

VAIL FIRE DEPARTMENT
 CONVERSION FACTORS FOR COMPUTATION OF AVAILABLE FIRE FLOWS
 FROM FIRE HYDRANTS

The following conversion factors need to be applied to the results of fire flow tests conducted within the Town of Vail. The conversion factor is applied to the results to compensate for "peak demand." The conversion factors are listed for each month in which a fire flow test is conducted. The factor shown as Q_{pkd} is multiplied against the gallons per minute flowing (GPM), represented by "Q" in Freeman's formula $Q = (29.71 d^2 \sqrt{P}) \times Q_{pkd}$.

CONVERSION FACTORS (Q_{pkd})

Month in which Flow Test was conducted.....	Factor (Q_{pkd})
January.....	60.89%
February.....	58.66%
March.....	74.79%
April.....	53.32%
May.....	56.21%
June.....	81.16%
July.....	100%
August.....	83.23%
September.....	68.12%
October.....	46.99%
November.....	38.06%
December.....	82.22%

EXAMPLE: A flow test is conducted in March. The results indicate a static pressure of 135 PSI, residual pressure 90 PSI, with 1600 GPM flowing. The flow rate of 1600 GPM is multiplied by the conversion factor (Q_{pkd}) for March, 74.79% (1600 GPM x 74.79% = 1197 GPM). NOTE: The 1600 GPM has been reduced from 1761 GPM by the coefficient of discharge, .90.

Recompute the pressure using Freeman's formula, by replacing the value for Q (1600), with the new Q value (1197), to derive the new derated residual pressure ($\sqrt{P_r}$), in order to allow for peak demand (1197 = 29.7 x $d^2 \sqrt{P}$). Given d^2 is a constant (6.25), the new pressure is = $[(1197/29.71)/6.25]^2 = 44.55 P_r$.