## Flow of water at 75 deg C in Multipipe

$M$ = mass flow rate      kg/s
$l_e$ = equivalent length of  m
$\Delta p_l$ = pressure loss per uni Pa/m
$v$ = velocity      m/s

**MULTIPIPE**
**WATER AT 75 degC**

| $\Delta p_l$ | $v$ | 16 mm | | 20 mm | | 25 mm | | 32 mm | | $v$ | $\Delta p_l$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $M$ | $l_e$ | $M$ | $l_e$ | $M$ | $l_e$ | $M$ | $l_e$ | | |
| 0.1 | | | | 0.001 | 0.1 | 0.002 | 0.2 | 0.004 | 0.3 | | 0.1 |
| 0.2 | | 0.0007 | 0.1 | 0.001 | 0.2 | 0.003 | 0.3 | 0.007 | 0.4 | | 0.2 |
| 0.3 | | 0.0009 | 0.1 | 0.002 | 0.2 | 0.004 | 0.3 | 0.008 | 0.4 | | 0.3 |
| 0.4 | | 0.0011 | 0.1 | 0.002 | 0.2 | 0.005 | 0.3 | 0.010 | 0.5 | | 0.4 |
| 0.5 | | 0.0013 | 0.1 | 0.003 | 0.2 | 0.005 | 0.3 | 0.011 | 0.5 | | 0.5 |
| 0.6 | | 0.0014 | 0.1 | 0.003 | 0.2 | 0.006 | 0.3 | 0.013 | 0.5 | | 0.6 |
| 0.7 | | 0.0016 | 0.1 | 0.003 | 0.2 | 0.007 | 0.3 | 0.014 | 0.5 | | 0.7 |
| 0.8 | | 0.0017 | 0.1 | 0.004 | 0.2 | 0.007 | 0.3 | 0.015 | 0.5 | | 0.8 |
| 0.9 | | 0.0018 | 0.1 | 0.004 | 0.2 | 0.008 | 0.4 | 0.016 | 0.5 | | 0.9 |
| 1.0 | | 0.0020 | 0.2 | 0.004 | 0.2 | 0.008 | 0.4 | 0.017 | 0.5 | | 1.0 |
| 1.5 | | 0.0025 | 0.2 | 0.005 | 0.3 | 0.011 | 0.4 | 0.022 | 0.6 | | 1.5 |
| 2.0 | | 0.0030 | 0.2 | 0.006 | 0.3 | 0.013 | 0.4 | 0.026 | 0.6 | 0.05 | 2.0 |
| 2.5 | | 0.0034 | 0.2 | 0.007 | 0.3 | 0.014 | 0.4 | 0.030 | 0.6 | | 2.5 |
| 3.0 | | 0.0038 | 0.2 | 0.008 | 0.3 | 0.016 | 0.4 | 0.033 | 0.7 | | 3.0 |
| 3.5 | | 0.0042 | 0.2 | 0.009 | 0.3 | 0.018 | 0.5 | 0.036 | 0.7 | | 3.5 |
| 4.0 | | 0.0046 | 0.2 | 0.009 | 0.3 | 0.019 | 0.5 | 0.039 | 0.7 | | 4.0 |
| 4.5 | | 0.0049 | 0.2 | 0.010 | 0.3 | 0.020 | 0.5 | 0.042 | 0.7 | | 4.5 |
| 5.0 | | 0.0052 | 0.2 | 0.011 | 0.3 | 0.022 | 0.5 | 0.045 | 0.7 | | 5.0 |
| 5.5 | | 0.0055 | 0.2 | 0.011 | 0.3 | 0.023 | 0.5 | 0.047 | 0.7 | | 5.5 |
| 6.0 | 0.05 | 0.0058 | 0.2 | 0.012 | 0.3 | 0.024 | 0.5 | 0.050 | 0.7 | | 6.0 |
| 6.5 | | 0.0061 | 0.2 | 0.012 | 0.3 | 0.025 | 0.5 | 0.052 | 0.8 | | 6.5 |
| 7.0 | | 0.0064 | 0.2 | 0.013 | 0.3 | 0.026 | 0.5 | 0.054 | 0.8 | | 7.0 |
| 7.5 | | 0.0067 | 0.2 | 0.014 | 0.4 | 0.027 | 0.5 | 0.056 | 0.8 | | 7.5 |
| 8.0 | | 0.0069 | 0.2 | 0.014 | 0.4 | 0.029 | 0.5 | 0.059 | 0.8 | | 8.0 |
| 8.5 | | 0.0072 | 0.2 | 0.015 | 0.4 | 0.030 | 0.5 | 0.061 | 0.8 | | 8.5 |
| 9.0 | | 0.0074 | 0.2 | 0.015 | 0.4 | 0.031 | 0.5 | 0.063 | 0.8 | | 9.0 |
| 9.5 | | 0.0077 | 0.2 | 0.016 | 0.4 | 0.032 | 0.5 | 0.065 | 0.8 | | 9.5 |
| 10.0 | | 0.0079 | 0.3 | 0.016 | 0.4 | 0.032 | 0.5 | 0.067 | 0.8 | | 10.0 |
| 12.5 | | 0.0090 | 0.3 | 0.018 | 0.4 | 0.037 | 0.6 | 0.076 | 0.8 | 0.15 | 12.5 |
| 15.0 | | 0.0101 | 0.3 | 0.020 | 0.4 | 0.041 | 0.6 | 0.084 | 0.9 | | 15.0 |
| 17.5 | | 0.0110 | 0.3 | 0.022 | 0.4 | 0.045 | 0.6 | 0.092 | 0.9 | | 17.5 |
| 20.0 | | 0.0119 | 0.3 | 0.024 | 0.4 | 0.049 | 0.6 | 0.099 | 0.9 | | 20.0 |
| 22.5 | | 0.0128 | 0.3 | 0.026 | 0.4 | 0.052 | 0.6 | 0.106 | 0.9 | | 22.5 |
| 25.0 | | 0.0136 | 0.3 | 0.027 | 0.4 | 0.055 | 0.6 | 0.113 | 0.9 | | 25.0 |
| 27.5 | | 0.0144 | 0.3 | 0.029 | 0.4 | 0.058 | 0.6 | 0.119 | 0.9 | | 27.5 |
| 30.0 | | 0.0151 | 0.3 | 0.031 | 0.4 | 0.061 | 0.7 | 0.125 | 1.0 | | 30.0 |
| 32.5 | | 0.0159 | 0.3 | 0.032 | 0.5 | 0.064 | 0.7 | 0.131 | 1.0 | | 32.5 |
| 35.0 | | 0.0166 | 0.3 | 0.033 | 0.5 | 0.067 | 0.7 | 0.137 | 1.0 | | 35.0 |
| 37.5 | 0.15 | 0.0172 | 0.3 | 0.035 | 0.5 | 0.070 | 0.7 | 0.142 | 1.0 | | 37.5 |
| 40.0 | | 0.0179 | 0.3 | 0.036 | 0.5 | 0.072 | 0.7 | 0.148 | 1.0 | | 40.0 |
| 42.5 | | 0.0185 | 0.3 | 0.037 | 0.5 | 0.075 | 0.7 | 0.153 | 1.0 | | 42.5 |
| 45.0 | | 0.0192 | 0.3 | 0.039 | 0.5 | 0.077 | 0.7 | 0.158 | 1.0 | | 45.0 |
| 47.5 | | 0.0198 | 0.3 | 0.040 | 0.5 | 0.080 | 0.7 | 0.163 | 1.0 | 0.3 | 47.5 |
| 50.0 | | 0.0204 | 0.3 | 0.041 | 0.5 | 0.082 | 0.7 | 0.168 | 1.0 | | 50.0 |
| 52.5 | | 0.0210 | 0.3 | 0.042 | 0.5 | 0.085 | 0.7 | 0.172 | 1.0 | | 52.5 |
| 55.0 | | 0.0215 | 0.3 | 0.043 | 0.5 | 0.087 | 0.7 | 0.177 | 1.0 | | 55.0 |
| 57.5 | | 0.0221 | 0.3 | 0.045 | 0.5 | 0.089 | 0.7 | 0.182 | 1.0 | | 57.5 |
| 60.0 | | 0.0227 | 0.3 | 0.046 | 0.5 | 0.091 | 0.7 | 0.186 | 1.0 | | 60.0 |
| 62.5 | | 0.0232 | 0.3 | 0.047 | 0.5 | 0.094 | 0.7 | 0.190 | 1.1 | | 62.5 |
| 65.0 | | 0.0237 | 0.3 | 0.048 | 0.5 | 0.096 | 0.7 | 0.195 | 1.1 | | 65.0 |
