

Open bar grating treads
for steel stairs**DIN**
24 531Trittstufen aus Gitterrost
für Treppen aus StahlSupersedes
May 1981 edition.

In keeping with current practice in standards published by the International Organization for Standardization (ISO), a comma has been used throughout as the decimal marker.

This standard has been jointly prepared by the Normenausschuß Maschinenbau (Mechanical Engineering Standards Committee) and the Hauptverband der gewerblichen Berufsgenossenschaften e. V., Zentralstelle für Unfallverhütung und Arbeitsmedizin (Federation of Industrial Employers' Liability Insurance Associations, Central Office for Accident Prevention and Occupational Medicine), Bonn.

Dimensions in mm

1 Field of application

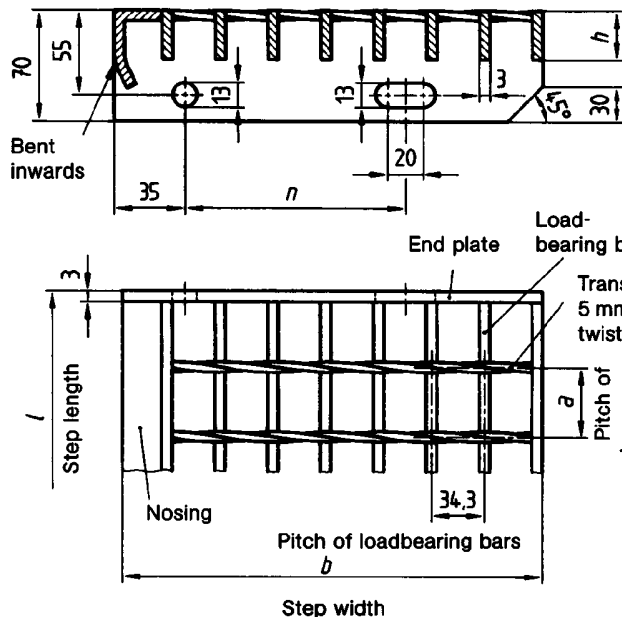
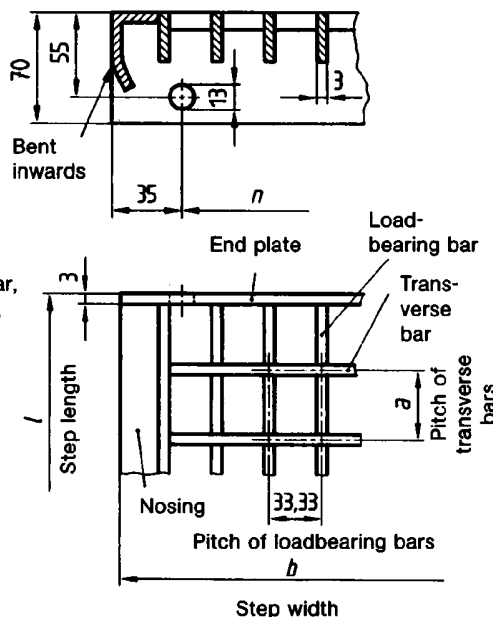
This standard specifies open bar grating treads for steel stairs for use in industrial applications (such as steel works, mills, power plants, and the chemical industry) and in mining.

2 Dimensions and designation

Treads are not expected to conform to the designs illustrated here; compliance is only required in the case of the dimensions specified.

For general tolerances, accuracy grade c as specified in ISO 2768 shall apply.

For welding tolerances, accuracy grade B as specified in DIN 8570 shall apply.

Type SP, gratings with bars fixed by welding**Type P, gratings with pressed bars**

Designation of a tread with a type SP grating in compliance with this standard, where h is equal to 40 mm, a is equal to 38,1 mm, l is equal to 800 mm and b is equal to 240 mm:

Tread DIN 24 531 - SP 40 - 38,1 - 800 × 240

Where the same tread is designed to be non-slip (e.g. of grade R 11), the designation shall be:

Tread DIN 24 531 - SP 40 - 38,1 - 800 × 240 - R 11

Continued on pages 2 and 3

Gratings

Dimensions and loadbearing capacity



24 537

Gitterroste; Maße, Bezeichnung, Belastung

Supersedes February 1980 edition.

In keeping with current practice in standards published by the International Organization for Standardization (ISO), a comma has been used throughout as the decimal marker.

Dimensions in mm

1 Scope and field of application

This standard specifies the dimensions and loadbearing capacity of gratings intended for use in industrial applications (such as steel works, mills, power plants, the chemical industry) and in mining.

