

Law of Squares - Flow & Pressure Differential Determination

REFERENCES: MARKS' MECHANICAL ENGINEERS HANDBOOK

NOTE: Always begin a new case by retrieving the original file. Direct entry of data in cells that originally contain table lookups could cause functions to be lost, or incorrect calculations. I format cells requiring entry colored **RED**; calculated values are black.

1.) Enter the service at [C4].

flow:

- 2.) Enter the known value of flow (W1) at [C9].
- 3.) Enter the known value of pressure (P1) at [C10].
- 4.) Enter the known value of pressure (P2) at [C11].
- 5.) The calculated value of flow (W2) is shown at [G11].

pressure:

- 6.) Enter the known value of flow (W1) at [C19].
- 7.) Enter the known value of flow (W2) at [C20].
- 8.) Enter the known value of pressure (P1) at [C21].
- 9.) The calculated value of pressure (P2) is shown at [G21].

Print out using direct EXCEL commands.

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The originator of these spreadsheet(s) specifically excludes all warranties, expressed or implied, as to the accuracy of the data and other information set forth and assumes NO liability for any losses or damage resulting from the use of the materials or application of the data.

Consistent with GOOD ENGINEERING PRACTICE, the burden rests with the USER of these spreadsheets to review ALL calculations, and assumptions. The USER IS FULLY RESPONSIBLE for the results or decisions based on This Spreadsheet Requires MACROS to be ENABLED to ASSURE proper operation. See the Workbook Help Sheet for Additional Instructions on Use.

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Determine: HAZ #7; Flow thru 1-1/2" HH-SS-30 SPRAYING SYSTEMS NOZZLES

Flow:

known	calculated
$W_1 = 102$ rate	$W_2 = (P_2 / P_1)^{0.5} \cdot W_1$
$P_1 = 100$ pressure	
$P_2 = 140$ pressure	$W_2 = 120.68803$ rate

Pressure:

known	calculated
$W_1 = 102$ rate	$P_2 = (W_2 / W_1)^2 \cdot P_1$
$W_2 = 120.7$ rate	
$P_1 = 100$ pressure	$P_2 = 140.02778$ pressure units