

S-PIPE OVERVIEW

The Elite Software S-PIPE program quickly computes optimal pipe sizes for hot and cold water domestic water supply systems in both residential and commercial buildings. S-PIPE can handle systems with up to 1000 pipe sections. Besides computing pipe sizes, S-PIPE can also perform a complete system analysis complete with a bill of materials and labor estimate. Reports list the gpm water flow, velocity, and pressure losses through all pipe sections, the maximum system demand pressure, and the total water gpm demanded by the system. S-PIPE is very easy to use as it contains built-in data concerning fitting equivalent lengths, pipe materials, internal pipe diameters and C-Values, fixture unit quantities and pressure requirements, equipment flow and pressure requirements for items such as dishwashers and hot water heaters, materials and labor costs, and demand gpm curves. S-PIPE is provided with plumbing code files that contain the different fixture unit and equipment requirements demanded by various codes such as UPC, IPC, BOCA, National, etc. There is even provision for creating custom plumbing code files, custom Hunter demand gpm curves, and new pipe materials. The SPIPE program provides both input and output reports. The input reports reflect all the data that was entered by the designer while the output reports list all values calculated by the program. The reports list pipe data including fittings and fixtures selected, general project information, system design requirements, and a bill of materials with labor costs. SPIPE allows you to specify exactly what reports you want and in what order you want them. Note that SPIPE provides many intermediate calculation values such that the results are easy to check and verify by hand.

DEMONSTRATION VERSION

If you would like to evaluate S-PIPE in further detail, you can **download free of charge** a functional demo of S-PIPE 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 limitations on the size of the projects allowed. Demonstration versions can be "unlocked" into full versions.

S-PIPE FEATURES

- Sizes both Hot and Cold Water Pipe Supply Systems
- Calculates Using ASHRAE and ASPE Procedures
- Built-in data for Pipes, Fittings, and Fixtures
- Uses Hunter GPM Curve or Your Own Demand Curve
- Allows for Many Types of Pipe Materials
- Calculates Demand Water Pressure and Flow
- Includes a single branch sizing calculator
- S-PIPE works on 32 and 64 bit computers and Links with the 32 bit version of the AutoCAD MEP CAD Software
- Computes Fitting Equivalent Lengths, Fixture Unit Loads, Demand Gpm Quantities, **Pipe Specific and Total Accumulated Pressure Drops**, Water Velocities, Optimal Pipe Sizes, and All Material and Labor Costs
- Provides Comprehensive and Concise Reports
- **No Copy Protection Hassles!**

CALCULATION METHOD

S-PIPE uses two criteria for sizing pipes, maximum allowed water velocity and maximum allowed pressure drop per 100 ft. of pipe length. If physical space problems exist, the user may also specify a limited range of sizes that S-PIPE can select from when calculating a size. There is even provision for directly specifying pipe sizes such that no size computation is performed. When S-PIPE is allowed to calculate sizes, it uses the Hazen-Williams equation to determine the pressure drop due to friction for a particular pipe size. Water velocity is calculated by first determining the expected gpm flow rate and then dividing by the pipe cross sectional area. Given no physical constraints, S-PIPE always selects the smallest optimal pipe size such that neither the maximum allowable water velocity or the maximum pressure drop is exceeded.

PROGRAM INPUT

S-PIPE uses Windows full screen editing features that provide a simple "fill in the blank" data entry procedure. All input data is checked at the time of entry so that no improper data can be entered. All data is saved to disk as it is entered. S-PIPE requires two types of data: general project data and pipe section data. The general project data includes the project name, the name of the designer, the client, the date, available water pressure at the main, and the pressure drop through water meter. The pipe data requires that each pipe section must be defined as having a beginning and ending node along with the pipe type and length. In addition, the type and quantity of fittings and fixtures that exist on each pipe section must be specified. There is also provision for equipment such as dishwashers, heaters, and backflow preventers. Optional pipe input data includes provision for specifying a maximum allowed pressure drop and a maximum allowed velocity. These constraints along with an allowable pipe size range may be changed from pipe to pipe. Once all the pipe sections, fittings, and fixtures have been entered the water distribution system is ready for calculation.

