# TECHNICAL INFORMATION

AQVASTAR PRO SERIES

## Friction loss chart - for your pipe selection

| Dia of pipe | | 32mm/25mm/1" | | | | 50mm/40mm/1.5" | | | | 63mm/50mm/2" | | | | 75mm/65mm/2.5" | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| size in mm | | ASTM(SCH40) | | BS STD(Class3)* | | ASTM(SCH40) | | BS STD(Class3)* | | ASTM(SCH40) | | BS STD(Class3)* | | ASTM(SCH40) | | BS STD(Class3)* | |
| Avg. ID Pipe | | 26.70 | | 29.50 | | 41.00 | | 46.40 | | 52.50 | | 58.50 | | 61.80 | | 69.50 | |
| OD Avg. | | 33.40 | | 32.00 | | 48.26 | | 50.00 | | 60.32 | | 63.00 | | 73.02 | | 75.00 | |
| wall Min. | | 3.60 | | 1.30 | | 3.90 | | 1.85 | | 4.30 | | 2.35 | | 6.00 | | 2.75 | |
| wall Flow | | 3.38 | | 1.20 | | 3.68 | | 1.70 | | 3.91 | | 2.20 | | 5.61 | | 2.60 | |
| M3/hr | LPM | Velocity {m/s} | M Loss | Velocity {m/s} | M Loss | Velocity {m/s} | M Loss | Velocity {m/s} | M Loss | Velocity {m/s} | M Loss | Velocity {m/s} | M Loss | Velocity {m/s} | M Loss | Velocity {m/s} | M Loss |
| 1.8 | 30 | 0.89 | 3.55 | 0.73 | 2.18 | 0.38 | 0.44 | 0.30 | 0.24 | | | | | | | | |
| 2.1 | 35 | 1.04 | 4.72 | 0.85 | 2.90 | 0.44 | 0.59 | 0.35 | 0.32 | 0.27 | 0.18 | 0.22 | 0.10 | | | | |
| 2.4 | 40 | 1.19 | 6.05 | 0.97 | 3.72 | 0.50 | 0.75 | 0.39 | 0.41 | 0.31 | 0.22 | 0.25 | 0.13 | 0.22 | 0.10 | 0.18 | 0.06 |
| 2.7 | 45 | 1.34 | 7.52 | 1.09 | 4.63 | 0.57 | 0.93 | 0.44 | 0.51 | 0.35 | 0.28 | 0.28 | 0.17 | 0.25 | 0.13 | 0.20 | 0.07 |
| 3.0 | 50 | 1.48 | 9.14 | 1.22 | 5.62 | 0.63 | 1.14 | 0.50 | 0.62 | 0.38 | 0.34 | 0.31 | 0.20 | 0.28 | 0.15 | 0.22 | 0.09 |
| 3.3 | 55 | 1.63 | 10.90 | 1.34 | 6.71 | 0.69 | 1.35 | 0.54 | 0.74 | 0.42 | 0.40 | 0.34 | 0.24 | 0.30 | 0.18 | 0.24 | 0.10 |
| 3.6 | 60 | 1.78 | 12.80 | 1.46 | 7.88 | 0.75 | 1.59 | 0.59 | 0.87 | 0.46 | 0.48 | 0.37 | 0.28 | 0.33 | 0.22 | 0.26 | 0.12 |
