

**GEBERIT MAPRESS CARBON STEEL
SYSTEM PIPES 1.0215
PRESSURE LOSS TABLES**

■ GEBERIT



DRUKVERLIESTABELLEN

**KNOW
HOW**
INSTALLED

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2 Pressure loss, compressed air

2.1 Compressed air, 3 bar

Medium:	Compressed air
Overpressure:	3 bar
Absolute pressure:	4 bar
Temperature:	20 °C
Density:	4.771 kg/m ³
Viscosity:	0.0000182635 Pa•s
Surface roughness:	0.01 mm

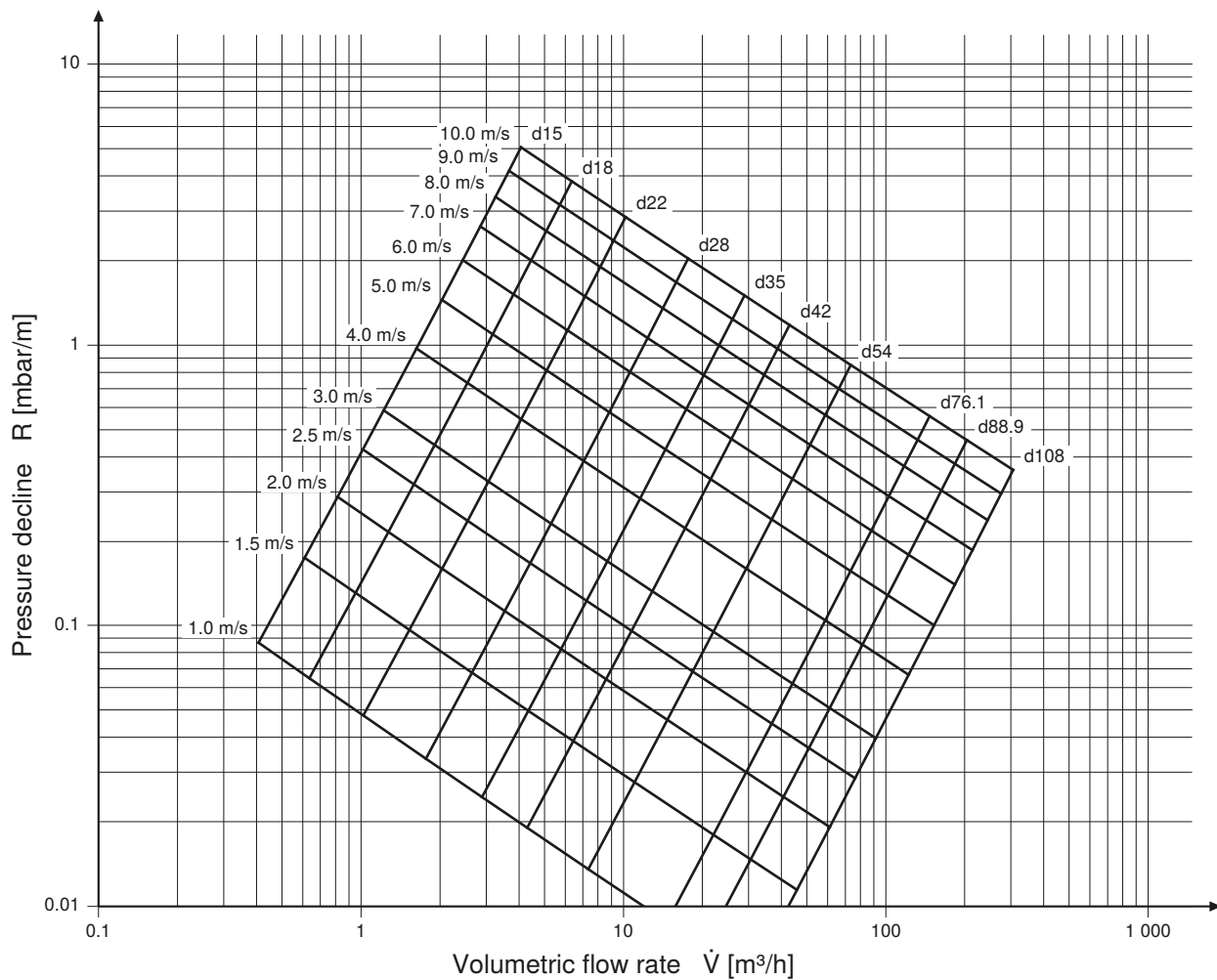


Table 1: Pressure loss for Geberit Mapress carbon steel system pipes 1.0215, compressed air 3 bar, d15–35 mm

d [mm]	15		18		22		28		35	
$\dot{V}$ [m³/h]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]
0.50	1.23	0.1236	—	—	—	—	—	—	—	—
0.75	1.84	0.2490	1.18	0.0863	—	—	—	—	—	—
1.00	2.46	0.4112	1.57	0.1418	0.98	0.0462	—	—	—	—
1.25	3.07	0.6084	1.96	0.2092	1.22	0.0679	—	—	—	—
1.50	3.68	0.8394	2.36	0.2878	1.47	0.0932	—	—	—	—
1.75	4.30	1.1035	2.75	0.3774	1.71	0.1219	0.99	0.0330	—	—
2.00	4.91	1.3999	3.14	0.4776	1.96	0.1540	1.13	0.0417	—	—
2.25	5.53	1.7282	3.54	0.5884	2.20	0.1893	1.27	0.0511	—	—
2.50	6.14	2.0879	3.93	0.7095	2.45	0.2279	1.41	0.0614	0.86	0.0190
2.75	6.75	2.4786	4.32	0.8408	2.69	0.2696	1.56	0.0726	0.95	0.0224
3.00	7.37	2.9002	4.72	0.9821	2.94	0.3144	1.70	0.0845	1.04	0.0261
3.25	7.98	3.3523	5.11	1.1334	3.18	0.3624	1.84	0.0973	1.12	0.0300
3.50	8.60	3.8347	5.50	1.2945	3.43	0.4133	1.98	0.1108	1.21	0.0341
3.75	9.21	4.3473	5.89	1.4654	3.67	0.4673	2.12	0.1251	1.30	0.0385
4.00	9.82	4.8898	6.29	1.6460	3.92	0.5243	2.26	0.1402	1.38	0.0431
4.50	—	—	7.07	2.0362	4.41	0.6470	2.55	0.1727	1.55	0.0530
5.00	—	—	7.86	2.4644	4.90	0.7815	2.83	0.2081	1.73	0.0638
5.50	—	—	8.65	2.9305	5.39	0.9274	3.11	0.2465	1.90	0.0754
6.00	—	—	9.43	3.4341	5.88	1.0848	3.40	0.2878	2.07	0.0880
6.50	—	—	—	—	6.37	1.2534	3.68	0.3320	2.25	0.1013
7.00	—	—	—	—	6.86	1.4333	3.96	0.3791	2.42	0.1156
7.50	—	—	—	—	7.35	1.6243	4.24	0.4290	2.59	0.1306
8.00	—	—	—	—	7.84	1.8263	4.53	0.4816	2.76	0.1465
8.50	—	—	—	—	8.33	2.0394	4.81	0.5371	2.94	0.1632
9.00	—	—	—	—	8.82	2.2633	5.09	0.5952	3.11	0.1807
9.50	—	—	—	—	9.31	2.4982	5.38	0.6562	3.28	0.1990
10.00	—	—	—	—	9.80	2.7439	5.66	0.7198	3.45	0.2181
10.50	—	—	—	—	—	—	5.94	0.7862	3.63	0.2380
11.00	—	—	—	—	—	—	6.22	0.8552	3.80	0.2587
11.50	—	—	—	—	—	—	6.51	0.9270	3.97	0.2802
12.00	—	—	—	—	—	—	6.79	1.0014	4.14	0.3025
12.50	—	—	—	—	—	—	7.07	1.0784	4.32	0.3255
13.00	—	—	—	—	—	—	7.36	1.1582	4.49	0.3493
13.50	—	—	—	—	—	—	7.64	1.2405	4.66	0.3739
14.00	—	—	—	—	—	—	7.92	1.3255	4.84	0.3992
14.50	—	—	—	—	—	—	8.21	1.4131	5.01	0.4253
15.00	—	—	—	—	—	—	8.49	1.5033	5.18	0.4521
16.00	—	—	—	—	—	—	9.05	1.6915	5.53	0.5081

d [mm]	15		18		22		28		35	
$\dot{V}$ [m³/h]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]
17.00	—	—	—	—	—	—	9.62	1.8901	5.87	0.5670
18.00	—	—	—	—	—	—	—	—	6.22	0.6289
19.00	—	—	—	—	—	—	—	—	6.56	0.6938
20.00	—	—	—	—	—	—	—	—	6.91	0.7616
21.00	—	—	—	—	—	—	—	—	7.25	0.8324
22.00	—	—	—	—	—	—	—	—	7.60	0.9061
23.00	—	—	—	—	—	—	—	—	7.94	0.9826
24.00	—	—	—	—	—	—	—	—	8.29	1.0621
25.00	—	—	—	—	—	—	—	—	8.63	1.1445

