

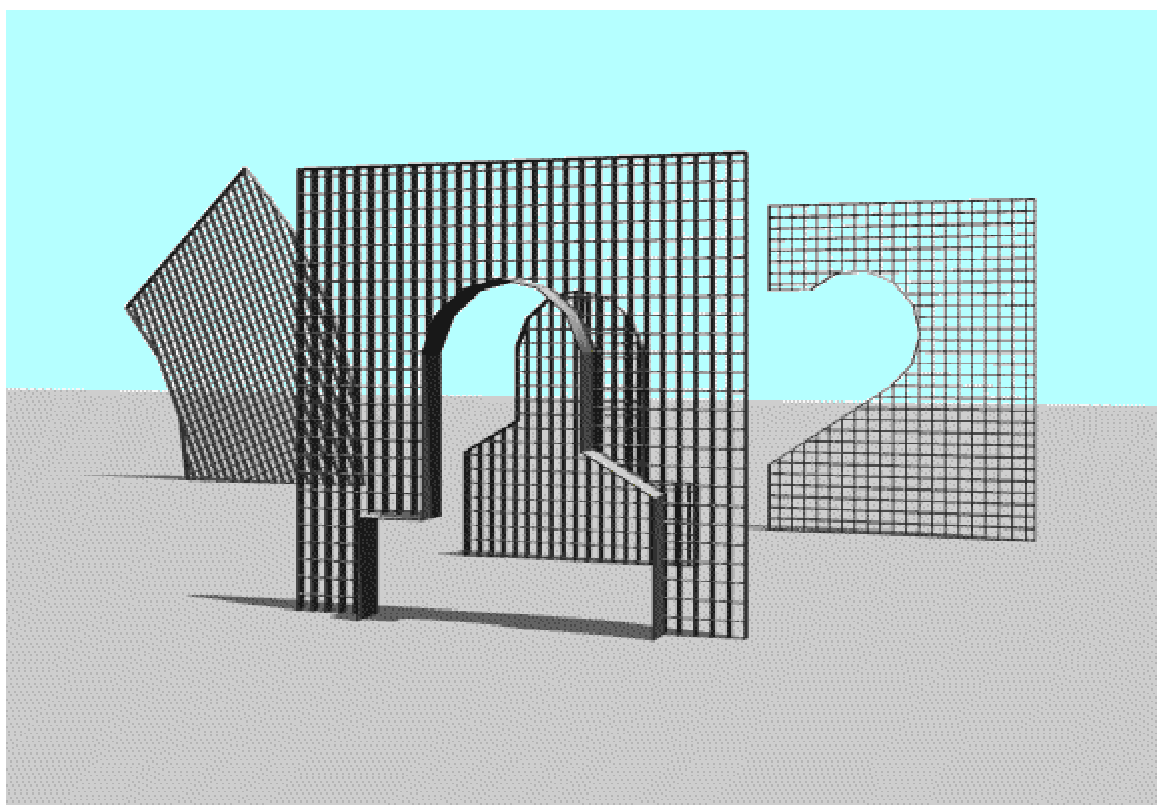
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NOVING Ltd.
Úlehlova 108/1
700 30 Ostrava – Hrabůvka
Czech Republic
TEL., FAX: +420 595 782 426 –7
E-MAIL: noving@noving.cz
<http://www.noving.cz>



FLOOR GRATINGS

DIRECTION 01



Types of Floor Gratings

Floor gratings consist of bearing rods and connecting rods. Grating types:

- welded gratings (connecting rods are welded to bearing rods)
- pressed gratings (connecting rods are connected to bearing rods by pressing)
- stainless gratings (kind of pressed gratings produced of stainless steel)

All the above-mentioned kinds are custom made, the dimensions and sizes are determined by the specific need of each customer, and they are also fulfilling the requirements of DIN 24 537 standard.

Usage

Gratings find numerous applications, namely in the following areas:

- access steelworks in industrial facilities and power engineering
- passages of overhead cranes and crane tracks
- passages along pipelines and tanks
- bridge flooring
- covering of drains, manholes or channels
- stair treads

The main advantages of floor gratings include easy floor cleaning, high load capacity with low weight, easy assembly and disassembly.

Surface Protection and Supplementary Production

Floor gratings and stair treads are supplied:

- raw without surface protection
- painted
- with surface protection by hot dipped galvanizing according to DIN 50 976

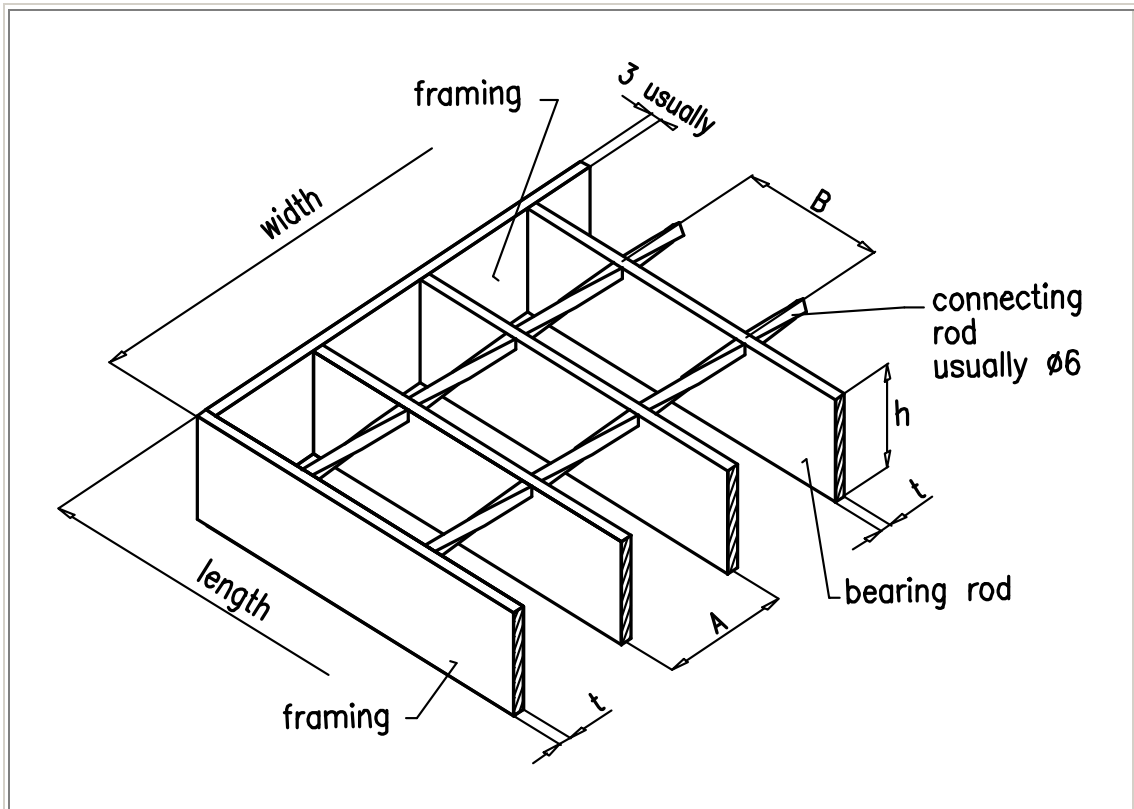
NOVING Ltd. supplies also stair treads according to DIN 24 531, spiral flights, and connecting material (grating clips).

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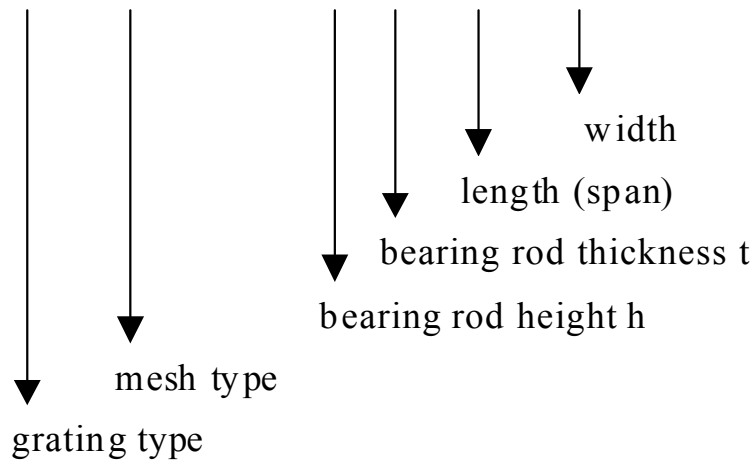
Welded Gratings According to DIN 24 537

Description



Sample description:

SP 30 x 30 AA / 30 x 3 / 900 x 1000



Term explanation

Length / Span	The size of grating in the direction of bearing rods. It corresponds to the span of supports. It is placed first in the description of grating size.
Width	The size of grating in the direction perpendicular to bearing rods.
Recommended width	The width, which does not require longitudinal framing. (Concerns welded gratings only.)
Recommended widths for supporting rod 2 mm	208, 242, 276, 311, 345, 379, 414, 448, 482, 517, 551, 585, 619, 654, 688, 722, 757, 791, 825, 860, 894, 928, 962, 997 (nominal width 1 m)
Recommended widths for supporting rod 3 mm	209, 243, 277, 312, 346, 380, 415, 449, 483, 518, 552, 586, 620, 655, 689, 723, 758, 792, 826, 861, 895, 929, 963, 998 (nominal width 1 m)
For ordering it is recommended to use the nominal width 1000 mm as much as possible. The real width is then 1000^{+0}_{-4} mm.	

