



Characteristic

Graepel-City has both upward and downward formations. The surface of Graepel-City consists of small embossed (diameter of 4.5 mm) and debossed holes (diameter of 8 mm) that are arranged in staggered rows. Graepel-City is based on Graepel-Indoor perforation and supplements it by drain holes. It provides good slip resistance and drainage effects. The open area for standard grating widths is approx. 6 %; the maximum embossed field is 460 mm.

Application

Graepel-City is designed for use in public buildings and outside facilities. This perforation provides a very safe and comfortable walking surface for pedestrians and cyclists. Water and sediments of small grain size can fall through the drain holes, but it is sufficiently opaque even on steps. If barefoot walking is required, the Graepel-Garden perforation is recommended. Graepel-City is also used in the industrial sector, e.g. in inspection pits for cars and commercial vehicles.

Options

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

Dimensions		Graepel-City
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
Dimensions	Stainless steel	2.0 mm
	EN AW-5754	2.0 2.5 3.0 mm
	Lengths (L) up to length divider	6,000 mm 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 11	V 10	
Stainless steel	R 12	V 10	
EN AW-5754	R 12	V 10	



Further details on the perforation on our website

Weight per meter for Graepel-City for material thickness D [in kg/m]															
Grating width [mm]	2.0									3.0					
	DD 11***/Stainless steel Height [mm]			EN AW-5754 Height [mm]			DD 11***/Stainless steel Height [mm]			EN AW-5754 Height [mm]					
182	4.1	4.8	5.6	1.4	1.6	1.9	5.2	6.0	7.0	1.8	2.1	2.4	2.1	2.5	2.9
240	5.0	5.7	6.5	1.7	2.0	2.2	6.3	7.1	8.1	2.2	2.4	2.8	2.6	2.9	3.3
298	6.0	6.6	7.4	2.1	2.3	2.5	7.5	8.3	9.3	2.6	2.8	3.2	3.1	3.4	3.8
330	6.4	7.1	7.9	2.2	2.4	2.7	8.0	8.8	9.8	2.8	3.0	3.4	3.3	3.6	4.1
356	6.9	7.5	8.3	2.4	2.6	2.9	8.6	9.4	10.4	3.0	3.2	3.6	3.5	3.9	4.3

H [mm]	D [mm]	Uniformly distributed load												Replacement load F _q [in kN] for uniformly distributed load (numerical values apply for single grating)												Concentrated load												Load F _q [in kN] for concentrated load (numerical values apply for single grating)											
		Support length L [mm]				Support length L [mm]				Support length L [mm]				Support length L [mm]				Support length L [mm]				Support length L [mm]				Support length L [mm]																							
DD 11, 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	1.853	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	1.667	1.400	8.595	5.289	3.820	2.989	2.456	2.084	1.809	1.562	1.264	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	3.975	3.246	2.869	2.570	2.327	2.127																										
EN AW-5754	30	2.0	4.005	1.780	1.001	0.641	0.445	0.327	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	0.481	0.333	0.244	0.186	0.147	0.119	0.098	0.083																									
	30	3.0	5.181	2.303	1.295	0.829	0.576	0.423	0.324	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	0.280																									
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	1.391	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	3.422	2.508	1.918	1.514	1.281	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																									

Grating width B [mm]	Maximum possible lump load F [in kN] (numerical values apply for DD 11)		
	Load area 200 x 200 mm		
	Material thickness [mm]		
	2.0	2.5	3.0
182***	1.42	2.22	3.19
240	0.94	1.46	2.11
298	0.73	1.14	1.64
330	0.66	1.03	1.49
356	0.62	0.97	1.39

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-X)			
Bend height H [mm]	Material thickness D [mm]	Moment of inertia I _x [mm ⁴]	Minimum section modulus W _x [mm ³]
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	418745.73	10977.18
	3.0	474710.43	12440.09

Conversion of the replacement load F_q 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]
 F_q = Replacement load from table with reference to the support width [kN]
 B = Grating width [mm]
 L = Support length [mm]