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Table 2: Pressure loss for Geberit Mapress carbon steel system pipes 1.0215, compressed air 3 bar, d15–35 mm

d [mm]	42		54		76.1		88.9		108	
$\dot{V}$ [m³/h]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]
3.75	0.87	0.0150	—	—	—	—	—	—	—	—
4.00	0.93	0.0168	—	—	—	—	—	—	—	—
4.50	1.05	0.0206	—	—	—	—	—	—	—	—
5.00	1.16	0.0248	—	—	—	—	—	—	—	—
5.50	1.28	0.0293	—	—	—	—	—	—	—	—
6.00	1.40	0.0342	—	—	—	—	—	—	—	—
6.50	1.51	0.0393	0.88	0.0109	—	—	—	—	—	—
7.00	1.63	0.0448	0.95	0.0125	—	—	—	—	—	—
7.50	1.74	0.0506	1.02	0.0141	—	—	—	—	—	—
8.00	1.86	0.0567	1.09	0.0157	—	—	—	—	—	—
8.50	1.98	0.0631	1.16	0.0175	—	—	—	—	—	—
9.00	2.09	0.0699	1.22	0.0194	—	—	—	—	—	—
9.50	2.21	0.0769	1.29	0.0213	—	—	—	—	—	—
10.00	2.33	0.0842	1.36	0.0233	—	—	—	—	—	—
10.50	2.44	0.0919	1.43	0.0254	—	—	—	—	—	—
11.00	2.56	0.0998	1.50	0.0276	—	—	—	—	—	—
11.50	2.67	0.1080	1.56	0.0298	—	—	—	—	—	—
12.00	2.79	0.1165	1.63	0.0322	—	—	—	—	—	—
12.50	2.91	0.1253	1.70	0.0346	0.85	0.0066	—	—	—	—
13.00	3.02	0.1344	1.77	0.0371	0.88	0.0071	—	—	—	—
13.50	3.14	0.1438	1.84	0.0396	0.92	0.0076	—	—	—	—
14.00	3.26	0.1535	1.90	0.0423	0.95	0.0081	—	—	—	—
14.50	3.37	0.1635	1.97	0.0450	0.99	0.0086	—	—	—	—
15.00	3.49	0.1737	2.04	0.0478	1.02	0.0091	—	—	—	—
16.00	3.72	0.1950	2.18	0.0536	1.09	0.0102	—	—	—	—

d [mm]	42		54		76.1		88.9		108	
$\dot{V}$ [m³/h]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]
17.00	3.95	0.2175	2.31	0.0597	1.16	0.0114	—	—	—	—
18.00	4.19	0.2410	2.45	0.0661	1.22	0.0126	0.88	0.0058	—	—
19.00	4.42	0.2657	2.58	0.0728	1.29	0.0138	0.93	0.0063	—	—
20.00	4.65	0.2914	2.72	0.0798	1.36	0.0152	0.98	0.0069	—	—
21.00	4.88	0.3183	2.86	0.0871	1.43	0.0165	1.03	0.0076	—	—
22.00	5.12	0.3462	2.99	0.0947	1.50	0.0180	1.08	0.0082	—	—
23.00	5.35	0.3752	3.13	0.1025	1.56	0.0194	1.13	0.0089	—	—
24.00	5.58	0.4053	3.26	0.1107	1.63	0.0210	1.18	0.0096	—	—
25.00	5.81	0.4364	3.40	0.1191	1.70	0.0225	1.23	0.0103	—	—
30.00	6.98	0.6080	4.08	0.1654	2.04	0.0312	1.47	0.0142	0.98	0.0054
35.00	8.14	0.8058	4.76	0.2185	2.38	0.0411	1.72	0.0187	1.14	0.0071
40.00	9.30	1.0293	5.44	0.2784	2.72	0.0522	1.96	0.0238	1.31	0.0090
45.00	—	—	6.12	0.3448	3.06	0.0645	2.21	0.0293	1.47	0.0111
50.00	—	—	6.80	0.4179	3.40	0.0780	2.45	0.0354	1.63	0.0134
55.00	—	—	7.48	0.4974	3.74	0.0926	2.70	0.0421	1.80	0.0158
60.00	—	—	8.16	0.5833	4.08	0.1084	2.94	0.0492	1.96	0.0185
65.00	—	—	8.84	0.6757	4.42	0.1253	3.19	0.0568	2.13	0.0214
70.00	—	—	9.52	0.7743	4.76	0.1433	3.43	0.0650	2.29	0.0244
75.00	—	—	—	—	5.10	0.1625	3.68	0.0736	2.45	0.0276
80.00	—	—	—	—	5.44	0.1827	3.93	0.0827	2.62	0.0310
85.00	—	—	—	—	5.78	0.2040	4.17	0.0923	2.78	0.0346
90.00	—	—	—	—	6.12	0.2265	4.42	0.1024	2.94	0.0384
95.00	—	—	—	—	6.46	0.2500	4.66	0.1130	3.11	0.0423
100.00	—	—	—	—	6.80	0.2746	4.91	0.1240	3.27	0.0464
105.00	—	—	—	—	7.14	0.3002	5.15	0.1355	3.43	0.0507
110.00	—	—	—	—	7.48	0.3270	5.40	0.1475	3.60	0.0552
115.00	—	—	—	—	7.82	0.3548	5.64	0.1600	3.76	0.0598
120.00	—	—	—	—	8.16	0.3836	5.89	0.1729	3.92	0.0646
125.00	—	—	—	—	8.50	0.4135	6.13	0.1863	4.09	0.0696
130.00	—	—	—	—	8.84	0.4445	6.38	0.2002	4.25	0.0747
135.00	—	—	—	—	9.18	0.4765	6.62	0.2145	4.41	0.0800
140.00	—	—	—	—	9.53	0.5095	6.87	0.2293	4.58	0.0855
145.00	—	—	—	—	9.87	0.5436	7.11	0.2445	4.74	0.0911
150.00	—	—	—	—	—	—	7.36	0.2602	4.90	0.0969
155.00	—	—	—	—	—	—	7.61	0.2764	5.07	0.1029
160.00	—	—	—	—	—	—	7.85	0.2930	5.23	0.1090
165.00	—	—	—	—	—	—	8.10	0.3100	5.40	0.1153
170.00	—	—	—	—	—	—	8.34	0.3275	5.56	0.1218
175.00	—	—	—	—	—	—	8.59	0.3455	5.72	0.1284

d [mm]	42		54		76.1		88.9		108	
$\dot{V}$ [m³/h]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]
180.00	—	—	—	—	—	—	8.83	0.3639	5.89	0.1352
185.00	—	—	—	—	—	—	9.08	0.3828	6.05	0.1422
190.00	—	—	—	—	—	—	9.32	0.4021	6.21	0.1493
195.00	—	—	—	—	—	—	9.57	0.4218	6.38	0.1565
200.00	—	—	—	—	—	—	9.81	0.4420	6.54	0.1640
205.00	—	—	—	—	—	—	10.06	0.4627	6.70	0.1716
210.00	—	—	—	—	—	—	—	—	6.87	0.1793
215.00	—	—	—	—	—	—	—	—	7.03	0.1873
220.00	—	—	—	—	—	—	—	—	7.19	0.1953
225.00	—	—	—	—	—	—	—	—	7.36	0.2036
230.00	—	—	—	—	—	—	—	—	7.52	0.2120
235.00	—	—	—	—	—	—	—	—	7.68	0.2205
240.00	—	—	—	—	—	—	—	—	7.85	0.2292
245.00	—	—	—	—	—	—	—	—	8.01	0.2381
250.00	—	—	—	—	—	—	—	—	8.17	0.2471
255.00	—	—	—	—	—	—	—	—	8.34	0.2563
260.00	—	—	—	—	—	—	—	—	8.50	0.2657
265.00	—	—	—	—	—	—	—	—	8.67	0.2752
270.00	—	—	—	—	—	—	—	—	8.83	0.2848
275.00	—	—	—	—	—	—	—	—	8.99	0.2946
280.00	—	—	—	—	—	—	—	—	9.16	0.3046
285.00	—	—	—	—	—	—	—	—	9.32	0.3147
290.00	—	—	—	—	—	—	—	—	9.48	0.3250
295.00	—	—	—	—	—	—	—	—	9.65	0.3354
300.00	—	—	—	—	—	—	—	—	9.81	0.3460

