Table 4.44 Pressure factors Z for compressible flow, using $Z = p^{1.929}$

Pressure, p / kPa	Z / $kPa^{1.929}$	Pressure, p / kPa	Z / $kPa^{1.929}$	Pressure, p / kPa	Z / $kPa^{1.929}$	Pressure, p / kPa	Z / $kPa^{1.929}$	Pressure, p / kPa	Z / $kPa^{1.929}$
10	85	210	30 200	410	110 000	610	236 000	810	408 000
20	323	220	33 000	420	115 000	620	244 000	820	418 000
30	707	230	36 000	430	120 000	630	251 000	830	427 000
40	1 230	240	39 000	440	126 000	640	259 000	840	437 000
50	1 890	250	42 230	450	131 000	650	267 000	850	448 000
60	2 690	260	45 500	460	137 000	660	275 000	860	458 000
70	3 620	270	49 000	470	143 000	670	283 000	870	468 000
80	4 690	280	52 500	480	149 000	680	291 000	880	479 000
90	5 880	290	56 200	490	155 000	690	299 000	890	489 000
100	7 210	300	60 000	500	161 000	700	308 000	900	500 000
110	8 670	310	63 900	510	167 000	710	316 000	910	510 000
120	10 300	320	68 000	520	174 000	720	325 000	920	521 000
130	12 000	330	72 100	530	180 000	730	334 000	930	532 000
140	13 800	340	76 400	540	187 000	740	343 000	940	543 000
150	15 800	350	80 800	550	193 000	750	351 000	950	555 000
160	17 900	360	85 300	560	200 000	760	361 000	960	566 000
170	20 100	370	90 000	570	207 000	770	370 000	970	577 000
180	22 400	380	94 700	580	214 000	780	379 000	980	589 000
190	24 900	390	99 600	590	221 000	790	389 000	990	601 000

4.6.2 Flow of condensate in pipes

The pressure drop of the condensate flow may be obtained in the same way as for hot water where:

(*a*) thermostatic traps, having small pressure differentials between inlet and outlet, are employed and

(*b*) air and other gases are prevented from entering the condensate drain by the use of automatic vents.

If air is required to traverse the condensate main and if flash steam is produced by the pressure drops in the trap and system then the resistance is greatly increased. The pressure drop in two-phase flow is always greater than for either phase individually, the calculation for which is beyond the scope of this Guide. In the absence of definite data it is recommended that where flash steam can occur the condensate mains should be sized for three times the normal hot water discharge.

4.7 Natural gas in pipes

4.7.1 General

It should be noted that gases are highly compressible and that the density therefore varies considerably with pressure and temperature. Although the viscosity varies little with pressure, that too varies with temperature. Thus pressure drops are therefore best obtained by direct calculation using the method explained in section 4.3. Although section 4.3 assumes incompressible flow (ρ = constant), the method may be used with reasonable accuracy so long as the drop in pressure along the pipe does not exceed 10 per cent of the initial (absolute) inlet pressure.

Nevertheless values have been calculated for a density ρ = 0.68 kg m^{-3} being reasonable for a pressure of 100 kPa and a temperature of 10°C. These are given in Table 4.45.

The table covers the regions of laminar and turbulent flows. In the intermediate zone, $2000 < Re < 3000$ the nature of the flow is unpredictable and the pressure drop similarly unpredictable. For $Re > 2000$ turbulent flow has been assumed in the calculation.

Table 4.45 Flow of natural gas in medium grade steel pipes

MEDIUM GRADE STEEL
NATURAL GAS

q_v = volume flow rate $m^3.s^{-1}$
c = velocity $m.s^{-1}$
$\Delta p/l$ = pressure drop per unit length $Pa.m^{-1}$
l_e = equivalent length of a component for $\zeta = 1$ m

