

FIRE OVERVIEW

The Elite Software FIRE Program quickly performs all necessary hydraulic calculations as required by the National Fire Protection Association (NFPA 13). FIRE is suitable for both residential and commercial fire protection calculations. FIRE also estimates sprinkler head requirements, calculates optimal pipe sizes, and automatically performs a peaking analysis. FIRE can handle all types of sprinkler systems (trees, grids, and hybrids) with up to 1,000 sprinklers and pipes. Fire pumps, meters, and stand pipes can also be analyzed. FIRE contains built-in data for virtually all types of pipe materials and fittings. The designer can add up to 50 additional pipe types to FIRE's pipe library. Data entry is a simple "fill in the blank" process with lots of help and choices available. Other reports list the gpm water flow and velocity through all pipe sections, the gpm flow and residual pressure at each sprinkler head, the pressure losses in each pipe section due to both pressure and elevation changes, the maximum system demand pressure and the total gpm demanded by the system. The NFPA style report format is designed to aid both the designer and the plan reviewer. FIRE also creates a water supply/demand graph.

THREE VERSIONS AVAILABLE

FIRE is available in three levels: 50 pipe capacity for \$495, 200 pipe capacity for \$795, and 1,000 pipe capacity for \$1,250. The 1,000 pipe capacity version is the only version that can import data from a CAD drawing made with AutoCAD MEP. Any user of a lower level of FIRE can upgrade to a higher level of FIRE simply by paying the difference in price between the level of FIRE already owned and the desired new level.

DEMONSTRATION VERSION

If you would like to evaluate FIRE in further detail, you can **download free of charge** a functional demo of FIRE from Elite's internet site, www.elitesoft.com. Alternately, a CDROM can be ordered directly from Elite Software. This evaluation version is a full version of the program, but with a 10 pipe limitation on the size of the projects that can be calculated. Demonstration versions can be "unlocked" into full versions by typing in a password you'll receive upon purchase.

FIRE FEATURES

- Performs Hydraulic Calculations Following NFPA 13
- Handles Sprinkler Systems with Up to 1,000 Sprinklers
- Calculates from Drawings Created by AutoCAD MEP
- Analyzes Stand Pipe Systems
- Automatically Sizes Pipe
- Creates Supply/Demand Graph
- Allows for All Types of Pipe Materials
- Provides for Fire Pumps and Pump Curve Data
- Automatically Calculates Fitting Equivalent Lengths
- Works on Trees, Grids, and Hybrid Sprinkler Systems
- Handles both English and Metric Units
- Tree and Grid Pipe Network Builder Included
- Computes Flow Rates, Velocities, & Pressure Drops
- Provides Comprehensive NFPA 13 Style Reports
- **No Copy Protection Hassles!**

CALCULATION METHOD

The FIRE Program uses the Newton-Raphson method for performing the hydraulic calculations. Calculations can be made for a given water supply pressure or they can be performed such that FIRE determines the lowest water supply pressure that can adequately drive the sprinkler system. Calculations are very fast and accurate. The user manual lists all pertinent equations to allow full manual verification.

PROGRAM INPUT

The FIRE program uses full screen editing features that provide a simple "fill in the blank" input procedure. All input data is checked at the time of entry so that no improper data can be entered. If you have a question about what the program is requesting, the built-in help offers additional explanations about the data being requested. If using AutoCAD MEP, FIRE can take data directly from a CAD drawing file. This CAD integration option is a great time saver in that all the detailed pipe network data is obtained directly from the drawing. Upon completion of the input process, whether entered manually or imported from a CAD drawing, all data is saved and can be reviewed and edited whenever desired. Two types of data are requested: general project data and pipe segment data. The general project data includes the project name and location, the client name, sprinkler specifications, hazard description, density requirements, hose stream allowances, hydrant test data, and other such data. The pipe data requires that each pipe section be defined as having a beginning and ending node number. If sprinkler heads are located at the pipe nodes, then the sprinkler K-factor must be given. In addition, the pipe length, nominal size, material type, and fitting quantities and types must be entered for each pipe section. FIRE contains a built-in library of pipe materials that includes cast iron, copper, steel, PVC, and many others. The pipe library allows up to 50 user defined pipe materials. Fitting equivalent lengths are automatically looked up depending upon fitting type, size, and pipe material.

SYSTEM REQUIREMENTS

FIRE is a Windows program and will run on any computer with Windows 2000 or higher, including Windows 7.

PROGRAM OUTPUT

The FIRE Program provides numerous reports including: general project data, pipe and node input data, node grouping flows, detailed pipe and sprinkler output, supply/demand graph, and a network summary. The user can specify exactly what reports are to be printed, and all reports can be previewed or printed as desired. Shown below are just some of the available reports.

