

# STEAM TRAP SIZING RULES OF THUMB

## 1. STEAM MAINS

- A. Safety Factor When Sizing
  - 1. Low Pressures – (VAC-30 PSIG) 2X Actual Load
  - 2. High Pressures – (30 PSIG and Up) 3X Actual Load
- B. Distance Between Traps:
  - 1. 500 Ft. if supervised start up.
  - 2. 200 Ft. if automatic start up.
- C. Location of Trap:
  - 1. At all low points
  - 2. At each change in elevation
  - 3. Before all control valves
  - 4. Always put a trap at end of main.
- D. Size of Collection Pocket for Drain Trap
  - 1. Full Size (pipe diameter) tees up to 12" – over 12" one pipe smaller
  - 2. Length of drip – 1-1/2 times pipe diameter but not less than 8".
- E. Velocity in Steam Main
  - 1. Low Noise (hospital, hotel, etc.) 4,000-6,000 FPM
  - 2. Industrial Plant – 8,000-12,000 FPM

## 2. STEAM LOAD CALCULATIONS

- A. For Water:
 
$$W = \frac{\text{GPM}}{2} \times (T_1 - t_2)$$
- B. For Fuel Oil:
 
$$W = \frac{\text{GPM}}{4} \times (T_1 - t_2)$$
- C. For Air:
 
$$W = \frac{\text{CFM}}{900} \times (T_1 - t_2) \quad (T_1 - t_2) = \text{Temp. Rise}$$
- D. For Radiation:
 
$$W = \frac{\text{EDR}}{4}$$
- E. Steam Flow through an orifice:
 
$$W = \frac{P_1 A}{70}$$

W= lbs of steam/hour  
 W= lbs of steam/second  
 P1= Absolute Pressure (PSIA)  
 A= Area of orifice ( $\pi R^2$ ) in Square Inches

## 3. LIFTING CONDENSATE

- F. For each 1 PSI – 2 Ft. of lift

## 4. 1000 BTU =1lb. Steam or Condensate

## 5. Effect of back pressure on steam trap capacity in % reduction in capacity

% Back Pressure	Inlet Pressure psig			
	5	25	100	200
25	6	3	0	0
50	20	12	10	5
75	38	30	28	23