Mesh types

Mesh type	Real rod distance (AxB)	
30 x 30 AA	34,3 x 38,1	
30 x 45 AC	34,3 x 50,8	
30 x 70 AE	34,3 x 76,2	
30 x 100 AH	30,2 x 101,6	
40 x 100 BH	41,5 x 101,6	

Bearing rod types

-	25 x 2	30 x 2	40 x 2	-	-	-	-
20 x 3	25 x 3	30 x 3	40 x 3	-	-	-	-
-	-	-	-	-	-	-	-
-	-	30 x 5	40 x 5	50 x 5	60 x 5	70 x 5	80 x 5

Load table

#	*	Length, span of supports [mm]																				
		500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500
		Mesh type 30 x 30 AA (nominal mesh size 30 x 30 mm, real mesh size 34,3 x 38,1 mm)																				
25 x 2	q	31,05	21,60	15,85	12,15	9,60	7,75	6,40	5,40	-	-	-	-	-	-	-	-	-	-	-	-	-
	f	1,6	2,3	3,1	4,1	5,1	6,3	7,7	9,1	-	-	-	-	-	-	-	-	-	-	-	-	-
	P	2,65	2,15	1,80	1,50	1,35	1,20	1,05	1,00	-	-	-	-	-	-	-	-	-	-	-	-	-
	fl	1,5	2,1	2,8	3,6	4,5	5,5	6,7	7,8	-	-	-	-	-	-	-	-	-	-	-	-	-
30 x 2	q	44,75	31,10	22,85	17,50	13,80	11,20	9,25	7,75	6,60	5,70	5,00	-	-	-	-	-	-	-	-	-	-
	f	1,3	1,9	2,6	3,4	4,3	5,3	6,4	7,6	8,9	10,4	11,9	-	-	-	-	-	-	-	-	-	-
	P	3,80	3,05	2,55	2,20	1,90	1,70	1,50	1,40	1,30	1,20	1,10	-	-	-	-	-	-	-	-	-	-
	fl	1,2	1,7	2,3	3,0	3,8	4,6	5,5	6,6	7,6	8,8	10,1	-	-	-	-	-	-	-	-	-	-
40 x 2	q	79,55	55,20	40,60	31,10	24,55	19,90	16,45	13,80	11,80	10,15	8,85	7,75	6,90	6,15	5,50	5,00	-	-	-	-	-
	f	1,0	1,4	1,9	2,5	3,2	4,0	4,8	5,7	6,7	7,8	8,89	10,2	11,5	12,9	14,3	15,9	-	-	-	-	-
	P	6,70	5,35	4,45	3,80	3,35	2,95	2,65	2,40	2,25	2,05	1,90	1,80	1,65	1,60	1,50	1,40	-	-	-	-	-
	fl	0,9	1,3	1,7	2,3	2,8	3,5	4,2	4,9	5,8	6,6	7,6	8,6	9,6	10,8	12,0	13,3	-	-	-	-	-
25 x 3	q	46,60	32,40	23,80	18,20	14,40	11,65	9,60	8,10	6,90	5,95	5,20	-	-	-	-	-	-	-	-	-	-
	f	1,6	2,3	3,1	4,1	5,1	6,4	7,7	9,1	10,7	12,4	14,3	-	-	-	-	-	-	-	-	-	-
	P	4,00	3,20	2,65	2,30	2,00	1,80	1,60	1,45	1,35	1,25	1,15	-	-	-	-	-	-	-	-	-	-
	fl	1,5	2,1	2,8	3,6	4,5	5,5	6,7	7,9	9,2	10,6	12,1	-	-	-	-	-	-	-	-	-	-
30 x 3	q	67,10	46,6	34,25	26,20	20,70	16,80	13,90	11,65	9,90	8,55	7,45	6,55	5,80	5,20	-	-	-	-	-	-	-
	f	1,3	1,9	2,6	3,4	4,3	5,3	6,4	7,6	8,9	10,4	11,9	13,5	15,3	17,1	-	-	-	-	-	-	-
	P	5,70	4,60	3,80	3,30	2,85	2,55	2,30	2,10	1,90	1,75	1,65	1,50	1,45	1,35	-	-	-	-	-	-	-
	fl	1,2	1,7	2,3	3,0	3,8	4,6	5,5	6,6	7,7	8,9	10,1	11,5	12,9	14,4	-	-	-	-	-	-	-
40 x 3	q	119,30	82,85	60,90	46,60	36,80	29,80	24,65	20,70	17,65	15,20	13,25	11,65	10,30	9,20	8,25	7,45	6,75	6,15	5,65	5,20	-
	f	1,0	1,4	1,9	2,5	3,2	4,0	4,8	5,7	6,7	7,8	8,9	10,2	11,5	12,9	14,3	15,9	17,5	19,2	21,0	22,9	-
	P	10,00	8,00	6,70	5,70	5,00	4,45	4,00	3,65	3,35	3,10	2,90	2,70	2,50	2,35	2,20	2,10	2,00	1,90	1,80	1,70	-
	fl	0,9	1,3	1,7	2,3	2,8	3,5	4,2	4,9	5,8	6,6	7,6	8,6	9,7	10,8	12,0	13,3	14,6	16,0	17,5	19,0	-
30 x 5	q	111,85	77,65	57,05	43,70	34,50	27,95	23,10	19,40	16,55	14,25	12,40	10,90	9,70	8,65	7,75	7,00	6,35	5,80	5,30	-	-
	f	1,3	1,9	2,6	3,4	4,3	5,3	6,4	7,6	8,9	10,4	11,9	13,5	15,3	17,1	19,1	21,2	23,3	25,6	28,0	-	-
	P	9,55	7,65	6,35	5,45	4,80	4,25	3,80	3,50	3,20	2,95	2,70	2,55	2,40	2,25	2,10	2,00	1,90	1,80	1,75	-	-
	fl	1,2	1,7	2,3	3,0	3,8	4,6	5,5	6,6	7,7	8,8	10,1	11,5	12,9	14,4	16,0	17,7	19,5	21,4	23,3	-	-
40 x 5	q	198,85	138,10	101,45	77,65	61,40	49,70	41,10	34,50	29,40	25,35	22,10	19,40	17,20	15,35	13,80	12,40	11,30	10,30	9,40	8,65	7,95
	f	1,0	1,4	1,9	2,5	3,2	4,0	4,8	5,7	6,7	7,8	8,9	10,2	11,5	12,9	14,3	15,9	17,5	19,2	21,0	22,9	24,8
	P	16,70	13,35	11,15	9,55	8,35	7,40	6,70	6,10	5,55	5,15	4,75	4,45	4,20	3,95	3,70	3,50	3,35	3,20	3,05	2,90	2,80
	fl	0,9	1,3	1,7	2,3	2,8	3,5	4,2	4,9	5,7	6,6	7,6	8,6	9,7	10,8	12,0	13,3	14,6	16,0	17,5	19,0	20,6
50 x 5	q	310,70	215,80	158,50	121,40	95,90	77,70	64,20	53,95	45,95	39,60	34,50	30,35	26,90	24,00	21,50	19,40	17,60	16,05	14,70	13,50	12,40
	f	0,8	1,1	1,5	2,0	2,6	3,2	3,8	4,6	5,4	6,2	7,1	8,1	9,2	10,3	11,5	12,7	14,0	15,4	16,8	18,3	19,8
	P	25,70	20,55	17,10	14,70	12,85	11,40	10,30	9,35	8,55	7,90	7,35	6,85	6,40	6,05	5,70	5,40	5,15	4,90	4,70	4,45	4,30
	fl	0,7	1,0	1,4	1,8	2,3	2,8	3,3	3,9	4,6	5,3	6,1	6,9	7,8	8,7	9,6	10,6	11,7	12,8	14,0	15,2	16,5
60 x 5	q	447,40	310,70	228,30	174,80	138,10	111,85	92,45	77,70	66,20	57,05	49,70	43,70	38,70	34,50	31,00	27,95	25,35	23,3	21,15	19,40	17,90
	f	0,7	1,0	1,3	1,7	2,1	2,6	3,2	3,8	4,5	5,2	6,0	6,8	7,7	8,6	9,6	10,6	11,7	12,8	14,0	15,2	16,5
	P	36,35	29,10	24,25	20,80	18,20	16,15	14,55	13,20	12,10	11,20	10,40	9,70	9,10	8,55	8,10	7,65	7,30	6,90	6,60	6,30	6,05
	fl	0,6	0,9	1,2	1,5	1,9	2,3	2,8	3,3	3,8	4,4	5,1	5,7	6,5	7,2	8,0	8,9	9,8	10,7	11,7	12,7	13,7
70 x 5	q	609,00	422,90	310,70	237,90	187,95	152,25	125,80	105,75	90,10	77,70	67,65	59,45	52,70	47,00	42,15	38,05	34,50	31,45	28,80	26,45	24,35
	f	0,6	0,8	1,1	1,4	1,8	2,3	2,7	3,3	3,8	4,4	5,1	5,8	6,6	7,3	8,2	9,1	10,0	11,0	12,0	13,1	14,2
	P	48,70	38,95	32,50	27,85	24,35	21,65	19,50	17,70	16,25	15,00	13,90	13,00	12,20	11,45	10,80	10,25	9,75	9,30	8,85	8,50	8,10
	fl	0,5	0,7	1,0	1,3	1,6	2,0	2,4	2,8	3,3	3,8	4,3	4,9	5,5	6,2	6,9	7,6	8,4	9,2	10,0	10,9	11,8
80 x 5	q	795,40	552,40	405,85	310,70	245,50	198,85	164,35	138,10	117,70	101,45	88,40	77,70	68,80	61,40	55,10	49,70	45,10	41,10	37,60	34,50	31,80
	f	0,5	0,7	1,0	1,3	1,6	2,0	2,4	2,9	3,4	3,9	4,5	5,1	5,7	6,4	7,2	7,9	8,8	9,6	10,5	11,4	12,4
	P	62,50	50,00	41,70	35,70	31,25	27,80	25,00	22,75	20,85	19,25	17,85	16,65	15,60	14,70	13,90	13,15	12,50	11,90	11,35	10,90	10,40
	fl	0,5	0,7	0,9	1,1	1,4	1,7	2,1	2,5	2,9	3,3	3,8	4,3	4,8	5,4	6,0	6,7	7,3	8,0	8,7	9,5	10,3