* $(Re) = 2000$ for $\rho = 0.68$ kg.m^{-3}
† $(Re) = 3000$

$\Delta p/l$	c	10 mm q_v	10 mm l_e	15 mm q_v	15 mm l_e	20 mm q_v	20 mm l_e	25 mm q_v	25 mm l_e	c	$\Delta p/l$
0.5		0.000028	*0.1*	0.000078	*0.1*	0.000250	*0.4*	0.000638	*0.9*		0.5
0.6		0.000033	*0.1*	0.000093	*0.2*	0.000300	*0.4*	0.000696*	*0.9*		0.6
0.7		0.000038	*0.1*	0.000108	*0.2*	0.000350	*0.5*	0.000725	*0.9*		0.7
0.8		0.000044	*0.1*	0.000124	*0.2*	0.000400	*0.6*	0.000755	*0.9*		0.8
0.9		0.000049	*0.1*	0.000139	*0.2*	0.000450	*0.6*	0.000784	*0.9*		0.9
1.0	0.5	0.000055	*0.1*	0.000155	*0.2*	0.000500*	*0.7*	0.000814	*0.9*		1.0
1.5		0.000082	*0.2*	0.000232	*0.3*	0.000583	*0.6*	0.000961†	*1.0*	1.5	1.5
2.0		0.000109	*0.2*	0.000309	*0.4*	0.000640	*0.6*	0.00112	*1.0*		2.0
2.5		0.000136	*0.2*	0.000386*	*0.5*	0.000697	*0.5*	0.00128	*1.0*		2.5
3.0		0.000163	*0.3*	0.000413	*0.5*	0.000754	*0.5*	0.00142	*1.1*		3.0
3.5	1.5	0.000190	*0.3*	0.000430	*0.5*	0.000813†	*0.5*	0.00155	*1.1*		3.5
4.0		0.000217	*0.3*	0.000447	*0.5*	0.000878	*0.5*	0.00167	*1.1*		4.0
4.5		0.000245	*0.4*	0.000465	*0.4*	0.000940	*0.5*	0.00179	*1.1*	3.0	4.5
5.0		0.000272	*0.4*	0.000482	*0.4*	0.000999	*0.6*	0.00190	*1.1*		5.0
5.5		0.000299	*0.4*	0.000499	*0.4*	0.00106	*0.6*	0.00201	*1.1*		5.5
6.0		0.000311*	*0.4*	0.000516	*0.4*	0.00111	*0.6*	0.00211	*1.2*		6.0
6.5		0.000317	*0.4*	0.000534	*0.4*	0.00116	*0.6*	0.00221	*1.2*		6.5
7.0		0.000323	*0.4*	0.000551	*0.4*	0.00121	*0.6*	0.00230	*1.2*		7.0
7.5		0.000329	*0.4*	0.000568	*0.4*	0.00126	*0.6*	0.00239	*1.2*		7.5
8.0		0.000335	*0.4*	0.000585	*0.4*	0.00131	*0.6*	0.00248	*1.2*		8.0
8.5		0.000341	*0.4*	0.000603†	*0.4*	0.00135	*0.6*	0.00257	*1.2*		8.5
9.0		0.000347	*0.4*	0.000624	*0.4*	0.00140	*0.6*	0.00265	*1.2*		9.0
9.5		0.000353	*0.4*	0.000643	*0.4*	0.00144	*0.6*	0.00274	*1.2*		9.5
10.0	3.0	0.000359	*0.3*	0.000663	*0.4*	0.00149	*0.6*	0.00282	*1.2*		10.0
12.5		0.000388	*0.3*	0.000753	*0.4*	0.00169	*0.6*	0.00319	*1.2*		12.5
15.0		0.000418	*0.3*	0.000836	*0.4*	0.00187	*0.6*	0.00354	*1.3*		15.0
17.5		0.000448†	*0.3*	0.000912	*0.4*	0.00204	*0.7*	0.00385	*1.3*		17.5
20.0		0.000480	*0.3*	0.000984	*0.4*	0.00220	*0.7*	0.00415	*1.3*		20.0
22.5		0.000514	*0.3*	0.00105	*0.5*	0.00235	*0.7*	0.00443	*1.3*		22.5
25.0		0.000545	*0.3*	0.00112	*0.5*	0.00249	*0.7*	0.00470	*1.3*		25.0