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2.2 Compressed air, 6 bar

Medium:	Compressed air
Overpressure:	6 bar
Absolute pressure:	7 bar
Temperature:	20 °C
Density:	8.352 kg/m ³
Viscosity:	0.000018302 Pa•s
Surface roughness:	0.01 mm

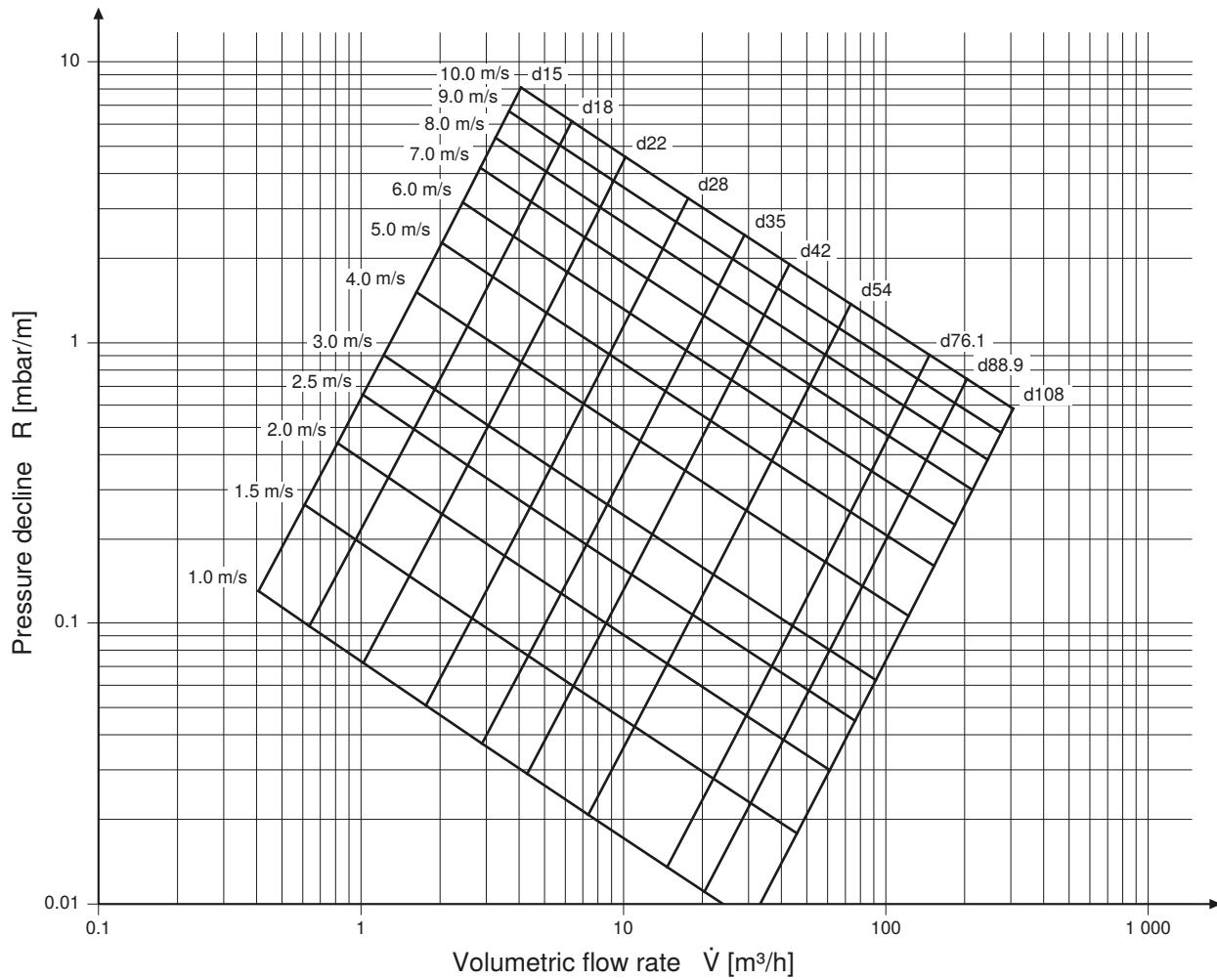


Table 3: Pressure loss for Geberit Mapress carbon steel system pipes 1.0215, compressed air 6 bar, d15–35 mm

d [mm]	15		18		22		28		35	
$\dot{V}$ [m³/h]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]
0.50	1.23	0.1862	—	—	—	—	—	—	—	—
0.75	1.84	0.3791	1.18	0.1303	—	—	—	—	—	—
1.00	2.46	0.6310	1.57	0.2158	0.98	0.0697	—	—	—	—
1.25	3.07	0.9396	1.96	0.3201	1.22	0.1030	—	—	—	—
1.50	3.68	1.3034	2.36	0.4425	1.47	0.1420	—	—	—	—
1.75	4.30	1.7213	2.75	0.5827	1.71	0.1865	0.99	0.0501	—	—
2.00	4.91	2.1927	3.14	0.7402	1.96	0.2364	1.13	0.0634	—	—
2.25	5.53	2.7168	3.54	0.9149	2.20	0.2915	1.27	0.0780	—	—
2.50	6.14	3.2932	3.93	1.1065	2.45	0.3518	1.41	0.0939	0.86	0.0288
2.75	6.75	3.9215	4.32	1.3148	2.69	0.4173	1.56	0.1112	0.95	0.0341
3.00	7.37	4.6014	4.72	1.5397	2.94	0.4878	1.70	0.1298	1.04	0.0397
3.25	7.98	5.3327	5.11	1.7811	3.18	0.5633	1.84	0.1496	1.12	0.0458
3.50	8.60	6.1151	5.50	2.0389	3.43	0.6438	1.98	0.1708	1.21	0.0522
3.75	9.21	6.9484	5.89	2.3129	3.67	0.7292	2.12	0.1931	1.30	0.0589
4.00	9.82	7.8325	6.29	2.6032	3.92	0.8196	2.26	0.2168	1.38	0.0661
4.50	—	—	7.07	3.2320	4.41	1.0148	2.55	0.2677	1.55	0.0815
5.00	—	—	7.86	3.9249	4.90	1.2293	2.83	0.3235	1.73	0.0983
5.50	—	—	8.65	4.6814	5.39	1.4630	3.11	0.3842	1.90	0.1165
6.00	—	—	9.43	5.5013	5.88	1.7155	3.40	0.4495	2.07	0.1361
6.50	—	—	—	—	6.37	1.9870	3.68	0.5196	2.25	0.1571
7.00	—	—	—	—	6.86	2.2771	3.96	0.5944	2.42	0.1795
7.50	—	—	—	—	7.35	2.5859	4.24	0.6739	2.59	0.2032
8.00	—	—	—	—	7.84	2.9134	4.53	0.7579	2.76	0.2283
8.50	—	—	—	—	8.33	3.2593	4.81	0.8465	2.94	0.2546
9.00	—	—	—	—	8.82	3.6236	5.09	0.9397	3.11	0.2824
9.50	—	—	—	—	9.31	4.0064	5.38	1.0375	3.28	0.3114
10.00	—	—	—	—	9.80	4.4075	5.66	1.1397	3.45	0.3417
10.50	—	—	—	—	—	—	5.94	1.2465	3.63	0.3733
11.00	—	—	—	—	—	—	6.22	1.3578	3.80	0.4063
11.50	—	—	—	—	—	—	6.51	1.4735	3.97	0.4405
12.00	—	—	—	—	—	—	6.79	1.5938	4.14	0.4760
12.50	—	—	—	—	—	—	7.07	1.7184	4.32	0.5127
13.00	—	—	—	—	—	—	7.36	1.8476	4.49	0.5508
13.50	—	—	—	—	—	—	7.64	1.9811	4.66	0.5901
14.00	—	—	—	—	—	—	7.92	2.1191	4.84	0.6306
14.50	—	—	—	—	—	—	8.21	2.2615	5.01	0.6725
15.00	—	—	—	—	—	—	8.49	2.4083	5.18	0.7156
16.00	—	—	—	—	—	—	9.05	2.7151	5.53	0.8055

d [mm]	15		18		22		28		35	
$\dot{V}$ [m³/h]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]
17.00	—	—	—	—	—	—	9.62	3.0395	5.87	0.9004
18.00	—	—	—	—	—	—	—	—	6.22	1.0003
19.00	—	—	—	—	—	—	—	—	6.56	1.1052
20.00	—	—	—	—	—	—	—	—	6.91	1.2150
21.00	—	—	—	—	—	—	—	—	7.25	1.3297
22.00	—	—	—	—	—	—	—	—	7.60	1.4493
23.00	—	—	—	—	—	—	—	—	7.94	1.5737
24.00	—	—	—	—	—	—	—	—	8.29	1.7031
25.00	—	—	—	—	—	—	—	—	8.63	1.8373