| 3.9 | 65 | 1.93 | 14.85 | 1.58 | 9.14 | 0.82 | 1.84 | 0.64 | 1.01 | 0.50 | 0.55 | 0.40 | 0.33 | 0.36 | 0.25 | 0.29 | 0.14 |
| 4.2 | 70 | 2.08 | 17.03 | 1.70 | 10.48 | 0.88 | 2.12 | 0.69 | 1.16 | 0.54 | 0.63 | 0.43 | 0.38 | 0.39 | 0.29 | 0.31 | 0.16 |
| 4.8 | 80 | 2.38 | 21.80 | 1.95 | 13.42 | 1.01 | 2.71 | 0.79 | 1.48 | 0.62 | 0.81 | 0.50 | 0.48 | 0.44 | 0.37 | 0.35 | 0.21 |
| 5.4 | 90 | 2.67 | 27.12 | 2.19 | 16.69 | 1.13 | 3.37 | 0.89 | 1.84 | 0.69 | 1.01 | 0.56 | 0.60 | 0.50 | 0.46 | 0.40 | 0.26 |
| 6.0 | 100 | 2.97 | 32.96 | 2.44 | 20.29 | 1.25 | 4.09 | 0.99 | 2.24 | 0.77 | 1.22 | 0.62 | 0.73 | 0.55 | 0.56 | 0.44 | 0.31 |
| 6.6 | 110 | 3.27 | 39.31 | 2.68 | 24.20 | 1.38 | 4.88 | 1.09 | 2.67 | 0.85 | 1.46 | 0.68 | 0.87 | 0.61 | 0.66 | 0.48 | 0.37 |
| 7.2 | 120 | 3.57 | 46.18 | 2.92 | 28.43 | 1.51 | 5.74 | 1.19 | 3.14 | 0.92 | 1.71 | 0.75 | 1.02 | 0.67 | 0.78 | 0.53 | 0.44 |
| 7.8 | 130 | | | | | 1.64 | 6.64 | 1.28 | 3.63 | 1.00 | 1.99 | 0.81 | 1.18 | 0.73 | 0.90 | 0.57 | 0.51 |
| 8.4 | 140 | | | | | 1.76 | 7.62 | 1.38 | 4.17 | 1.08 | 2.28 | 0.87 | 1.35 | 0.78 | 1.03 | 0.61 | 0.58 |
| 9.0 | 150 | | | | | 1.89 | 8.65 | 1.48 | 4.74 | 1.16 | 2.59 | 0.93 | 1.54 | 0.84 | 1.17 | 0.66 | 0.66 |
| 9.6 | 160 | | | | | 2.01 | 9.75 | 1.57 | 5.34 | 1.23 | 2.92 | 0.99 | 1.73 | 0.89 | 1.32 | 0.70 | 0.75 |
| 10.2 | 170 | | | | | 2.15 | 10.91 | 1.67 | 5.97 | 1.32 | 3.26 | 1.05 | 1.94 | 0.95 | 1.48 | 0.74 | 0.84 |
| 10.8 | 180 | | | | | 2.27 | 12.13 | 1.77 | 6.64 | 1.39 | 3.63 | 1.11 | 2.16 | 1.00 | 1.65 | 0.79 | 0.93 |
| 11.4 | 190 | | | | | 2.40 | 13.40 | 1.87 | 7.34 | 1.47 | 4.01 | 1.18 | 2.38 | 1.06 | 1.82 | 0.83 | 1.03 |
| 12.0 | 200 | | | | | 2.52 | 14.74 | 1.97 | 8.07 | 1.54 | 4.41 | 1.24 | 2.62 | 1.11 | 2.00 | 0.88 | 1.13 |
| 13.5 | 225 | | | | | 2.84 | 18.33 | 2.21 | 10.04 | 1.74 | 5.48 | 1.39 | 3.26 | 1.26 | 2.49 | 0.98 | 1.41 |