| 67.5 | | 0.0243 | 0.3 | 0.049 | 0.5 | 0.098 | 0.7 | 0.199 | 1.1 | | 67.5 |
| 70.0 | | 0.0248 | 0.4 | 0.050 | 0.5 | 0.100 | 0.7 | 0.203 | 1.1 | | 70.0 |
| 72.5 | | 0.0253 | 0.4 | 0.051 | 0.5 | 0.102 | 0.7 | 0.207 | 1.1 | | 72.5 |
| 75.0 | | 0.0258 | 0.4 | 0.052 | 0.5 | 0.104 | 0.7 | 0.211 | 1.1 | | 75.0 |
| 77.5 | | 0.0263 | 0.4 | 0.053 | 0.5 | 0.106 | 0.7 | 0.215 | 1.1 | | 77.5 |

Flow of water at 75 deg C in Multipipe

| | | MULTIPIPE | |
|---|---|---|---|
| | | WATER AT 75 degC | |

| $\Delta p_l$ | $v$ | 16 mm | | 20 mm | | 25 mm | | 32 mm | | $v$ | $\Delta p_l$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $M$ | $l_e$ | $M$ | $l_e$ | $M$ | $l_e$ | $M$ | $l_e$ | | |
| 80.0 | | 0.0268 | 0.4 | 0.054 | 0.5 | 0.108 | 0.8 | 0.219 | 1.1 | | 80.0 |
| 82.5 | | 0.0273 | 0.4 | 0.055 | 0.5 | 0.110 | 0.8 | 0.223 | 1.1 | | 82.5 |
| 85.0 | | 0.0277 | 0.4 | 0.056 | 0.5 | 0.111 | 0.8 | 0.227 | 1.1 | | 85.0 |
| 87.5 | | 0.0282 | 0.4 | 0.057 | 0.5 | 0.113 | 0.8 | 0.230 | 1.1 | | 87.5 |
| 90.0 | | 0.0287 | 0.4 | 0.058 | 0.5 | 0.115 | 0.8 | 0.234 | 1.1 | | 90.0 |
| 92.5 | | 0.029 | 0.4 | 0.059 | 0.5 | 0.117 | 0.8 | 0.238 | 1.1 | | 92.5 |
| 95.0 | | 0.030 | 0.4 | 0.059 | 0.5 | 0.119 | 0.8 | 0.241 | 1.1 | | 95.0 |
| 97.5 | | 0.030 | 0.4 | 0.060 | 0.5 | 0.121 | 0.8 | 0.245 | 1.1 | | 97.5 |
| 100.0 | | 0.030 | 0.4 | 0.061 | 0.5 | 0.122 | 0.8 | 0.248 | 1.1 | 0.5 | 100.0 |
| 120.0 | 0.3 | 0.034 | 0.4 | 0.068 | 0.6 | 0.136 | 0.8 | 0.275 | 1.1 | | 120.0 |
| 140.0 | | 0.037 | 0.4 | 0.074 | 0.6 | 0.148 | 0.8 | 0.301 | 1.2 | | 140.0 |
| 160.0 | | 0.040 | 0.4 | 0.080 | 0.6 | 0.160 | 0.8 | 0.324 | 1.2 | | 160.0 |
| 180.0 | | 0.043 | 0.4 | 0.086 | 0.6 | 0.171 | 0.8 | 0.346 | 1.2 | | 180.0 |
| 200.0 | | 0.045 | 0.4 | 0.091 | 0.6 | 0.181 | 0.9 | 0.367 | 1.2 | | 200.0 |
| 220.0 | | 0.048 | 0.4 | 0.096 | 0.6 | 0.191 | 0.9 | 0.388 | 1.2 | | 220.0 |
| 240.0 | | 0.050 | 0.4 | 0.101 | 0.6 | 0.201 | 0.9 | 0.407 | 1.3 | | 240.0 |
| 260.0 | | 0.053 | 0.4 | 0.106 | 0.6 | 0.210 | 0.9 | 0.426 | 1.3 | | 260.0 |
| 280.0 | | 0.055 | 0.4 | 0.110 | 0.6 | 0.219 | 0.9 | 0.444 | 1.3 | | 280.0 |
| 300.0 | 0.5 | 0.057 | 0.4 | 0.115 | 0.6 | 0.228 | 0.9 | 0.461 | 1.3 | | 300.0 |
| 320.0 | | 0.059 | 0.4 | 0.119 | 0.6 | 0.236 | 0.9 | 0.478 | 1.3 | | 320.0 |
| 340.0 | | 0.061 | 0.4 | 0.123 | 0.6 | 0.244 | 0.9 | 0.495 | 1.3 | | 340.0 |
| 360.0 | | 0.064 | 0.4 | 0.127 | 0.6 | 0.252 | 0.9 | 0.511 | 1.3 | | 360.0 |
| 380.0 | | 0.066 | 0.5 | 0.131 | 0.6 | 0.260 | 0.9 | 0.527 | 1.3 | | 380.0 |
| 400.0 | | 0.067 | 0.5 | 0.135 | 0.7 | 0.268 | 0.9 | 0.542 | 1.3 | 1.0 | 400.0 |
| 420.0 | | 0.069 | 0.5 | 0.139 | 0.7 | 0.275 | 0.9 | 0.557 | 1.3 | | 420.0 |
| 440.0 | | 0.071 | 0.5 | 0.142 | 0.7 | 0.283 | 0.9 | 0.572 | 1.4 | | 440.0 |
| 460.0 | | 0.073 | 0.5 | 0.146 | 0.7 | 0.290 | 0.9 | 0.586 | 1.4 | | 460.0 |
| 480.0 | | 0.075 | 0.5 | 0.149 | 0.7 | 0.297 | 1.0 | 0.600 | 1.4 | | 480.0 |
| 500.0 | | 0.077 | 0.5 | 0.153 | 0.7 | 0.304 | 1.0 | 0.614 | 1.4 | | 500.0 |
| 520.0 | | 0.078 | 0.5 | 0.156 | 0.7 | 0.311 | 1.0 | 0.628 | 1.4 | | 520.0 |
| 540.0 | | 0.080 | 0.5 | 0.160 | 0.7 | 0.317 | 1.0 | 0.641 | 1.4 | | 540.0 |
| 560.0 | | 0.082 | 0.5 | 0.163 | 0.7 | 0.324 | 1.0 | 0.654 | 1.4 | | 560.0 |
| 580.0 | | 0.083 | 0.5 | 0.166 | 0.7 | 0.330 | 1.0 | 0.667 | 1.4 | | 580.0 |
| 600.0 | | 0.085 | 0.5 | 0.170 | 0.7 | 0.336 | 1.0 | 0.680 | 1.4 | | 600.0 |
| 620.0 | | 0.087 | 0.5 | 0.173 | 0.7 | 0.343 | 1.0 | 0.692 | 1.4 | | 620.0 |
| 640.0 | | 0.088 | 0.5 | 0.176 | 0.7 | 0.349 | 1.0 | 0.705 | 1.4 | | 640.0 |
| 660.0 | | 0.090 | 0.5 | 0.179 | 0.7 | 0.355 | 1.0 | 0.717 | 1.4 | | 660.0 |
| 680.0 | | 0.091 | 0.5 | 0.182 | 0.7 | 0.361 | 1.0 | 0.729 | 1.4 | | 680.0 |
| 700.0 | | 0.093 | 0.5 | 0.185 | 0.7 | 0.367 | 1.0 | 0.741 | 1.4 | | 700.0 |
| 720.0 | | 0.094 | 0.5 | 0.188 | 0.7 | 0.373 | 1.0 | 0.753 | 1.4 | | 720.0 |
| 740.0 | | 0.096 | 0.5 | 0.191 | 0.7 | 0.378 | 1.0 | 0.764 | 1.4 | | 740.0 |
| 760.0 | | 0.097 | 0.5 | 0.194 | 0.7 | 0.384 | 1.0 | 0.776 | 1.4 | | 760.0 |
| 780.0 | | 0.099 | 0.5 | 0.197 | 0.7 | 0.390 | 1.0 | 0.787 | 1.4 | | 780.0 |
| 800.0 | | 0.100 | 0.5 | 0.199 | 0.7 | 0.395 | 1.0 | 0.798 | 1.4 | | 800.0 |
| 820.0 | | 0.101 | 0.5 | 0.202 | 0.7 | 0.401 | 1.0 | 0.809 | 1.5 | 1.5 | 820.0 |
| 840.0 | | 0.103 | 0.5 | 0.205 | 0.7 | 0.406 | 1.0 | 0.820 | 1.5 | | 840.0 |