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Table 4: Pressure loss for Geberit Mapress carbon steel system pipes 1.0215, compressed air 6 bar, d42–108 mm

d [mm]	42		54		76.1		88.9		108	
$\dot{V}$ [m³/h]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]
3.75	0.87	0.0229	—	—	—	—	—	—	—	—
4.00	0.93	0.0256	—	—	—	—	—	—	—	—
4.50	1.05	0.0315	—	—	—	—	—	—	—	—
5.00	1.16	0.0380	—	—	—	—	—	—	—	—
5.50	1.28	0.0450	—	—	—	—	—	—	—	—
6.00	1.40	0.0525	—	—	—	—	—	—	—	—
6.50	1.51	0.0606	0.88	0.0167	—	—	—	—	—	—
7.00	1.63	0.0691	0.95	0.0191	—	—	—	—	—	—
7.50	1.74	0.0782	1.02	0.0216	—	—	—	—	—	—
8.00	1.86	0.0878	1.09	0.0242	—	—	—	—	—	—
8.50	1.98	0.0978	1.16	0.0269	—	—	—	—	—	—
9.00	2.09	0.1084	1.22	0.0298	—	—	—	—	—	—
9.50	2.21	0.1195	1.29	0.0328	—	—	—	—	—	—
10.00	2.33	0.1310	1.36	0.0360	—	—	—	—	—	—
10.50	2.44	0.1430	1.43	0.0392	—	—	—	—	—	—
11.00	2.56	0.1555	1.50	0.0426	—	—	—	—	—	—
11.50	2.67	0.1685	1.56	0.0462	—	—	—	—	—	—
12.00	2.79	0.1820	1.63	0.0498	—	—	—	—	—	—
12.50	2.91	0.1959	1.70	0.0536	0.85	0.0102	—	—	—	—
13.00	3.02	0.2103	1.77	0.0575	0.88	0.0109	—	—	—	—
13.50	3.14	0.2252	1.84	0.0615	0.92	0.0116	—	—	—	—
14.00	3.26	0.2406	1.90	0.0657	0.95	0.0124	—	—	—	—
14.50	3.37	0.2564	1.97	0.0699	0.99	0.0132	—	—	—	—
15.00	3.49	0.2727	2.04	0.0743	1.02	0.0141	—	—	—	—
16.00	3.72	0.3066	2.18	0.0835	1.09	0.0158	—	—	—	—

d [mm]	42		54		76.1		88.9		108	
$\dot{V}$ [m³/h]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]
17.00	3.95	0.3424	2.31	0.0931	1.16	0.0176	—	—	—	—
18.00	4.19	0.3800	2.45	0.1033	1.22	0.0195	0.88	0.0089	—	—
19.00	4.42	0.4195	2.58	0.1139	1.29	0.0214	0.93	0.0098	—	—
20.00	4.65	0.4607	2.72	0.1249	1.36	0.0235	0.98	0.0107	—	—
21.00	4.88	0.5038	2.86	0.1365	1.43	0.0256	1.03	0.0117	—	—
22.00	5.12	0.5487	2.99	0.1485	1.50	0.0279	1.08	0.0127	—	—
23.00	5.35	0.5953	3.13	0.1610	1.56	0.0302	1.13	0.0137	—	—
24.00	5.58	0.6438	3.26	0.1739	1.63	0.0326	1.18	0.0148	—	—
25.00	5.81	0.6940	3.40	0.1873	1.70	0.0350	1.23	0.0160	—	—
30.00	6.98	0.9716	4.08	0.2612	2.04	0.0487	1.47	0.0221	0.98	0.0083
35.00	8.14	1.2930	4.76	0.3464	2.38	0.0643	1.72	0.0292	1.14	0.0110
40.00	9.30	1.6579	5.44	0.4427	2.72	0.0819	1.96	0.0372	1.31	0.0140
45.00	—	—	6.12	0.5501	3.06	0.1015	2.21	0.0460	1.47	0.0173
50.00	—	—	6.80	0.6685	3.40	0.1230	2.45	0.0556	1.63	0.0209
55.00	—	—	7.48	0.7977	3.74	0.1464	2.70	0.0662	1.80	0.0248
60.00	—	—	8.16	0.9377	4.08	0.1717	2.94	0.0775	1.96	0.0290
65.00	—	—	8.84	1.0884	4.42	0.1988	3.19	0.0897	2.13	0.0335
70.00	—	—	9.52	1.2499	4.76	0.2278	3.43	0.1027	2.29	0.0383
75.00	—	—	—	—	5.10	0.2587	3.68	0.1165	2.45	0.0435
80.00	—	—	—	—	5.44	0.2913	3.93	0.1311	2.62	0.0489
85.00	—	—	—	—	5.78	0.3258	4.17	0.1465	2.78	0.0546
90.00	—	—	—	—	6.12	0.3622	4.42	0.1627	2.94	0.0606
95.00	—	—	—	—	6.46	0.4003	4.66	0.1797	3.11	0.0669
100.00	—	—	—	—	6.80	0.4402	4.91	0.1975	3.27	0.0734
105.00	—	—	—	—	7.14	0.4820	5.15	0.2161	3.43	0.0803
110.00	—	—	—	—	7.48	0.5255	5.40	0.2355	3.60	0.0874
115.00	—	—	—	—	7.82	0.5708	5.64	0.2557	3.76	0.0948
120.00	—	—	—	—	8.16	0.6179	5.89	0.2766	3.92	0.1025
125.00	—	—	—	—	8.50	0.6668	6.13	0.2983	4.09	0.1105
130.00	—	—	—	—	8.84	0.7174	6.38	0.3208	4.25	0.1188
135.00	—	—	—	—	9.18	0.7698	6.62	0.3440	4.41	0.1273
140.00	—	—	—	—	9.53	0.8240	6.87	0.3681	4.58	0.1361
145.00	—	—	—	—	9.87	0.8800	7.11	0.3929	4.74	0.1452
150.00	—	—	—	—	—	—	7.36	0.4184	4.90	0.1546
155.00	—	—	—	—	—	—	7.61	0.4448	5.07	0.1642
160.00	—	—	—	—	—	—	7.85	0.4719	5.23	0.1742
165.00	—	—	—	—	—	—	8.10	0.4997	5.40	0.1843
170.00	—	—	—	—	—	—	8.34	0.5283	5.56	0.1948
175.00	—	—	—	—	—	—	8.59	0.5577	5.72	0.2055

d [mm]	42		54		76.1		88.9		108	
$\dot{V}$ [m³/h]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]
180.00	—	—	—	—	—	—	8.83	0.5879	5.89	0.2165
185.00	—	—	—	—	—	—	9.08	0.6188	6.05	0.2278
190.00	—	—	—	—	—	—	9.32	0.6504	6.21	0.2394
195.00	—	—	—	—	—	—	9.57	0.6828	6.38	0.2512
200.00	—	—	—	—	—	—	9.81	0.7160	6.54	0.2633
205.00	—	—	—	—	—	—	10.06	0.7499	6.70	0.2756
210.00	—	—	—	—	—	—	—	—	6.87	0.2883
215.00	—	—	—	—	—	—	—	—	7.03	0.3012
220.00	—	—	—	—	—	—	—	—	7.19	0.3143
225.00	—	—	—	—	—	—	—	—	7.36	0.3277
230.00	—	—	—	—	—	—	—	—	7.52	0.3414
235.00	—	—	—	—	—	—	—	—	7.68	0.3554
240.00	—	—	—	—	—	—	—	—	7.85	0.3696
245.00	—	—	—	—	—	—	—	—	8.01	0.3841
250.00	—	—	—	—	—	—	—	—	8.17	0.3989
255.00	—	—	—	—	—	—	—	—	8.34	0.4139
260.00	—	—	—	—	—	—	—	—	8.50	0.4292
265.00	—	—	—	—	—	—	—	—	8.67	0.4448
270.00	—	—	—	—	—	—	—	—	8.83	0.4606
275.00	—	—	—	—	—	—	—	—	8.99	0.4767
280.00	—	—	—	—	—	—	—	—	9.16	0.4930
285.00	—	—	—	—	—	—	—	—	9.32	0.5096
290.00	—	—	—	—	—	—	—	—	9.48	0.5265
295.00	—	—	—	—	—	—	—	—	9.65	0.5437
300.00	—	—	—	—	—	—	—	—	9.81	0.5611

