

How to Calculate Rated Capacity of a Fire Hydrant with a Diffuser

To calculate the gallons per minute (GPM) or predicted flow of a fire hydrant, we will use both 2 1/2" sides of a fire hydrant.

In order to calculate the NFPA or AWWA rated capacity, you will need to take three measurements before and during your flow test:

- Static Pressure
- Residual Pressure
- Gallons Per Minute

Static pressure is measured when water is not flowing from a cap gauge attached to a fire hydrant.

Residual pressure is measured from the same cap gauge while water is flowing.

Gallons per minute is measured by a diffuser with a pitot and a GPM gauge while the hydrant is flowing.

NFPA and AWWA predicted flow of any fire hydrant is based on the rated capacity at 20 psi. All hydrants are assumed to provide at least 20 psi.

Sample Flow Test Results

- Static Pressure (SP) 70
- Residual Pressure (RP) 40
- Gallons Per Minute (GPM) 1500

Note - NFPA and AWWA Predicted Flow (PF) is always 20

- Step 1 - $(SP - PF) = 50$
- Step 2 - $(SP - RP) = 30$
- Step 3 - $(50 / 30) = 1.67$
- Step 4 - $1.67 ^ 0.54 = 1.32$
- Step 5 - $GPM \times 1.32$

Calculated Rated Capacity - Answer 1,976 GPM (Paint or mark this hydrant blue)

Note - The caret is the symbol (^) above the number 6 key on a standard United States QWERTY keyboard. In mathematics, the caret represents an exponent, square, cube, or other power.

National Fire Protection Agency (NFPA) recommends that fire departments and water districts follow a set standard of color-coding. Known as NFPA 291, it says fire hydrants using public water supply systems should be painted yellow, and their tops and caps should indicate the available GPM.

- Red - Below 500 GPM
- Orange - 500-999 GPM
- Green - 1000-1499 GPM
- Blue - 1500 GPM or more