Table 4.45 Flow of natural gas in medium grade steel pipes — *continued*

$\Delta p/l$	c	32 mm q_v	32 mm l_e	40 mm q_v	40 mm l_e	50 mm q_v	50 mm l_e	65 mm q_v	65 mm l_e	c	$\Delta p/l$
0.5		0.00113	*0.9*	0.00164	*1.0*	0.00313	*1.4*	0.00637	*2.1*		0.5
0.6		0.00122	*0.9*	0.00182	*1.0*	0.00347	*1.5*	0.00707	*2.1*		0.6
0.7		0.00131†	*0.9*	0.00199	*1.1*	0.00380	*1.5*	0.00772	*2.2*		0.7
0.8		0.00141	*0.9*	0.00215	*1.1*	0.00410	*1.5*	0.00833	*2.2*		0.8
0.9	1.5	0.00151	*0.9*	0.00230	*1.1*	0.00439	*1.5*	0.00890	*2.2*		0.9
1.0		0.00161	*0.9*	0.00245	*1.1*	0.00466	*1.6*	0.00945	*2.3*		1.0
1.5		0.00204	*1.0*	0.00309	*1.2*	0.00587	*1.7*	0.0119	*2.4*	3.0	1.5
2.0		0.00240	*1.0*	0.00364	*1.2*	0.00691	*1.7*	0.0140	*2.5*		2.0
2.5		0.00273	*1.0*	0.00413	*1.3*	0.00784	*1.8*	0.0158	*2.5*		2.5
3.0	3.0	0.00303	*1.1*	0.00458	*1.3*	0.00869	*1.8*	0.0175	*2.6*		3.0
3.5		0.00331	*1.1*	0.00500	*1.3*	0.00947	*1.8*	0.0191	*2.6*	5.0	3.5
4.0		0.00357	*1.1*	0.00539	*1.4*	0.0102	*1.9*	0.0206	*2.7*		4.0
4.5		0.00381	*1.1*	0.00576	*1.4*	0.0109	*1.9*	0.0220	*2.7*		4.5
5.0		0.00405	*1.1*	0.00612	*1.4*	0.0116	*1.9*	0.0233	*2.7*		5.0
5.5		0.00427	*1.1*	0.00645	*1.4*	0.0122	*1.9*	0.0245	*2.8*		5.5
6.0		0.00449	*1.2*	0.00677	*1.4*	0.0128	*2.0*	0.0257	*2.8*		6.0
6.5		0.00469	*1.2*	0.00708	*1.4*	0.0134	*2.0*	0.0269	*2.8*		6.5
7.0		0.00489	*1.2*	0.00738	*1.4*	0.0139	*2.0*	0.0280	*2.8*		7.0
7.5	5.0	0.00508	*1.2*	0.00767	*1.5*	0.0145	*2.0*	0.0291	*2.8*		7.5
8.0		0.00527	*1.2*	0.00795	*1.5*	0.0150	*2.0*	0.0301	*2.9*		8.0
8.5		0.00545	*1.2*	0.00823	*1.5*	0.0155	*2.0*	0.0312	*2.9*		8.5
9.0		0.00563	*1.2*	0.00849	*1.5*	0.0160	*2.1*	0.0322	*2.9*		9.0
9.5		0.00580	*1.2*	0.00875	*1.5*	0.0165	*2.1*	0.0331	*2.9*		9.5
10.0		0.00597	*1.2*	0.00900	*1.5*	0.0170	*2.1*	0.0341	*2.9*		10.0
12.5		0.00676	*1.2*	0.0102	*1.5*	0.0192	*2.1*	0.0385	*3.0*	10.0	12.5
15.0		0.00748	*1.3*	0.0113	*1.6*	0.0212	*2.1*	0.0425	*3.0*		15.0
17.5		0.00814	*1.3*	0.0123	*1.6*	0.0231	*2.2*	0.0462	*3.1*		17.5
20.0		0.00877	*1.3*	0.0132	*1.6*	0.0248	*2.2*	0.0496	*3.1*		20.0
22.5		0.00935	*1.3*	0.0141	*1.6*	0.0264	*2.2*	0.0529	*3.1*		22.5
25.0		0.00991	*1.3*	0.0149	*1.6*	0.0280	*2.2*	0.0560	*3.2*		25.0

Table 4.45 Flow of natural gas in medium grade steel pipes — *continued*

MEDIUM GRADE STEEL
NATURAL GAS

q_v = volume flow rate $m^3.s^{-1}$
c = velocity $m.s^{-1}$
$\Delta p/l$ = pressure drop per unit length $Pa.m^{-1}$
l_e = equivalent length of a component for $\zeta = 1$ m