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2.3 Compressed air, 8 bar

Medium:	Compressed air
Overpressure:	8 bar
Absolute pressure:	9 bar
Temperature:	20 °C
Density:	10.739 kg/m ³
Viscosity:	0.00001833 Pa•s
Surface roughness:	0.01 mm

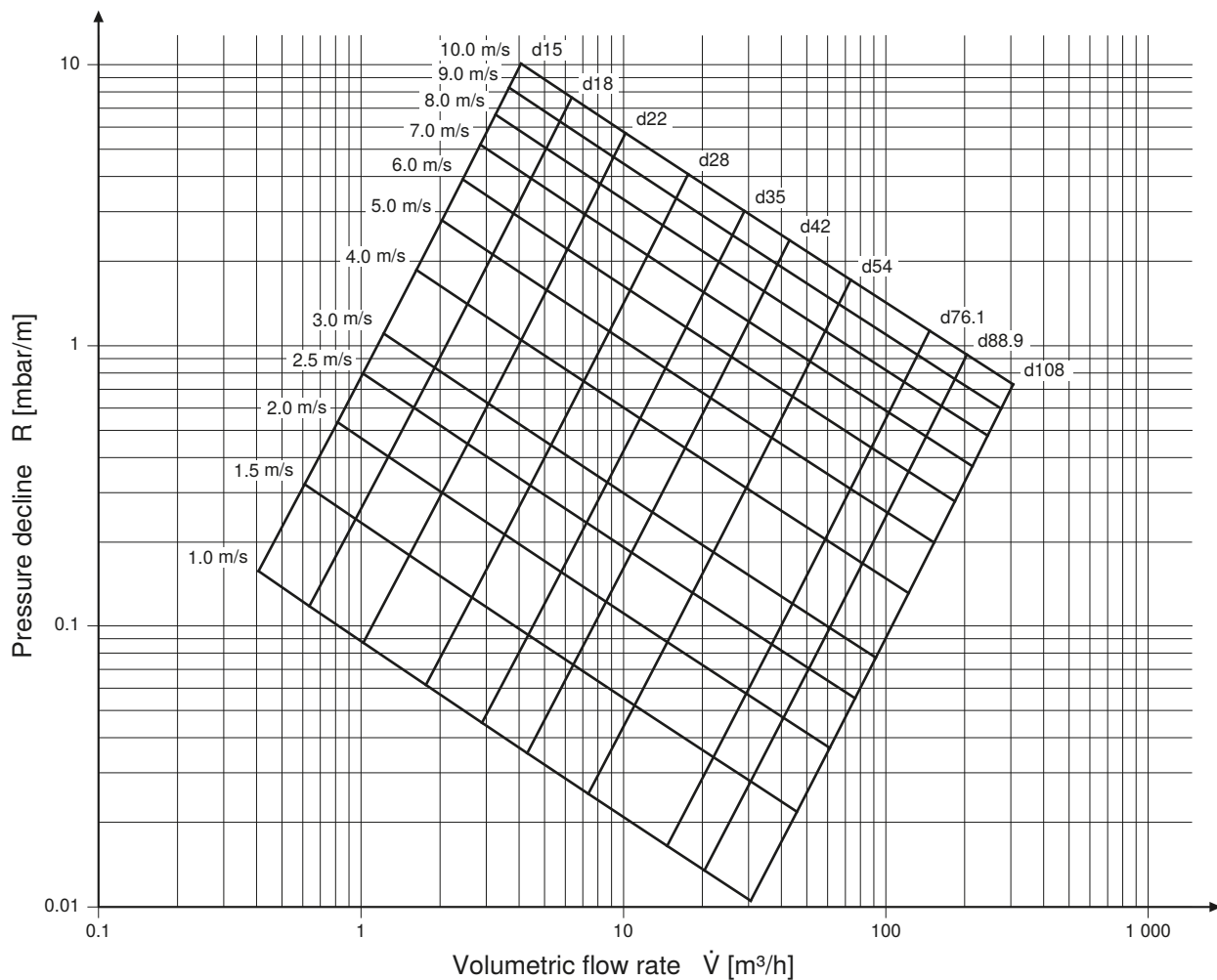


Table 5: Pressure loss for Geberit Mapress carbon steel system pipes 1.0215, compressed air 8 bar, d15–35 mm

d [mm]	15		18		22		28		35	
$\dot{V}$ [m³/h]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]
0.50	1.23	0.2249	—	—	—	—	—	—	—	—
0.75	1.84	0.4603	1.18	0.1575	—	—	—	—	—	—
1.00	2.46	0.7689	1.57	0.2618	0.98	0.0842	—	—	—	—
1.25	3.07	1.1484	1.96	0.3894	1.22	0.1248	—	—	—	—
1.50	3.68	1.5970	2.36	0.5396	1.47	0.1724	—	—	—	—
1.75	4.30	2.1137	2.75	0.7118	1.71	0.2268	0.99	0.0607	—	—
2.00	4.91	2.6977	3.14	0.9059	1.96	0.2879	1.13	0.0768	—	—
2.25	5.53	3.3484	3.54	1.1214	2.20	0.3555	1.27	0.0947	—	—
2.50	6.14	4.0652	3.93	1.3582	2.45	0.4296	1.41	0.1142	0.86	0.0349
2.75	6.75	4.8478	4.32	1.6160	2.69	0.5102	1.56	0.1353	0.95	0.0413
3.00	7.37	5.6958	4.72	1.8948	2.94	0.5970	1.70	0.1580	1.04	0.0482
3.25	7.98	6.6091	5.11	2.1943	3.18	0.6902	1.84	0.1824	1.12	0.0556
3.50	8.60	7.5873	5.50	2.5146	3.43	0.7896	1.98	0.2083	1.21	0.0634
3.75	9.21	8.6303	5.89	2.8554	3.67	0.8952	2.12	0.2358	1.30	0.0717
4.00	9.82	9.7380	6.29	3.2167	3.92	1.0069	2.26	0.2648	1.38	0.0804
4.50	—	—	7.07	4.0006	4.41	1.2487	2.55	0.3275	1.55	0.0992
5.00	—	—	7.86	4.8658	4.90	1.5148	2.83	0.3963	1.73	0.1199
5.50	—	—	8.65	5.8120	5.39	1.8051	3.11	0.4711	1.90	0.1422
6.00	—	—	9.43	6.8388	5.88	2.1193	3.40	0.5519	2.07	0.1663
6.50	—	—	—	—	6.37	2.4574	3.68	0.6386	2.25	0.1922
7.00	—	—	—	—	6.86	2.8192	3.96	0.7311	2.42	0.2197
7.50	—	—	—	—	7.35	3.2047	4.24	0.8296	2.59	0.2489
8.00	—	—	—	—	7.84	3.6138	4.53	0.9338	2.76	0.2798
8.50	—	—	—	—	8.33	4.0464	4.81	1.0438	2.94	0.3124
9.00	—	—	—	—	8.82	4.5024	5.09	1.1596	3.11	0.3466
9.50	—	—	—	—	9.31	4.9819	5.38	1.2811	3.28	0.3824
10.00	—	—	—	—	9.80	5.4848	5.66	1.4084	3.45	0.4200
10.50	—	—	—	—	—	—	5.94	1.5413	3.63	0.4591
11.00	—	—	—	—	—	—	6.22	1.6800	3.80	0.4999
11.50	—	—	—	—	—	—	6.51	1.8243	3.97	0.5422
12.00	—	—	—	—	—	—	6.79	1.9743	4.14	0.5862
12.50	—	—	—	—	—	—	7.07	2.1299	4.32	0.6319
13.00	—	—	—	—	—	—	7.36	2.2912	4.49	0.6791
13.50	—	—	—	—	—	—	7.64	2.4581	4.66	0.7279
14.00	—	—	—	—	—	—	7.92	2.6307	4.84	0.7783
14.50	—	—	—	—	—	—	8.21	2.8088	5.01	0.8303
15.00	—	—	—	—	—	—	8.49	2.9925	5.18	0.8839
16.00	—	—	—	—	—	—	9.05	3.3769	5.53	0.9958

d [mm]	15		18		22		28		35	
$\dot{V}$ [m³/h]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]
17.00	—	—	—	—	—	—	9.62	3.7835	5.87	1.1140
18.00	—	—	—	—	—	—	—	—	6.22	1.2385
19.00	—	—	—	—	—	—	—	—	6.56	1.3693
20.00	—	—	—	—	—	—	—	—	6.91	1.5063
21.00	—	—	—	—	—	—	—	—	7.25	1.6496
22.00	—	—	—	—	—	—	—	—	7.60	1.7991
23.00	—	—	—	—	—	—	—	—	7.94	1.9548
24.00	—	—	—	—	—	—	—	—	8.29	2.1167
25.00	—	—	—	—	—	—	—	—	8.63	2.2848