Explanations:

bearing rod [mm]

* q= uniform load in kN/m², f= deflection in mm from load q

P= point load in kN in the center of grating 200x200 mm, fl= deflection in mm from P

To determine the load of welded gratings with different mesh size it is possible to use the coefficient w from the following table.

Mesh type	30x30 AA	30x45 AC	30x70 AE	30x100 AH	40x100 BH
Coefficient w	1,00	0,95	0,92	0,95	0,72

Weight table

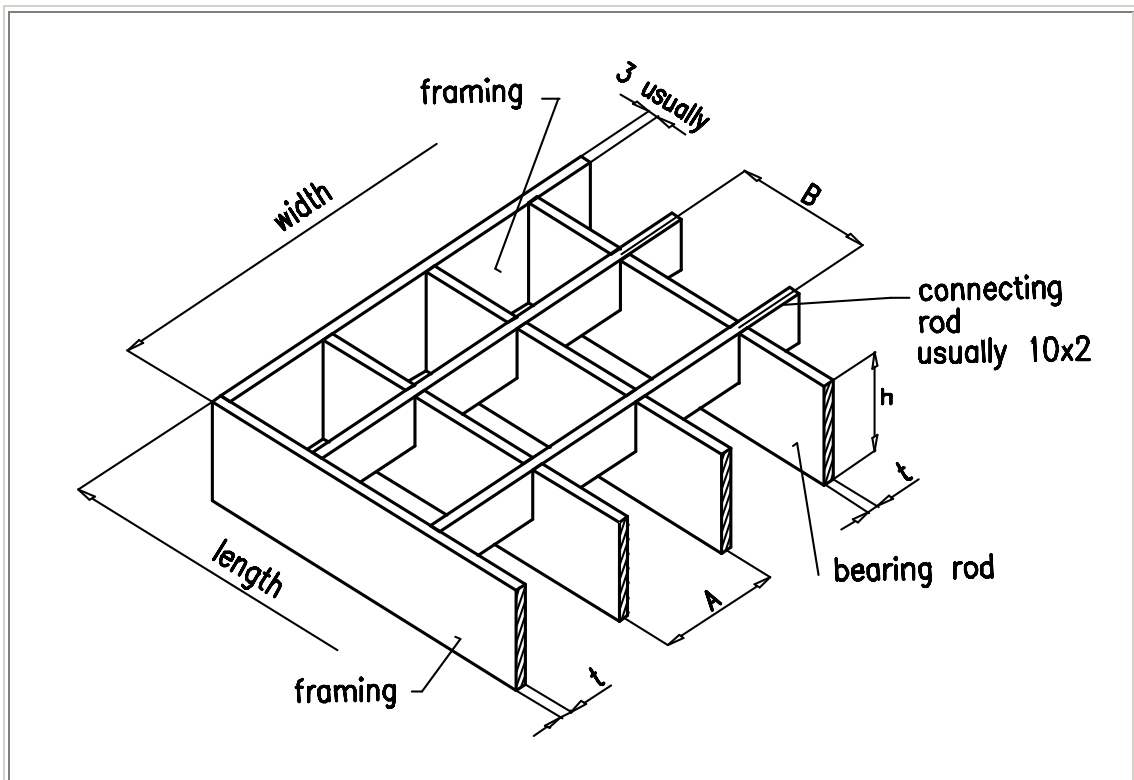
Mesh type	Bearing rod [mm]	Framed gratings	
		raw	galvanized
		weight [kg/m ²]	weight [kg/m ²]
30 x 30	-	-	-
	25 x 2	17,0	19,0
	30 x 2	19,5	22,0
	40 x 2	24,5	27,5
	25 x 3	23,5	25,5
	30 x 3	27,5	29,5
	40 x 3	34,5	37,5
	-	-	-
	30 x 5	44,5	47,0
	40 x 5	57,0	61,0
	50 x 5	69,5	75,5
	60 x 5	81,5	88,0
	70 x 5	94,5	102,0
	80 x 5	106,5	114,5
30 x 45	-	-	-
	25 x 2	16,0	17,5
	30 x 2	18,5	20,5
	40 x 2	23,5	26,0
	25 x 3	22,0	24,0
	30 x 3	26,0	28,5
	40 x 3	33,5	36,5
	-	-	-

Mesh type	Bearing rod [mm]	Framed gratings	
		raw	galvanized
		weight [kg/m ²]	weight [kg/m ²]
30 x 45	30 x 5	42,5	45,5
	40 x 5	55,0	58,5
	50 x 5	67,5	72,0
	60 x 5	80,0	85,0
	70 x 5	92,5	98,5
	80 x 5	105,0	112,0
	-	-	-
30 x 70	25 x 2	15,0	16,5
	30 x 2	17,5	19,5
	40 x 2	22,5	25,0
	25 x 3	21,0	23,0
	30 x 3	24,5	26,5
	40 x 3	32,5	35,0
	-	-	-
	30 x 5	41,0	43,5
	40 x 5	53,5	56,5
	50 x 5	66,0	70,0
	60 x 5	78,0	83,5
	70 x 5	91,0	96,5
	80 x 5	102,0	110,0

Pressed Gratings According to DIN 24 537

Pressed gratings found their applications in industry as well as architectural elements in interiors, air-conditioning covers etc.

Description



Sample description:

P 33 x 33 / 30 x 3 / 900 x 1000

↓ mesh type
↓ grating type

↓ bearing rod height h

↓ bearing rod thickness t

↓ length (span)

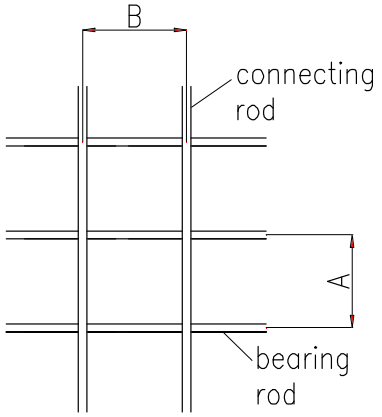
↓ width

Term explanation

Length / Span	The size of grating in the direction of bearing rods. It corresponds to the span of supports. It is placed first in the description of grating size.
Width	The size of grating in the direction perpendicular to bearing rods.

