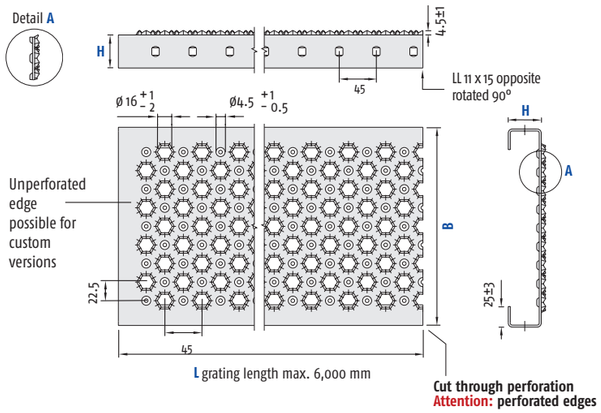
Graepel-Star (formerly Graepel Round Z)



Characteristic

Graepel-Star has upward and downward formations. Its surface is characterized by embossed, star-shaped openings (d = 16 mm) and debossed holes (d = 4.5 mm). The perforation extends about 4.5 mm upwards. The open area for standard grating widths is approximately 21 %. Graepel-Star offers excellent slip resistance, a wide displacement space and a certain drainage. The maximum embossed field is 460 mm.

Application

Its look was influential in the naming of this perforation. Graepel-Star is especially suitable for use in industrial applications where lubricants put underfoot safety at risk: The serrated edges of the holes with upward-pointing tips ensure a high slip resistance. The drainage holes discharges these liquids downwards into appropriate collection trays.

Options

- This perforation is program controllable. Thus, individual embossments can be created.
- The standard edge perforation may be omitted.

Dimensions	Graepel-Star
Material thickness	
DD 11 raw	2.0 | 2.5 mm
DD 11 hot-dip galvanized | DX 51 D pre-galvanized	2.0 | 2.5 mm
Stainless steel	2.0 mm
EN AW-5754	2.0 | 2.5 | 3.0 mm
Dimensions	
Lengths (L) up to	6,000 mm
Length divider	45 mm
Standard grating widths[1] (B)	
DD 11 | DX 51 D | Stainless steel | EN AW-5754	182 to 356 mm in steps of 22.5 mm
Width divider	22.5 mm
Heights (H)	30 | 50 | 75 mm

[1] Other dimensions on request.

Anti-slip values

Material	Evaluation of anti-slip	Displacement
DD 11 hot-dip galvanized	R 12	V 10
EN AW-5754	R 13	V 10
Aluminum powder coated	R 10	V 10

Further details on the perforation on our website

Weight per meter for Graepel-Star for material thickness D [in kg/m]

Grating width [mm]	2.0						2.5						3.0		
	DD 11**/ Stainless steel Height [mm]			EN AW-5754 Height [mm]			DD 11** Height [mm]			EN AW-5754 Height [mm]			EN AW-5754 Height [mm]		
	30	50	75	30	50	75	30	50	75	30	50	75	30	50	75
182	3.9	4.6	5.4	1.4	1.6	1.9	4.9	5.7	6.7	1.7	2.0	2.3	2.0	2.4	2.8
240	4.7	5.4	6.2	1.6	1.9	2.1	5.9	6.7	7.7	2.0	2.3	2.7	2.4	2.8	3.2
298	5.6	6.3	7.1	1.9	2.2	2.4	7.1	7.9	8.9	2.4	2.7	3.0	2.9	3.2	3.7
330	6.0	6.6	7.4	2.1	2.3	2.6	7.5	8.3	9.3	2.6	2.8	3.2	3.1	3.4	3.8
336	6.4	7.0	7.8	2.2	2.4	2.7	8.0	8.8	9.8	2.8	3.0	3.4	3.3	3.6	4.0

Legend
* Available only up to a length of 3,000 mm
** Values also apply for DX 51 D
*** For gratings smaller than 200 mm, the lump load is added to the neighboring gratings corresponding to the portion of the load area.