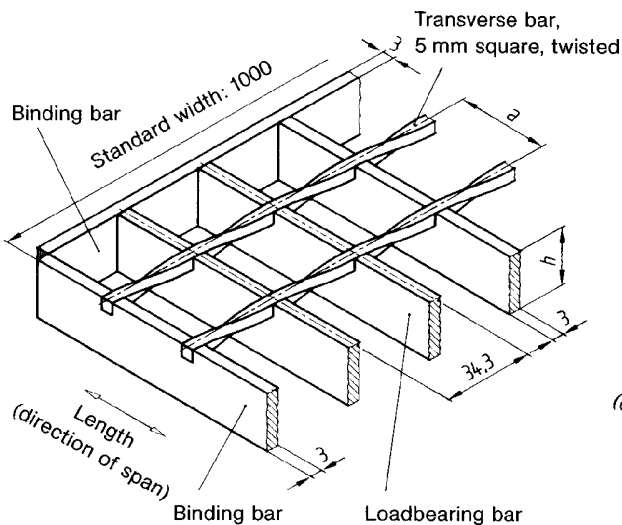
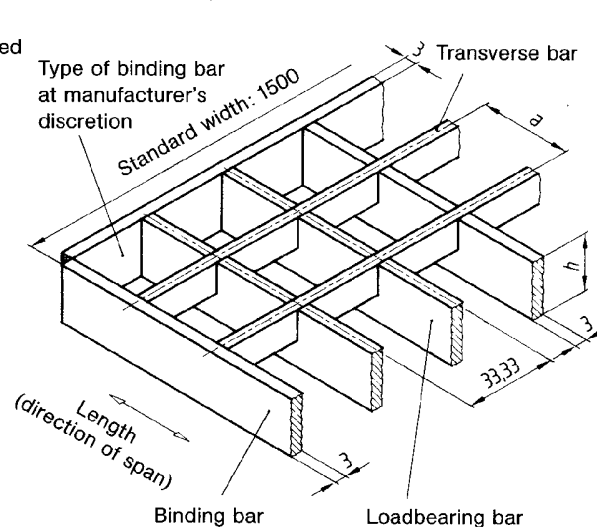
2 Note regarding safety

Gratings in accordance with this standard shall not be square, since it would not be possible to positively identify the direction of loading. (This does not apply for gratings supported on all sides, such as landings).

3 Dimensions and designation

For general tolerances, the specifications given in *RAL-Vorschrift* (RAL Specification) RAL GZ 638 shall apply.

The semi-finished products used shall be subject to the relevant tolerances.

Type SP, gratings with bars fixed by welding**Type P**, gratings with pressed bars

Designation of a type SP grating complying with this standard, where h is equal to 40 mm, a is equal to 38,1 mm, with a length in the direction of span (T) of 800 mm and a width of 1000 mm:

Grating DIN 27 537 – SP 40 – 38,1 – T 800 × 1000

Where the same grating is designed to be non-slip (e. g. of grade R 11), the designation shall be amended to read:

Grating DIN 24 537 – SP 40 – 38,1 – T 800 × 1000 – R 11

Table 1: Dimensions and masses

h	Pitch of transverse bars, a , for type		Approx. mass, in kg/m ²	
	SP	P	SP	P
30	38,1	33,33	29,5	30
40			37,5	38
30	50,8	-	28	-
40			36	-

Continued on pages 2 and 3.

4 Material

Gratings shall be made from DIN EN 10 025 weldable steel, the steel grade being at the manufacturer's discretion.

5 Design

Gratings shall either be of type SP (with bars fixed by welding) or of type P (with pressed bars).

Where non-slip gratings are required, this shall be specified at the time of ordering, including grades R 10 to R 13 as defined in the *Merkblatt für Fußböden in Arbeitsräumen und Arbeitsbereichen mit erhöhter Rutschgefahr* (Instruction sheet for floors in work rooms and work areas where there is a high risk of slipping) (ZH 1/571).

Corrosion protection shall be provided by means of hot-dip galvanizing in accordance with DIN 50 976, other types of corrosion protection being subject to agreement.

6 Loadbearing capacity

The required loadbearing capacity of gratings shall be the subject of agreement at the time of ordering.

In the case of gratings made from grade Fe 360 B (previously, St 37-2) steel as specified in DIN EN 10 025, their loadbearing capacity, as a function of effective span (which corresponds to the length measured in a direction parallel to the loadbearing bars) shall be as given in table 2. The values have been based on a maximum tensile stress of 160 N/mm² and a maximum deflection, f , of 1/200 of the effective span, but at most 4 mm.

Table 2: Loadbearing capacity of gratings

Grating type	h	Pitch of bars	Loadbearing capacity and deflection for an effective span, in mm, of					
				600	800	1000	1200	1500
SP	30	34,3 × 38,1	F_v	46,6	26,2	12,7	6,1	–
			f_1	1,9	3,4	4,0	4,0	–
		34,3 × 50,8	F_p	4,6	3,2	2,2	–	–
			f_2	1,7	2,9	4,0	–	–
	40	34,3 × 38,1	F_v	82,8	46,6	29,8	14,5	5,9
			f_1	1,4	2,5	4,0	4,0	4,0
		34,3 × 50,8	F_p	8,0	5,7	4,4	3,0	1,5
			f_2	1,3	2,2	3,4	4,0	4,0
P	30	33,3 × 33,3	F_v	43,2	24,3	11,8	5,7	–
			f_1	1,9	3,4	4,0	4,0	–
	40	33,3 × 33,3	F_p	4,8	3,4	2,3	–	–
			f_2	1,7	3,0	4,0	–	–
Key to symbols: F_v uniformly distributed load, in kN/m ² f_1 deflection, in mm, related to load F_v F_p concentrated imposed load, in kN, which acts on the centre of an area measuring 200 mm × 200 mm f_2 deflection, in mm, related to load F_p								

