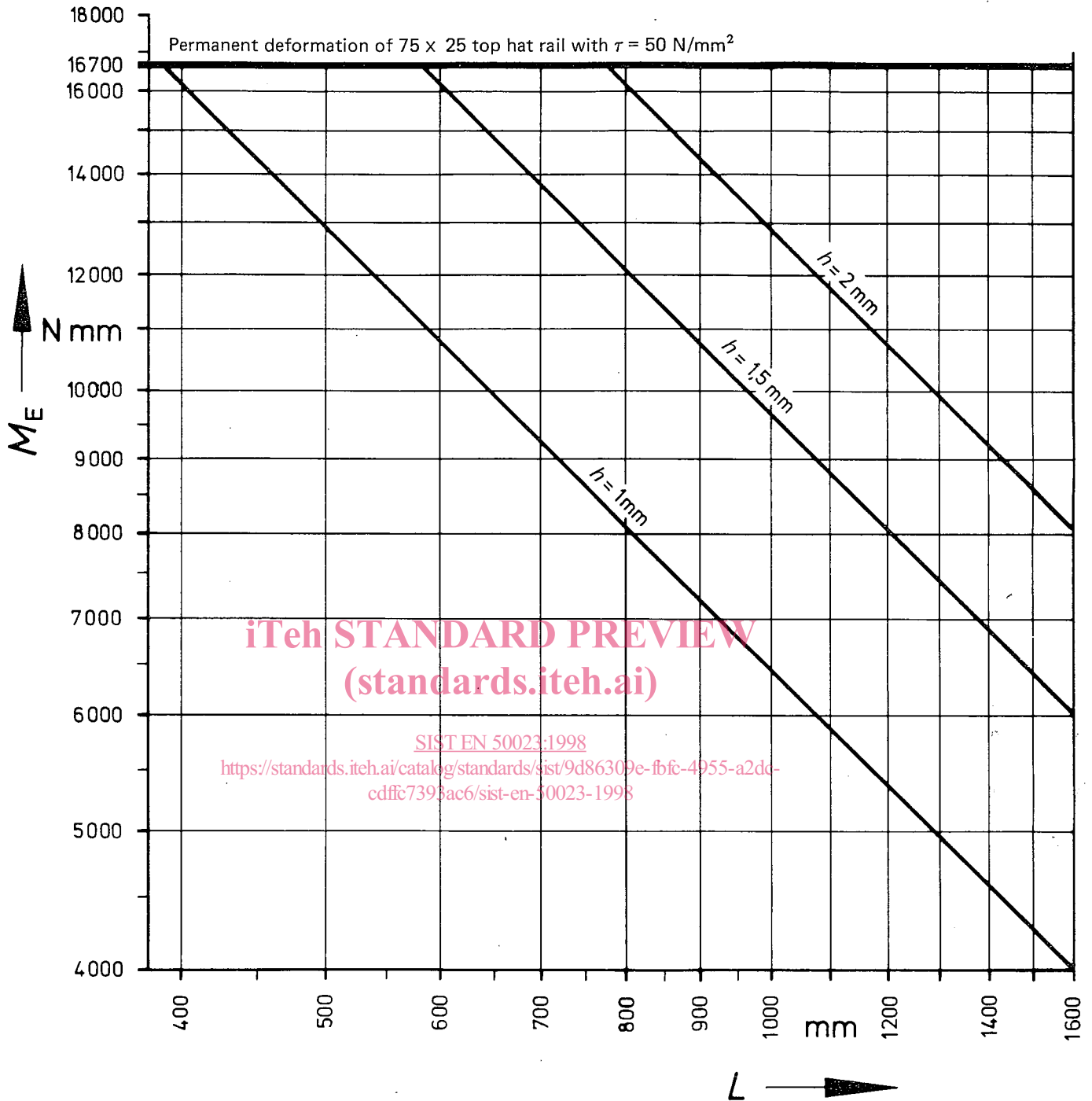


Figure 4. Load capacity, $M_E = f(L, h)$

Example: A top hat rail 75 mm x 25 mm and 800 mm long can be loaded with an equivalent torque of 8000 N mm, if subjected to a 1 mm deformation.