SYSTEM REQUIREMENTS

S-PIPE is a Windows program and will run on any computer with Windows 2000 or higher, including Windows 7 and 8.

S-PIPE - Plumbing Service Supply Pipe Sizing		Elite Software Development, Inc.	
Weekes Engineering Hamilton, OH L8L6N4		Example Project Page 3	
General Project Data Input			
General Project Information			
Project file name:	C:\Users\Bill Smith\Documents\Elite Software\S-Pipe 2		
Project title:	Projects\Sample.spw		
Designed by:	Example Project		
Project date:	Your Name		
Project comment:	1-14-02		
Client name:	Expected completion by mid-2002		
Client address:	Housing, Inc.		
Client city:	1234 Main St.		
Client phone:	Houston, TX 77082		
Client fax:	713-555-5555		
Client email:	713-555-5556		
Client website:	john@housinginc.com		
Client comment:	http://www.housinginc.com		
Company name:	Serves metro area		
Company representative:	Your Company Name		
Company address:	Bob Jones		
Company city:	5578 Vine St.		
Company phone:	Fort Worth, TX 76101		
Company fax:	817-555-5557		
Company email:	817-555-5558		
Company website:	yourname@yourcompany.com		
Company comment:	http://www.yourcompany.com		
Default Pipe Material Type:	Comment on your company		
Default Demand GPM Curve:	Type K Copper		
Default Primary Pipe Segment Type:	Hunter Curve		

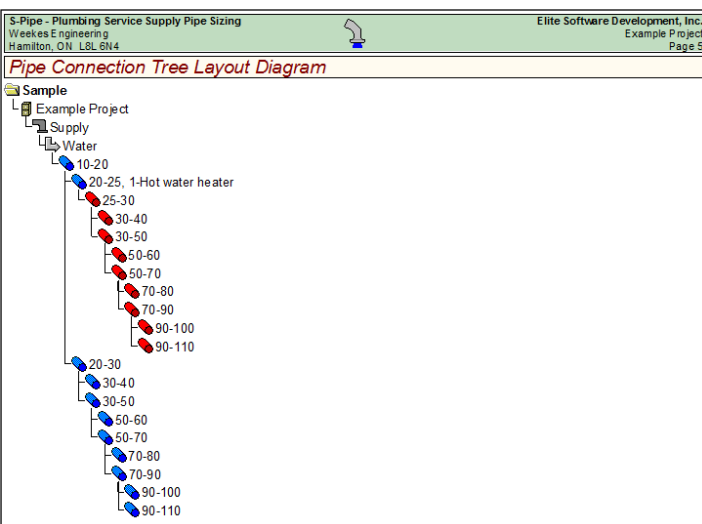
Pipe Material - Type K Copper										
Size	Qty	Length	Qty	Length	Qty	Length	Qty	Length	Tot Len	\$ Costs
1.000	1	34.00	2	10.00	1	340.00	1	8.00	402.00	\$442.20
1.250	2	4.50	3	8.00	1	12.00			45.00	\$63.00
1.500	1	12.00	1	15.00	1	10.00			37.00	\$62.90
2.000	1	25.00	1	5.00	2	12.00	1	15.00	79.00	\$150.10
2.000	1	10.00								
Material: \$634.20 Labor: \$84.00 Total: \$718.20										

Fittings									
Fitting Type	Fitting Qty	In Size	Out Size	Out Size	Fitting Qty	In Size	Out Size	Out Size	Fitting Costs
Straight Run Tee	1	1.250	1.000	1.250					\$3.60
	1	1.500	1.250	1.250	1	1.500	1.000	1.500	\$9.00
	1	2.000	2.000	2.000	1	2.000	1.000	2.000	\$11.60
	1	2.000	1.250	1.500	1	2.000	1.000	1.500	\$11.60
Regular 90° Elbow	1	1.250	1.250						\$2.00
	1	1.500	1.500						\$2.50
	1	2.000	2.000						\$3.80
Material: \$19.40 Labor: \$24.70 Total: \$44.10									