| 860.0 | | 0.104 | 0.5 | 0.208 | 0.7 | 0.412 | 1.0 | 0.831 | 1.5 | | 860.0 |
| 880.0 | | 0.106 | 0.5 | 0.210 | 0.7 | 0.417 | 1.0 | 0.842 | 1.5 | | 880.0 |
| 900.0 | | 0.107 | 0.5 | 0.213 | 0.7 | 0.422 | 1.0 | 0.852 | 1.5 | | 900.0 |
| 920.0 | | 0.108 | 0.5 | 0.216 | 0.7 | 0.427 | 1.0 | 0.863 | 1.5 | | 920.0 |
| 940.0 | | 0.110 | 0.5 | 0.218 | 0.7 | 0.433 | 1.0 | 0.873 | 1.5 | | 940.0 |
| 960.0 | | 0.111 | 0.5 | 0.221 | 0.7 | 0.438 | 1.0 | 0.883 | 1.5 | | 960.0 |
| 980.0 | | 0.112 | 0.5 | 0.223 | 0.7 | 0.443 | 1.0 | 0.893 | 1.5 | | 980.0 |
| 1000.0 | 1.0 | 0.113 | 0.5 | 0.226 | 0.7 | 0.448 | 1.0 | 0.904 | 1.5 | | 1000.0 |
| 1100.0 | | 0.120 | 0.5 | 0.238 | 0.7 | 0.472 | 1.1 | 0.953 | 1.5 | | 1100.0 |
| 1200.0 | | 0.126 | 0.5 | 0.250 | 0.8 | 0.496 | 1.1 | 1.000 | 1.5 | | 1200.0 |
| 1300.0 | | 0.132 | 0.5 | 0.262 | 0.8 | 0.519 | 1.1 | 1.045 | 1.5 | 2.0 | 1300.0 |
| 1400.0 | | 0.137 | 0.5 | 0.273 | 0.8 | 0.540 | 1.1 | 1.089 | 1.5 | | 1400.0 |
| 1500.0 | | 0.143 | 0.5 | 0.284 | 0.8 | 0.562 | 1.1 | 1.132 | 1.6 | | 1500.0 |
| 1600.0 | | 0.148 | 0.5 | 0.294 | 0.8 | 0.582 | 1.1 | 1.173 | 1.6 | | 1600.0 |

| $\Delta p_l$ | v | 16 mm | | 20 mm | | 25 mm | | 32 mm | | v | $\Delta p_l$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | M | $l_e$ | M | $l_e$ | M | $l_e$ | M | $l_e$ | | |
| 1600.0 | | 0.148 | 0.5 | 0.294 | 0.8 | 0.582 | 1.1 | 1.173 | 1.6 | | 1700.0 |
| 1700.0 | | 0.153 | 0.6 | 0.304 | 0.8 | 0.602 | 1.1 | 1.213 | 1.6 | | 1800.0 |
| 1800.0 | | 0.158 | 0.6 | 0.314 | 0.8 | 0.622 | 1.1 | 1.252 | 1.6 | | 1900.0 |
| 1900.0 | | 0.163 | 0.6 | 0.324 | 0.8 | 0.641 | 1.1 | 1.290 | 1.6 | | 2000.0 |
| 2000.0 | | 0.168 | 0.6 | 0.333 | 0.8 | 0.659 | 1.1 | 1.327 | 1.6 | | 2100.0 |
| 2100.0 | 1.5 | 0.172 | 0.6 | 0.342 | 0.8 | 0.677 | 1.1 | 1.364 | 1.6 | 2.5 | 2100.0 |
| 2200.0 | | 0.177 | 0.6 | 0.351 | 0.8 | 0.695 | 1.1 | 1.399 | 1.6 | | 2200.0 |
| 2300.0 | | 0.181 | 0.6 | 0.360 | 0.8 | 0.712 | 1.1 | 1.434 | 1.6 | | 2300.0 |
| 2400.0 | | 0.186 | 0.6 | 0.369 | 0.8 | 0.729 | 1.2 | 1.468 | 1.6 | | 2400.0 |
| 2500.0 | | 0.190 | 0.6 | 0.377 | 0.8 | 0.746 | 1.2 | 1.501 | 1.6 | | 2500.0 |
| 2600.0 | | 0.194 | 0.6 | 0.386 | 0.8 | 0.763 | 1.2 | 1.534 | 1.6 | | 2600.0 |
| 2700.0 | | 0.198 | 0.6 | 0.394 | 0.8 | 0.779 | 1.2 | 1.567 | 1.7 | | 2700.0 |
| 2800.0 | | 0.203 | 0.6 | 0.402 | 0.8 | 0.795 | 1.2 | 1.598 | 1.7 | 3.0 | 2800.0 |
| 2900.0 | | 0.207 | 0.6 | 0.410 | 0.8 | 0.810 | 1.2 | 1.630 | 1.7 | | 2900.0 |
| 3000.0 | | 0.210 | 0.6 | 0.418 | 0.8 | 0.826 | 1.2 | 1.661 | 1.7 | | 3000.0 |
| 3100.0 | | 0.214 | 0.6 | 0.426 | 0.8 | 0.841 | 1.2 | 1.691 | 1.7 | | 3100.0 |
| 3200.0 | | 0.218 | 0.6 | 0.433 | 0.8 | 0.856 | 1.2 | 1.721 | 1.7 | | 3200.0 |
| 3300.0 | | 0.222 | 0.6 | 0.441 | 0.8 | 0.870 | 1.2 | 1.750 | 1.7 | | 3300.0 |
| 3400.0 | | 0.226 | 0.6 | 0.448 | 0.8 | 0.885 | 1.2 | 1.779 | 1.7 | | 3400.0 |
| 3500.0 | 2.0 | 0.229 | 0.6 | 0.455 | 0.9 | 0.899 | 1.2 | 1.808 | 1.7 | | 3500.0 |
| 3600.0 | | 0.233 | 0.6 | 0.462 | 0.9 | 0.913 | 1.2 | 1.836 | 1.7 | | 3600.0 |
| 3700.0 | | 0.237 | 0.6 | 0.470 | 0.9 | 0.927 | 1.2 | 1.864 | 1.7 | | 3700.0 |
| 3800.0 | | 0.240 | 0.6 | 0.477 | 0.9 | 0.941 | 1.2 | 1.892 | 1.7 | | 3800.0 |
| 3900.0 | | 0.244 | 0.6 | 0.484 | 0.9 | 0.955 | 1.2 | 1.919 | 1.7 | | 3900.0 |
| 4000.0 | | 0.247 | 0.6 | 0.490 | 0.9 | 0.968 | 1.2 | 1.946 | 1.7 | | 4000.0 |
| 4100.0 | | 0.251 | 0.6 | 0.497 | 0.9 | 0.981 | 1.2 | 1.973 | 1.7 | | 4100.0 |
| 4200.0 | | 0.254 | 0.6 | 0.504 | 0.9 | 0.995 | 1.2 | 1.999 | 1.7 | | 4200.0 |
| 4300.0 | | 0.257 | 0.6 | 0.511 | 0.9 | 1.008 | 1.2 | 2.025 | 1.7 | | 4300.0 |
| 4400.0 | | 0.261 | 0.6 | 0.517 | 0.9 | 1.021 | 1.2 | 2.051 | 1.7 | | 4400.0 |
| 4500.0 | | 0.264 | 0.6 | 0.524 | 0.9 | 1.033 | 1.2 | 2.076 | 1.7 | | 4500.0 |
| 4600.0 | | 0.267 | 0.6 | 0.530 | 0.9 | 1.046 | 1.2 | 2.102 | 1.7 | | 4600.0 |
| 4700.0 | | 0.271 | 0.6 | 0.536 | 0.9 | 1.058 | 1.2 | 2.127 | 1.7 | | 4700.0 |
| 4800.0 | | 0.274 | 0.6 | 0.543 | 0.9 | 1.071 | 1.2 | 2.151 | 1.8 | | 4800.0 |
| 4900.0 | | 0.277 | 0.6 | 0.549 | 0.9 | 1.083 | 1.2 | 2.176 | 1.8 | | 4900.0 |
| 5000.0 | | 0.280 | 0.6 | 0.555 | 0.9 | 1.095 | 1.2 | 2.200 | 1.8 | | 5000.0 |
| 5100.0 | | 0.283 | 0.6 | 0.561 | 0.9 | 1.107 | 1.2 | 2.224 | 1.8 | | 5100.0 |
