

□マニングの公式(VPVUの場合)

| 勾配 | 流速[m/s] | | | | | | | | 流量[L/s] | | | | | | | | | |
|------|---------|-------|-------|-------|-------|-------|-------|-------|---------|-------|-------|-------|-------|--------|--------|---------|---------|---------|
| | 配管径 | | | | | | | | 配管径 | | | | | | | | | |
| | 25φ | 40φ | 50φ | 75φ | 100φ | 150φ | 200φ | 250φ | 300φ | 25φ | 40φ | 50φ | 75φ | 100φ | 150φ | 200φ | 250φ | 300φ |
| 0.1% | 0.107 | 0.147 | 0.170 | 0.223 | 0.270 | 0.354 | 0.429 | 0.498 | 0.562 | 0.053 | 0.185 | 0.334 | 0.985 | 2.121 | 6.256 | 13.477 | 24.446 | 39.725 |
| 0.2% | 0.152 | 0.208 | 0.241 | 0.316 | 0.382 | 0.501 | 0.607 | 0.704 | 0.795 | 0.075 | 0.261 | 0.473 | 1.396 | 3.000 | 8.853 | 19.069 | 34.558 | 56.195 |
| 0.3% | 0.186 | 0.254 | 0.295 | 0.387 | 0.468 | 0.614 | 0.743 | 0.863 | 0.974 | 0.091 | 0.319 | 0.579 | 1.710 | 3.676 | 10.850 | 23.342 | 42.362 | 68.848 |
| 0.4% | 0.215 | 0.294 | 0.341 | 0.446 | 0.541 | 0.709 | 0.858 | 0.996 | 1.125 | 0.106 | 0.369 | 0.670 | 1.970 | 4.249 | 12.529 | 26.955 | 48.891 | 79.522 |
| 0.5% | 0.240 | 0.328 | 0.381 | 0.499 | 0.605 | 0.792 | 0.960 | 1.114 | 1.258 | 0.118 | 0.412 | 0.748 | 2.205 | 4.752 | 13.996 | 30.159 | 54.683 | 88.923 |
| 0.6% | 0.263 | 0.360 | 0.417 | 0.547 | 0.662 | 0.868 | 1.051 | 1.220 | 1.378 | 0.129 | 0.452 | 0.819 | 2.417 | 5.199 | 15.339 | 33.018 | 59.887 | 97.405 |
| 0.7% | 0.284 | 0.388 | 0.451 | 0.590 | 0.715 | 0.937 | 1.136 | 1.318 | 1.488 | 0.139 | 0.488 | 0.886 | 2.607 | 5.616 | 16.558 | 35.688 | 64.697 | 105.181 |
| 0.8% | 0.303 | 0.415 | 0.482 | 0.631 | 0.765 | 1.002 | 1.214 | 1.409 | 1.591 | 0.149 | 0.522 | 0.946 | 2.788 | 6.008 | 17.707 | 38.139 | 69.164 | 112.461 |
| 0.9% | 0.322 | 0.440 | 0.511 | 0.670 | 0.811 | 1.063 | 1.288 | 1.494 | 1.687 | 0.158 | 0.553 | 1.003 | 2.960 | 6.370 | 18.785 | 40.464 | 73.337 | 119.247 |
| 1% | 0.339 | 0.464 | 0.539 | 0.706 | 0.855 | 1.120 | 1.357 | 1.575 | 1.778 | 0.166 | 0.583 | 1.058 | 3.119 | 6.715 | 19.792 | 42.631 | 77.313 | 125.679 |
| 1.1% | 0.356 | 0.487 | 0.565 | 0.740 | 0.897 | 1.175 | 1.423 | 1.652 | 1.865 | 0.175 | 0.612 | 1.109 | 3.269 | 7.045 | 20.764 | 44.705 | 81.092 | 131.829 |
| 1.2% | 0.372 | 0.508 | 0.590 | 0.773 | 0.937 | 1.227 | 1.487 | 1.725 | 1.948 | 0.183 | 0.638 | 1.158 | 3.415 | 7.359 | 21.683 | 46.715 | 84.676 | 137.696 |
| 1.3% | 0.387 | 0.529 | 0.614 | 0.805 | 0.975 | 1.277 | 1.547 | 1.796 | 2.028 | 0.190 | 0.665 | 1.206 | 3.556 | 7.658 | 22.566 | 48.600 | 88.161 | 143.351 |