Standards and other documents referred to

- DIN 50 976 Corrosion protection by means of hot dip galvanizing; requirements and testing
- DIN EN 10 025 Hot rolled unalloyed structural steel products; technical delivery conditions
- RAL GZ 638 *Gütesicherung Gitterroste* (Quality assurance for gratings), issued by the *Ausschuß für Lieferbedingungen und Gütesicherung*, Bornheimer Straße 180, D-53119 Bonn
- ZH 1/571 *Merkblatt für Fußböden in Arbeitsräumen und Arbeitsbereichen mit erhöhter Rutschgefahr*, issued by the *Hauptverband der gewerblichen Berufsgenossenschaften e. V.*

Other relevant standards

- DIN 24 530 Design of steel stairs with open bar grating treads
- DIN 24 531 Lattice treads for steel stairs
- DIN 24 532 Fixed vertical steel ladders
- DIN 24 533 Steel railings

Previous edition

DIN 24 537: 02.80.

Amendments

In comparison with the February 1980 edition, the following amendments have been made.

- a) Nomenclature and symbols have been changed.
- b) Bar spacing is no longer specified, it being required instead to specify the pitch of transverse bars in the designation.
- c) Limit deviations have been changed.
- d) Requirements have been specified for non-slip gratings for the first time.
- e) Some of the values specified for load and deflection have been changed.
- f) The standard has been editorially revised.

<i>l</i>	<i>b</i>	<i>h</i>	<i>n</i>	Pitch of transverse bars, <i>a</i> , for type		Permissible concentrated load 1), in N	Approx. mass per unit, in kg
				SP	P		
0 -3	± 5						
600	240	30	120	38,1 50,8	33,33	1500	6
		40					7,5
	270	30	150				7,5
		40					9,5
	305	30	180				10
		40					12
800	240	30	120				8
		40					9,5
	270	30	150				9
		40					10,5
	305	30	180				11,5
		40					13
1000	240	30	120	9,5			
		40		11,5			
	270	30	150	10,5			
		40		12,5			
	305	30	180	13			
		40		15			
1200	240	40	120	13			
	270	40	150	15,5			
	305	40	180	18			

The lengths given in bold print shall be preferred.
 1) Load spread over an area of 100 mm × 100 mm, placed at the centre of the front edge of the tread.

3 Material

Treads shall be made from DIN EN 10 025 weldable steel, the steel grade being at the manufacturer's discretion.

4 Design

Both types of tread shall be manufactured in accordance with DIN 24 537.

Where non-slip treads are required, this shall be specified in the designation at the time of ordering, including grades R 10 to R 13 as defined in the *Merkblatt für Fußböden in Arbeitsräumen und Arbeitsbereichen mit erhöhter Rutschgefahr* (Instruction sheet for floors in work rooms and work areas where there is a high risk of slipping) (ZH 1/571).

The nosing of treads shall have a non-slip surface.

Corrosion protection shall be provided by means of hot-dip galvanizing in accordance with DIN 50 976, other types of corrosion protection being subject to agreement.

Standards and other documents referred to

DIN 8570 Part 1	General tolerances for welded structures; linear and angular dimensions.
DIN 24 537	Open bar gratings; dimensions, designation and permissible loading
DIN 50 976	Corrosion protection by means of hot-dip galvanizing; requirements and testing
DIN EN 10 025	Hot rolled unalloyed steel products; technical delivery conditions
ZH 1/571	<i>Merkblatt für Fußböden in Arbeitsräumen und Arbeitsbereichen mit erhöhter Rutschgefahr</i> , issued by the <i>Hauptverband der gewerblichen Berufsgenossenschaften e. V.</i>
ISO 2768 Part 1	Tolerances for linear and angular dimensions without individual tolerance indications

Other relevant standards

DIN 24 530	Design of steel stairs with open bar grating treads
DIN 24 532	Fixed vertical steel ladders
DIN 24 533	Steel railings

Previous editions

DIN 24 531: 03.70, 05.81.

Amendments

The following amendments have been made to the May 1981 edition.

- a) The illustration, symbols and dimension b have been changed; where l is equal to 1200 mm, h shall always be equal to 40 mm (and not 30 mm, as previously).
- b) The specified general tolerances have been changed.
- c) The values specified for the concentrated load have been changed.
- d) Treads designed to have a non-slip surface have been included.
- e) The standard has been editorially revised.