The amount of steam required by various size retorts, and how much boiler capacity is necessary, is a subject that is rather complicated if one considers all the various types of boilers and retorts involved. This bulletin will make an effort to simplify the problem as much as possible.

It is recommended that the steam pressure in the line to the retorts should not be less than approximately 90 psi at all times during operation. This is recommended because steam is used to drive air from between the cans during come-up. If you do not have enough steam pressure, air will stay between the cans and possible cause undercooking of some cans.

In any retort, steam is used at the greatest rate during the come-up. The usage then falls off during the remainder of the process. For example, a 5-car retort might use 76 boiler horsepower during come-up and then fall off to 16 bhp during the remainder of the cook.

To simplify, whether a retort is a 5, 6, 8 or 10 car retort, the maximum rate at which steam can be used is controlled by the size of the steam inlet. Peaks for various size inlets may reach the following rates:

1 inch inlet  2500 pounds of steam/hour  72.5 bhp
1¼ inch inlet  3500 pounds of steam/hour  100.0 bhp
1½ inch inlet  4500 pounds of steam/hour  130.0 bhp
2 inch inlet  6000 pounds of steam/hour  174.0 bhp

Note that these are possible peak rates. You probably won't reach them.

If you are cooking two 5-car retorts with 1½ inch steam inlets and bringing up a third you could be using 15 bhp in each cooking retort and from 100-130 bhp in the third.

This would be a steam demand of 132 to 162 bhp. As soon as the third retort is vented and brought to cooking temperature the demand would drop back to a total of 48 bhp for all three retorts.

You should have a boiler which will supply the peak demand, without the pressure in the boiler line dropping below 90 psi.
cont. Steam Requirements of Retorts

Some boilers are able to deliver considerably above their rated capacities. This was true of the horizontal return tube boilers formerly used in many salmon canneries and is true in some of the larger water tube boilers. Some of these could deliver double their rated capacity for a short time.

Many of the newer "packaged" boilers lack this ability. Therefore, when purchasing this type you should determine what overloads in excess of rated steam producing capacity are possible.

In most salmon canneries the principal use of steam is in retorting. Should you have other uses such as in steam engines or heating buildings you will need to add these additional requirements to figure your peak load.

Be sure you have adequate boiler capacity if you wish to avoid long come-up time and possible inadequate venting.

Each installation of boilers and retorts should be carefully planned. This bulletin does not cover all details. It does give you a quick method of estimating requirements so that the all too frequent installation of undersize boilers will not occur.

In retorts of varying sizes, but with the same size inlet, it is obvious that the smaller retort will use less total steam during the come-up. The smaller retort may, however, use steam at the same rate.

By counting the number of steam inlets and determining the size, you can easily estimate the peak number of pounds of steam, or boiler horsepower, in your cannery.