| 5200.0 | | 0.286 | 0.6 | 0.567 | 0.9 | 1.119 | 1.3 | 2.248 | 1.8 | | 5200.0 |
| 5300.0 | 2.5 | 0.289 | 0.6 | 0.573 | 0.9 | 1.131 | 1.3 | 2.272 | 1.8 | | 5300.0 |
| 5400.0 | | 0.292 | 0.6 | 0.579 | 0.9 | 1.143 | 1.3 | 2.295 | 1.8 | | 5400.0 |
| 5500.0 | | 0.295 | 0.6 | 0.585 | 0.9 | 1.154 | 1.3 | 2.319 | 1.8 | | 5500.0 |
| 5600.0 | | 0.298 | 0.6 | 0.591 | 0.9 | 1.166 | 1.3 | 2.342 | 1.8 | | 5600.0 |
| 5700.0 | | 0.301 | 0.6 | 0.597 | 0.9 | 1.177 | 1.3 | 2.364 | 1.8 | | 5700.0 |
| 5800.0 | | 0.304 | 0.6 | 0.603 | 0.9 | 1.189 | 1.3 | 2.387 | 1.8 | | 5800.0 |
| 5900.0 | | 0.307 | 0.6 | 0.608 | 0.9 | 1.200 | 1.3 | 2.410 | 1.8 | | 5900.0 |
| 6000.0 | | 0.310 | 0.6 | 0.614 | 0.9 | 1.211 | 1.3 | 2.432 | 1.8 | | 6000.0 |
| 6100.0 | | 0.313 | 0.6 | 0.620 | 0.9 | 1.222 | 1.3 | 2.454 | 1.8 | | 6100.0 |
| 6200.0 | | 0.316 | 0.6 | 0.625 | 0.9 | 1.233 | 1.3 | 2.476 | 1.8 | | 6200.0 |
| 6300.0 | | 0.319 | 0.6 | 0.631 | 0.9 | 1.244 | 1.3 | 2.498 | 1.8 | | 6300.0 |
| 6400.0 | | 0.321 | 0.6 | 0.637 | 0.9 | 1.255 | 1.3 | 2.520 | 1.8 | | 6400.0 |
| 6500.0 | | 0.324 | 0.6 | 0.642 | 0.9 | 1.266 | 1.3 | 2.541 | 1.8 | | 6500.0 |
| 6600.0 | | 0.327 | 0.6 | 0.647 | 0.9 | 1.277 | 1.3 | 2.563 | 1.8 | | 6600.0 |
| 6700.0 | | 0.330 | 0.6 | 0.653 | 0.9 | 1.287 | 1.3 | 2.584 | 1.8 | | 6700.0 |
| 6800.0 | | 0.332 | 0.7 | 0.658 | 0.9 | 1.298 | 1.3 | 2.605 | 1.8 | | 6800.0 |
| 6900.0 | | 0.335 | 0.7 | 0.664 | 0.9 | 1.308 | 1.3 | 2.626 | 1.8 | | 6900.0 |
| 7000.0 | | 0.338 | 0.7 | 0.669 | 0.9 | 1.319 | 1.3 | 2.647 | 1.8 | | 7000.0 |
| 7100.0 | | 0.340 | 0.7 | 0.674 | 0.9 | 1.329 | 1.3 | 2.667 | 1.8 | | 7100.0 |
| 7200.0 | | 0.343 | 0.7 | 0.679 | 0.9 | 1.339 | 1.3 | 2.688 | 1.8 | | 7200.0 |
| 7300.0 | 3.0 | 0.346 | 0.7 | 0.685 | 0.9 | 1.349 | 1.3 | 2.708 | 1.8 | | 7300.0 |
| 7400.0 | | 0.348 | 0.7 | 0.690 | 0.9 | 1.360 | 1.3 | 2.729 | 1.8 | | 7400.0 |
| 7500.0 | | 0.351 | 0.7 | 0.695 | 0.9 | 1.370 | 1.3 | 2.749 | 1.8 | | 7500.0 |

| | | | |
|---|---|---|---|
| $M$ | = mass flow rate | kg/s | **MULTIPIPE** |
| $l_e$ | = equivalent length of pipe | m | **WATER AT 75 degC** |
| $\Delta p_l$ | = pressure loss per unit length | Pa/m | |
| $v$ | = velocity | m/s | |

| $\Delta p_l$ | $v$ | 40 mm $M$ | 40 mm $l_e$ | 50 mm $M$ | 50 mm $l_e$ | 63 mm $M$ | 63 mm $l_e$ | 75 mm $M$ | 75 mm $l_e$ | 90 mm $M$ | 90 mm $l_e$ | 110 mm $M$ | 110 mm $l_e$ | $v$ | $\Delta p_l$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.1 | | 0.008 | 0.5 | 0.016 | 0.7 | 0.029 | 1.0 | 0.045 | 1.3 | 0.078 | 1.8 | 0.139 | 2.4 | | 0.1 |
| 0.2 | | 0.012 | 0.6 | 0.024 | 0.8 | 0.043 | 1.2 | 0.068 | 1.5 | 0.117 | 2.0 | 0.207 | 2.7 | | 0.2 |
| 0.3 | | 0.015 | 0.6 | 0.030 | 0.9 | 0.055 | 1.2 | 0.086 | 1.6 | 0.148 | 2.1 | 0.262 | 2.9 | | 0.3 |
| 0.4 | | 0.018 | 0.6 | 0.036 | 0.9 | 0.065 | 1.3 | 0.102 | 1.7 | 0.175 | 2.2 | 0.309 | 3.0 | 0.05 | 0.4 |
| 0.5 | | 0.020 | 0.7 | 0.041 | 1.0 | 0.074 | 1.4 | 0.116 | 1.7 | 0.199 | 2.3 | 0.351 | 3.1 | | 0.5 |
| 0.6 | | 0.023 | 0.7 | 0.045 | 1.0 | 0.083 | 1.4 | 0.129 | 1.8 | 0.221 | 2.4 | 0.390 | 3.2 | | 0.6 |
| 0.7 | | 0.025 | 0.7 | 0.050 | 1.0 | 0.090 | 1.4 | 0.141 | 1.8 | 0.241 | 2.4 | 0.426 | 3.3 | | 0.7 |
| 0.8 | | 0.027 | 0.7 | 0.054 | 1.1 | 0.098 | 1.5 | 0.152 | 1.9 | 0.260 | 2.5 | 0.460 | 3.3 | | 0.8 |
| 0.9 | | 0.029 | 0.7 | 0.057 | 1.1 | 0.105 | 1.5 | 0.163 | 1.9 | 0.278 | 2.5 | 0.492 | 3.4 | | 0.9 |
| 1.0 | | 0.031 | 0.8 | 0.061 | 1.1 | 0.111 | 1.5 | 0.173 | 1.9 | 0.296 | 2.6 | 0.522 | 3.5 | | 1.0 |
| 1.5 | 0.05 | 0.039 | 0.8 | 0.077 | 1.2 | 0.141 | 1.6 | 0.219 | 2.0 | 0.373 | 2.7 | 0.658 | 3.7 | | 1.5 |
| 2.0 | | 0.046 | 0.8 | 0.091 | 1.2 | 0.166 | 1.7 | 0.258 | 2.1 | 0.440 | 2.8 | 0.774 | 3.8 | | 2.0 |
| 2.5 | | 0.053 | 0.9 | 0.104 | 1.3 | 0.189 | 1.7 | 0.293 | 2.2 | 0.499 | 2.9 | 0.879 | 3.9 | | 2.5 |
| 3.0 | | 0.059 | 0.9 | 0.116 | 1.3 | 0.209 | 1.8 | 0.326 | 2.3 | 0.554 | 3.0 | 0.974 | 4.0 | 0.15 | 3.0 |
| 3.5 | | 0.064 | 0.9 | 0.126 | 1.3 | 0.229 | 1.8 | 0.355 | 2.3 | 0.604 | 3.1 | 1.063 | 4.1 | | 3.5 |
| 4.0 | | 0.069 | 1.0 | 0.136 | 1.4 | 0.247 | 1.9 | 0.383 | 2.4 | 0.652 | 3.1 | 1.146 | 4.2 | | 4.0 |
| 4.5 | | 0.074 | 1.0 | 0.146 | 1.4 | 0.264 | 1.9 | 0.410 | 2.4 | 0.697 | 3.2 | 1.224 | 4.2 | | 4.5 |
| 5.0 | | 0.079 | 1.0 | 0.155 | 1.4 | 0.280 | 1.9 | 0.435 | 2.4 | 0.739 | 3.2 | 1.299 | 4.3 | | 5.0 |
