

# Steam & Condensate Pipe Sizing

## Capacity of Steam Pipes in kg/h

Practical experience shows that reasonable velocities for dry saturated steam mains are 25-40m/s. Longer branch lines should be restricted to a velocity below 15m/s unless the pressure drop is also calculated.

Pressure bar g	Velocity m/s	Pipe size (nominal)										
		15	20	25	32	40	50	65	80	100	125	150
		Actual inside pipe diameter Schedule 40										
		15.80	20.93	26.64	35.04	40.90	52.50	62.70	77.92	102.26	128.20	154.05
Pipeline capacity kg/h												
0.4	15	9	15	25	43	58	95	136	210	362	569	822
	25	14	25	41	71	97	159	227	350	603	948	1369
	40	23	40	66	113	154	254	363	561	965	1517	2191
0.7	15	10	18	29	51	69	114	163	251	433	681	983
	25	17	30	49	85	115	190	271	419	722	1135	1638
	40	28	48	78	136	185	304	434	671	1155	1815	2621
1	15	12	21	34	59	81	133	189	292	503	791	1142
	25	20	35	57	99	134	221	315	487	839	1319	1904
	40	32	56	91	158	215	354	505	779	1342	2110	3046
2	15	18	31	50	86	118	194	277	427	735	1156	1669
	25	29	51	83	144	196	323	461	712	1226	1927	2782
	40	47	82	133	230	314	517	737	1139	1961	3083	4451
3	15	23	40	65	113	154	254	362	559	962	1512	2183
	25	38	67	109	188	256	423	603	931	1603	2520	3639
	40	61	107	174	301	410	676	964	1490	2565	4032	5822
4	15	28	50	80	139	190	313	446	689	1186	1864	2691
	25	47	83	134	232	316	521	743	1148	1976	3106	4485
	40	75	132	215	371	506	833	1189	1836	3162	4970	7176
5	15	34	59	96	165	225	371	529	817	1408	2213	3195
	25	56	98	159	276	375	619	882	1362	2347	3688	5325
	40	90	157	255	441	601	990	1411	2180	3755	5901	8521
6	15	39	68	111	191	261	430	613	947	1631	2563	3700
	25	65	114	184	319	435	716	1022	1578	2718	4271	6167
	40	104	182	295	511	696	1146	1635	2525	4348	6834	9867
7	15	44	77	125	217	296	487	695	1073	1848	2904	4194
	25	74	129	209	362	493	812	1158	1788	3080	4841	6989
	40	118	206	334	579	788	1299	1853	2861	4928	7745	11183
8	15	49	86	140	242	330	544	775	1198	2063	3242	4681
	25	82	144	233	404	550	906	1292	1996	3438	5403	7802
	40	131	230	373	646	880	1450	2068	3194	5501	8645	12484
10	15	60	105	170	294	401	660	942	1455	2506	3938	5686
	25	100	175	283	490	668	1101	1570	2425	4176	6563	9477
	40	160	280	453	785	1069	1761	2512	3880	6682	10502	15164
14	15	80	141	228	394	537	886	1263	1951	3360	5281	7625
	25	134	235	380	657	896	1476	2105	3251	5600	8801	12708
	40	214	375	608	1052	1433	2362	3368	5202	8960	14082	20333

## Capacity of Condensate Pipes in kg/h

For condensate pipe sizing, use the starting load which will in most cases be about twice the running load. This will make allowance for flash steam and avoid high back pressure on start up.

Size the line on a resistance of 1.4 mbar per metre of travel for steam pressure up to 10 bar. For higher pressures, increase the pipe size to allow for larger volumes of flash steam.

### Approximate frictional resistance in mbar per m travel

	0.3 (30 Pa)	0.5 (50 Pa)	0.6 (60 Pa)	0.8 (80 Pa)	1 (100 Pa)	1.4 (140 Pa)
15mm	95	130	140	160	180	220
20mm	220	290	320	370	420	500
25mm	410	540	600	690	790	940
32mm	890	1180	1300	1500	1700	2040
40mm	1360	1790	2000	2290	2590	3100
50mm	2630	3450	3810	4390	4990	6000
65mm	5350	6950	7730	8900	10150	12100
80mm	8320	10900	12000	13800	15650	18700
100mm	17000	22200	24500	28200	31900	38000

## The Release of Flash Steam