* (Re) = 2000 for ρ = 0.68 $kg.m^{-3}$

$\Delta p/l$	c	80 mm		90 mm		100 mm		125 mm		150 mm		c	$\Delta p/l$
		q_v	l_e	q_v	l_e	q_v	l_e	q_v	l_e	q_v	l_e		
0.5		0.00988	*2.6*	0.0146	*3.2*	0.0203	*3.8*	0.0360	*5.1*	0.0583	*6.5*	3.0	0.5
0.6		0.0110	*2.7*	0.0162	*3.2*	0.0224	*3.8*	0.0400	*5.2*	0.0645	*6.6*		0.6
0.7		0.0120	*2.7*	0.0177	*3.3*	0.0245	*3.9*	0.0434	*5.3*	0.0703	*6.7*		0.7
0.8		0.0129	*2.8*	0.0190	*3.4*	0.0264	*4.0*	0.0468	*5.3*	0.0757	*6.8*		0.8
0.9		0.0138	*2.8*	0.0203	*3.4*	0.0282	*4.0*	0.0500	*5.4*	0.0808	*6.9*		0.9
1.0	3.0	0.0146	*2.8*	0.0216	*3.5*	0.0299	*4.1*	0.0530	*5.5*	0.0857	*7.0*		1.0
1.5		0.0184	*3.0*	0.0271	*3.6*	0.0375	*4.3*	0.0663	*5.7*	0.107	*7.3*	5.0	1.5
2.0		0.0216	*3.1*	0.0318	*3.7*	0.0440	*4.4*	0.0778	*5.9*	0.126	*7.5*		2.0
2.5	5.0	0.0245	*3.2*	0.0360	*3.8*	0.0498	*4.5*	0.0879	*6.0*	0.142	*7.7*		2.5
3.0		0.0271	*3.2*	0.0398	*3.9*	0.0550	*4.6*	0.0972	*6.1*	0.157	*7.8*		3.0
3.5		0.0295	*3.3*	0.0433	*4.0*	0.0599	*4.7*	0.106	*6.2*	0.170	*7.9*		3.5
4.0		0.0317	*3.3*	0.0466	*4.0*	0.0645	*4.7*	0.114	*6.3*	0.183	*8.0*	10.0	4.0
4.5		0.0339	*3.4*	0.0498	*4.1*	0.0688	*4.8*	0.121	*6.4*	0.195	*8.1*		4.5
5.0		0.0359	*3.4*	0.0572	*4.1*	0.0728	*4.8*	0.128	*6.4*	0.207	*8.1*		5.0
5.5		0.0378	*3.4*	0.0555	*4.2*	0.0767	*4.9*	0.135	*6.5*	0.218	*8.2*		5.5
6.0		0.0397	*3.5*	0.0583	*4.2*	0.0804	*4.9*	0.142	*6.5*	0.228	*8.2*		6.0
6.5		0.0414	*3.5*	0.0609	*4.2*	0.0840	*5.0*	0.148	*6.6*	0.238	*8.3*		6.5
7.0		0.0432	*3.5*	0.0634	*4.2*	0.0875	*5.0*	0.154	*6.6*	0.248	*8.3*		7.0
7.5		0.0448	*3.5*	0.0658	*4.3*	0.0908	*5.0*	0.160	*6.6*	0.257	*8.4*		7.5
8.0		0.0464	*3.6*	0.0681	*4.3*	0.0941	*5.0*	0.166	*6.7*	0.266	*8.4*		8.0
8.5		0.0480	*3.6*	0.0704	*4.3*	0.0972	*5.1*	0.171	*6.7*	0.275	*8.5*		8.5
9.0		0.0495	*3.6*	0.0726	*4.3*	0.100	*5.1*	0.176	*6.7*	0.284	*8.5*	15.0	9.0
9.5	10.0	0.0510	*3.6*	0.0748	*4.4*	0.103	*5.1*	0.182	*6.8*	0.292	*8.5*		9.5
10.0		0.0524	*3.6*	0.0769	*4.4*	0.106	*5.1*	0.187	*6.8*	0.300	*8.6*		10.0
12.5		0.0592	*3.7*	0.0868	*4.5*	0.120	*5.2*	0.210	*6.9*	0.338	*8.7*		12.5
15.0		0.0653	*3.7*	0.0957	*4.5*	0.132	*5.3*	0.232	*7.0*	0.373	*8.8*		15.0
17.5	15.0	0.0710	*3.8*	0.104	*4.6*	0.143	*5.4*	0.252	*7.1*	0.404	*8.9*		17.5
20.0		0.0763	*3.8*	0.112	*4.6*	0.154	*5.4*	0.270	*7.1*	0.434	*9.0*		20.0
22.5		0.0812	*3.9*	0.119	*4.7*	0.164	*5.4*	0.288	*7.2*	0.462	*9.0*		22.5
25.0		0.0860	*3.9*	0.126	*4.7*	0.173	*5.5*	0.304	*7.2*	0.488	*9.1*		25.0