| 5.5 | | 0.083 | 1.0 | 0.164 | 1.4 | 0.296 | 2.0 | 0.460 | 2.5 | 0.780 | 3.2 | 1.371 | 4.3 | | 5.5 |
| 6.0 | | 0.088 | 1.0 | 0.172 | 1.5 | 0.311 | 2.0 | 0.483 | 2.5 | 0.820 | 3.3 | 1.439 | 4.4 | | 6.0 |
| 6.5 | | 0.092 | 1.0 | 0.180 | 1.5 | 0.326 | 2.0 | 0.505 | 2.5 | 0.857 | 3.3 | 1.506 | 4.4 | | 6.5 |
| 7.0 | | 0.096 | 1.0 | 0.188 | 1.5 | 0.340 | 2.0 | 0.527 | 2.5 | 0.894 | 3.3 | 1.570 | 4.5 | | 7.0 |
| 7.5 | | 0.100 | 1.0 | 0.195 | 1.5 | 0.353 | 2.0 | 0.548 | 2.6 | 0.930 | 3.4 | 1.632 | 4.5 | | 7.5 |
| 8.0 | | 0.103 | 1.1 | 0.203 | 1.5 | 0.366 | 2.1 | 0.568 | 2.6 | 0.964 | 3.4 | 1.692 | 4.5 | | 8.0 |
| 8.5 | | 0.107 | 1.1 | 0.210 | 1.5 | 0.379 | 2.1 | 0.588 | 2.6 | 0.997 | 3.4 | 1.750 | 4.6 | | 8.5 |
| 9.0 | | 0.111 | 1.1 | 0.217 | 1.5 | 0.392 | 2.1 | 0.607 | 2.6 | 1.030 | 3.4 | 1.807 | 4.6 | | 9.0 |
| 9.5 | | 0.114 | 1.1 | 0.224 | 1.5 | 0.404 | 2.1 | 0.626 | 2.6 | 1.062 | 3.5 | 1.863 | 4.6 | | 9.5 |
| 10.0 | 0.15 | 0.117 | 1.1 | 0.230 | 1.6 | 0.416 | 2.1 | 0.645 | 2.7 | 1.093 | 3.5 | 1.917 | 4.7 | 0.3 | 10.0 |
| 12.5 | | 0.134 | 1.1 | 0.262 | 1.6 | 0.472 | 2.2 | 0.731 | 2.7 | 1.239 | 3.6 | 2.172 | 4.8 | | 12.5 |
| 15.0 | | 0.148 | 1.2 | 0.290 | 1.7 | 0.523 | 2.2 | 0.810 | 2.8 | 1.373 | 3.7 | 2.405 | 4.9 | | 15.0 |
| 17.5 | | 0.162 | 1.2 | 0.317 | 1.7 | 0.571 | 2.3 | 0.884 | 2.9 | 1.496 | 3.7 | 2.621 | 5.0 | | 17.5 |
| 20.0 | | 0.175 | 1.2 | 0.342 | 1.7 | 0.615 | 2.3 | 0.953 | 2.9 | 1.613 | 3.8 | 2.824 | 5.1 | | 20.0 |
| 22.5 | | 0.187 | 1.2 | 0.365 | 1.7 | 0.658 | 2.4 | 1.018 | 3.0 | 1.722 | 3.9 | 3.016 | 5.1 | | 22.5 |
| 25.0 | | 0.198 | 1.2 | 0.388 | 1.8 | 0.698 | 2.4 | 1.080 | 3.0 | 1.827 | 3.9 | 3.198 | 5.2 | 0.5 | 25.0 |
| 27.5 | | 0.209 | 1.3 | 0.409 | 1.8 | 0.736 | 2.4 | 1.139 | 3.0 | 1.927 | 4.0 | 3.372 | 5.2 | | 27.5 |
| 30.0 | | 0.220 | 1.3 | 0.430 | 1.8 | 0.773 | 2.4 | 1.196 | 3.1 | 2.023 | 4.0 | 3.540 | 5.3 | | 30.0 |
| 32.5 | | 0.230 | 1.3 | 0.450 | 1.8 | 0.809 | 2.5 | 1.251 | 3.1 | 2.115 | 4.0 | 3.701 | 5.3 | | 32.5 |
| 35.0 | 0.3 | 0.240 | 1.3 | 0.469 | 1.8 | 0.843 | 2.5 | 1.304 | 3.1 | 2.205 | 4.1 | 3.856 | 5.4 | | 35.0 |
| 37.5 | | 0.250 | 1.3 | 0.487 | 1.9 | 0.877 | 2.5 | 1.355 | 3.1 | 2.291 | 4.1 | 4.007 | 5.4 | | 37.5 |
| 40.0 | | 0.259 | 1.3 | 0.505 | 1.9 | 0.909 | 2.5 | 1.405 | 3.2 | 2.375 | 4.1 | 4.153 | 5.5 | | 40.0 |
| 42.5 | | 0.268 | 1.3 | 0.523 | 1.9 | 0.940 | 2.6 | 1.454 | 3.2 | 2.457 | 4.2 | 4.295 | 5.5 | | 42.5 |
| 45.0 | | 0.277 | 1.4 | 0.540 | 1.9 | 0.971 | 2.6 | 1.501 | 3.2 | 2.536 | 4.2 | 4.434 | 5.5 | | 45.0 |
| 47.5 | | 0.286 | 1.4 | 0.557 | 1.9 | 1.001 | 2.6 | 1.547 | 3.2 | 2.613 | 4.2 | 4.569 | 5.6 | | 47.5 |
| 50.0 | | 0.294 | 1.4 | 0.573 | 1.9 | 1.030 | 2.6 | 1.592 | 3.2 | 2.689 | 4.2 | 4.701 | 5.6 | | 50.0 |
| 52.5 | | 0.302 | 1.4 | 0.589 | 1.9 | 1.058 | 2.6 | 1.636 | 3.3 | 2.763 | 4.3 | 4.829 | 5.6 | | 52.5 |
| 55.0 | | 0.310 | 1.4 | 0.605 | 2.0 | 1.086 | 2.6 | 1.679 | 3.3 | 2.836 | 4.3 | 4.956 | 5.7 | | 55.0 |
| 57.5 | | 0.318 | 1.4 | 0.620 | 2.0 | 1.114 | 2.6 | 1.721 | 3.3 | 2.907 | 4.3 | 5.079 | 5.7 | | 57.5 |
| 60.0 | | 0.326 | 1.4 | 0.635 | 2.0 | 1.141 | 2.7 | 1.762 | 3.3 | 2.976 | 4.3 | 5.200 | 5.7 | | 60.0 |
| 62.5 | | 0.334 | 1.4 | 0.650 | 2.0 | 1.167 | 2.7 | 1.803 | 3.3 | 3.044 | 4.3 | 5.319 | 5.7 | | 62.5 |
| 65.0 | | 0.341 | 1.4 | 0.664 | 2.0 | 1.193 | 2.7 | 1.843 | 3.3 | 3.112 | 4.4 | 5.436 | 5.8 | | 65.0 |
| 67.5 | | 0.348 | 1.4 | 0.678 | 2.0 | 1.218 | 2.7 | 1.882 | 3.4 | 3.177 | 4.4 | 5.551 | 5.8 | | 67.5 |
| 70.0 | | 0.356 | 1.4 | 0.692 | 2.0 | 1.243 | 2.7 | 1.921 | 3.4 | 3.242 | 4.4 | 5.664 | 5.8 | | 70.0 |
| 72.5 | | 0.363 | 1.4 | 0.706 | 2.0 | 1.268 | 2.7 | 1.959 | 3.4 | 3.306 | 4.4 | 5.775 | 5.8 | | 72.5 |
| 75.0 | | 0.370 | 1.4 | 0.720 | 2.0 | 1.292 | 2.7 | 1.996 | 3.4 | 3.369 | 4.4 | 5.884 | 5.8 | | 75.0 |
| 77.5 | | 0.377 | 1.4 | 0.733 | 2.0 | 1.316 | 2.7 | 2.033 | 3.4 | 3.431 | 4.4 | 5.992 | 5.9 | | 77.5 |

| $\Delta p_l$ | $v$ | 40 mm | | 50 mm | | 63 mm | | 75 mm | | 90 mm | | 110 mm | | $v$ | $\Delta p_l$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $M$ | $l_e$ | $M$ | $l_e$ | $M$ | $l_e$ | $M$ | $l_e$ | $M$ | $l_e$ | $M$ | $l_e$ | | |
| 80.0 | | 0.383 | 1.5 | 0.746 | 2.0 | 1.34 | 2.8 | 2.07 | 3.4 | 3.49 | 4.5 | 6.10 | 5.9 | | 80.0 |
