

## What Does “from and at 212<sup>0</sup>F” Mean?

A given boiler capacity is rated at 100 HP or 3450 #/Hr from and at 212<sup>0</sup>F. What does that mean?

“From and at” means that if 212<sup>0</sup>F was brought into a boiler operating at 0 psig, it would produce 3450 #/Hr.

That situation does not exist in nature but it is a useful number to know. Steam boiler capacities are cataloged at “from and at 212<sup>0</sup>F” to give a universal rating that is common to all manufacturers for comparative purposes.

Let’s assume that 5000 #/Hr of 5 psig steam is required for humidification of a space. No condensate will be returned. Picking a boiler with a capacity of 5000 #/Hr “from and at 212<sup>0</sup>F” will result in a boiler that is well undersized! Only 4,332 #/Hr will be produced from the selected boiler.

The amount of power (BTU/Hr) needs to be determined and *then* the appropriate boiler can be selected. A simple way to select the boiler is to determine how many BTUH it takes to heat the water entering the boiler to the boiling temperature and add that to the latent heat required to boil the water once it is at the proper temperature. In this case it takes

$5000 \text{ #/Hr} * 1 \text{ BTU/#-F} * (227-60) = 835,000 \text{ BTUH}$  to heat the 60<sup>0</sup>F water to the boiling point.

$5000 \text{ #/Hr} * 953 \text{ BTU/#} = 4,765,000 \text{ BTUH}$  to boiler the water at 5 psig steam pressure

The total number of BTUH needed is 5,600,000.

To select the proper boiler, ignore the “from and at” rating and look at the BTUH output of the boilers that the manufacturer lists. Find the next larger size and select that model.