| 1.4% | 0.401 | 0.549 | 0.637 | 0.835 | 1.012 | 1.326 | 1.606 | 1.863 | 2.104 | 0.197 | 0.690 | 1.251 | 3.689 | 7.948 | 23.432 | 50.454 | 91.450 | 148.723 |
| 1.5% | 0.416 | 0.568 | 0.660 | 0.864 | 1.047 | 1.372 | 1.662 | 1.929 | 2.178 | 0.204 | 0.714 | 1.296 | 3.817 | 8.223 | 24.245 | 52.213 | 94.690 | 153.954 |
| 1.6% | 0.429 | 0.587 | 0.681 | 0.893 | 1.081 | 1.417 | 1.717 | 1.992 | 2.250 | 0.211 | 0.738 | 1.337 | 3.945 | 8.490 | 25.004 | 53.941 | 97.782 | 159.043 |
| 1.7% | 0.442 | 0.605 | 0.702 | 0.920 | 1.115 | 1.461 | 1.770 | 2.053 | 2.319 | 0.217 | 0.760 | 1.378 | 4.064 | 8.757 | 25.818 | 55.606 | 100.776 | 163.920 |
| 1.8% | 0.455 | 0.623 | 0.723 | 0.947 | 1.147 | 1.503 | 1.821 | 2.113 | 2.386 | 0.223 | 0.783 | 1.420 | 4.184 | 9.009 | 26.560 | 57.208 | 103.722 | 168.656 |
| 1.9% | 0.468 | 0.640 | 0.742 | 0.973 | 1.179 | 1.544 | 1.871 | 2.171 | 2.451 | 0.230 | 0.804 | 1.457 | 4.299 | 9.260 | 27.285 | 58.779 | 106.569 | 173.251 |
| 2% | 0.480 | 0.656 | 0.762 | 0.998 | 1.209 | 1.584 | 1.919 | 2.227 | 2.515 | 0.236 | 0.824 | 1.496 | 4.409 | 9.495 | 27.992 | 60.287 | 109.318 | 177.775 |
| 2.1% | 0.492 | 0.673 | 0.781 | 1.023 | 1.239 | 1.624 | 1.967 | 2.282 | 2.577 | 0.242 | 0.846 | 1.533 | 4.519 | 9.731 | 28.698 | 61.795 | 112.017 | 182.157 |
| 2.2% | 0.503 | 0.688 | 0.799 | 1.047 | 1.268 | 1.662 | 2.013 | 2.336 | 2.638 | 0.247 | 0.865 | 1.569 | 4.626 | 9.959 | 29.370 | 63.240 | 114.668 | 186.469 |
| 2.3% | 0.515 | 0.704 | 0.817 | 1.070 | 1.297 | 1.699 | 2.058 | 2.388 | 2.697 | 0.253 | 0.885 | 1.604 | 4.727 | 10.187 | 30.024 | 64.654 | 117.221 | 190.640 |
| 2.4% | 0.526 | 0.719 | 0.834 | 1.093 | 1.325 | 1.736 | 2.103 | 2.440 | 2.755 | 0.258 | 0.904 | 1.638 | 4.829 | 10.407 | 30.678 | 66.068 | 119.773 | 194.739 |
| 2.5% | 0.536 | 0.734 | 0.852 | 1.116 | 1.352 | 1.771 | 2.146 | 2.490 | 2.812 | 0.263 | 0.922 | 1.673 | 4.930 | 10.619 | 31.296 | 67.419 | 122.228 | 198.769 |
| 2.6% | 0.547 | 0.748 | 0.868 | 1.138 | 1.379 | 1.807 | 2.188 | 2.539 | 2.868 | 0.269 | 0.940 | 1.704 | 5.028 | 10.831 | 31.932 | 68.738 | 124.633 | 202.727 |
| 2.7% | 0.558 | 0.763 | 0.885 | 1.160 | 1.405 | 1.841 | 2.230 | 2.588 | 2.922 | 0.274 | 0.959 | 1.738 | 5.125 | 11.035 | 32.533 | 70.058 | 127.038 | 206.544 |
| 2.8% | 0.568 | 0.777 | 0.901 | 1.181 | 1.431 | 1.875 | 2.271 | 2.635 | 2.976 | 0.279 | 0.976 | 1.769 | 5.217 | 11.239 | 33.134 | 71.346 | 129.345 | 210.361 |
| 2.9% | 0.578 | 0.790 | 0.917 | 1.202 | 1.456 | 1.908 | 2.311 | 2.682 | 3.029 | 0.284 | 0.993 | 1.801 | 5.310 | 11.435 | 33.710 | 72.602 | 131.652 | 214.107 |