| 82.5 | | 0.390 | 1.5 | 0.759 | 2.1 | 1.36 | 2.8 | 2.10 | 3.4 | 3.55 | 4.5 | 6.20 | 5.9 | | 82.5 |
| 85.0 | | 0.397 | 1.5 | 0.772 | 2.1 | 1.39 | 2.8 | 2.14 | 3.5 | 3.61 | 4.5 | 6.31 | 5.9 | | 85.0 |
| 87.5 | | 0.403 | 1.5 | 0.785 | 2.1 | 1.41 | 2.8 | 2.17 | 3.5 | 3.67 | 4.5 | 6.41 | 5.9 | 1.0 | 87.5 |
| 90.0 | 0.5 | 0.410 | 1.5 | 0.797 | 2.1 | 1.43 | 2.8 | 2.21 | 3.5 | 3.73 | 4.5 | 6.51 | 6.0 | | 90.0 |
| 92.5 | | 0.416 | 1.5 | 0.810 | 2.1 | 1.45 | 2.8 | 2.24 | 3.5 | 3.78 | 4.5 | 6.61 | 6.0 | | 92.5 |
| 95.0 | | 0.422 | 1.5 | 0.822 | 2.1 | 1.47 | 2.8 | 2.28 | 3.5 | 3.84 | 4.5 | 6.71 | 6.0 | | 95.0 |
| 97.5 | | 0.429 | 1.5 | 0.834 | 2.1 | 1.50 | 2.8 | 2.31 | 3.5 | 3.90 | 4.6 | 6.80 | 6.0 | | 97.5 |
| 100.0 | | 0.435 | 1.5 | 0.846 | 2.1 | 1.52 | 2.8 | 2.34 | 3.5 | 3.95 | 4.6 | 6.90 | 6.0 | | 100.0 |
| 120.0 | | 0.482 | 1.5 | 0.937 | 2.1 | 1.68 | 2.9 | 2.59 | 3.6 | 4.37 | 4.7 | 7.63 | 6.1 | | 120.0 |
| 140.0 | | 0.525 | 1.6 | 1.021 | 2.2 | 1.83 | 2.9 | 2.82 | 3.7 | 4.76 | 4.7 | 8.31 | 6.2 | | 140.0 |
| 160.0 | | 0.566 | 1.6 | 1.100 | 2.2 | 1.97 | 3.0 | 3.04 | 3.7 | 5.13 | 4.8 | 8.94 | 6.3 | | 160.0 |
| 180.0 | | 0.605 | 1.6 | 1.175 | 2.3 | 2.10 | 3.0 | 3.25 | 3.8 | 5.47 | 4.9 | 9.54 | 6.4 | 1.5 | 180.0 |
| 200.0 | | 0.642 | 1.6 | 1.246 | 2.3 | 2.23 | 3.1 | 3.44 | 3.8 | 5.80 | 4.9 | 10.11 | 6.5 | | 200.0 |
| 220.0 | | 0.677 | 1.6 | 1.314 | 2.3 | 2.35 | 3.1 | 3.63 | 3.8 | 6.11 | 5.0 | 10.65 | 6.5 | | 220.0 |
| 240.0 | | 0.710 | 1.7 | 1.379 | 2.3 | 2.47 | 3.1 | 3.81 | 3.9 | 6.41 | 5.0 | 11.17 | 6.6 | | 240.0 |
| 260.0 | | 0.743 | 1.7 | 1.442 | 2.4 | 2.58 | 3.1 | 3.98 | 3.9 | 6.70 | 5.1 | 11.68 | 6.6 | | 260.0 |
| 280.0 | | 0.774 | 1.7 | 1.502 | 2.4 | 2.69 | 3.2 | 4.14 | 3.9 | 6.98 | 5.1 | 12.16 | 6.7 | | 280.0 |
| 300.0 | 1.0 | 0.805 | 1.7 | 1.561 | 2.4 | 2.79 | 3.2 | 4.31 | 4.0 | 7.25 | 5.1 | 12.63 | 6.7 | 2.0 | 300.0 |
| 320.0 | | 0.834 | 1.7 | 1.618 | 2.4 | 2.90 | 3.2 | 4.46 | 4.0 | 7.51 | 5.2 | 13.09 | 6.8 | | 320.0 |
| 340.0 | | 0.863 | 1.7 | 1.674 | 2.4 | 2.99 | 3.2 | 4.61 | 4.0 | 7.77 | 5.2 | 13.53 | 6.8 | | 340.0 |
| 360.0 | | 0.891 | 1.7 | 1.728 | 2.4 | 3.09 | 3.3 | 4.76 | 4.0 | 8.01 | 5.2 | 13.96 | 6.9 | | 360.0 |
| 380.0 | | 0.918 | 1.8 | 1.780 | 2.5 | 3.18 | 3.3 | 4.91 | 4.1 | 8.26 | 5.2 | 14.38 | 6.9 | | 380.0 |
| 400.0 | | 0.945 | 1.8 | 1.832 | 2.5 | 3.28 | 3.3 | 5.05 | 4.1 | 8.49 | 5.3 | 14.79 | 6.9 | | 400.0 |
| 420.0 | | 0.971 | 1.8 | 1.882 | 2.5 | 3.37 | 3.3 | 5.18 | 4.1 | 8.72 | 5.3 | 15.19 | 7.0 | | 420.0 |
| 440.0 | | 0.997 | 1.8 | 1.931 | 2.5 | 3.45 | 3.3 | 5.32 | 4.1 | 8.95 | 5.3 | 15.58 | 7.0 | | 440.0 |
| 460.0 | | 1.021 | 1.8 | 1.979 | 2.5 | 3.54 | 3.3 | 5.45 | 4.1 | 9.17 | 5.3 | 15.97 | 7.0 | 2.5 | 460.0 |
| 480.0 | | 1.046 | 1.8 | 2.027 | 2.5 | 3.62 | 3.4 | 5.58 | 4.2 | 9.39 | 5.4 | 16.34 | 7.0 | | 480.0 |
| 500.0 | | 1.070 | 1.8 | 2.073 | 2.5 | 3.71 | 3.4 | 5.71 | 4.2 | 9.60 | 5.4 | 16.71 | 7.1 | | 500.0 |
| 520.0 | | 1.094 | 1.8 | 2.118 | 2.5 | 3.79 | 3.4 | 5.83 | 4.2 | 9.81 | 5.4 | 17.07 | 7.1 | | 520.0 |
| 540.0 | | 1.117 | 1.8 | 2.163 | 2.5 | 3.87 | 3.4 | 5.95 | 4.2 | 10.01 | 5.4 | 17.43 | 7.1 | | 540.0 |
| 560.0 | | 1.140 | 1.8 | 2.207 | 2.6 | 3.94 | 3.4 | 6.07 | 4.2 | 10.22 | 5.5 | 17.78 | 7.1 | | 560.0 |
| 580.0 | | 1.162 | 1.8 | 2.251 | 2.6 | 4.02 | 3.4 | 6.19 | 4.2 | 10.42 | 5.5 | 18.13 | 7.2 | | 580.0 |
| 600.0 | | 1.184 | 1.9 | 2.293 | 2.6 | 4.10 | 3.4 | 6.31 | 4.3 | 10.61 | 5.5 | 18.46 | 7.2 | | 600.0 |
| 620.0 | | 1.206 | 1.9 | 2.335 | 2.6 | 4.17 | 3.4 | 6.42 | 4.3 | 10.80 | 5.5 | 18.80 | 7.2 | | 620.0 |
| 640.0 | 1.5 | 1.227 | 1.9 | 2.377 | 2.6 | 4.25 | 3.5 | 6.54 | 4.3 | 10.99 | 5.5 | 19.13 | 7.2 | 3.0 | 640.0 |
| 660.0 | | 1.249 | 1.9 | 2.417 | 2.6 | 4.32 | 3.5 | 6.65 | 4.3 | 11.18 | 5.5 | 19.45 | 7.3 | | 660.0 |
| 680.0 | | 1.270 | 1.9 | 2.458 | 2.6 | 4.39 | 3.5 | 6.76 | 4.3 | 11.36 | 5.6 | 19.77 | 7.3 | | 680.0 |
| 700.0 | | 1.290 | 1.9 | 2.497 | 2.6 | 4.46 | 3.5 | 6.87 | 4.3 | 11.55 | 5.6 | 20.09 | 7.3 | | 700.0 |
| 720.0 | | 1.310 | 1.9 | 2.536 | 2.6 | 4.53 | 3.5 | 6.97 | 4.3 | 11.73 | 5.6 | 20.40 | 7.3 | | 720.0 |
| 740.0 | | 1.331 | 1.9 | 2.575 | 2.6 | 4.60 | 3.5 | 7.08 | 4.3 | 11.90 | 5.6 | 20.71 | 7.3 | | 740.0 |
| 760.0 | | 1.350 | 1.9 | 2.613 | 2.6 | 4.67 | 3.5 | 7.18 | 4.4 | 12.08 | 5.6 | 21.01 | 7.4 | | 760.0 |