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Table 6: Pressure loss for Geberit Mapress carbon steel system pipes 1.0215, compressed air 8 bar, d42–108 mm

d [mm]	42		54		76.1		88.9		108	
$\dot{V}$ [m³/h]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]
3.75	0.87	0.0277	—	—	—	—	—	—	—	—
4.00	0.93	0.0311	—	—	—	—	—	—	—	—
4.50	1.05	0.0383	—	—	—	—	—	—	—	—
5.00	1.16	0.0462	—	—	—	—	—	—	—	—
5.50	1.28	0.0548	—	—	—	—	—	—	—	—
6.00	1.40	0.0640	—	—	—	—	—	—	—	—
6.50	1.51	0.0739	0.88	0.0203	—	—	—	—	—	—
7.00	1.63	0.0843	0.95	0.0232	—	—	—	—	—	—
7.50	1.74	0.0955	1.02	0.0262	—	—	—	—	—	—
8.00	1.86	0.1072	1.09	0.0294	—	—	—	—	—	—
8.50	1.98	0.1196	1.16	0.0328	—	—	—	—	—	—
9.00	2.09	0.1326	1.22	0.0363	—	—	—	—	—	—
9.50	2.21	0.1462	1.29	0.0400	—	—	—	—	—	—
10.00	2.33	0.1604	1.36	0.0439	—	—	—	—	—	—
10.50	2.44	0.1752	1.43	0.0479	—	—	—	—	—	—
11.00	2.56	0.1907	1.50	0.0520	—	—	—	—	—	—
11.50	2.67	0.2067	1.56	0.0564	—	—	—	—	—	—
12.00	2.79	0.2233	1.63	0.0609	—	—	—	—	—	—
12.50	2.91	0.2405	1.70	0.0655	0.85	0.0124	—	—	—	—
13.00	3.02	0.2583	1.77	0.0703	0.88	0.0133	—	—	—	—
13.50	3.14	0.2767	1.84	0.0752	0.92	0.0142	—	—	—	—
14.00	3.26	0.2957	1.90	0.0803	0.95	0.0151	—	—	—	—
14.50	3.37	0.3152	1.97	0.0856	0.99	0.0161	—	—	—	—
15.00	3.49	0.3354	2.04	0.0910	1.02	0.0171	—	—	—	—
16.00	3.72	0.3774	2.18	0.1023	1.09	0.0192	—	—	—	—

d [mm]	42		54		76.1		88.9		108	
$\dot{V}$ [m³/h]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]
17.00	3.95	0.4218	2.31	0.1142	1.16	0.0214	—	—	—	—
18.00	4.19	0.4685	2.45	0.1267	1.22	0.0237	0.88	0.0108	—	—
19.00	4.42	0.5174	2.58	0.1397	1.29	0.0262	0.93	0.0119	—	—
20.00	4.65	0.5687	2.72	0.1534	1.36	0.0287	0.98	0.0131	—	—
21.00	4.88	0.6222	2.86	0.1677	1.43	0.0313	1.03	0.0143	—	—
22.00	5.12	0.6780	2.99	0.1825	1.50	0.0341	1.08	0.0155	—	—
23.00	5.35	0.7360	3.13	0.1980	1.56	0.0369	1.13	0.0168	—	—
24.00	5.58	0.7963	3.26	0.2140	1.63	0.0399	1.18	0.0181	—	—
25.00	5.81	0.8589	3.40	0.2306	1.70	0.0429	1.23	0.0195	—	—
30.00	6.98	1.2053	4.08	0.3222	2.04	0.0597	1.47	0.0271	0.98	0.0102
35.00	8.14	1.6073	4.76	0.4280	2.38	0.0790	1.72	0.0358	1.14	0.0134
40.00	9.30	2.0646	5.44	0.5479	2.72	0.1007	1.96	0.0456	1.31	0.0171
45.00	—	—	6.12	0.6818	3.06	0.1250	2.21	0.0564	1.47	0.0211
50.00	—	—	6.80	0.8295	3.40	0.1516	2.45	0.0684	1.63	0.0256
55.00	—	—	7.48	0.9910	3.74	0.1806	2.70	0.0814	1.80	0.0304
60.00	—	—	8.16	1.1663	4.08	0.2120	2.94	0.0954	1.96	0.0356
65.00	—	—	8.84	1.3552	4.42	0.2457	3.19	0.1105	2.13	0.0412
70.00	—	—	9.52	1.5577	4.76	0.2818	3.43	0.1266	2.29	0.0471
75.00	—	—	—	—	5.10	0.3202	3.68	0.1437	2.45	0.0535
80.00	—	—	—	—	5.44	0.3609	3.93	0.1619	2.62	0.0601
85.00	—	—	—	—	5.78	0.4039	4.17	0.1810	2.78	0.0672
90.00	—	—	—	—	6.12	0.4492	4.42	0.2012	2.94	0.0746
95.00	—	—	—	—	6.46	0.4968	4.66	0.2224	3.11	0.0824
100.00	—	—	—	—	6.80	0.5467	4.91	0.2445	3.27	0.0906
105.00	—	—	—	—	7.14	0.5989	5.15	0.2677	3.43	0.0991
110.00	—	—	—	—	7.48	0.6534	5.40	0.2918	3.60	0.1079
115.00	—	—	—	—	7.82	0.7101	5.64	0.3169	3.76	0.1171
120.00	—	—	—	—	8.16	0.7691	5.89	0.3431	3.92	0.1267
125.00	—	—	—	—	8.50	0.8303	6.13	0.3702	4.09	0.1366
130.00	—	—	—	—	8.84	0.8938	6.38	0.3982	4.25	0.1469
135.00	—	—	—	—	9.18	0.9596	6.62	0.4273	4.41	0.1575
140.00	—	—	—	—	9.53	1.0276	6.87	0.4573	4.58	0.1685
145.00	—	—	—	—	9.87	1.0979	7.11	0.4884	4.74	0.1798
150.00	—	—	—	—	—	—	7.36	0.5203	4.90	0.1915
155.00	—	—	—	—	—	—	7.61	0.5533	5.07	0.2035
160.00	—	—	—	—	—	—	7.85	0.5872	5.23	0.2158
165.00	—	—	—	—	—	—	8.10	0.6221	5.40	0.2285
170.00	—	—	—	—	—	—	8.34	0.6580	5.56	0.2416
175.00	—	—	—	—	—	—	8.59	0.6948	5.72	0.2550

d [mm]	42		54		76.1		88.9		108	
$\dot{V}$ [m³/h]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]
180.00	—	—	—	—	—	—	8.83	0.7326	5.89	0.2687
185.00	—	—	—	—	—	—	9.08	0.7714	6.05	0.2828
190.00	—	—	—	—	—	—	9.32	0.8111	6.21	0.2972
195.00	—	—	—	—	—	—	9.57	0.8518	6.38	0.3120
200.00	—	—	—	—	—	—	9.81	0.8935	6.54	0.3271
205.00	—	—	—	—	—	—	10.06	0.9361	6.70	0.3425
210.00	—	—	—	—	—	—	—	—	6.87	0.3583
215.00	—	—	—	—	—	—	—	—	7.03	0.3745
220.00	—	—	—	—	—	—	—	—	7.19	0.3909
225.00	—	—	—	—	—	—	—	—	7.36	0.4077
230.00	—	—	—	—	—	—	—	—	7.52	0.4249
235.00	—	—	—	—	—	—	—	—	7.68	0.4424
240.00	—	—	—	—	—	—	—	—	7.85	0.4602
245.00	—	—	—	—	—	—	—	—	8.01	0.4784
250.00	—	—	—	—	—	—	—	—	8.17	0.4969
255.00	—	—	—	—	—	—	—	—	8.34	0.5157
260.00	—	—	—	—	—	—	—	—	8.50	0.5349
265.00	—	—	—	—	—	—	—	—	8.67	0.5544
270.00	—	—	—	—	—	—	—	—	8.83	0.5742
275.00	—	—	—	—	—	—	—	—	8.99	0.5944
280.00	—	—	—	—	—	—	—	—	9.16	0.6149
285.00	—	—	—	—	—	—	—	—	9.32	0.6358
290.00	—	—	—	—	—	—	—	—	9.48	0.6570
295.00	—	—	—	—	—	—	—	—	9.65	0.6785
300.00	—	—	—	—	—	—	—	—	9.81	0.7004

