

Laagspanningsschakelmaterieel voor industriële toepassing - Montagerails - C-profiel en toebehoren voor bevestiging van toestellen

**NEDERLANDSE
NORM**

Low voltage switchgear and controlgear for industrial use - Mounting rails - C-profile and accessories for the mounting of equipment

NEN-EN 50 024

1e druk, augustus 1980

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Preview

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National foreword

With reference to clause 1, the European Standards EN 50 022, EN 50 023 and EN 50 035 have been published respectively as

NEN-EN 50 022 Laagspanningsschakelmaterieel voor industriële toepassing -
Montagerails - Hoedprofiel met een breedte van 35 mm voor
klikbevestiging van toestellen

NEN-EN 50 023 Laagspanningsschakelmaterieel voor industriële toepassing -
Montagerails - Hoedprofiel met een breedte van 75 mm voor
klikbevestiging van toestellen

NEN-EN 50 035 Laagspanningsschakelmaterieel voor industriële toepassing -
Montagerails - G-profiel voor bevestiging van klemmenlijsten

With reference to 3.6, ISO/R 1101 is technically equivalent to NEN 3311
"Technische tekeningen - Aanduiding van vorm- en plaatstoleranties"

With reference to 4.2.4, ISO/R 898-1 is technically equivalent to NEN 914
"Bevestigingsartikelen met metrische schroefdraad - Technische leverings-
voorwaarden".

Forthcoming
Preview

UDC 621.316.54 : 621.3.027.2 : 62-218-423.9

Key words : electrical switchgear and controlgear, low voltage, industrial use, domestic application, mounting rail, mounting of equipment, screw mounting, C-profile steel rail, dimensional standardization

English version

Low voltage switchgear and controlgear for industrial use

Mounting rails

C-profile

and accessories for the mounting of equipment

Appareillage industriel à basse
tension. Profilés supports.
Profilé C et accessoires pour la
fixation des appareils

Industrielle Niederspannungs-
Schaltgeräte. Tragschienen.
C-Schiene und Zubehör zur
Befestigung von Geräten

This European Standard was accepted by CENELEC on 1978-12-8. The CENELEC members are bound to adhere to the CENELEC Internal Regulations which specify under which conditions this European Standard has to be given, without any alteration, the status of a national standard.

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.

This European Standard is established by CENELEC in three official versions (English, French, German). A translation made by another member under its own responsibility, in its own language, and notified to CENELEC, has the same status.

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CENELEC

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

General Secretariat : 2, rue Bréderode, boîte 5, 1000 Bruxelles

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

1. General

To promote the universal use of mounting rails for the mounting of equipment certain types of rail are being standardized.

Two types of rail are specified in European Standard EN 50 022, 'Top hat rails 35 mm wide for the snap-on mounting of equipment'.

For equipment which is either too large or too heavy for either of the 35 mm rails, a top hat rail 75 mm wide is specified in European Standard EN 50 023 for snap-on mounting of equipment.

A G-profile rail is specified in European Standard EN 50 035 for the snap-on mounting or screw fixing of terminal blocks.

This European Standard specifies requirements for C-profile rails and accessories for the screw fixing of equipment by means of screws.

2. Scope

This European Standard specifies requirements for certain sizes of C-profile steel rail and accessories for the screw fixing of equipment.

3. C-profile

3.1 Dimensions. The dimensions of C-profile rails shall be as shown in figure 1 and detailed in table 1.

These dimensions shall apply over the whole length of the C-profile rail. Verification of these dimensions shall not be made less than 10 mm from each end of the rail.

3.2 Designation. The designation of a C-profile rail, rated size C 40, shall be as follows:

C-profile rail EN 50 024-C 40.

3.3 Material. The material used shall be cold rolled carbon steel and shall have the following characteristics:

- skin passed after annealing,
- bright surface finish,
- tensile strength between 320 and 420 N/mm²
- elongation at least 30 %,
- 180° bend tested horizontally and transversally with regard to the direction of rolling.

Each country may indicate its corresponding national standard.

3.4 Finish. The finish shall be zinc-plating and chromating, 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 manufacturer and user.

3.5 Availability. C-profile rails shall be supplied either in manufactured lengths of at least 2 m or in ready-cut lengths.

3.6 Tolerances on form. The tolerances on form shall be as shown in figure 2 and shall be in accordance with ISO/R 1101*.

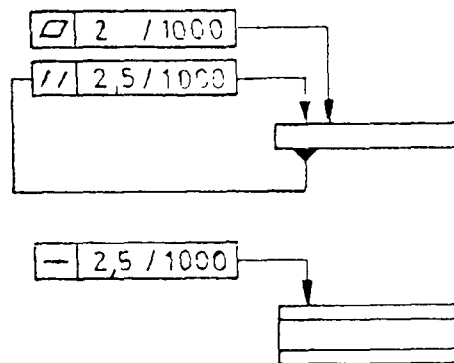


Figure 2. Tolerances on form

4. Accessories

4.1 Types. The following types of accessories are specified for the mounting of equipment on C-profile rails, by means of screws:

- sliding nuts,
- T-head bolts,
- hooked head bolts.