Table 4.46 Flow of natural gas in copper pipes

COPPER, TABLE X
NATURAL GAS

q_v = volume flow rate $m^3.s^{-1}$
c = velocity $m.s^{-1}$
$\Delta p/l$ = pressure drop per unit length $Pa.m^{-1}$
l_e = equivalent length of a component for $\zeta = 1$ m

* $(Re) = 2000$ for $\rho = 0.68\ kg.m^{-3}$
† $(Re) = 3000$

$\Delta p/l$	c	6 mm q_v	l_e	8 mm q_v	l_e	10 mm q_v	l_e	12 mm q_v	l_e	15 mm q_v	l_e	c	$\Delta p/l$
0.5		0.000001	−0.0	0.000003	0.0	0.000007	0.0	0.000016	0.0	0.000040	0.1	0.3	0.5
0.6		0.000001	0.0	0.000003	0.0	0.000009	0.0	0.000019	0.0	0.000048	0.1		0.6
0.7		0.000001	0.0	0.000004	0.0	0.000010	0.0	0.000022	0.0	0.000055	0.1		0.7
0.8		0.000001	0.0	0.000004	0.0	0.000012	0.0	0.000025	0.0	0.000063	0.1		0.8
0.9		0.000002	0.0	0.000005	0.0	0.000013	0.0	0.000029	0.0	0.000071	0.1		0.9
1.0	0.1	0.000002	0.0	0.000005	0.0	0.000014	0.0	0.000032	0.0	0.000079	0.2		1.0
1.5		0.000002	0.0	0.000008	0.0	0.000021	0.0	0.000047	0.1	0.000118	0.2		1.5
2.0	0.15	0.000003	0.0	0.000010	0.0	0.000028	0.0	0.000063	0.1	0.000157	0.2	1.0	2.0
2.5		0.000004	0.0	0.000013	0.0	0.000035	0.0	0.000079	0.1	0.000197	0.3		2.5
3.0		0.000004	0.0	0.000015	0.0	0.000042	0.1	0.000094	0.1	0.000236	0.3		3.0
3.5		0.000005	0.0	0.000018	0.0	0.000049	0.1	0.000110	0.1	0.000275	0.4		3.5
4.0	0.3	0.000005	0.0	0.000020	0.0	0.000056	0.1	0.000125	0.2	0.000314	0.4		4.0
4.5		0.000006	0.0	0.000023	0.0	0.000062	0.1	0.000141	0.2	0.000341*	0.5		4.5
5.0		0.000007	0.0	0.000025	0.0	0.000069	0.1	0.000157	0.2	0.000350	0.4		5.0
5.5		0.000007	0.0	0.000027	0.0	0.000076	0.1	0.000172	0.2	0.000360	0.4		5.5
6.0		0.000008	0.0	0.000030	0.0	0.000083	0.2	0.000188	0.2	0.000369	0.4		6.0
6.5		0.000008	0.0	0.000032	0.0	0.000090	0.2	0.000203	0.3	0.000379	0.4		6.5
7.0		0.000009	0.0	0.000035	0.0	0.000097	0.2	0.000219	0.3	0.000388	0.4		7.0
7.5		0.000010	0.0	0.000037	0.1	0.000104	0.2	0.000235	0.3	0.000398	0.4		7.5
8.0		0.000010	0.0	0.000040	0.1	0.000111	0.2	0.000250	0.4	0.000407	0.4		8.0
8.5		0.000011	0.0	0.000042	0.1	0.000117	0.2	0.000266*	0.4	0.000417	0.4		8.5
9.0		0.000011	0.0	0.000045	0.1	0.000124	0.2	0.000271	0.3	0.000426	0.4		9.0
9.5		0.000012	0.0	0.000047	0.1	0.000131	0.2	0.000275	0.3	0.000436	0.4	3.0	9.5
10.0		0.000013	0.0	0.000050	0.1	0.000138	0.2	0.000278	0.3	0.000445	0.4		10.0
12.5		0.000016	0.0	0.000062	0.1	0.000172	0.3	0.000297	0.3	0.000493†	0.4		12.5
15.0	1.0	0.000019	0.0	0.000074	0.1	0.000207*	0.3	0.000316	0.3	0.000546	0.4		15.0
17.5		0.000022	0.0	0.000086	0.1	0.000224	0.3	0.000335	0.3	0.000597	0.4		17.5
20.0		0.000025	0.0	0.000099	0.1	0.000232	0.3	0.000354	0.3	0.000646	0.4		20.0
22.5		0.000028	0.0	0.000111	0.2	0.000240	0.3	0.000373	0.3	0.000692	0.4		22.5