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2.4 Compressed air, 10 bar

Medium:	Compressed air
Overpressure:	10 bar
Absolute pressure:	11 bar
Temperature:	20 °C
Density:	13.133 kg/m ³
Viscosity:	0.0000183576 Pa•s
Surface roughness:	0.01 mm

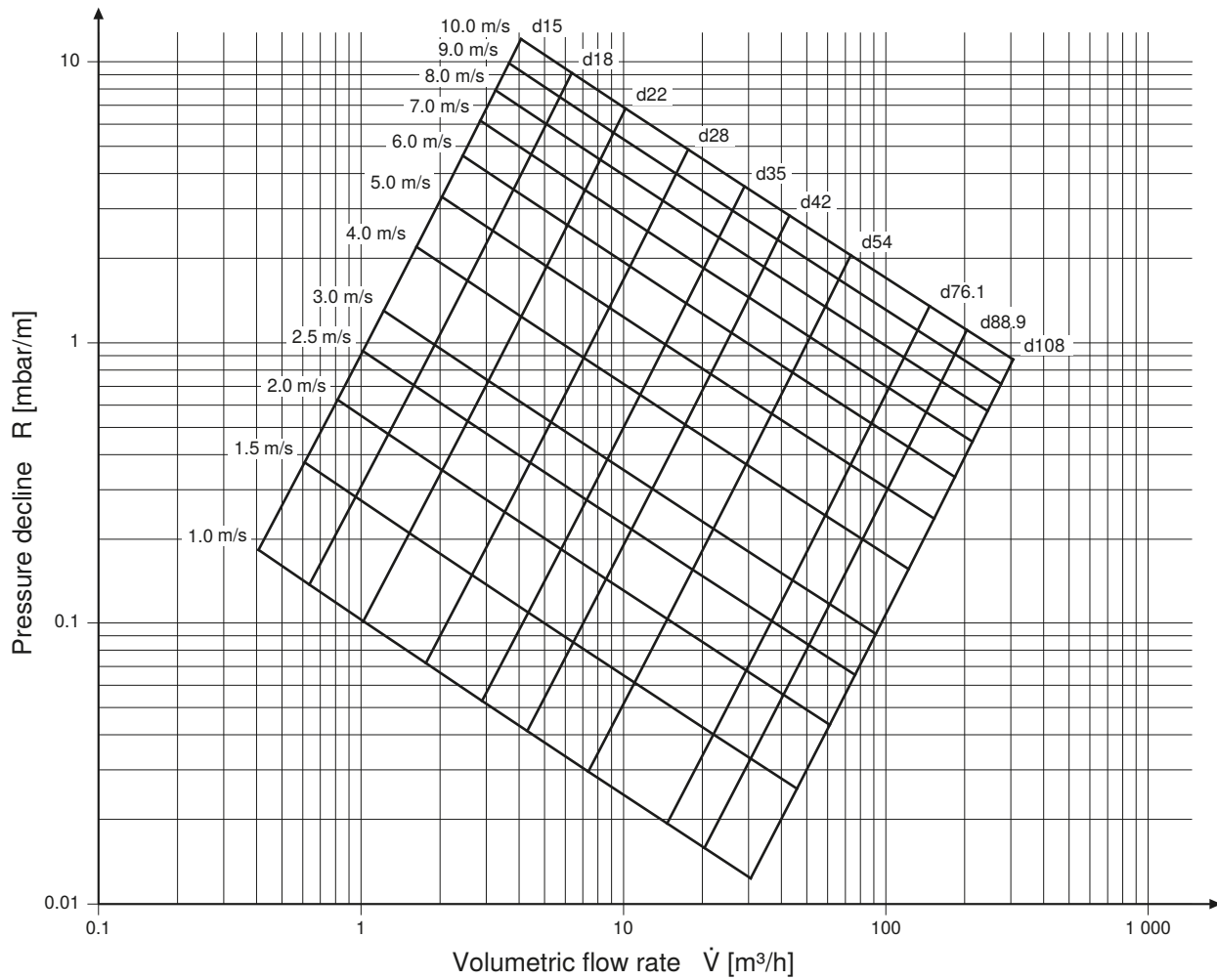


Table 7: Pressure loss for Geberit Mapress carbon steel system pipes 1.0215, compressed air 10 bar, d15–35 mm

d [mm]	15		18		22		28		35	
$\dot{V}$ [m³/h]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]
0.50	1.23	0.2622	—	—	—	—	—	—	—	—
0.75	1.84	0.5388	1.18	0.1838	—	—	—	—	—	—
1.00	2.46	0.9029	1.57	0.3063	0.98	0.0982	—	—	—	—
1.25	3.07	1.3519	1.96	0.4566	1.22	0.1458	—	—	—	—
1.50	3.68	1.8840	2.36	0.6338	1.47	0.2018	—	—	—	—
1.75	4.30	2.4981	2.75	0.8376	1.71	0.2658	0.99	0.0709	—	—
2.00	4.91	3.1934	3.14	1.0675	1.96	0.3379	1.13	0.0898	—	—
2.25	5.53	3.9693	3.54	1.3232	2.20	0.4177	1.27	0.1108	—	—
2.50	6.14	4.8251	3.93	1.6045	2.45	0.5054	1.41	0.1337	0.86	0.0408
2.75	6.75	5.7607	4.32	1.9111	2.69	0.6007	1.56	0.1586	0.95	0.0483
3.00	7.37	6.7756	4.72	2.2431	2.94	0.7036	1.70	0.1854	1.04	0.0564
3.25	7.98	7.8697	5.11	2.6001	3.18	0.8140	1.84	0.2141	1.12	0.0650
3.50	8.60	9.0428	5.50	2.9821	3.43	0.9320	1.98	0.2447	1.21	0.0742
3.75	9.21	10.2945	5.89	3.3891	3.67	1.0574	2.12	0.2772	1.30	0.0840
4.00	9.82	11.6250	6.29	3.8209	3.92	1.1902	2.26	0.3115	1.38	0.0943
4.50	—	—	7.07	4.7587	4.41	1.4780	2.55	0.3857	1.55	0.1165
5.00	—	—	7.86	5.7951	4.90	1.7951	2.83	0.4672	1.73	0.1408
5.50	—	—	8.65	6.9297	5.39	2.1413	3.11	0.5559	1.90	0.1672
6.00	—	—	9.43	8.1624	5.88	2.5165	3.40	0.6518	2.07	0.1957
6.50	—	—	—	—	6.37	2.9206	3.68	0.7549	2.25	0.2262
7.00	—	—	—	—	6.86	3.3535	3.96	0.8649	2.42	0.2588
7.50	—	—	—	—	7.35	3.8152	4.24	0.9821	2.59	0.2934
8.00	—	—	—	—	7.84	4.3054	4.53	1.1063	2.76	0.3300
8.50	—	—	—	—	8.33	4.8241	4.81	1.2374	2.94	0.3687
9.00	—	—	—	—	8.82	5.3714	5.09	1.3755	3.11	0.4093
9.50	—	—	—	—	9.31	5.9472	5.38	1.5206	3.28	0.4519
10.00	—	—	—	—	9.80	6.5513	5.66	1.6726	3.45	0.4964
10.50	—	—	—	—	—	—	5.94	1.8314	3.63	0.5430
11.00	—	—	—	—	—	—	6.22	1.9972	3.80	0.5915
11.50	—	—	—	—	—	—	6.51	2.1699	3.97	0.6419
12.00	—	—	—	—	—	—	6.79	2.3494	4.14	0.6943
12.50	—	—	—	—	—	—	7.07	2.5358	4.32	0.7486
13.00	—	—	—	—	—	—	7.36	2.7290	4.49	0.8049
13.50	—	—	—	—	—	—	7.64	2.9290	4.66	0.8631
14.00	—	—	—	—	—	—	7.92	3.1359	4.84	0.9232
14.50	—	—	—	—	—	—	8.21	3.3496	5.01	0.9852
15.00	—	—	—	—	—	—	8.49	3.5700	5.18	1.0492
16.00	—	—	—	—	—	—	9.05	4.0314	5.53	1.1828

d [mm]	15		18		22		28		35	
$\dot{V}$ [m³/h]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]
17.00	—	—	—	—	—	—	9.62	4.5199	5.87	1.3241
18.00	—	—	—	—	—	—	—	—	6.22	1.4730
19.00	—	—	—	—	—	—	—	—	6.56	1.6295
20.00	—	—	—	—	—	—	—	—	6.91	1.7936
21.00	—	—	—	—	—	—	—	—	7.25	1.9652
22.00	—	—	—	—	—	—	—	—	7.60	2.1444
23.00	—	—	—	—	—	—	—	—	7.94	2.3311
24.00	—	—	—	—	—	—	—	—	8.29	2.5254
25.00	—	—	—	—	—	—	—	—	8.63	2.7271