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	H [mm]	D [mm]	Uniformly distributed load — Replacement load Fq [in kN] for uniformly distributed load (numerical values apply for single grating) — Support length L [mm] 500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000	Concentrated load — Load Fq [in kN] for concentrated load (numerical values apply for single grating) — Support length L [mm] 500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000
DD11, DX 51 D	30	2.0	5.676	3.784	2.838	2.009	1.395	1.025	0.785	0.620	0.502	0.415	0.349	3.548	2.183	1.577	1.234	0.879	0.645	0.493	0.389	0.315	0.260	0.218
	30	2.5	6.732	4.488	3.366	2.382	1.654	1.215	0.931	0.735	0.596	0.492	0.414	4.208	2.589	1.870	1.464	1.043	0.765	0.584	0.461	0.373	0.308	0.259
	50	2.0	11.407	7.605	5.703	4.563	3.802	3.259	2.614	2.065	1.673	1.382	1.162	7.129	4.387	3.169	2.480	2.037	1.728	1.501	1.296	1.049	0.866	0.728
	50	2.5	13.751	9.168	6.876	5.501	4.584	3.929	3.151	2.490	2.017	1.1667	1.400	8.595	5.289	3.820	2.989	2.456	2.084	1.809	1.562	1.265	1.044	0.877
	75	2.0	20.283	13.522	10.141	8.113	6.761	5.795	5.071	4.507	4.057	3.671	3.084	12.677	7.801	5.634	4.409	3.622	3.073	2.669	2.358	2.113	1.913	1.749
	75	2.5	24.671	16.447	12.336	9.868	8.224	7.049	6.168	5.482	4.934	4.465	3.752	15.419	9.489	6.853	5.363	4.406	3.738	3.246	2.869	2.570	2.327	2.127
EN AW-5754	30	2.0	4.005	1.780	1.001	0.641	0.4455	4.788	0.250	0.198	0.160	0.132	0.111	2.697	1.151	0.638	0.406	0.281	0.206	0.157	0.124	0.100	0.083	0.070
	30	2.5	4.751	2.111	1.188	0.760	0.528	0.388	0.297	0.235	0.190	0.157	0.132	3.199	1.365	0.757	0.638	0.406	0.281	0.206	0.157	0.124	0.100	0.083
	30	3.0	5.181	2.303	1.295	0.829	0.576	0.423	3.518	0.256	0.207	0.171	0.144	3.489	1.489	0.825	0.525	0.363	0.266	0.203	0.161	0.130	0.107	0.090
	50	2.0	8.963	5.930	3.336	2.135	1.482	1.089	0.834	0.659	0.534	0.441	0.371	5.602	3.447	2.125	1.351	0.935	0.685	0.524	0.413	0.335	0.276	0.232
	50	2.5	10.805	7.149	4.021	2.574	1.787	1.313	1.005	0.794	0.643	0.532	0.447	6.753	4.156	2.562	1.629	1.127	0.826	0.631	0.498	0.403	0.333	0.232
	50	3.0	12.064	7.986	4.492	2.875	1.997	1.467	1.123	0.887	0.719	0.594	0.499	7.540	4.640	2.862	1.819	1.259	0.923	0.705	0.557	0.451	0.372	0.313
	75	2.0	15.936	10.624	7.968	5.668	3.936	2.892	2.214	1.749	1.417	1.171	0.984	9.960	6.129	4.427	3.464	2.481	1.819	1.381	1.098	0.888	0.734	0.616
	75	2.5	19.384	12.923	9.692	6.895	4.788	3.518	2.693	2.128	1.724	1.425	1.197	12.115	7.456	5.385	4.214	3.019	2.213	1.692	1.335	1.081	0.893	0.750
	75	3.0	21.968	14.645	10.984	7.817	5.428	3.988	3.053	2.413	1.954	1.615	1.357	13.730	8.449	6.102	4.776	3.442	2.508	1.918	1.514	1.225	1.012	0.850
Stainless steel	30	2.0	6.217	4.144	3.108	2.009	1.395	1.025	0.785	0.620	0.502	0.415	0.349	3.885	2.391	1.727	1.271	0.879	0.645	0.493	0.389	0.315	0.260	0.218
	50	2.0	12.493	8.329	6.247	4.997	4.164	3.414	2.614	2.065	1.673	1.382	1.162	7.808	4.805	3.470	2.716	2.231	1.893	1.642	1.296	1.049	0.866	0.728
	75	2.0	22.214	14.810	11.107	8.886	7.405	6.347	5.554	4.937	4.441	3.671	3.084	13.884	8.544	6.171	4.829	3.967	3.366	2.923	2.583	2.314	2.096	1.915

Lump load	Maximum possible lump load F [in kN] (numerical values apply for DD 11)		
Grating width B [mm]	Load area 200 x 200 mm		
	Material thickness [mm]		
	2.0	2.5	3.0
182***	1.89	2.49	3.18
240	1.25	1.65	2.10
298	0.97	1.28	1.63
330	0.88	1.16	1.48
356	0.82	1.09	1.38

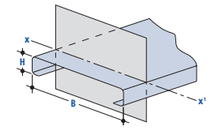
Note concerning lump load

The values are calculated for gratings which are supported over their whole length. For a given span width, the values stated in this lump load table must not exceed those given in the concentrated load table.

For **stainless steel**, the values in the table must be multiplied by a factor of **1.04** or for **EN AW-5754** by a factor of **0.75**.

Moments of inertia and section modulus

Grating cross-sections (axis X-X1)



Bend height H [mm]	Material thickness D [mm]	Moment of inertia I_x [mm⁴]	Minimum section modulus W_2 [mm³]
30	2.0	38918.66	2525.54
	2.5	46161.04	2995.52
	3.0	50344.74	3264.69
50	2.0	129645.30	5075.43
	2.5	156300.69	6118.51
	3.0	174605.86	6831.59
75	2.0	344236.50	9024.56
	2.5	418745.50	9024.56
	3.0	474710.43	12440.09

Conversion of the replacement load Fq from the table into a distributed load Q

$$Q = \frac{10^6 \times F_q}{B \times L}$$

with:
Q = Distributed load for a grating [kN/m²]
Fq = Replacement load from table with reference to the support width [kN]
B = Grating width [mm]
L = Support length [mm]