Table 4.46 Flow of natural gas in copper pipes — *continued*

$\Delta p/l$	c	22 mm q_v	l_e	28 mm q_v	l_e	35 mm q_v	l_e	42 mm q_v	l_e	54 mm q_v	l_e	c	$\Delta p/l$
0.5		0.000192	0.3	0.000543	0.7	0.000927	0.8	0.00143	1.0	0.00295	1.4		0.5
0.6		0.000231	0.3	0.000649*	0.9	0.000990	0.8	0.00158	1.0	0.00328	1.4		0.6
0.7	1.0	0.000269	0.4	0.000675	0.8	0.00105	0.8	0.00173	1.0	0.00359	1.5		0.7
0.8		0.000307	0.4	0.000702	0.8	0.00112	0.8	0.00187	1.0	0.00388	1.5		0.8
0.9		0.000346	0.5	0.000728	0.7	0.00118†	0.8	0.00201	1.0	0.00415	1.5		0.9
1.0		0.000384	0.5	0.000754	0.7	0.00125	0.8	0.00213	1.1	0.00442	1.6		1.0
1.5		0.000519*	0.6	0.000886	0.7	0.00158	0.9	0.00270	1.1	0.00558	1.7		1.5
2.0		0.000565	0.5	0.00102†	0.7	0.00187	0.9	0.00320	1.2	0.00659	1.7	3.0	2.0
2.5		0.000611	0.5	0.00117	0.7	0.00213	0.9	0.00364	1.2	0.00749	1.8		2.5
3.0		0.000658	0.5	0.00130	0.7	0.00237	1.0	0.00404	1.3	0.00832	1.8		3.0
3.5		0.000704	0.5	0.00142	0.7	0.00260	1.0	0.00442	1.3	0.00909	1.9		3.5
4.0		0.000751†	0.5	0.00154	0.7	0.00281	1.0	0.00477	1.3	0.00981	1.9		4.0
4.5		0.000805	0.5	0.00165	0.8	0.00300	1.0	0.00510	1.3	0.0105	1.9	5.0	4.5
5.0		0.000856	0.5	0.00175	0.8	0.00319	1.0	0.00543	1.4	0.0111	2.0		5.0
5.5		0.000906	0.5	0.00185	0.8	0.00337	1.1	0.00573	1.4	0.0118	2.0		5.5
6.0	3.0	0.000953	0.5	0.00195	0.8	0.00355	1.1	0.00603	1.4	0.0124	2.0		6.0
6.5		0.000999	0.6	0.00204	0.8	0.00371	1.1	0.00631	1.4	0.0129	2.0		6.5
7.0		0.00104	0.6	0.00213	0.8	0.00388	1.1	0.00658	1.4	0.0135	2.1		7.0
7.5		0.00109	0.6	0.00222	0.8	0.00403	1.1	0.00685	1.4	0.0140	2.1		7.5
8.0		0.00113	0.6	0.00230	0.8	0.00419	1.1	0.00710	1.5	0.0146	2.1		8.0
8.5		0.00117	0.6	0.00239	0.8	0.00433	1.1	0.00736	1.5	0.0151	2.1		8.5
9.0		0.00121	0.6	0.00247	0.8	0.00448	1.1	0.00760	1.5	0.0156	2.1		9.0
9.5		0.00125	0.6	0.00254	0.8	0.00462	1.1	0.00784	1.5	0.0160	2.2		9.5
10.0		0.00129	0.6	0.00262	0.9	0.00476	1.2	0.00807	1.5	0.0165	2.2		10.0
12.5		0.00146	0.6	0.00298	0.9	0.00541	1.2	0.00917	1.6	0.0187	2.2		12.5
15.0	5.0	0.00163	0.6	0.00331	0.9	0.00600	1.2	0.0102	1.6	0.0208	2.3	10.0	15.0
17.5		0.00178	0.6	0.00361	0.9	0.00656	1.2	0.0111	1.6	0.0227	2.3		17.5
20.0		0.00192	0.7	0.00390	0.9	0.00707	1.3	0.0120	1.7	0.0244	2.4		20.0
22.5		0.00206	0.7	0.00418	1.0	0.00756	1.3	0.0128	1.7	0.0261	2.4		22.5
25.0		0.00219	0.7	0.00444	1.0	0.00803	1.3	0.0136	1.7	0.0277	2.4		25.0