| 15.0 | 250 | | | | | 3.15 | 22.37 | 2.46 | 12.2 | 1.93 | 6.69 | 1.55 | 3.96 | 1.39 | 3.03 | 1.10 | 1.71 |
| 16.5 | 275 | | | | | | | 2.71 | 14.55 | 2.11 | 7.98 | 1.70 | 4.73 | 1.52 | 3.62 | 1.21 | 2.04 |
| 18.0 | 300 | | | | | | | 2.95 | 17.09 | 2.30 | 9.37 | 1.86 | 5.53 | 1.66 | 4.25 | 1.32 | 2.38 |
| 19.5 | 325 | | | | | | | | | 2.50 | 10.87 | 2.01 | 6.42 | 1.81 | 4.93 | 1.42 | 2.77 |
| 21.0 | 350 | | | | | | | | | 2.69 | 12.46 | 2.17 | 7.36 | 1.94 | 5.65 | 1.54 | 3.17 |
| 22.5 | 375 | | | | | | | | | 2.88 | 14.16 | 2.32 | 8.36 | 2.08 | 6.42 | 1.64 | 3.60 |
| 24.0 | 400 | | | | | | | | | 3.07 | 15.96 | 2.48 | 9.42 | 2.22 | 7.24 | 1.76 | 4.06 |
| 25.5 | 425 | | | | | | | | | 3.27 | 17.85 | 2.63 | 10.54 | 2.36 | 8.10 | 1.86 | 4.54 |
| 27.0 | 450 | | | | | | | | | 3.46 | 19.84 | 2.79 | 11.72 | 2.50 | 9.00 | 1.98 | 5.05 |
| 28.5 | 475 | | | | | | | | | 3.65 | 21.94 | 2.94 | 12.95 | 2.64 | 9.95 | 2.08 | 5.58 |
| 30.0 | 500 | | | | | | | | | 3.84 | 24.11 | 3.10 | 14.24 | 2.77 | 10.94 | 2.20 | 6.14 |
| 33.0 | 550 | | | | | | | | | | | | | 3.05 | 13.01 | 2.41 | 7.34 |
| 36.0 | 600 | | | | | | | | | | | | | 3.33 | 15.28 | 2.63 | 8.63 |
| 39.0 | 650 | | | | | | | | | | | | | 3.61 | 17.72 | 2.85 | 10.00 |
| 42.0 | 700 | | | | | | | | | | | | | 3.88 | 20.32 | 3.07 | 11.48 |
| 45.0 | 750 | | | | | | | | | | | | | 4.16 | 23.09 | 3.29 | 13.04 |
| 48.0 | 800 | | | | | | | | | | | | | 4.44 | 26.02 | 3.51 | 14.68 |
| 54.0 | 900 | | | | | | | | | | | | | | | | |
| 60.0 | 1000 | | | | | | | | | | | | | | | | |
| 72.0 | 1200 | | | | | | | | | | | | | | | | |
| 84.0 | 1400 | | | | | | | | | | | | | | | | |
| 96.0 | 1600 | | | | | | | | | | | | | | | | |
| 108.0 | 1800 | | | | | | | | | | | | | | | | |
| 120.0 | 2000 | | | | | | | | | | | | | | | | |
| 132.0 | 2200 | | | | | | | | | | | | | | | | |
| 144.0 | 2400 | | | | | | | | | | | | | | | | |
| 156.0 | 2600 | | | | | | | | | | | | | | | | |