| 780.0 | | 1.370 | 1.9 | 2.651 | 2.6 | 4.74 | 3.5 | 7.29 | 4.4 | 12.25 | 5.6 | 21.31 | 7.4 | | 780.0 |
| 800.0 | | 1.389 | 1.9 | 2.689 | 2.7 | 4.80 | 3.5 | 7.39 | 4.4 | 12.42 | 5.6 | 21.61 | 7.4 | | 800.0 |
| 820.0 | | 1.409 | 1.9 | 2.725 | 2.7 | 4.87 | 3.5 | 7.49 | 4.4 | 12.59 | 5.7 | 21.90 | 7.4 | | 820.0 |
| 840.0 | | 1.427 | 1.9 | 2.762 | 2.7 | 4.93 | 3.6 | 7.59 | 4.4 | 12.76 | 5.7 | 22.19 | 7.4 | | 840.0 |
| 860.0 | | 1.446 | 1.9 | 2.798 | 2.7 | 5.00 | 3.6 | 7.69 | 4.4 | 12.92 | 5.7 | 22.48 | 7.4 | | 860.0 |
| 880.0 | | 1.465 | 1.9 | 2.834 | 2.7 | 5.06 | 3.6 | 7.79 | 4.4 | 13.09 | 5.7 | 22.76 | 7.5 | | 880.0 |
| 900.0 | | 1.483 | 1.9 | 2.869 | 2.7 | 5.12 | 3.6 | 7.88 | 4.4 | 13.25 | 5.7 | 23.04 | 7.5 | | 900.0 |
| 920.0 | | 1.501 | 1.9 | 2.904 | 2.7 | 5.19 | 3.6 | 7.98 | 4.4 | 13.41 | 5.7 | 23.32 | 7.5 | | 920.0 |
| 940.0 | | 1.519 | 1.9 | 2.939 | 2.7 | 5.25 | 3.6 | 8.07 | 4.4 | 13.57 | 5.7 | 23.60 | 7.5 | | 940.0 |
| 960.0 | | 1.537 | 2.0 | 2.973 | 2.7 | 5.31 | 3.6 | 8.17 | 4.5 | 13.73 | 5.7 | 23.87 | 7.5 | | 960.0 |
| 980.0 | | 1.555 | 2.0 | 3.007 | 2.7 | 5.37 | 3.6 | 8.26 | 4.5 | 13.88 | 5.8 | 24.14 | 7.5 | | 980.0 |
| 1000.0 | 2.0 | 1.572 | 2.0 | 3.041 | 2.7 | 5.43 | 3.6 | 8.35 | 4.5 | 14.04 | 5.8 | 24.41 | 7.5 | | 1000.0 |
| 1100.0 | | 1.658 | 2.0 | 3.205 | 2.7 | 5.72 | 3.7 | 8.80 | 4.5 | 14.79 | 5.8 | 25.71 | 7.6 | | 1100.0 |
| 1200.0 | | 1.739 | 2.0 | 3.363 | 2.8 | 6.00 | 3.7 | 9.23 | 4.6 | 15.51 | 5.9 | 26.95 | 7.7 | | 1200.0 |
| 1300.0 | | 1.818 | 2.0 | 3.514 | 2.8 | 6.27 | 3.7 | 9.64 | 4.6 | 16.20 | 5.9 | 28.16 | 7.7 | | 1300.0 |
| 1400.0 | | 1.894 | 2.0 | 3.660 | 2.8 | 6.53 | 3.7 | 10.04 | 4.6 | 16.87 | 5.9 | 29.31 | 7.8 | | 1400.0 |
| 1500.0 | | 1.968 | 2.0 | 3.802 | 2.8 | 6.78 | 3.8 | 10.43 | 4.6 | 17.52 | 6.0 | 30.44 | 7.8 | | 1500.0 |
| 1600.0 | 2.5 | 2.039 | 2.1 | 3.940 | 2.9 | 7.03 | 3.8 | 10.80 | 4.7 | 18.14 | 6.0 | 31.52 | 7.9 | | 1600.0 |

| MULTIPIPE |
|---|
| WATER AT 75 degC |

| $\Delta p_l$ | v | 40 mm | | 50 mm | | 63 mm | | 75 mm | | 90 mm | | 110 mm | | v | $\Delta p_l$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | M | $l_e$ | M | $l_e$ | M | $l_e$ | M | $l_e$ | M | $l_e$ | M | $l_e$ | | |
| 1600.0 | | 2.04 | 2.1 | 3.94 | 2.9 | 7.03 | 3.8 | 10.80 | 4.7 | 18.14 | 6.0 | 31.52 | 7.9 | | 1700.0 |
| 1700.0 | | 2.11 | 2.1 | 4.07 | 2.9 | 7.26 | 3.8 | 11.17 | 4.7 | 18.75 | 6.1 | 32.58 | 7.9 | | 1800.0 |
| 1800.0 | | 2.18 | 2.1 | 4.20 | 2.9 | 7.50 | 3.8 | 11.52 | 4.7 | 19.35 | 6.1 | 33.61 | 7.9 | | 1900.0 |
| 1900.0 | | 2.24 | 2.1 | 4.33 | 2.9 | 7.72 | 3.9 | 11.87 | 4.8 | 19.92 | 6.1 | 34.61 | 8.0 | | 2000.0 |
| 2000.0 | | 2.31 | 2.1 | 4.45 | 2.9 | 7.94 | 3.9 | 12.21 | 4.8 | 20.49 | 6.1 | 35.59 | 8.0 | | 2100.0 |
| 2100.0 | | 2.37 | 2.1 | 4.57 | 2.9 | 8.16 | 3.9 | 12.54 | 4.8 | 21.04 | 6.2 | 36.54 | 8.1 | | 2100.0 |
| 2200.0 | 3.0 | 2.43 | 2.1 | 4.69 | 2.9 | 8.37 | 3.9 | 12.86 | 4.8 | 21.58 | 6.2 | 37.48 | 8.1 | | 2200.0 |
| 2300.0 | | 2.49 | 2.1 | 4.81 | 3.0 | 8.57 | 3.9 | 13.17 | 4.8 | 22.11 | 6.2 | 38.39 | 8.1 | | 2300.0 |
| 2400.0 | | 2.55 | 2.1 | 4.92 | 3.0 | 8.77 | 3.9 | 13.48 | 4.9 | 22.63 | 6.2 | 39.29 | 8.1 | | 2400.0 |
| 2500.0 | | 2.61 | 2.2 | 5.03 | 3.0 | 8.97 | 4.0 | 13.79 | 4.9 | 23.14 | 6.3 | 40.17 | 8.2 | | 2500.0 |
| 2600.0 | | 2.66 | 2.2 | 5.14 | 3.0 | 9.17 | 4.0 | 14.08 | 4.9 | 23.63 | 6.3 | 41.03 | 8.2 | | 2600.0 |
| 2700.0 | | 2.72 | 2.2 | 5.25 | 3.0 | 9.36 | 4.0 | 14.38 | 4.9 | 24.12 | 6.3 | 41.88 | 8.2 | | 2700.0 |
| 2800.0 | | 2.78 | 2.2 | 5.36 | 3.0 | 9.54 | 4.0 | 14.66 | 4.9 | 24.61 | 6.3 | 42.71 | 8.3 | | 2800.0 |
| 2900.0 | | 2.83 | 2.2 | 5.46 | 3.0 | 9.73 | 4.0 | 14.95 | 4.9 | 25.08 | 6.3 | 43.53 | 8.3 | | 2900.0 |
| 3000.0 | | 2.88 | 2.2 | 5.56 | 3.0 | 9.91 | 4.0 | 15.23 | 5.0 | 25.55 | 6.4 | 44.34 | 8.3 | | 3000.0 |
| 3100.0 | | 2.94 | 2.2 | 5.66 | 3.0 | 10.09 | 4.0 | 15.50 | 5.0 | 26.00 | 6.4 | 45.14 | 8.3 | | 3100.0 |
| 3200.0 | | 2.99 | 2.2 | 5.76 | 3.1 | 10.27 | 4.0 | 15.77 | 5.0 | 26.46 | 6.4 | 45.92 | 8.3 | | 3200.0 |
| 3300.0 | | 3.04 | 2.2 | 5.86 | 3.1 | 10.44 | 4.1 | 16.04 | 5.0 | 26.90 | 6.4 | 46.69 | 8.4 | | 3300.0 |
| 3400.0 | | 3.09 | 2.2 | 5.96 | 3.1 | 10.61 | 4.1 | 16.30 | 5.0 | 27.34 | 6.4 | 47.45 | 8.4 | | 3400.0 |
| 3500.0 | | 3.14 | 2.2 | 6.05 | 3.1 | 10.78 | 4.1 | 16.56 | 5.0 | 27.78 | 6.4 | 48.20 | 8.4 | | 3500.0 |