Fixtures					
Fixture Type or Fixture Group	Type of Occupancy and/or Control	Fixture Cost	Labor Costs	Fixture Qty	Fixture Costs
Water closet	large tank, Public	\$100.00	\$25.00	1	\$125.00
Combination Bath/Shower	Public and Private	\$350.00	\$45.00	3	\$1,185.00
Bathtub	Public and Private	\$350.00	\$45.00	2	\$790.00
Kitchen Sink	Private	\$90.00	\$25.00	1	\$115.00
Dishwasher	Public and Private	\$380.00	\$45.00	1	\$425.00
Lavatory	Private	\$8.00	\$5.00	2	\$25.00
Water closet	large tank, Private	\$100.00	\$25.00	1	\$125.00
Clotheswasher	Public and Private	\$40.00	\$15.00	1	\$55.00
Material: \$2,476.00 Labor: \$370.00 Total: \$2,846.00					

Equipment						
Equipment Type or Equipment Group	Primary Type of Service	Pressure Loss	Equipment Costs	Labor Costs	Equip Qty	Equip Costs
Hot water heater	private	5.6	\$150.00	\$25.00	1	\$175.00
Material: \$150.00 Labor: \$25.00 Total: \$175.00						

Totals		
Total Cost for Materials:		\$3,279.60
Total Cost for Labor:		\$503.70
Total Cost for Project:		\$3,783.30



S-PIPE - Plumbing Service Supply Pipe Sizing		Elite Software Development, Inc.					
Weekes Engineering Hamilton, OH L8L6N4		Example Project Page 3					
Cold Pipe Output Data							
Pipe Nodes	Pipe	Pipe	Pipe Fittings	Pipe Fixtures	-- Pipe Section	Data --	Size
Begin	Len	Material - Type	Quantity/Description	Quantity/Descrip	GPM Curve	Vel-Act	PD/100
End	Rise	Mult & Eq Len	Quantity/Description	Quantity/Descrip	Pri Seg Type	P-Req	PD-Act
	GPM	Fixture Units	Quantity/Description	Quantity/Descrip			PD-Cum
							Actual
10	27.0	Type K Copper	1 - Straight Run Tee	1 - Water closet	Hunter Curve	5.813	3.437
20	3.0	1.00 2.00		Flush Tank	17.227	2.227	12.000
	54.6	5.50 47.25				2.227	0.750
20	12.0	Type K Copper	1 - Regular	Hunter Curve	3.592	1.411	12.000
25	2.0	1.00 7.00	90° Elbow	Flush Tank	8.862	1.035	0.750
	33.8	0.00 18.38				8.862	2.000
Equipment: 1 - Hot water heater							
20	14.0	Type K Copper	1 - Straight Run Tee	Hunter Curve	4.045	1.758	12.000
30	2.0	1.00 2.00		Flush Tank	3.339	1.112	0.750
	38.0	0.00 23.38				3.339	2.000
30	34.0	Type K Copper		1 - Combination	Hunter Curve	2.476	1.561
40	0.0	1.00 0.00		Bath/Shower	8.870	0.531	0.750
	6.0	4.00 4.00				3.870	1.000
30	17.0	Type K Copper	1 - Straight Run Tee	Hunter Curve	3.805	1.570	12.000
50	0.0	1.00 2.00		Flush Tank	3.606	0.267	0.750
	35.8	0.00 19.38				3.606	2.000
50	10.0	Type K Copper		1 - Combination	Hunter Curve	2.476	1.561
60	0.0	1.00 0.00		Bath/Shower	8.762	0.156	0.750
	6.0	7.00 7.00		1 - Bathtub		3.762	1.000
50	12.0	Type K Copper	1 - Straight Run Tee	Hunter Curve	3.566	1.392	12.000
70	0.0	1.00 2.00		Flush Tank	3.773	0.167	0.750
	33.5	0.00 12.38				3.773	2.000
70	4.5	Type K Copper		1 - Kitchen Sink	Hunter Curve	3.953	2.857
80	0.0	1.00 0.00		1 - Dishwasher	18.902	0.129	0.750
	15.0	1.88 1.88				3.902	1.250
70	18.5	Type K Copper	1 - Regular	Hunter Curve	4.805	3.349	12.000
90	0.0	1.00 6.50	90° Elbow	Flush Tank	4.393	0.619	0.750
	25.8	0.00 10.50	1 - Straight Run Tee			4.393	1.500
90	8.0	Type K Copper		2 - Lavatory	Hunter Curve	3.953	2.857
100	0.0	1.00 0.00		1 - Water closet	10.621	0.229	0.750
	15.0	7.50 7.50		1 - Bathtub		4.621	1.250
90	12.0	Type K Copper	1 - Regular	Hunter Curve	3.953	2.857	12.000
110	0.0	1.00 4.00	90° Elbow	Flush Tank	14.735	0.343	0.750
	15.0	3.00 3.00				4.735	1.250