Sea Green shaded area represents RECOMMENDED velocities lesser than 2M/S.

LIGHT YELLOW shaded area represents velocities over 2M/S. use with caution.

*If you use class 4 UPVC BS STD pipes, please multiply the results with 1.30 for accurate answer

# TECHNICAL INFORMATION

## Friction loss chart - for your pipe selection

| Dia of pipe | | 90mm/80mm/3" | | | | 110mm/100mm/4" | | | | 160mm/150mm/6" | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| size in mm | | ASTM(SCH40) | | BS STD(Class3)* | | ASTM(SCH40) | | BS STD(Class3)* | | ASTM(SCH40) | | BS STD(Class3)* | |
| Avg. ID Pipe | | 77.90 | | 83.50 | | 102.30 | | 102.20 | | 154.50 | | 147.50 | |
| OD Avg. | | 88.90 | | 90.00 | | 114.30 | | 110.00 | | 168.28 | | 160.00 | |
| wall Min. | | 6.00 | | 3.25 | | 6.50 | | 3.90 | | 7.70 | | 6.45 | |
| wall Flow | | 5.49 | | 3.10 | | 6.02 | | 3.70 | | 7.11 | | 6.20 | |
| M3/hr | LPM | Velocity {m/s} | M Loss | Velocity {m/s} | M Loss | Velocity {m/s} | M Loss | Velocity {m/s} | M Loss | Velocity {m/s} | M Loss | Velocity {m/s} | M Loss |
| 1.8 | 30 | | | | | | | | | | | | |
| 2.1 | 35 | | | | | | | | | | | | |
| 2.4 | 40 | | | | | | | | | | | | |
| 2.7 | 45 | | | | | | | | | | | | |
| 3.0 | 50 | | | | | | | | | | | | |
| 3.3 | 55 | 0.19 | 0.06 | 0.17 | 0.04 | | | | | | | | |
| 3.6 | 60 | 0.21 | 0.07 | 0.19 | 0.05 | | | | | | | | |
| 3.9 | 65 | 0.23 | 0.08 | 0.20 | 0.06 | | | | | | | | |
| 4.2 | 70 | 0.24 | 0.09 | 0.22 | 0.07 | | | | | | | | |
| 4.8 | 80 | 0.28 | 0.12 | 0.25 | 0.09 | 0.16 | 0.03 | 0.16 | 0.03 | | | | |
| 5.4 | 90 | 0.31 | 0.15 | 0.28 | 0.11 | 0.18 | 0.04 | 0.18 | 0.04 | | | | |
| 6.0 | 100 | 0.35 | 0.18 | 0.31 | 0.13 | 0.20 | 0.05 | 0.20 | 0.05 | | | | |
| 6.6 | 110 | 0.38 | 0.21 | 0.34 | 0.15 | 0.22 | 0.06 | 0.22 | 0.06 | | | | |
| 7.2 | 120 | 0.42 | 0.25 | 0.37 | 0.18 | 0.24 | 0.07 | 0.24 | 0.07 | | | | |
| 7.8 | 130 | 0.46 | 0.29 | 0.40 | 0.21 | 0.26 | 0.08 | 0.26 | 0.08 | | | | |
| 8.4 | 140 | 0.49 | 0.34 | 0.43 | 0.24 | 0.28 | 0.09 | 0.28 | 0.09 | | | | |
| 9.0 | 150 | 0.53 | 0.38 | 0.46 | 0.27 | 0.30 | 0.10 | 0.31 | 0.10 | | | | |
| 9.6 | 160 | 0.56 | 0.43 | 0.49 | 0.31 | 0.32 | 0.11 | 0.32 | 0.11 | 0.14 | 0.02 | 0.15 | 0.01 |
| 10.2 | 170 | 0.60 | 0.48 | 0.52 | 0.34 | 0.35 | 0.13 | 0.34 | 0.12 | 0.15 | 0.02 | 0.16 | 0.02 |
| 10.8 | 180 | 0.63 | 0.53 | 0.55 | 0.38 | 0.37 | 0.14 | 0.36 | 0.14 | 0.16 | 0.02 | 0.17 | 0.02 |
| 11.4 | 190 | 0.67 | 0.59 | 0.59 | 0.42 | 0.39 | 0.16 | 0.39 | 0.15 | 0.17 | 0.02 | 0.18 | 0.02 |
| 12.0 | 200 | 0.70 | 0.65 | 0.62 | 0.46 | 0.41 | 0.17 | 0.41 | 0.17 | 0.18 | 0.02 | 0.19 | 0.02 |
| 13.5 | 225 | 0.79 | 0.81 | 0.69 | 0.58 | 0.46 | 0.21 | 0.46 | 0.21 | 0.20 | 0.03 | 0.22 | 0.03 |