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Table 8: Pressure loss for Geberit Mapress carbon steel system pipes 1.0215, compressed air 10 bar, d42–108 mm

d [mm]	42		54		76.1		88.9		108	
$\dot{V}$ [m³/h]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]
3.75	0.87	0.0324	—	—	—	—	—	—	—	—
4.00	0.93	0.0364	—	—	—	—	—	—	—	—
4.50	1.05	0.0449	—	—	—	—	—	—	—	—
5.00	1.16	0.0541	—	—	—	—	—	—	—	—
5.50	1.28	0.0642	—	—	—	—	—	—	—	—
6.00	1.40	0.0751	—	—	—	—	—	—	—	—
6.50	1.51	0.0867	0.88	0.0238	—	—	—	—	—	—
7.00	1.63	0.0991	0.95	0.0272	—	—	—	—	—	—
7.50	1.74	0.1122	1.02	0.0307	—	—	—	—	—	—
8.00	1.86	0.1261	1.09	0.0345	—	—	—	—	—	—
8.50	1.98	0.1407	1.16	0.0385	—	—	—	—	—	—
9.00	2.09	0.1561	1.22	0.0426	—	—	—	—	—	—
9.50	2.21	0.1722	1.29	0.0470	—	—	—	—	—	—
10.00	2.33	0.1890	1.36	0.0515	—	—	—	—	—	—
10.50	2.44	0.2066	1.43	0.0562	—	—	—	—	—	—
11.00	2.56	0.2249	1.50	0.0612	—	—	—	—	—	—
11.50	2.67	0.2439	1.56	0.0663	—	—	—	—	—	—
12.00	2.79	0.2636	1.63	0.0716	—	—	—	—	—	—
12.50	2.91	0.2840	1.70	0.0770	0.85	0.0145	—	—	—	—
13.00	3.02	0.3051	1.77	0.0827	0.88	0.0155	—	—	—	—
13.50	3.14	0.3270	1.84	0.0886	0.92	0.0166	—	—	—	—
14.00	3.26	0.3495	1.90	0.0946	0.95	0.0177	—	—	—	—
14.50	3.37	0.3728	1.97	0.1008	0.99	0.0189	—	—	—	—
15.00	3.49	0.3967	2.04	0.1072	1.02	0.0201	—	—	—	—
16.00	3.72	0.4467	2.18	0.1206	1.09	0.0226	—	—	—	—

d [mm]	42		54		76.1		88.9		108	
$\dot{V}$ [m³/h]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]
17.00	3.95	0.4995	2.31	0.1347	1.16	0.0252	—	—	—	—
18.00	4.19	0.5551	2.45	0.1494	1.22	0.0279	0.88	0.0127	—	—
19.00	4.42	0.6135	2.58	0.1650	1.29	0.0307	0.93	0.0140	—	—
20.00	4.65	0.6746	2.72	0.1812	1.36	0.0337	0.98	0.0153	—	—
21.00	4.88	0.7384	2.86	0.1981	1.43	0.0368	1.03	0.0167	—	—
22.00	5.12	0.8050	2.99	0.2157	1.50	0.0401	1.08	0.0182	—	—
23.00	5.35	0.8743	3.13	0.2341	1.56	0.0434	1.13	0.0197	—	—
24.00	5.58	0.9464	3.26	0.2531	1.63	0.0469	1.18	0.0213	—	—
25.00	5.81	1.0212	3.40	0.2728	1.70	0.0505	1.23	0.0229	—	—
30.00	6.98	1.4358	4.08	0.3819	2.04	0.0704	1.47	0.0319	0.98	0.0120
35.00	8.14	1.9178	4.76	0.5081	2.38	0.0933	1.72	0.0421	1.14	0.0158
40.00	9.30	2.4669	5.44	0.6513	2.72	0.1191	1.96	0.0537	1.31	0.0201
45.00	—	—	6.12	0.8114	3.06	0.1479	2.21	0.0666	1.47	0.0249
50.00	—	—	6.80	0.9883	3.40	0.1795	2.45	0.0808	1.63	0.0301
55.00	—	—	7.48	1.1819	3.74	0.2141	2.70	0.0962	1.80	0.0358
60.00	—	—	8.16	1.3921	4.08	0.2515	2.94	0.1129	1.96	0.0420
65.00	—	—	8.84	1.6190	4.42	0.2917	3.19	0.1309	2.13	0.0486
70.00	—	—	9.52	1.8624	4.76	0.3347	3.43	0.1500	2.29	0.0557
75.00	—	—	—	—	5.10	0.3806	3.68	0.1704	2.45	0.0632
80.00	—	—	—	—	5.44	0.4293	3.93	0.1920	2.62	0.0711
85.00	—	—	—	—	5.78	0.4807	4.17	0.2149	2.78	0.0795
90.00	—	—	—	—	6.12	0.5350	4.42	0.2389	2.94	0.0884
95.00	—	—	—	—	6.46	0.5920	4.66	0.2642	3.11	0.0976
100.00	—	—	—	—	6.80	0.6518	4.91	0.2907	3.27	0.1073
105.00	—	—	—	—	7.14	0.7143	5.15	0.3183	3.43	0.1174
110.00	—	—	—	—	7.48	0.7796	5.40	0.3472	3.60	0.1280
115.00	—	—	—	—	7.82	0.8477	5.64	0.3772	3.76	0.1390
120.00	—	—	—	—	8.16	0.9185	5.89	0.4085	3.92	0.1504
125.00	—	—	—	—	8.50	0.9920	6.13	0.4409	4.09	0.1622
130.00	—	—	—	—	8.84	1.0683	6.38	0.4746	4.25	0.1744
135.00	—	—	—	—	9.18	1.1473	6.62	0.5094	4.41	0.1871
140.00	—	—	—	—	9.53	1.2291	6.87	0.5454	4.58	0.2002
145.00	—	—	—	—	9.87	1.3136	7.11	0.5826	4.74	0.2137
150.00	—	—	—	—	—	—	7.36	0.6209	4.90	0.2277
155.00	—	—	—	—	—	—	7.61	0.6605	5.07	0.2420
160.00	—	—	—	—	—	—	7.85	0.7012	5.23	0.2568
165.00	—	—	—	—	—	—	8.10	0.7431	5.40	0.2720
170.00	—	—	—	—	—	—	8.34	0.7861	5.56	0.2876
175.00	—	—	—	—	—	—	8.59	0.8304	5.72	0.3036

d [mm]	42		54		76.1		88.9		108	
$\dot{V}$ [m³/h]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]	v [m/s]	R [mbar/m]
180.00	—	—	—	—	—	—	8.83	0.8758	5.89	0.3201
185.00	—	—	—	—	—	—	9.08	0.9224	6.05	0.3369
190.00	—	—	—	—	—	—	9.32	0.9701	6.21	0.3542
195.00	—	—	—	—	—	—	9.57	1.0191	6.38	0.3719
200.00	—	—	—	—	—	—	9.81	1.0692	6.54	0.3900
205.00	—	—	—	—	—	—	10.06	1.1204	6.70	0.4085
210.00	—	—	—	—	—	—	—	—	6.87	0.4274
215.00	—	—	—	—	—	—	—	—	7.03	0.4468
220.00	—	—	—	—	—	—	—	—	7.19	0.4665
225.00	—	—	—	—	—	—	—	—	7.36	0.4867
230.00	—	—	—	—	—	—	—	—	7.52	0.5072
235.00	—	—	—	—	—	—	—	—	7.68	0.5282
240.00	—	—	—	—	—	—	—	—	7.85	0.5496
245.00	—	—	—	—	—	—	—	—	8.01	0.5714
250.00	—	—	—	—	—	—	—	—	8.17	0.5936
255.00	—	—	—	—	—	—	—	—	8.34	0.6163
260.00	—	—	—	—	—	—	—	—	8.50	0.6393
265.00	—	—	—	—	—	—	—	—	8.67	0.6627
270.00	—	—	—	—	—	—	—	—	8.83	0.6866
275.00	—	—	—	—	—	—	—	—	8.99	0.7109
280.00	—	—	—	—	—	—	—	—	9.16	0.7355
285.00	—	—	—	—	—	—	—	—	9.32	0.7606
290.00	—	—	—	—	—	—	—	—	9.48	0.7861
295.00	—	—	—	—	—	—	—	—	9.65	0.8120
300.00	—	—	—	—	—	—	—	—	9.81	0.8383

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