Mesh types

Mesh type A x B					
22 x 11	22 x 22	22 x 33	22 x 44	-	-
33 x 11	33 x 22	33 x 33	33 x 44	-	33 x 66
44 x 11	44 x 22	44 x 33	44 x 44	44 x 55	-
-	-	-	-	55 x 55	-
-	-	-	-	-	66 x 66



Bearing rod types

20 x 2	25 x 2	30 x 2	-	40 x 2	-	-
20 x 3	25 x 3	30 x 3	-	40 x 3	50 x 3	
-	-	-	-	40 x 4	-	-
-	-	30 x 5	-	40 x 5	50 x 5	60 x 5

Load table

#	*	Mesh type 33 x 33. Length, span of supports [mm]																					
		500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500	
20 x 2	q	18,45	12,80	9,40	7,20	5,70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	f	2,0	2,9	3,9	5,1	6,4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P	1,80	1,45	1,20	1,00	0,90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	f1	1,8	2,6	3,5	4,5	5,7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 x 2	q	28,80	20,00	14,70	11,25	8,90	7,20	5,95	5,00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	f	1,6	2,3	3,1	4,1	5,1	6,3	7,7	9,1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P	2,75	2,20	1,85	1,60	1,40	1,25	1,10	1,00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	f1	1,5	2,1	2,8	3,6	4,5	5,5	6,7	7,9	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30 x 2	q	41,50	28,80	21,15	16,20	12,80	10,35	8,55	7,20	6,15	5,30	-	-	-	-	-	-	-	-	-	-	-	-
	f	1,3	1,9	2,6	3,4	4,3	5,3	6,4	7,6	8,9	10,4	-	-	-	-	-	-	-	-	-	-	-	-
	P	3,95	3,20	2,65	2,25	2,00	1,75	1,60	1,45	1,30	1,20	-	-	-	-	-	-	-	-	-	-	-	-
	f1	1,2	1,7	2,3	3,0	3,8	4,6	5,5	6,6	7,7	8,8	-	-	-	-	-	-	-	-	-	-	-	-
40 x 2	q	73,75	51,20	37,60	28,80	22,75	18,45	15,25	12,80	10,90	9,40	8,20	7,20	6,40	5,70	5,10	-	-	-	-	-	-	-
	f	1,0	1,4	1,9	2,5	3,2	4,0	4,8	5,7	6,7	7,8	8,9	10,2	11,5	12,9	14,3	-	-	-	-	-	-	-
	P	6,90	5,55	4,60	3,95	3,45	3,10	2,75	2,50	2,30	2,15	1,98	1,84	1,72	1,63	1,54	-	-	-	-	-	-	-
	f1	0,9	1,3	1,7	2,3	2,8	3,5	4,2	4,9	5,7	6,6	7,6	8,6	9,7	10,8	12,0	-	-	-	-	-	-	-
20 x 3	q	27,65	19,20	14,10	10,80	8,55	6,90	5,70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	f	2,0	2,9	3,9	5,1	6,4	7,9	9,6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	P	2,70	2,15	1,80	1,55	1,35	1,20	1,05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	f1	1,8	2,6	3,5	4,5	5,7	6,9	8,3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25 x 3	q	43,20	30,00	22,05	16,90	13,35	10,80	8,90	7,50	6,40	5,50	-	-	-	-	-	-	-	-	-	-	-	-
	f	1,6	2,3	3,1	4,1	5,1	6,4	7,7	9,1	10,7	12,4	-	-	-	-	-	-	-	-	-	-	-	-
	P	4,15	3,35	2,80	2,40	2,10	1,85	1,65	1,50	1,40	1,30	-	-	-	-	-	-	-	-	-	-	-	-
	f1	1,5	2,1	2,8	3,6	4,5	5,5	6,7	7,9	9,2	10,6	-	-	-	-	-	-	-	-	-	-	-	-
30 x 3	q	62,20	43,20	31,75	24,30	19,20	15,55	12,85	10,80	9,20	7,95	6,90	6,10	5,40	-	-	-	-	-	-	-	-	-
	f	1,3	1,9	2,6	3,4	4,3	5,3	6,4	7,6	8,9	10,4	11,9	13,5	15,3	-	-	-	-	-	-	-	-	-
	P	5,95	4,75	3,95	3,40	3,00	2,65	2,40	2,15	2,00	1,85	1,70	1,60	1,50	-	-	-	-	-	-	-	-	-
	f1	1,2	1,7	2,3	3,0	3,8	4,6	5,5	6,6	7,7	8,8	10,1	11,5	12,9	-	-	-	-	-	-	-	-	-
40 x 3	q	110,60	76,80	56,45	43,20	34,15	27,65	22,85	19,20	16,35	14,10	12,30	10,80	9,55	8,55	7,65	6,90	6,30	5,70	5,20	-	-	-
	f	1,0	1,4	1,9	2,5	3,2	4,0	4,8	5,7	6,7	7,8	8,9	10,2	11,5	12,9	14,3	15,9	17,5	19,2	21,0	-	-	-
	P	10,40	8,30	6,90	5,95	5,20	4,60	4,15	3,75	3,45	3,20	2,95	2,75	2,60	2,45	2,30	2,20	2,05	2,00	1,90	-	-	-
	f1	0,9	1,3	1,7	2,3	2,8	3,5	4,2	4,9	5,7	6,6	7,6	8,6	9,7	10,8	12,0	13,3	14,6	16,0	17,5	-	-	-
40 x 4	q	147,50	102,40	75,25	57,60	45,50	36,85	30,45	25,60	21,80	18,80	16,40	14,40	12,75	11,40	10,20	9,20	8,35	7,60	6,95	6,40	5,90	-
	f	1,0	1,4	1,9	2,5	3,2	4,0	4,8	5,7	6,7	7,8	8,9	10,2	11,5	12,9	14,3	15,9	17,5	19,2	21,0	22,9	24,8	-
	P	13,80	11,05	9,20	7,90	6,90	6,15	5,55	5,05	4,60	4,25	3,95	3,70	3,45	3,25	3,05	2,90	2,75	2,65	2,50	2,40	2,30	-
	f1	0,9	1,3	1,7	2,3	2,8	3,5	4,2	4,9	5,7	6,6	7,6	8,6	9,7	10,8	12,0	13,3	14,6	16,0	17,5	19,0	20,6	-
30 x 5	q	103,70	72,00	52,90	40,50	32,00	25,90	21,40	18,00	15,35	13,20	11,50	10,10	8,95	8,00	7,20	6,50	5,90	5,35	4,90	-	-	-
	f	1,3	1,9	2,6	3,4	4,3	5,3	6,4	7,6	8,9	10,4	11,9	13,5	15,3	17,1	19,1	21,2	23,3	25,6	28,0	-	-	-
	P	9,70	7,80	6,50	5,55	4,85	4,30	3,90	3,55	3,25	3,00	2,80	2,60	2,45	2,30	2,15	2,05	1,95	1,85	1,75	-	-	-
	f1	1,2	1,7	2,3	3,0	3,8	4,6	5,5	6,6	7,7	8,8	10,1	11,5	12,9	14,4	16,0	17,7	19,5	21,4	23,3	-	-	-
40 x 5	q	184,35	128,00	94,05	72,00	56,90	46,10	38,10	32,00	27,25	23,50	20,50	18,00	15,95	14,20	12,75	11,50	10,45	9,50	8,70	8,00	7,40	-
	f	1,0	1,4	1,9	2,5	3,2	4,0	4,8	5,7	6,7	7,8	8,9	10,2	11,5	12,9	14,3	15,9	17,5	19,2	21,0	22,9	24,8	-
	P	17,30	13,80	11,50	9,90	8,65	7,70	6,90	6,30	5,75	5,30	4,95	4,60	4,30	4,05	3,85	3,65	3,45	3,30	3,15	3,00	2,90	-
	f1	0,9	1,3	1,7	2,3	2,8	3,5	4,2	4,9	5,7	6,6	7,6	8,6	9,7	10,8	12,0	13,3	14,6	16,0	17,5	19,0	20,6	-
50 x 5	q	288,00	200,00	146,95	112,50	88,90	72,00	59,50	50,00	42,60	36,75	32,00	28,10	24,90	22,20	19,95	18,00	16,30	14,85	13,60	12,50	11,50	-
	f	0,8	1,1	1,6	2,0	2,6	3,2	3,8	4,6	5,4	6,2	7,1	8,1	9,2	10,3	11,5	12,7	14,0	15,4	16,8	18,3	19,8	-
	P	26,50	21,20	17,65	15,15	13,25	11,75	10,60	9,65	8,85	8,15	7,60	7,05	6,60	6,25	5,90	5,60	5,30	5,05	4,80	4,60	4,40	-
	f1	0,7	1,0	1,4	1,8	2,3	2,8	3,3	3,9	4,6	5,3	6,1	6,9	7,7	8,7	9,6	10,6	11,7	12,8	14,0	15,2	16,5	-
60 x 5	q	414,75	288,00	211,60	162,00	128,00	103,70	85,70	72,00	61,35	52,90	46,10	40,50	35,90	32,00	28,70	25,90	23,50	21,40	19,60	18,00	16,60	-
	f	0,7	1,0	1,3	1,7	2,1	2,6	3,2	3,8	4,5	5,2	6,0	6,8	7,6	8,6	9,6	10,6	11,7	12,8	14,0	15,2	16,5	-
	P	37,45	30,00	24,95	21,40	18,75	16,65	15,00	13,60	12,50	11,55	10,70	10,00	9,35	8,80	8,30	7,90	7,50	7,15	6,80	6,50	6,25	-
	f1	0,6	0,9	1,2	1,5	1,9	2,3	2,8	3,3	3,8	4,4	5,1	5,7	6,5	7,2	8,0	8,9	9,8	10,7	11,7	12,7	13,7	-

Explanations:

bearing rod [mm]

* q= uniform load in kN/m², f= deflection in mm from load q

P= point load in kN in the center of grating 200x200 mm, f1= deflection in mm from P

To determine the load of pressed gratings with different mesh type it is possible to use the coefficient w from the following table.