| 15.0 | 250 | 0.88 | 0.98 | 0.77 | 0.70 | 0.51 | 0.26 | 0.51 | 0.25 | 0.22 | 0.04 | 0.24 | 0.03 |
| 16.5 | 275 | 0.96 | 1.17 | 0.85 | 0.83 | 0.56 | 0.31 | 0.56 | 0.30 | 0.24 | 0.04 | 0.27 | 0.04 |
| 18.0 | 300 | 1.04 | 1.38 | 0.93 | 0.98 | 0.61 | 0.37 | 0.61 | 0.35 | 0.27 | 0.05 | 0.29 | 0.05 |
| 19.5 | 325 | 1.14 | 1.60 | 1.00 | 1.13 | 0.66 | 0.42 | 0.66 | 0.41 | 0.29 | 0.06 | 0.32 | 0.05 |
| 21.0 | 350 | 1.22 | 1.83 | 1.08 | 1.30 | 0.71 | 0.49 | 0.71 | 0.47 | 0.31 | 0.07 | 0.34 | 0.06 |
| 22.5 | 375 | 1.31 | 2.08 | 1.16 | 1.48 | 0.76 | 0.55 | 0.76 | 0.53 | 0.33 | 0.08 | 0.36 | 0.07 |
| 24.0 | 400 | 1.39 | 2.35 | 1.23 | 1.66 | 0.81 | 0.62 | 0.81 | 0.60 | 0.36 | 0.09 | 0.39 | 0.08 |
| 25.5 | 425 | 1.49 | 2.63 | 1.31 | 1.86 | 0.86 | 0.70 | 0.86 | 0.67 | 0.38 | 0.10 | 0.41 | 0.09 |
| 27.0 | 450 | 1.57 | 2.92 | 1.39 | 2.07 | 0.91 | 0.78 | 0.91 | 0.75 | 0.40 | 0.11 | 0.44 | 0.10 |
| 28.5 | 475 | 1.66 | 3.23 | 1.46 | 2.29 | 0.96 | 0.86 | 0.96 | 0.83 | 0.42 | 0.12 | 0.46 | 0.11 |
| 30.0 | 500 | 1.74 | 3.55 | 1.54 | 2.51 | 1.01 | 0.94 | 1.02 | 0.91 | 0.45 | 0.13 | 0.49 | 0.12 |
| 33.0 | 550 | 1.92 | 4.22 | 1.69 | 3.01 | 1.11 | 1.12 | 1.11 | 1.09 | 0.49 | 0.15 | 0.53 | 0.14 |
| 36.0 | 600 | 2.09 | 4.96 | 1.85 | 3.53 | 1.21 | 1.32 | 1.22 | 1.28 | 0.54 | 0.18 | 0.58 | 0.17 |
| 39.0 | 650 | 2.27 | 5.75 | 2.00 | 4.10 | 1.32 | 1.53 | 1.32 | 1.48 | 0.58 | 0.21 | 0.63 | 0.20 |
| 42.0 | 700 | 2.44 | 6.59 | 2.16 | 4.70 | 1.42 | 1.75 | 1.42 | 1.70 | 0.62 | 0.24 | 0.68 | 0.23 |
| 45.0 | 750 | 2.62 | 7.49 | 2.31 | 5.34 | 1.52 | 1.99 | 1.52 | 1.94 | 0.67 | 0.27 | 0.73 | 0.26 |
| 48.0 | 800 | 2.79 | 8.44 | 2.47 | 6.01 | 1.62 | 2.24 | 1.62 | 2.18 | 0.71 | 0.31 | 0.78 | 0.29 |
| 54.0 | 900 | 3.14 | 10.49 | 2.73 | 7.48 | 1.82 | 2.79 | 1.80 | 2.71 | 0.80 | 0.38 | 0.86 | 0.36 |
| 60.0 | 1000 | 3.49 | 12.74 | 3.04 | 9.09 | 2.02 | 3.38 | 2.00 | 3.29 | 0.89 | 0.46 | 0.96 | 0.44 |
| 72.0 | 1200 | 4.19 | 17.86 | 3.65 | 12.74 | 2.43 | 4.74 | 2.40 | 4.62 | 1.07 | 0.65 | 1.15 | 0.61 |
| 84.0 | 1400 | | | 4.26 | 16.94 | 2.84 | 6.30 | 2.80 | 6.14 | 1.25 | 0.86 | 1.34 | 0.82 |
| 96.0 | 1600 | | | | | 3.24 | 8.07 | 3.25 | 8.11 | 1.43 | 1.10 | 1.56 | 1.08 |
| 108.0 | 1800 | | | | | 3.64 | 10.04 | 3.65 | 10.69 | 1.60 | 1.37 | 1.75 | 1.42 |
| 120.0 | 2000 | | | | | | | | | 1.78 | 1.66 | 1.95 | 2.05 |
| 132.0 | 2200 | | | | | | | | | 1.96 | 1.98 | 2.14 | 2.45 |
| 144.0 | 2400 | | | | | | | | | 2.14 | 2.33 | 2.34 | 2.88 |
| 156.0 | 2600 | | | | | | | | | 2.32 | 2.70 | 2.53 | 3.34 |

For Class4 BS Std pipe pls multiply by 1.15 to get Loss in Mtr.

For SCH80 ASTM Std pipe pls multiply by 1.35 to get Loss in Mtr.