| 3% | 0.588 | 0.804 | 0.933 | 1.222 | 1.481 | 1.941 | 2.351 | 2.728 | 3.080 | 0.289 | 1.010 | 1.832 | 5.399 | 11.622 | 34.300 | 73.859 | 133.910 | 217.712 |
| 3.1% | 0.597 | 0.817 | 0.948 | 1.243 | 1.505 | 1.973 | 2.390 | 2.773 | 3.131 | 0.293 | 1.027 | 1.861 | 5.491 | 11.820 | 34.866 | 75.084 | 136.119 | 221.317 |
| 3.2% | 0.607 | 0.830 | 0.963 | 1.263 | 1.529 | 2.004 | 2.428 | 2.817 | 3.181 | 0.298 | 1.043 | 1.891 | 5.580 | 12.009 | 35.414 | 76.278 | 138.279 | 224.852 |
| 3.3% | 0.616 | 0.843 | 0.978 | 1.282 | 1.553 | 2.035 | 2.465 | 2.861 | 3.231 | 0.302 | 1.059 | 1.920 | 5.664 | 12.197 | 35.961 | 77.440 | 140.439 | 228.386 |
| 3.4% | 0.626 | 0.856 | 0.993 | 1.301 | 1.577 | 2.066 | 2.503 | 2.904 | 3.279 | 0.307 | 1.076 | 1.950 | 5.748 | 12.386 | 36.509 | 78.634 | 142.550 | 231.779 |
| 3.5% | 0.635 | 0.868 | 1.008 | 1.320 | 1.600 | 2.096 | 2.539 | 2.946 | 3.327 | 0.312 | 1.091 | 1.979 | 5.832 | 12.566 | 37.039 | 79.765 | 144.611 | 235.172 |
| 3.6% | 0.644 | 0.881 | 1.022 | 1.339 | 1.622 | 2.126 | 2.575 | 2.988 | 3.374 | 0.316 | 1.107 | 2.007 | 5.916 | 12.739 | 37.570 | 80.896 | 146.673 | 238.494 |
| 3.7% | 0.653 | 0.893 | 1.036 | 1.358 | 1.645 | 2.155 | 2.611 | 3.029 | 3.421 | 0.321 | 1.122 | 2.034 | 5.999 | 12.920 | 38.082 | 82.027 | 148.686 | 241.816 |
| 3.8% | 0.661 | 0.905 | 1.050 | 1.376 | 1.667 | 2.184 | 2.646 | 3.070 | 3.467 | 0.324 | 1.137 | 2.062 | 6.079 | 13.093 | 38.594 | 83.127 | 150.698 | 245.068 |
| 3.9% | 0.670 | 0.917 | 1.064 | 1.394 | 1.688 | 2.213 | 2.680 | 3.110 | 3.512 | 0.329 | 1.152 | 2.089 | 6.159 | 13.258 | 39.107 | 84.195 | 152.662 | 248.249 |
| 4% | 0.679 | 0.928 | 1.077 | 1.412 | 1.710 | 2.241 | 2.714 | 3.150 | 3.557 | 0.333 | 1.166 | 2.115 | 6.238 | 13.430 | 39.602 | 85.263 | 154.625 | 251.430 |
| 4.1% | 0.687 | 0.940 | 1.091 | 1.429 | 1.731 | 2.269 | 2.748 | 3.189 | 3.601 | 0.337 | 1.181 | 2.142 | 6.313 | 13.595 | 40.097 | 86.331 | 156.540 | 254.540 |
| 4.2% | 0.695 | 0.951 | 1.104 | 1.446 | 1.752 | 2.296 | 2.781 | 3.228 | 3.645 | 0.341 | 1.195 | 2.168 | 6.388 | 13.760 | 40.574 | 87.368 | 158.454 | 257.560 |
| 4.3% | 0.704 | 0.963 | 1.117 | 1.464 | 1.773 | 2.323 | 2.814 | 3.266 | 3.688 | 0.346 | 1.210 | 2.193 | 6.468 | 13.925 | 41.051 | 88.404 | 160.319 | 260.689 |
| 4.4% | 0.712 | 0.974 | 1.130 | 1.480 | 1.793 | 2.350 | 2.847 | 3.304 | 3.731 | 0.350 | 1.224 | 2.219 | 6.538 | 14.082 | 41.528 | 89.441 | 162.185 | 263.729 |
| 4.5% | 0.720 | 0.985 | 1.143 | 1.497 | 1.814 | 2.377 | 2.879 | 3.341 | 3.773 | 0.353 | 1.238 | 2.244 | 6.614 | 14.247 | 42.005 | 90.446 | 164.001 | 266.698 |