Mesh type	22x11 22x22 22x33 22x44	33x11 33x22 33x33 33x44 33x66	44x11 44x22 44x33 44x44 44x55	55x55	66x66
Coefficient w	1,48	1,00	0,74	0,58	0,52

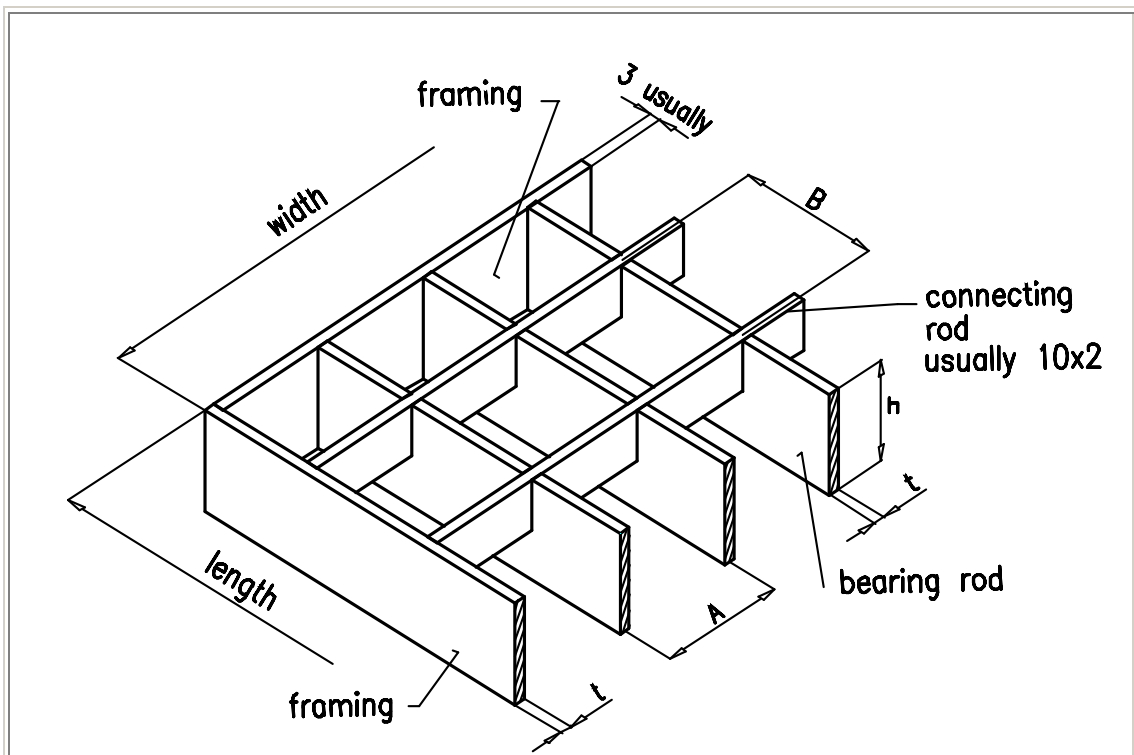
Weight table

Weight [kg/m ²]	Bearing rod [mm]									
	20x2	25x2	30x2	40x2	50x2	20x3	25x3	30x3	40x3	50x3
11 x 11	42,9	50,0	57,2	71,5	85,8	57,2	67,9	78,6	100,0	121,5
22 x 11	28,8	32,3	36,0	43,2	50,4	36,0	41,4	46,8	57,7	68,5
22 x 22	21,7	25,3	28,9	36,1	43,4	28,9	34,3	39,7	50,6	61,4
22 x 33	19,4	22,9	26,5	33,8	41,0	26,5	32,0	37,4	48,2	59,1
22 x 44	18,2	21,7	25,4	32,6	39,8	25,4	30,8	36,2	47,1	57,9
33 x 11	24,0	26,5	28,9	33,8	38,6	28,9	32,6	36,2	43,5	50,8
33 x 22	17,0	19,4	21,9	26,7	31,6	21,9	25,5	29,1	36,5	43,8
33 x 33	14,6	17,1	19,5	24,4	29,2	19,5	23,2	26,8	34,1	41,4
33 x 44	13,5	16,9	18,3	23,2	28,1	18,3	22,0	25,6	32,9	40,2
33 x 77	11,9	14,4	16,8	21,7	26,6	16,8	20,5	24,1	31,4	38,8
44 x 11	21,7	23,5	25,4	29,1	32,8	25,4	28,2	30,9	36,5	42,0
44 x 22	14,6	16,5	18,3	22,0	25,7	18,3	21,1	23,9	29,4	34,9
44 x 33	12,3	14,1	16,0	19,7	23,3	16,0	18,7	21,5	27,0	32,6
44 x 44	11,1	12,9	14,8	18,5	22,2	14,8	17,6	20,3	25,9	31,4
44 x 55	10,4	12,2	14,1	17,8	21,5	14,1	16,9	19,6	25,1	30,7
55 x 55	8,9	10,5	11,9	14,9	17,9	11,9	14,2	16,4	20,9	25,4
66 x 66	7,5	8,8	10,1	12,6	15,1	10,1	11,9	13,8	17,6	21,4
99 x 99	5,2	6,0	6,9	8,6	10,4	6,9	8,2	9,5	12,1	14,7

Stainless Gratings According to DIN 24 537

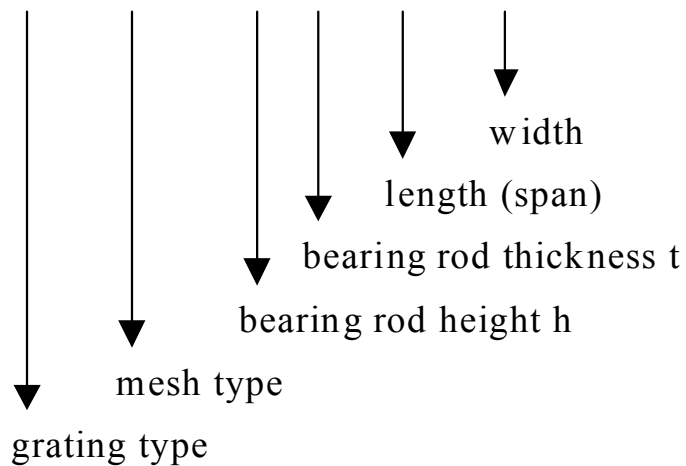
The construction of stainless gratings is identical to the one of pressed gratings. Therefore, their properties, such as weight or loading capability are the same as these of pressed gratings. The only difference between them is used material - stainless steel according to DIN 1.4301.

Description



Sample description:

PN 33 x 33 / 30 x 3 / 900 x 1000



Term explanation

Length / Span	The size of grating in the direction of bearing rods. It corresponds to the span of supports. It is placed first in the description of grating size.
Width	The size of grating in the direction perpendicular to bearing rods.

Mesh types

Mesh type A x B					
-	-	25 x 25	-	-	
33 x 11	33 x 16	-	33 x 33	33 x 66	

Bearing rod types

Bearing rods 30 x 2 are produced for all mesh types, rods 30 x 3, 40 x 2, and 40 x 3 are produced for selected mesh types only.

Load table

To determine the approximate values of load and deflection for stainless gratings, it is possible to use relevant tables for pressed gratings with the following reduction coefficients:

Load coefficient	0,9
Deflection coefficient	0,9

Weight table

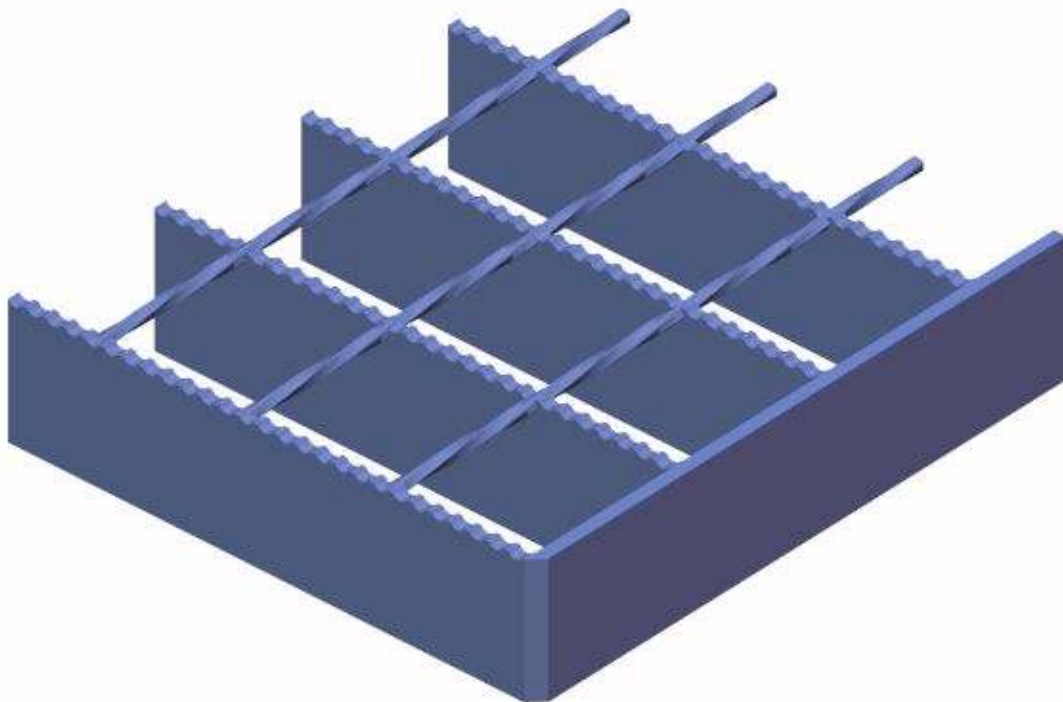
To determine the weight of stainless gratings, relevant tables for pressed gratings may be employed.

