



Thermal Expansion

Examples of rates of expansion over a temperature range of 0°C to 82°C

Steel Pipe	0.91 mm/metre of pipe
Copper Pipe	1.38 mm/metre of pipe
Stainless Steel Pipe	1.35 mm/metre of pipe
Plastic Pipe	Up to 10 mm/metre

Expansion Of Pipe In Millimetre Per Metre

Temperature °C	Equivalent Saturated Steam Pressure bar	Steel Pipe	Stainless Steel Pipe	Cast Iron	Copper Pipe
-20		-0.20	-0.31	-0.20	-0.33
-10		-0.10	-0.15	-0.10	-0.16
0		0	0	0	0
10		0.10	0.15	0.10	0.16
20		0.20	0.31	0.20	0.33
30		0.32	0.51	0.30	0.50
40		0.43	0.65	0.40	0.67
50		0.55	0.81	0.50	0.84
60		0.66	0.98	0.60	1.01
70		0.78	1.15	0.70	1.18
80		0.89	1.32	0.81	1.35
90		1.01	1.49	0.92	1.52
100	0	1.13	1.66	1.03	1.69
110	0.43	1.24	1.83	1.14	1.86
120	0.97	1.36	2.00	1.25	2.03
130	1.70	1.47	2.17	1.37	2.20
140	2.60	1.59	2.34	1.48	2.39

Temperature °C	Equivalent Saturated Steam Pressure bar	Steel Pipe	Stainless Steel Pipe	Cast Iron	Copper Pipe
150	3.75	1.71	2.52	1.60	2.57
160	5.17	1.83	2.69	1.71	2.75
170	6.91	1.95	2.87	1.83	2.92
180	9.01	2.08	3.01	1.95	3.10
190	11.55	2.20	3.23	2.06	3.28
200	14.55	2.32	3.41	2.17	3.46
210	18.05	2.45	3.59	2.30	3.63
220	22.15	2.57	3.78	2.42	3.81
230	27.00	2.70	3.96	2.55	3.98
240	32.50	2.82	4.14	2.68	4.16
250	38.70	2.95	4.32	2.80	4.34
260	46.00	3.07	4.50	2.93	4.51
270		3.20	4.68	3.06	4.69
280		3.33	4.87	3.19	4.87
290		3.46	5.06	3.32	5.04
300		3.59	5.24	3.45	5.22