

FEBRUARY 2026



From Experience

Principles for Effective Steam Distribution

Steam distribution systems are a vital component to any food and beverage plant. Issues such as steam leaks, poor or failing pipe insulation, improperly managed condensate return systems or missed maintenance on steam traps are very real concerns that can cause steam distribution costs to skyrocket. Over the years, Hixson has recommended the following items to keep steam systems in the best possible operating condition:

- **Sizing.** Whether looking to replace an existing steam distribution system or considering design of a new one, pipe sizing is a primary consideration. Pipes that are too small in diameter, or too large, can create unwanted problems such as noise and pipe erosion. When sizing steam piping, Hixson recommends the following the guidelines to achieve the best combination of flow and pressure:

Sizing Steam Piping: Maximum Allowable Flow & Pressure Drop

	Branch			Header		
Pressure (psig)	600	175	30	600	175	30
ΔP (psi/100')	1.0	0.70	0.50	0.70	0.40	0.30
Nominal Pipe Size (in)	Maximum (1000's) Lb/Hr					
3	7.5	3.6	1.2	6.2	2.7	0.9
4	15.0	7.5	3.2	12.0	5.7	2.5
6	40.0	21.0	8.5	33.0	16.0	6.6
8	76.0	42.0	18.0	63.0	32.0	14.0
10	130.0	76.0	32.0	108.0	58.0	25.0

- **Piping Insulation.** Choosing the proper thickness for new or replacement pipe insulation typically involves balancing energy conservation, material and installation costs, and personnel safety. Every insulation application must be reviewed in light of its unique issues.

- **Valve Insulation.** Hixson typically recommends using removable blanket insulation to prevent energy loss from valves. This insulation, which only requires about an hour to install per valve, is fully customizable to fit the application, offering numerous choices in the type of material available, as well as multiple on/off options (snaps, velcro, etc.) for ease of maintenance or replacement.
- **Maintenance/Inspections.** A structured inspection and maintenance program helps steam systems continue to operate as designed over their full lifecycle. Regularly scheduled reviews by qualified personnel, supported by clear documentation and performance tracking, allow plants to optimize efficiency, plan capital improvements, and avoid unexpected disruptions.

For additional information on steam system design, resources such as webinars and training are available from various manufacturers, including Cleaver-Brooks, Merlo Energy, Spirax Sarco, Watson McDaniel, TLV Corporation, MAPEI, Steam Management, Inc., and Inveno Engineering.

Experience in Brief

Boiler Horsepower (BHp) Equation

$$BHp \approx Q/(33475 \text{ (Constant)})$$

or

$$BHp \approx S/(34.5 \text{ (Constant)})$$

where...

$$Q=BTU/hr$$

$$S=lb/hr \text{ of steam}$$

WANT MORE FROM EXPERIENCE?

[Stormwater Permitting: A Clear Path to Compliance](#)

[Rising to the Occasion: A Look at Lift Stations](#)

CONTACT US

Dave Klenk, P.E. , Department Manager, Mechanical Engineering

dklenk@hixson-inc.com