Special Gratings According to DIN 24 537

Special gratings to be used for slanted areas and bridges or in places with higher danger of slipping (snow, ice, wetness, oil...). These gratings are produced in order to maximally increase the friction to ensure safety under the above-mentioned conditions. Employed kinds of gratings are welded, pressed or stainless gratings.

Special gratings are usually supplied with following bearing rods: 30x3, 40x3. Upon request it is possible to supply also rods 20x3, 25x3.

Loading capacity of special gratings is 9-24% lower than equivalent normal grating. Deflections are increased by approximately 4-17%.



Grating Type Selection

Simplified type selection

Under an assumption of support distance 1000 to 1500 mm and permitted deflection $f = 1 / 200$, maximum 4 mm, it is possible to choose the dimensions of bearing rods according to the following table:

Load	Load kind	Presumed load [kN/m²]	Recommended minimal dimensions if bearing rods [mm]
Light	single person	3,40	30 x 2

Load	Load kind	Presumed load [kN/m ²]	Recommended minimal dimensions if bearing rods [mm]
Middle	pedestrians	3,40 to 4,90	30 x 2 30 x 3
Middle heavy	transport and storing of lighter loads	4,90 to 9,80	30 x 3 40 x 2
Heavy	transport and storing of heavy loads	from 9,80	40 x 3
Transport	heavy trucks and other heavy vehicles	Max. wheel pressure as a point load	40 x 4 and higher

General procedure of type selection

In other cases it is necessary to proceed in a following way:

1. Determine the load to be supported by grating (e.g. using the project specification, relevant standards or using the table "Simplified Type Selection")
2. Decide the distance of supports, deflection limits or other limiting factors.
3. Select desired grating using the grating load tables.

Example Nr. 1)

- Given:
 - Sizes: distance of supports = 800 mm, width = 1000 mm.
 - Load: 1200 kg/m² = 12 kN/m².
 - Requirement: pressed grating without special requirements.
- Solution:
 - Using load table for pressed gratings we can find the closest higher grating: 30 x 2 with loading capability 16,3 kN/m².
 - Order: **Pressed grating P 33 x 33 / 30 x 2 / 860 x 1000**
- Note: Length is increased as grating should be fixed to supports for distance equal to the height of bearing rods, at least 30 mm, see construction details.

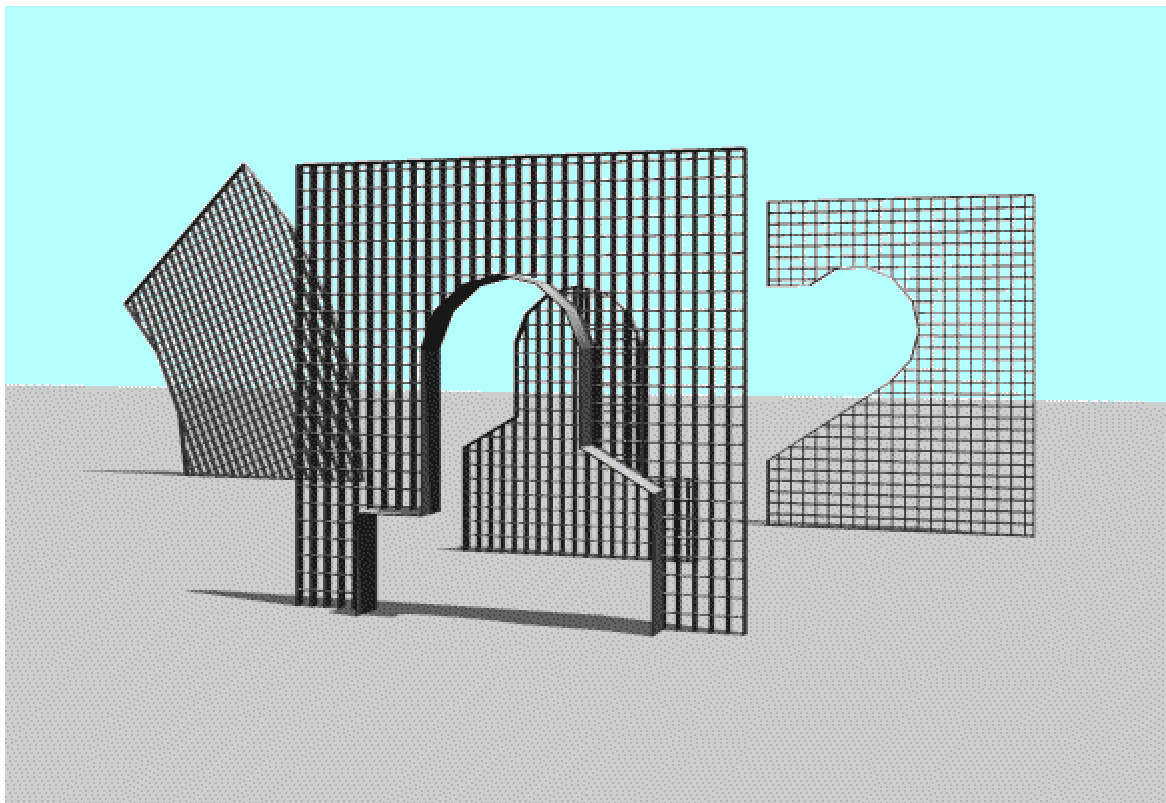
Example Nr. 2)

- Given:
 - Load: not specified, grating is used for pedestrians.
 - Sizes: distance of supports = 1500 mm, width = 1000 mm.
 - Requirement: welded grating without special requirements.
- Solution:
 - Using the table "Simplified Type Selection" we can determine load approximately 4,9 kN/m².
 - Using load table for welded gratings we can find the closest higher grating: 30 x 3 with loading capacity 6,72 kN/m².
 - Order: **Welded grating SP 30 x 30 / 30 x 3 / 1560 x 1000**
- Note: Length is increased as grating should be fixed to supports for distance equal to the height of bearing rods, at least 30 mm, see construction details.

Construction Details

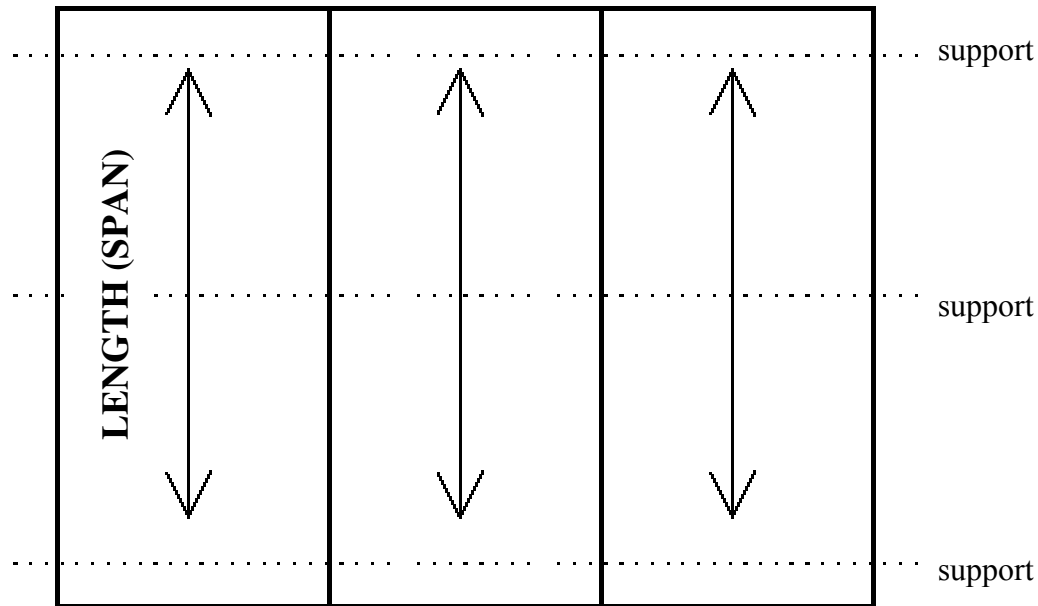
Floor gratings are custom made. Thus their size, layout, fixing points etc. are made according to customers' wishes.