| 4.6% | 0.728 | 0.996 | 1.155 | 1.514 | 1.834 | 2.403 | 2.911 | 3.378 | 3.814 | 0.357 | 1.252 | 2.268 | 6.689 | 14.404 | 42.465 | 91.452 | 165.817 | 269.596 |
| 4.7% | 0.736 | 1.006 | 1.168 | 1.530 | 1.854 | 2.429 | 2.942 | 3.414 | 3.856 | 0.361 | 1.264 | 2.293 | 6.759 | 14.561 | 42.924 | 92.426 | 167.584 | 272.565 |
| 4.8% | 0.743 | 1.017 | 1.180 | 1.546 | 1.873 | 2.455 | 2.973 | 3.450 | 3.896 | 0.365 | 1.278 | 2.317 | 6.830 | 14.711 | 43.383 | 93.400 | 169.351 | 275.392 |
| 4.9% | 0.751 | 1.027 | 1.192 | 1.562 | 1.893 | 2.480 | 3.004 | 3.486 | 3.937 | 0.369 | 1.291 | 2.340 | 6.901 | 14.868 | 43.825 | 94.373 | 171.119 | 278.290 |
| 5% | 0.759 | 1.038 | 1.204 | 1.578 | 1.912 | 2.505 | 3.035 | 3.522 | 3.977 | 0.373 | 1.304 | 2.364 | 6.971 | 15.017 | 44.267 | 95.347 | 172.886 | 281.118 |
| 5.1% | 0.766 | 1.048 | 1.216 | 1.594 | 1.931 | 2.530 | 3.065 | 3.557 | 4.016 | 0.376 | 1.317 | 2.388 | 7.042 | 15.166 | 44.709 | 96.290 | 174.604 | 283.874 |
| 5.2% | 0.774 | 1.058 | 1.228 | 1.609 | 1.950 | 2.555 | 3.095 | 3.591 | 4.055 | 0.380 | 1.330 | 2.411 | 7.108 | 15.315 | 45.151 | 97.232 | 176.273 | 286.631 |
| 5.3% | 0.781 | 1.069 | 1.240 | 1.625 | 1.968 | 2.579 | 3.125 | 3.626 | 4.094 | 0.383 | 1.343 | 2.435 | 7.179 | 15.457 | 45.575 | 98.175 | 177.991 | 289.388 |
| 5.4% | 0.788 | 1.079 | 1.252 | 1.640 | 1.987 | 2.603 | 3.154 | 3.660 | 4.133 | 0.387 | 1.356 | 2.458 | 7.245 | 15.606 | 45.999 | 99.086 | 179.660 | 292.145 |
| 5.5% | 0.796 | 1.089 | 1.263 | 1.655 | 2.005 | 2.627 | 3.183 | 3.693 | 4.171 | 0.391 | 1.368 | 2.480 | 7.312 | 15.747 | 46.423 | 99.997 | 181.280 | 294.831 |
| 5.6% | 0.803 | 1.098 | 1.275 | 1.670 | 2.023 | 2.651 | 3.212 | 3.727 | 4.209 | 0.394 | 1.380 | 2.503 | 7.378 | 15.889 | 46.847 | 100.908 | 182.949 | 297.517 |
| 5.7% | 0.810 | 1.108 | 1.286 | 1.685 | 2.041 | 2.675 | 3.240 | 3.760 | 4.246 | 0.398 | 1.392 | 2.525 | 7.444 | 16.030 | 47.271 | 101.788 | 184.569 | 300.132 |
| 5.8% | 0.817 | 1.118 | 1.297 | 1.700 | 2.059 | 2.698 | 3.269 | 3.793 | 4.283 | 0.401 | 1.405 | 2.547 | 7.510 | 16.171 | 47.678 | 102.699 | 186.188 | 302.747 |
| 5.9% | 0.824 | 1.127 | 1.308 | 1.714 | 2.077 | 2.721 | 3.297 | 3.825 | 4.320 | 0.404 | 1.416 | 2.568 | 7.572 | 16.313 | 48.084 | 103.578 | 187.759 | 305.363 |
| 6% | 0.831 | 1.137 | 1.319 | 1.729 | 2.094 | 2.744 | 3.324 | 3.858 | 4.356 | 0.408 | 1.429 | 2.590 | 7.638 | 16.446 | 48.490 | 104.427 | 189.379 | 307.907 |
| 6.1% | 0.838 | 1.146 | 1.330 | 1.743 | 2.112 | 2.767 | 3.352 | 3.890 | 4.392 | 0.411 | 1 | | | | | | | |