4.2 Requirements

4.2.1 Accessories shall be insertable at any point of the rail and shall be able to slide along the rail.

Rated sizes C20, C30

Rated sizes C40, C50

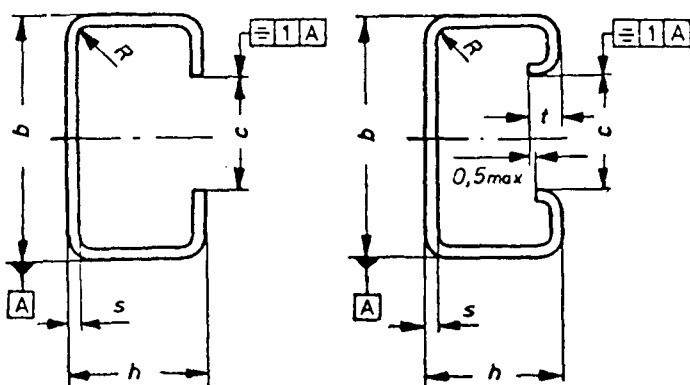


Figure 1. C-profile rails

Table 1. Dimensions of C-profile rails

Dimensions are in millimetres

Rated sizes	b ± 0.75	h ± 0.75	c	Perm. tol.	R max	s	t ± 1.2
C 20	20	10	11	± 0.3	1	1	—
C 30	30	15	16	± 0.5	1.5	1.5	—
C 40	40	22,5	18	± 0.5	2	2	5.5
C 50	50	30	22	± 0.5	3	3	7

*... Reference of corresponding national standard

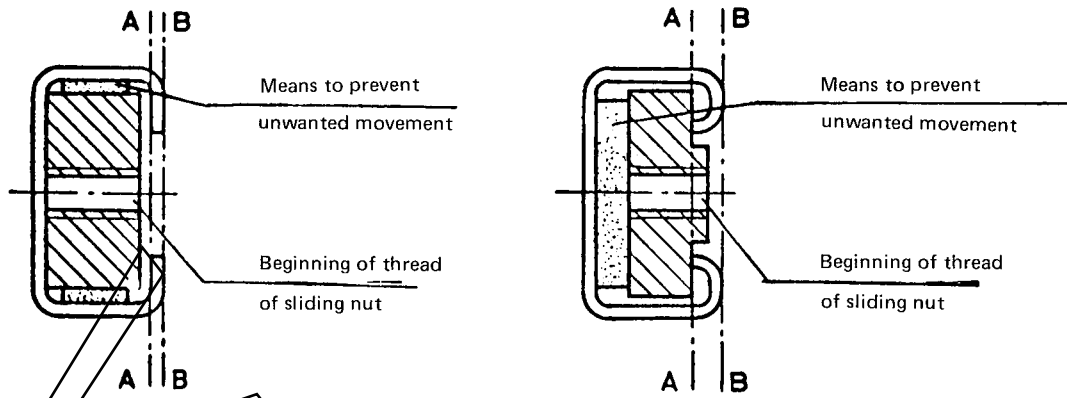


Figure 3. Requirements for sliding nuts according to 4.2.2

4.2.2 Sliding nuts shall be so designed that the thread entrance shall be neither more than 1 mm behind plane A-A, nor be in front of plane B-B, as shown in figure 3.

Furthermore, means shall be provided to prevent any unwanted movement of sliding nuts inside the rail.

4.2.3 When fixing the device on the rail, only a limited amount of rotation is permissible.

4.2.4 When loaded in accordance with this standard, accessories shall comply with the mechanical characteristics of ISO/R 898-1* – Mechanical class 4.6.

4.2.5 Accessories shall be adequately protected against corrosion.

4.3 Dimensions. In addition to the requirements of 4.2, only thread diameters and thread lengths for accessories complying with this standard are given in table 2.

4.4 Examples of designations of accessories

Sliding nut for a C-profile rail-size C 20-thread M4 :

Sliding nut EN 50 024-C 20/M4

T-head bolt for a C-profile rail-size C 30-thread M6 and a bolt thread length 30 mm:

T-head bolt EN 50 024-C 30/M6 x 30.

Hookhead bolt for a C-profile rail-size C 50-thread M6 and a bolt thread length 40 mm:

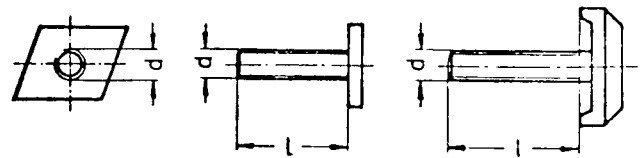
Hook-head bolt EN 50 024-C 50/M10 x 40.