- If removing is not presumed, it is possible to use gratings without kerb-type framing.
- For gratings, which should be removable, the usage of gratings with kerb-type framing is common.
- Gratings may contain holes and their shapes may be complex, but these must be fitted with framing in order to ensure loading capability of grating.
- Framing may be of the same thickness as the grating or it may be higher to ensure safe passage of pedestrians.



Attachment of gratings

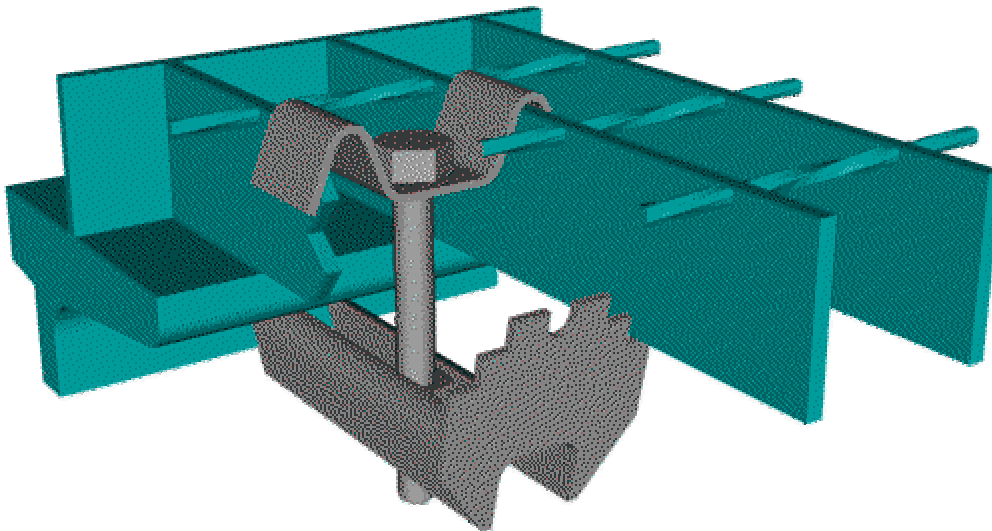
- In the case of bigger area, it is necessary to prepare grating layout sketch in advance. The sketch should consider geometrical tolerances of gratings from +0 mm to -4 mm and construction of supports. The sketch must also show the direction of bearing rods.
- It is possible to use so-called grating stripes, see figure.



If possible, gratings should be in the direction of bearing rods supported in the length of at least equal to the height of bearing rods, minimally 30 mm.

Gratings should be attached to supports by means of clips to prevent accidental lifting or shifting of the grating. The minimal amount of clips is 4 pieces per grating. Surface protection of all the connecting materials by hot dipped galvanizing corresponds to DIN 50 976.

Alternatively it is possible to weld the gratings to supports.



Surface protection

Floor gratings and stair treads are supplied:

- raw without surface protection
- painted
- with surface protection by hot dipped galvanizing according to DIN 50 976.

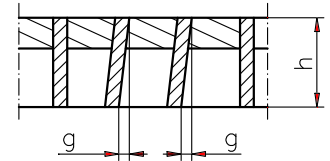
Tolerances of Dimensions According to ČSN 73 2611

The following geometrical tolerances are valid for all kinds of welded, pressed as well as stainless gratings under the following assumptions:

- bearing rod up to 60 x 5 mm
- mesh size from 11 mm to 68 mm
- grating area does not exceed 2 m² and no grating dimension is greater than 2000 mm

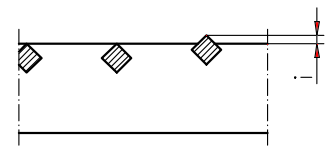
Deflection of bearing rod from vertical plane

$$g_{\max} = 0,1 \times H$$



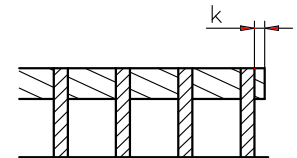
Vertical position of connecting rod

- connecting rod 6 mm: $i_{\max} = 1,5$ mm
- connecting rod 8 mm: $i_{\max} = 2$ mm



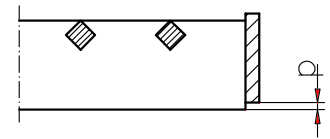
Horizontal position of connecting rod

$$k_{\max} = 0,5 \text{ mm}$$



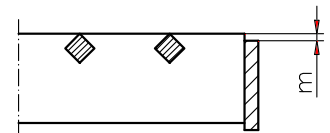
High framing

$$p_{\max} = 1 \text{ mm}$$



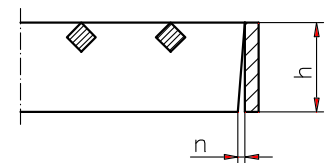
Low framing

$$m_{\max} = 1 \text{ mm}$$



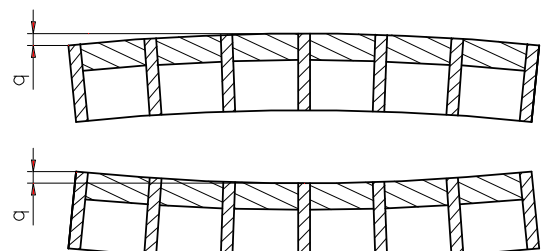
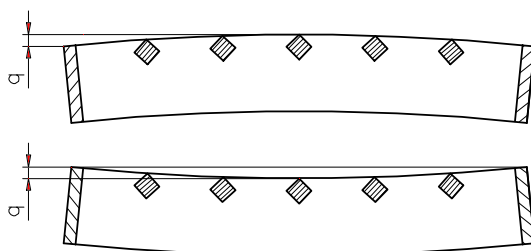
Slanted cut of bearing rod

$$n_{\max} = 0,1 \times H$$



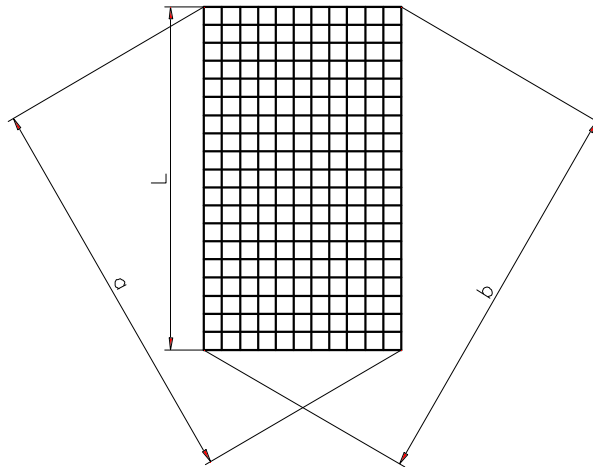
Deflection

- length to 600 mm: $q_{\max} = 3$ mm
- length over 600 mm: $q_{\max} = 1 / 200$ of length



Difference of diagonals

$$a - b = \max. 0,012 \times L$$



Tolerances of holes and shapes

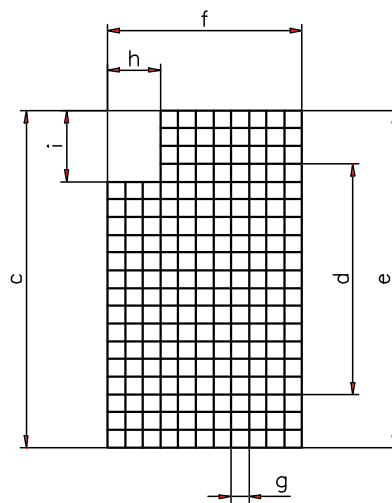
c, e, f = max. +0 mm, -4 mm

g = max. +/- 1,5 mm

d = max. +/- 4 mm (measured through 10 cells)

h = max. +8 mm, -0 mm

i = max. +8 mm, -0 mm



Bearing rod types

25 x 2	30 x 2	40 x 2
25 x 3	30 x 3	40 x 3

Typical stair tread sizes

L [mm]	W [mm]	n [mm]	e [mm]
600	240	120	85
	270	150	85
	305	180	90
800	240	120	85
	270	150	85
	305	180	90
1000	240	120	85
	270	150	85
	305	180	90
1200	240	120	85
	270	150	85
	305	180	90

Loading capacity

Single force acting on area 100 x 100 mm in the middle of the tread span is 1500 N.

The choice of grating type for stair threads is subject to the same rules as grating type selection.

Construction details

Any modifications like holes or cuts within stepping edge rod are not permitted.

Stair tread attachment

Side boards of stair treads are supplied with circular and longitudinal holes for M 12 screws. Each tread should be attached by 4 screws.