Sample Reports

General Data

Project Title: EXAMPLE PROJECT
 Designed By: YOUR NAME
 Code Reference: NFPA 13
 Job number: 97594
 Client Name: Jones & Wilson, Architects
 Address: 1234 First Street NW
 Company Name: ABC Engineering, Inc.
 Company Address: 4567 2nd St.
 Phone: 555-555-9876
 Job number: 97594
 Building Name: Test Building
 Contact at Building: Jim Jones
 Project File Name: Sample.fw
 Date: November 20, 2000
 Approving Agency: LOCAL JURISDICTION
 Phone: 555-555-1234
 City, State Zip Code: Harrisburg, PA
 Representative: Mike Roberts
 City And State: Harrisburg, PA
 Building Owner: Amalgamated, Inc.
 Phone at Building: 555-555-9876

Project Data

Description Of Hazard: Ordinary Group 1
 Design Area Of Water Application: 600 ft²
 Default Sprinkler K-Factor: 5.65 K
 Inside Hose Stream Allowance: 50.00 gpm
 In Rack Sprinkler Allowance: 0.00 gpm
 Sprinkler System Type: Wet
 Maximum Area Per Sprinkler: 130 ft²
 Default Pipe Material: SCHED 40 WET STEEL
 Outside Hose Stream Allowance: 0.00 gpm

Sprinkler Specifications

Make: GLOBE
 Size: 1
 NONE
 Model: G
 Temperature Rating: 160 F

Water Supply Test Data

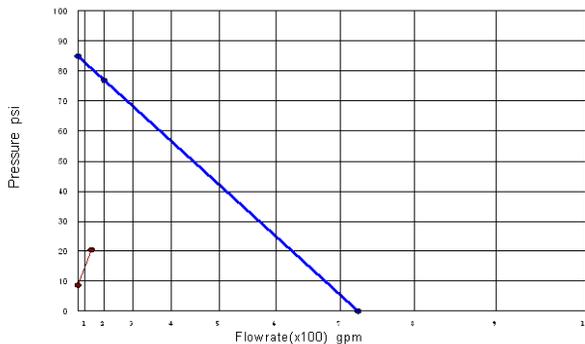
Source Of Information: LOCAL FIRE MARSHAL
 Test Hydrant ID: 3B
 Date Of Test: DECEMBER 15, 1992
 Hydrant Elevation: 0 ft
 Test Flow Rate: 202.00 gpm
 Calculated System Flow Rate: 141.08 gpm
 Available Inflow Residual Pressure: 80.88 psi
 Static Pressure: 85.00 psi
 Test Residual Pressure: 77.00 psi
 Calculated Inflow Residual Pressure: 20.44 psi

Calculation Project Data

Calculation Mode: Demand
 HMD Minimum Residual Pressure: 7.00 psi
 Maximum Water Velocity: 20.00 ft/s
 Number Of Active Nodes: 10
 Number Of Active Pipes: 10
 Minimum Desired Flow Density: 0.00 gpm/ft²
 Maximum Frictional Loss / 100 feet: 20.00 psi
 Number Of Inactive Pipes: 0

Fire Sprinkler Output Data

Hydraulic Supply/Demand Graph



Adjusted Hydrant Data

Static Pressure: 85 psi
 Test Residual Pressure: 77 psi
 Test Flow Rate: 202 gpm

Demand Point Data

Calculated Residual Pressure: 20.44 psi
 Calculated Flow Rate: 141.08 gpm
 Excess Available Inflow Residual Pressure: 60.44 psi

Fire Sprinkler Output Data

Overall Node Groupings Output Data

Pipe Seg. Beg. Node	Pipe Seg. End. Node	Pipe Type Group	Pipe Flow Rate (gpm)	Sprinkler Flow At Beg. Node (gpm)	Non-Sprinkler Flow Out (+) (gpm)	Non-Sprinkler Flow In (-) (gpm)	Beg. Node Residual Pressure (psi)	Imbalance Flow At Beg. Node (gpm)
10	20	1	0.00	15.50	0.00	0.00	7.52	0.00066
10	60	1	0.00					
20	10	1	0.00	15.50	0.00	0.00	7.52	0.00066
20	50	1	0.00					
30	40	2	0.00	14.95	0.00	0.00	7.00	0.00000
40	30	2	0.00	15.05	0.00	0.00	7.09	-0.00010
40	50	2	0.00					
50	20	1	0.00	0.00	50.00	0.00	7.54	0.00001
50	40	2	0.00					
50	90	1	0.00					
60	10	1	0.00	0.00	0.00	0.00	7.58	
60	70	2	0.00					
60	90	1	0.00					
70	60	2	0.00	15.09	0.00	0.00	7.14	-0.00023
70	80	2	0.00					