Sample Reports

S-PIPE - Plumbing Service Supply Pipe Sizing		Elite Software Development, Inc.					
Weekes Engineering Hamilton, OH L8L6N4		Example Project Page 4					
Hot Pipe Output Data							
Pipe Nodes	Pipe	Pipe	Pipe Fittings	Pipe Fixtures	-- Pipe Section	Data --	Size
Begin	Len	Material - Type	Quantity/Description	Quantity/Descrip	GPM Curve	Vel-Act	PD/100
End	Rise	Mult & Eq Len	Quantity/Description	Quantity/Descrip	Pri Seg Type	P-Req	PD-Act
	GPM	Fixture Units	Quantity/Description	Quantity/Descrip			PD-Cum
							Actual
25	21.0	Type K Copper	1 - Regular	Hunter Curve	3.592	1.411	12.000
30	0.0	1.00 9.00	90° Elbow	Flush Tank	9.159	0.296	0.500
	33.8	0.00 18.38	1 - Straight Run Tee			9.159	2.000
30	34.0	Type K Copper		1 - Combination	Hunter Curve	2.476	1.561
40	0.0	1.00 0.00		Bath/Shower	19.466	5.307	0.500
	6.0	3.00 3.00				14.466	1.000
30	16.5	Type K Copper	1 - Straight Run Tee	Hunter Curve	5.867	4.844	12.000
50	0.0	1.00 1.50		Flush Tank	9.958	0.799	0.500
	31.5	0.00 15.38				9.958	1.500
50	10.0	Type K Copper		1 - Combination	Hunter Curve	2.476	1.561
60	0.0	1.00 0.00		Bath/Shower	15.114	0.156	0.500
	6.0	6.00 6.00		1 - Bathtub		10.114	1.000
50	11.5	Type K Copper	1 - Straight Run Tee	Hunter Curve	5.448	4.224	12.000
70	0.0	1.00 1.50		Flush Tank	10.444	0.486	0.500
	29.3	0.00 9.38				10.444	1.500
70	4.5	Type K Copper		1 - Kitchen Sink	Hunter Curve	3.953	2.857
80	0.0	1.00 0.00		1 - Dishwasher	25.572	0.129	0.500
	15.0	1.88 1.88				10.572	1.250
70	17.2	Type K Copper	1 - Regular	Hunter Curve	5.007	4.424	12.000
90	0.0	1.00 5.20	90° Elbow	Flush Tank	11.205	0.761	0.500
	19.0	0.00 7.50	1 - Straight Run Tee			11.205	1.250
90	8.0	Type K Copper		2 - Lavatory	Hunter Curve	2.476	1.561
100	0.0	1.00 0.00		1 - Bathtub	16.330	0.125	0.500
	6.0	4.50 4.50				11.330	1.000
90	12.0	Type K Copper	1 - Regular	Hunter Curve	3.953	2.857	12.000
110	0.0	1.00 4.00	90° Elbow	Flush Tank	21.548	0.343	0.500
	15.0	3.00 3.00				11.548	1.250
Max Press Drop at Cold Pipe 70-80 + 6 psi Meter Loss:						24.9 psi	
Max Press Drop at Hot Pipe 70-80 + 6 psi Meter Loss:						31.6 psi	
Available Press at Point of Max Loss, Hot Node 80:						13.4 psi	
Equiv System Length to Pt of Max Loss, Hot Node 80:						92.5 ft	
Maximum Water Flowrate in Cold Pipes:						54.6 gpm	
Maximum Water Flowrate in Hot Pipes:						33.8 gpm	
Minimum Required Water Pressure From Main:						31.6 psi	
Maximum Water Flowrate in System (at Main):						54.6 gpm	