NOTE. The designation of accessories only gives information on their use in accordance with this standard.

No indication is given of their form and construction.

Table 2. Dimensions of accessories

All dimensions are in millimetres.



C-profile rated sizes	Sliding nuts <i>d</i>	T-head bolts		Hooked-head bolts	
		<i>d</i>	<i>l</i>	<i>d</i>	<i>l</i>
C 20	M4, M5, M6, M8	M4, M5 M6, M8	20	/	/
			30		
			40		
C 30	M4, M5, M6 M8, M10, M12	M4, M5 M6, M8 M10, M12	30	/	/
			40		
			50		
C40, C50	M4, M5, M6, M8, M10, M12, M16	/	/	M6, M8	30
				M10, M12	40
				M16	50

* . . . Reference of corresponding national standard

Appendix A

Guidance for use of C-profile 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 permanent deformation of the rail.

The maximum permissible torque, according to table 3 for that stress, is independent of the distance between rail fixing points.

Table 3. Maximum torque M_{max}

C-profile	C 20	C 30	C 40	C 50
M_{max} in N mm	700	2 400	6 400	20 000

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

A method for assessing this deflection is shown in figure 4.

Using this method the maximum permissible torque, M_E , as a function of the distance, L , between fixing points has been calculated for the deflection $h = 1 \text{ mm}$ and is shown in figure 5.

For other values of h , (e.g. h_*) the torque M_{E*} may be calculated proportionally:

$$\frac{M_E}{M_{E*}} = \frac{h}{h*}$$

at any rate without exceeding the value M_{max} , to avoid a permanent deformation of the rail.

In practice deviations from the theoretical values may occur.

Measurements have shown that the deflection $h = 1 \text{ mm}$ is reached for moments M_E shown in figure 5 for distances, L , from 800 to 1 000 mm.

For shorter distances, the deflection, h , may be reduced to 0,5 mm and, for greater distances, increased to 2 mm.

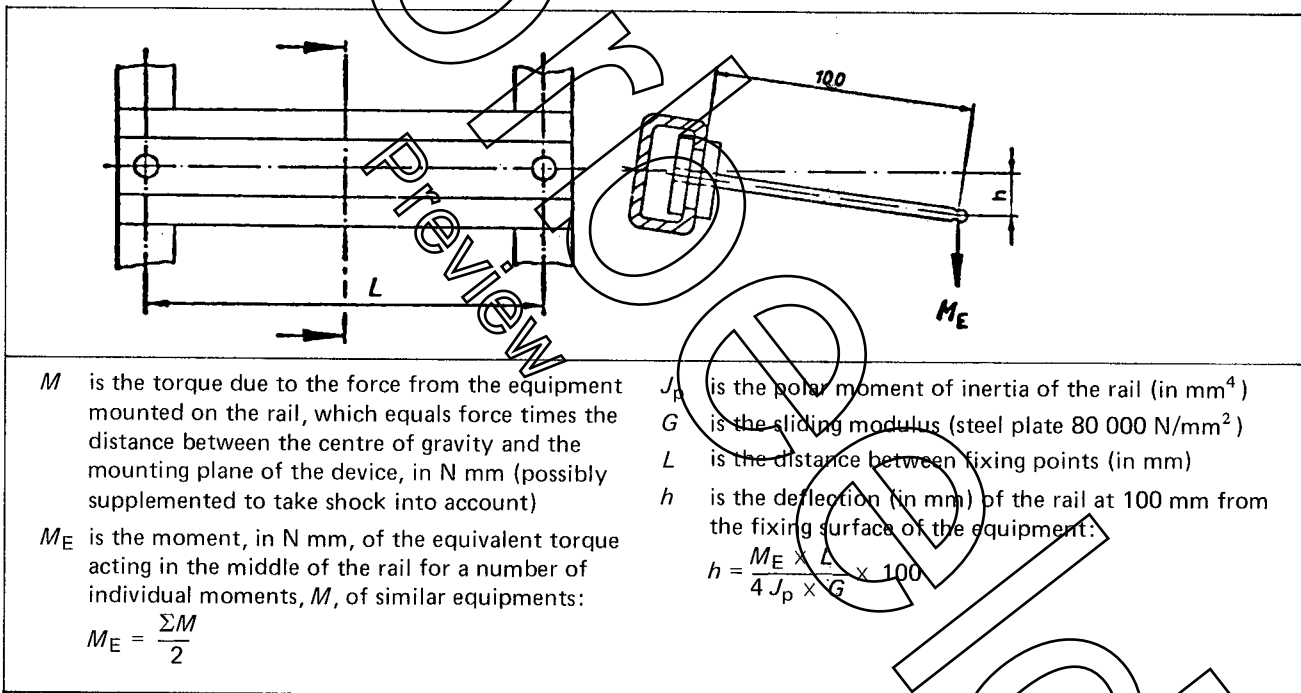


Figure 4. Assessment of deflection of a rail

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