Fire Sprinkler Output Data

Overall Pipe Output Data

Beg. End. Node	Nodal K-Factor (K)	Elevation (feet)	Spk/Hose Discharge (gpm)	Residual Pressure (psi)	Norm. Dia. Inside Dia. C-Value	Q (gpm) Velocity (fps)	F. L. Ft (ps/ft) Fittings Type-Grp	Pipe Len. Fit. Len. Tot. Len. (ft)	PF-(psi) PE-(psi) PV-(psi)
10	5.65	20.00	15.50	7.52	2.50	3.82	0.00009	10.00	0.001
20	5.65	20.00	15.50	7.52	2.469	0.26	----	0.00	0.000
			SCHED 40 WET STEEL			120	1	10.00	0.000
40	5.65	20.00	15.05	7.09	1.50	14.95	0.00343	10.00	0.094
30	5.65	20.00	14.95	7.00	1.610	2.36	----	0.00	0.000
			SCHED 40 WET STEEL			120	2	10.00	0.002
50	0.00	20.00	50.00	7.54	2.50	11.68	0.00074	15.00	0.016
20	5.65	20.00	15.50	7.52	2.469	0.78	E	6.00	0.000
			SCHED 40 WET STEEL			120	1	21.00	0.000
50	0.00	20.00	50.00	7.54	1.50	30.00	0.03422	5.00	0.445
40	5.65	20.00	15.05	7.09	1.610	4.73	T	8.00	0.000
			SCHED 40 WET STEEL			120	2	13.00	0.005
60	0.00	20.00	0.00	7.58	2.50	19.32	0.00189	25.00	0.059
10	5.65	20.00	15.50	7.52	2.469	1.29	E	6.00	0.000
			SCHED 40 WET STEEL			120	1	31.00	0.001
60	0.00	20.00	0.00	7.58	1.50	30.09	0.03440	5.00	0.447
70	5.65	20.00	15.09	7.14	1.610	4.74	T	8.00	0.000
			SCHED 40 WET STEEL			120	2	13.00	0.005
70	5.65	20.00	15.09	7.14	1.50	14.99	0.00348	10.00	0.095
80	5.65	20.00	14.99	7.04	1.610	2.36	----	0.00	0.000
			SCHED 40 WET STEEL			120	2	10.00	0.003
90	0.00	20.00	0.00	8.04	2.50	91.68	0.03369	15.00	0.505
50	0.00	20.00	50.00	7.54	2.469	6.14	----	0.00	0.000
			SCHED 40 WET STEEL			120	1	15.00	0.003
90	0.00	20.00	0.00	8.04	2.50	49.40	0.01073	25.00	0.462
60	0.00	20.00	0.00	7.58	2.469	3.31	ET	18.00	0.000
			SCHED 40 WET STEEL			120	1	43.00	0.001

Fire Sprinkler Output Summary

Hydraulically Most Demanding Sprinkler Node

HMD Sprinkler Node Number: 30
 HMD Actual Residual Pressure: 7.00 psi
 HMD Actual GPM: 14.95 gpm

Sprinkler Summary

Sprinkler System Type: Wet
 Specified Area Of Application: 600.00 ft²
 Minimum Desired Density: 0.000 gpm/ft²
 Application Average Density: 0.152 gpm/ft²
 Application Average Area Per Sprinkler: 100.00 ft²
 Sprinkler Flow: 91.08 gpm
 Average Sprinkler Flow: 15.18 gpm

Flow Velocity And Imbalance Summary

Maximum Flow Velocity (In Pipe 0 - 0): 0.00 ft/sec
 Maximum Velocity Pressure (In Pipe 0 - 0): 0.00 psi
 Allowable Maximum Nodal Pressure Imbalance: 0.0100 psi
 Actual Maximum Nodal Pressure Imbalance: 0.0081 psi
 Actual Average Nodal Pressure Imbalance: 0.0013 psi
 Actual Maximum Nodal Flow Imbalance: 0.0007 gpm
 Actual Average Nodal Flow Imbalance: 0.0002 gpm

Overall Network Summary

Number Of Unique Pipe Sections: 10
 Number Of Flowing Sprinklers: 6
 Pipe System Water Volume: 12.09 gal
 Sprinkler Flow: 91.08 gpm
 Non-Sprinkler Flow: 50.00 gpm
 Total System Demand Flow: 141.08 gpm
 Minimum Required Residual Pressure At System Inflow Node: 20.44 psi
 Demand Flow At System Inflow Node: 141.08 gpm