The distance of attaching screws may be modified according to customer's needs.

Surface protection

Stair treads are supplied:

- raw without surface protection
- painted
- with surface protection by hot dipped galvanizing according to DIN 50 976

Tolerances

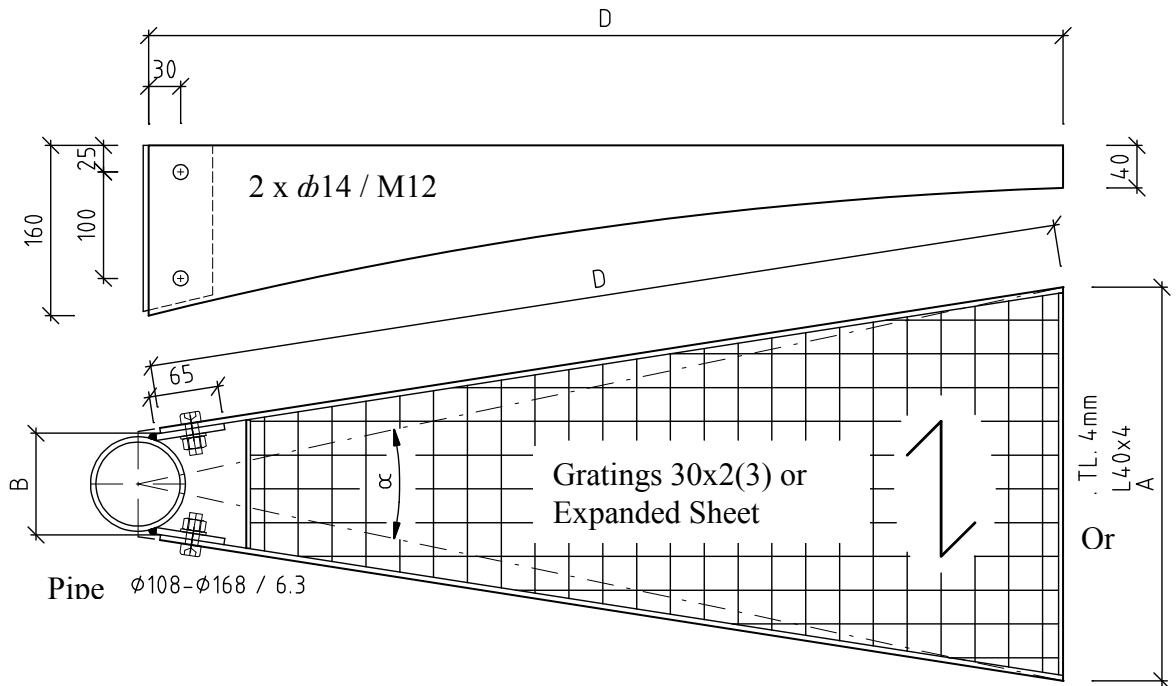
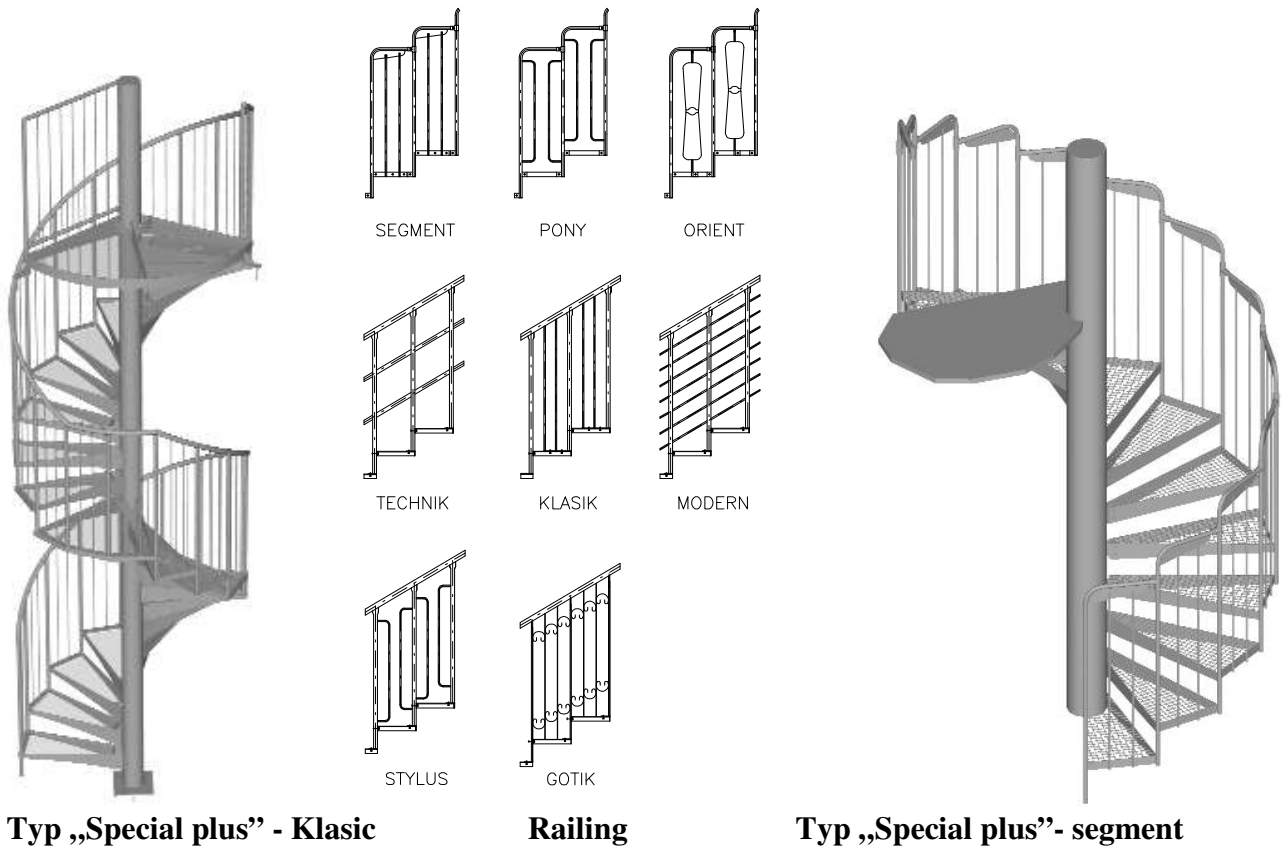
- L = max. +0, -3 mm
- W = max. +5, -5 mm
- for other see general grating tolerances

Weight table

Tread length L [mm]	Tread width W [mm]	Weight of welded hot-dip galvanized tread with bearing rod [mm]					
		25x2	30x2	40x2	25x3	30x3	40x3
		[kg/piece]					
600	240	3,90	4,25	4,95	4,74	5,26	6,29
	260	4,19	4,58	5,34	5,12	5,69	6,82
	270	4,34	4,74	5,54	5,31	5,91	7,08
	295	4,71	5,15	6,04	5,78	6,44	7,74
	305	4,86	5,32	6,23	5,97	6,65	8,00
800	240	4,90	5,37	6,31	6,04	6,73	8,11
	260	5,27	5,79	6,81	6,52	7,28	8,78
	270	5,46	5,99	7,06	6,76	7,55	9,12
	295	5,92	6,51	7,69	7,36	8,24	9,97
	305	6,10	6,72	7,94	7,60	8,51	10,31
1000	240	5,91	6,50	7,67	7,34	8,21	9,92
	260	6,36	7,00	8,28	7,92	8,87	10,75
	270	6,58	7,25	8,58	8,21	9,20	11,16
	295	7,13	7,87	9,34	8,94	10,03	12,20
	305	7,35	8,12	9,65	9,23	10,36	12,61
1200	240	6,92	7,62	9,03	8,63	9,68	11,73
	260	7,44	8,21	9,74	9,32	10,46	12,71
	270	7,70	8,50	10,10	9,66	10,85	13,20
	295	8,34	9,23	11,00	10,51	11,83	14,43
	305	8,60	9,52	11,36	10,85	12,22	14,92

Spiral Flight

Spiral flights are supplied as modular system. Stair treads and railing elements are designed in such a way to enable different geometry of flights. Stair treads are attached to the central pipe by screws.



Order

Please, copy and fill this form in. You can submit it by mail, fax or e-mail. Similar form may be also found on our homepage www.noving.cz for easier sending by e-mail.

Address of customer account number:	Address of supplier Noving Ltd., U Nádraží 27 703 00 Ostrava – Vítkovice Czech Republic tel., fax: +420 595 782 426 -7 595 783 891 e-mail: noving@noving.cz
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Order Nr. _____ **from (date)** _____

We order the following gratings/stair treads:

Nr. **mesh type** **rod type** **span** **width** **pieces** **style/surface protection**

Example: 1 welded 30x30 30x2 1000 1000 32 pieces framing galvanized

Clips: _____ pieces

Transport by: _____

Delivery address: _____

Delivery date: _____

Way of payment: _____

Responsible person: _____