Cost of Friction Loss in PVC Plastic Irrigation Pipe  
(SDR 51, 80 psi) for Various Fuels User Guide

Introduction

Determining the cost of pipe friction loss in PVC Irrigation Pipe is a management practice that can reduce costs and save energy. Utilizing this spreadsheet can help the user determine the cost of friction loss per hour for inputs of various fuels and pumps, allowing the user to select the cost effective pumping solution for their individual needs. Eight (8) types of irrigation pumping models are compared for friction loss in this spreadsheet: Diesel (cells B8:B15), Electrical - LST (cells E8:E15), Electrical – HOZ PTO (cells H8:H15), Electric - Hoz Belt (cells K8:K15), Electric – Submersible (cells B19:B26), Natural Gas (cells E19:E26), Liquid Petroleum (cells H19:H26), and Gasoline (cells K19:K26).

Inputs

The user must input four (4) unknowns for each energy source to be compared. Pipe diameter should be put in cells B8, E8, H8, K8, B19, E19, H19, and K19 in inches format. The spreadsheet software will automatically calculate the Nominal ID Specifications for P.I.P. SDR51 (80 psi) PVC pipe from Diamond Plastics Corporation (http://www.dpcpipe.com/) based on the whole number outside diameter entered by the user.

Price of the energy source should be put in cells B9, E9, H9, K9, B20, E20, H20, and K20. The energy source price for diesel, liquid petroleum, and gasoline is in $/gallon (cells B9, H20, and K20); for all electrical pumps is $/KWH (cells E9, H9, K9, and B20); and for natural gas is $/ccf (cell E20).

The flow rate should be entered into cells B10, E10, H10, K10, B21, E21, H21, and K21 in gallons per minute.

The length of pipe should be entered into cells B11, E11, H11, K11, B22, E22, H22, and K22 in feet.

Guidelines for acceptable and appropriate values for each of these inputs are accessible by selecting the cell. A pop-up tab will give additional information for each cell.

Intermediate Value

Friction loss is calculated and entered in the following cells by the spreadsheet program: Diesel (cell B13), Electrical - LST (cell E13), Electrical – HOZ PTO (cell H13), Electric - Hoz Belt (cell K13), Electric – Submersible (cell B24), Natural Gas (cell E24), Liquid Petroleum (cell H24), and Gasoline (cell K24). Friction loss is calculated in feet.

Final Values

Calculations for the cost of friction loss are found in cells B15, E15, H15, K15, B26, E26, H26, and K26 in $ per hour.

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