

FIRE PUMP ANALYSIS

A USER'S GUIDE

#1

US

SI

FIRE PUMP ANALYSIS

#2

FIRE PUMP PARAMETERS

$P_{100\%}$	Rated Pressure Manuf. Rating	75	psi
$Q_{100\%}$	Rated Flow Manuf. Rating	1000	gpm
$P_{0\%}$	Churn Pressure (0% Flow) NFA 13 curve (default - 1.2x rated)	90	psi
$P_{150\%}$	Pressure at Max Flow (150%) NFA 13 curve (default - 0.65x rated)	48.75	psi

#3

FLOW TEST INFORMATION

P_{STATIC}	Static Pressure Flow Test	70	psi
P_{RESID}	Residual Pressure Flow Test	55	psi
Q_{RESID}	Flow Flow Test	1200	gpm

#4

SYSTEM DEMAND

P_s	System Pressure at Pump Given	115	psi
Q_s	System Flow at Pump Given	812.5	gpm
$Q_{s,\text{HOSE}}$	Hose Allowance Given	250	gpm
P_{START}	Start Pressure (0 flow) Sprinkler	7	psi

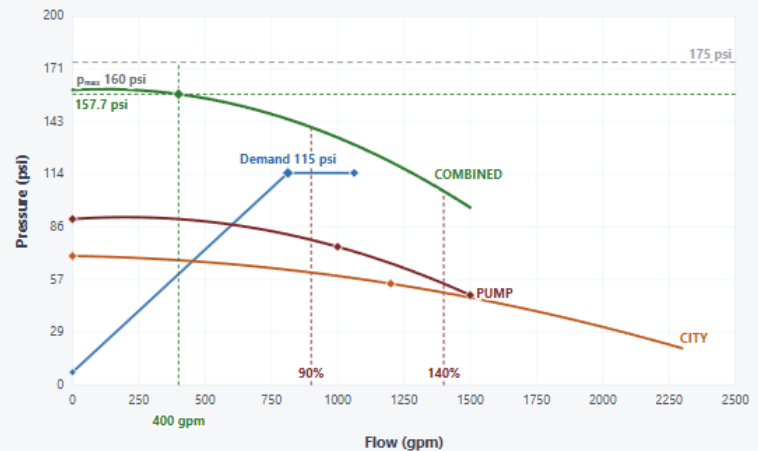
#5

POINT OF INTEREST

☒	Include point of interest		
Q_x	Flow at Point of Interest Given	400	gpm

#6

FIRE PUMP & WATER SUPPLY ANALYSIS



Max. Combined Discharge Pressure

160.4 psi

Flow where Max. Pressure Occurs

114 gpm

#8

POINT OF INTEREST RESULTS

Q_x	Flow at Point of Interest	400	gpm
$P_{C,X}$	City (Supply) Pressure at X	67.7	psi
$P_{P,X}$	Pump Pressure at X	90	psi
$P_{T,X}$	Combined Pressure at X	157.7	psi

$$P_{T,X} = P_{C,X} + P_{P,X} = (67.7) + (90) = 157.7 \text{ psi}$$

DESCRIPTION

PURPOSE: The Fire Pump Analysis tool plots a fire pump's performance against the available water supply and the system demand on a single graph. It (1) fits the pump and water-supply curves per NFPA 13 and the flow test, (2) combines them to find the maximum combined discharge pressure, and (3) evaluates the city, pump, and combined pressures at any point of interest. The tool supports US/SI units, DXF, PNG, and PDF export, and a printable one-page report.

#1 UNIT TOGGLE: Switch between US Imperial units (US) and metric (SI). Every input, result, and the chart updates automatically.

#2 FIRE PUMP PARAMETERS: The pump's rating. Enter the Rated Pressure ($p_{100\%}$) and Rated Flow ($Q_{100\%}$) from the manufacturer. The Churn Pressure ($p_{0\%}$, at 0% flow) and Pressure at Max Flow ($p_{150\%}$, at 150% flow) default to the NFPA 13 pump curve (120% and 65% of rated) and can be overwritten with a manufacturer's certified curve.

#3 FLOW TEST INFORMATION: The available water supply from a hydrant flow test. Enter the Static Pressure (p_{STATIC}), Residual Pressure (p_{RESIDUAL}), and test Flow (Q_{RESIDUAL}). These define the water supply (city) curve.

#4 SYSTEM DEMAND: The system's required delivery at the pump. Enter the System Pressure (p_s), System Flow (Q_s), Hose Allowance ($Q_{s,\text{HOSE}}$), and the Start Pressure at zero flow (p_{START}) — the most-remote sprinkler pressure, typically 7 psi (0.5 bar). These plot the demand point, the diagonal demand line, and the hose allowance line.

#5 POINT OF INTEREST: Optional. Check “Include point of interest” and enter a Flow at Point of Interest (Q_x) to evaluate the pressures available at a specific flow. Uncheck it to remove the point of interest from both the chart and the results.

#6 FIRE PUMP & WATER SUPPLY ANALYSIS: The chart plots everything on one graph — the Pump curve, the Water supply (flow test) curve, and the Combined curve — along with the system demand and hose allowance, the 175/300 psi pressure limit, and the 90% and 140% pump-flow markers.

#7 MAXIMUM COMBINED DISCHARGE PRESSURE: The peak pressure of the combined (pump + supply) curve (p_{MAX}) and the flow where that peak occurs ($Q_{\text{P,MAX}}$). This is the maximum pressure that downstream piping and components must be rated to withstand.

#8 POINT OF INTEREST RESULTS: At the flow entered above (Q_x), the tool reports the City/Supply Pressure ($p_{\text{C,X}}$), the Pump Pressure ($p_{\text{P,X}}$), and the Combined Pressure ($p_{\text{T,X}} = p_{\text{C,X}} + p_{\text{P,X}}$).

#9 EXPORT & PRINT: Export the graph to CAD (DXF), a transparent image (PNG), or PDF — or Print a clean one-page report of the full analysis. These buttons appear below the tool.