| 3600.0 | | 3.19 | 2.2 | 6.15 | 3.1 | 10.95 | 4.1 | 16.82 | 5.0 | 28.20 | 6.5 | 48.94 | 8.4 | | 3600.0 |
| 3700.0 | | 3.24 | 2.2 | 6.24 | 3.1 | 11.11 | 4.1 | 17.07 | 5.0 | 28.63 | 6.5 | 49.67 | 8.4 | | 3700.0 |
| 3800.0 | | 3.28 | 2.2 | 6.33 | 3.1 | 11.28 | 4.1 | 17.32 | 5.1 | 29.04 | 6.5 | 50.40 | 8.5 | | 3800.0 |
| 3900.0 | | 3.33 | 2.3 | 6.42 | 3.1 | 11.44 | 4.1 | 17.56 | 5.1 | 29.46 | 6.5 | 51.11 | 8.5 | | 3900.0 |
| 4000.0 | | 3.38 | 2.3 | 6.51 | 3.1 | 11.60 | 4.1 | 17.81 | 5.1 | 29.86 | 6.5 | 51.81 | 8.5 | | 4000.0 |
| 4100.0 | | 3.42 | 2.3 | 6.60 | 3.1 | 11.75 | 4.1 | 18.05 | 5.1 | 30.27 | 6.5 | 52.51 | 8.5 | | 4100.0 |
| 4200.0 | | 3.47 | 2.3 | 6.69 | 3.1 | 11.91 | 4.1 | 18.29 | 5.1 | 30.66 | 6.5 | 53.20 | 8.5 | | 4200.0 |
| 4300.0 | | 3.51 | 2.3 | 6.77 | 3.1 | 12.06 | 4.2 | 18.52 | 5.1 | 31.06 | 6.6 | 53.88 | 8.5 | | 4300.0 |
| 4400.0 | | 3.56 | 2.3 | 6.86 | 3.1 | 12.21 | 4.2 | 18.75 | 5.1 | 31.45 | 6.6 | 54.55 | 8.6 | | 4400.0 |
| 4500.0 | | 3.60 | 2.3 | 6.94 | 3.2 | 12.36 | 4.2 | 18.98 | 5.1 | 31.83 | 6.6 | 55.22 | 8.6 | | 4500.0 |
| 4600.0 | | 3.65 | 2.3 | 7.03 | 3.2 | 12.51 | 4.2 | 19.21 | 5.1 | 32.21 | 6.6 | 55.88 | 8.6 | | 4600.0 |
| 4700.0 | | 3.69 | 2.3 | 7.11 | 3.2 | 12.66 | 4.2 | 19.44 | 5.2 | 32.59 | 6.6 | 56.53 | 8.6 | | 4700.0 |
| 4800.0 | | 3.73 | 2.3 | 7.19 | 3.2 | 12.81 | 4.2 | 19.66 | 5.2 | 32.96 | 6.6 | 57.18 | 8.6 | | 4800.0 |
| 4900.0 | | 3.77 | 2.3 | 7.28 | 3.2 | 12.95 | 4.2 | 19.88 | 5.2 | 33.33 | 6.6 | 57.82 | 8.6 | | 4900.0 |
| 5000.0 | | 3.82 | 2.3 | 7.36 | 3.2 | 13.09 | 4.2 | 20.10 | 5.2 | 33.70 | 6.6 | 58.45 | 8.7 | | 5000.0 |
| 5100.0 | | 3.86 | 2.3 | 7.44 | 3.2 | 13.24 | 4.2 | 20.32 | 5.2 | 34.06 | 6.7 | 59.08 | 8.7 | | 5100.0 |
| 5200.0 | | 3.90 | 2.3 | 7.51 | 3.2 | 13.38 | 4.2 | 20.54 | 5.2 | 34.42 | 6.7 | 59.70 | 8.7 | | 5200.0 |
| 5300.0 | | 3.94 | 2.3 | 7.59 | 3.2 | 13.52 | 4.2 | 20.75 | 5.2 | 34.78 | 6.7 | 60.32 | 8.7 | | 5300.0 |
| 5400.0 | | 3.98 | 2.3 | 7.67 | 3.2 | 13.65 | 4.2 | 20.96 | 5.2 | 35.13 | 6.7 | 60.93 | 8.7 | | 5400.0 |
| 5500.0 | | 4.02 | 2.3 | 7.75 | 3.2 | 13.79 | 4.2 | 21.17 | 5.2 | 35.49 | 6.7 | 61.54 | 8.7 | | 5500.0 |
| 5600.0 | | 4.06 | 2.3 | 7.83 | 3.2 | 13.93 | 4.3 | 21.38 | 5.2 | 35.83 | 6.7 | 62.14 | 8.7 | | 5600.0 |
| 5700.0 | | 4.10 | 2.3 | 7.90 | 3.2 | 14.06 | 4.3 | 21.58 | 5.2 | 36.18 | 6.7 | 62.74 | 8.7 | | 5700.0 |
| 5800.0 | | 4.14 | 2.3 | 7.98 | 3.2 | 14.19 | 4.3 | 21.79 | 5.2 | 36.52 | 6.7 | 63.33 | 8.8 | | 5800.0 |
| 5900.0 | | 4.18 | 2.3 | 8.05 | 3.2 | 14.33 | 4.3 | 21.99 | 5.3 | 36.86 | 6.7 | 63.92 | 8.8 | | 5900.0 |
| 6000.0 | | 4.22 | 2.3 | 8.13 | 3.2 | 14.46 | 4.3 | 22.19 | 5.3 | 37.20 | 6.7 | 64.50 | 8.8 | | 6000.0 |
| 6100.0 | | 4.26 | 2.4 | 8.20 | 3.2 | 14.59 | 4.3 | 22.39 | 5.3 | 37.53 | 6.8 | 65.07 | 8.8 | | 6100.0 |
| 6200.0 | | 4.29 | 2.4 | 8.27 | 3.2 | 14.72 | 4.3 | 22.59 | 5.3 | 37.86 | 6.8 | 65.65 | 8.8 | | 6200.0 |
| 6300.0 | | 4.33 | 2.4 | 8.34 | 3.2 | 14.85 | 4.3 | 22.79 | 5.3 | 38.19 | 6.8 | 66.22 | 8.8 | | 6300.0 |
| 6400.0 | | 4.37 | 2.4 | 8.42 | 3.3 | 14.97 | 4.3 | 22.98 | 5.3 | 38.52 | 6.8 | 66.78 | 8.8 | | 6400.0 |
| 6500.0 | | 4.41 | 2.4 | 8.49 | 3.3 | 15.10 | 4.3 | 23.18 | 5.3 | 38.84 | 6.8 | 67.34 | 8.8 | | 6500.0 |
| 6600.0 | | 4.44 | 2.4 | 8.56 | 3.3 | 15.23 | 4.3 | 23.37 | 5.3 | 39.16 | 6.8 | 67.90 | 8.8 | | 6600.0 |
| 6700.0 | | 4.48 | 2.4 | 8.63 | 3.3 | 15.35 | 4.3 | 23.56 | 5.3 | 39.48 | 6.8 | 68.45 | 8.9 | | 6700.0 |
| 6800.0 | | 4.52 | 2.4 | 8.70 | 3.3 | 15.48 | 4.3 | 23.75 | 5.3 | 39.80 | 6.8 | 69.00 | 8.9 | | 6800.0 |
| 6900.0 | | 4.55 | 2.4 | 8.77 | 3.3 | 15.60 | 4.3 | 23.94 | 5.3 | 40.12 | 6.8 | 69.54 | 8.9 | | 6900.0 |
| 7000.0 | | 4.59 | 2.4 | 8.84 | 3.3 | 15.72 | 4.3 | 24.13 | 5.3 | 40.43 | 6.8 | 70.09 | 8.9 | | 7000.0 |
| 7100.0 | | 4.62 | 2.4 | 8.91 | 3.3 | 15.84 | 4.3 | 24.31 | 5.3 | 40.74 | 6.8 | 70.62 | 8.9 | | 7100.0 |
| 7200.0 | | 4.66 | 2.4 | 8.97 | 3.3 | 15.96 | 4.3 | 24.50 | 5.3 | 41.05 | 6.8 | 71.16 | 8.9 | | 7200.0 |
| 7300.0 | | 4.70 | 2.4 | 9.04 | 3.3 | 16.08 | 4.4 | 24.68 | 5.4 | 41.36 | 6.9 | 71.69 | 8.9 | | 7300.0 |
| 7400.0 | | 4.73 | 2.4 | 9.11 | 3.3 | 16.20 | 4.4 | 24.87 | 5.4 | 41.66 | 6.9 | 72.22 | 8.9 | | 7400.0 |
| 7500.0 | | 4.76 | 2.4 | 9.18 | 3.3 | 16.32 | 4.4 | 25.05 | 5.4 | 41.96 | 6.9 | 72.74 | 8.9 | | 7500.0 |