

- **Cpm:** ask for the unit's rated capacity in containers per minute (cpm) and about compatibility with your product when talking with equipment suppliers.
- **Price Ranges:** \$4,000 to 8,000 (typical) for single-head, semiautomatic operation but vary depending on size, construction, and condition of equipment.

SOME SELECTION TIPS

- Know the batch size you intend to make and the size of the containers that will be used.
- Have an idea of the plant capacity that you intend to have. Know the capacity in terms of containers per minute or hour as well as pounds per hour or day.
- Desired capacity should be based on an analysis of costs for your operation and the market potential for your product.
- Make equipment cost comparisons based on the initial cost and number of years of expected use. For example, a new filler costing \$7,000 with about 7 years of use will average \$1,000 per year. A used machine costing \$5,000 with 4 years of use will cost \$1,250 per year.
- Have an idea of the amount you can afford to pay for equipment based on capacity and product price. There will be a range of equipment capacities that will be profitable for your operation. Operating outside this range will cost—not pay—you money.
- Know the degree of viscosity, chunkiness, and stickiness of the product. A watery beverage product may require a different filler from chunky, thick salsa.

- Know the food regulations that your product falls under. For example, a sauce with more than 3 percent meat will be under USDA regulations and will require use of USDA-approved equipment; other products will fall under FDA regulations. This will affect selection and price of fillers.
- Have an idea how your facility may change over time. Consider the possibility of adding products, container, or higher capacity.

FOR MORE INFORMATION

This brochure is intended as an overview of fillers. For more information on fillers, processing equipment, or other food processing needs, contact the Food Engineering Specialist at:

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Filling Machines for the Smaller Food Processing Operation

A description
of filling machinery,
selection considerations,
and typical uses.

DEPARTMENT OF
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INTRODUCTION

Small food processing businesses often develop production levels where a filling machine is considered. Higher production levels, small containers, or lack of available labor often are reasons a filling machine is considered.

A filling machine, or filler, can have several benefits for the food processor. It can increase the output of a processing operation and increase the precision in filling a container to the correct head space and net weight requirement. Fillers also can decrease labor needs through partial automation of this processing step. Fillers can allow better and more consistent sealing of containers since filling and capping can be more rapid than by hand, leading to higher fill temperatures.

In a recent pilot run at the K-State Research and Extension Thermal Processing Laboratory, using a single-head, semiautomatic piston filler, pint jars were filled at a rate of 10 to 15 cpm (containers per minute).

There can be some drawbacks to owning a filling machine. Time is required to find the appropriate filling machine, taking the processor away from other business duties. Like all equipment, fillers must be properly adjusted and maintained to assure efficient and safe operation. Most importantly, fillers are expensive. Therefore, purchase should be justified on an economic basis.

Buying a filling machine can be a confusing task. After all, most people new to the food processing industry have never seen a filling machine. Furthermore, many issues are at stake as a selection is made. Most likely the selection

takes place over the phone, the filler may not be in new condition, unfamiliar terms are used to describe the filler, and usually a large investment is involved.

Issues regarding equipment selection are discussed in more detail in *Selection and Purchase of Used Food Processing Equipment*, MF-2096. This fact sheet was developed as a resource for locating a variety of used food processing equipment. You may wish to refer to this publication as well to locate a filler.

SUMMARY

The basic process for locating a filler, like other processing equipment, can be summarized in the following steps:

- 1) determine your filling machine needs,
- 2) determine the size of investment that is feasible,
- 3) locate equipment possibilities,
- 4) evaluate these possibilities, and
- 5) modify your selection, if needed, as new information becomes available to you.

SOME ADVICE

- *Know your investment limits and stick to them*
- *Contact several suppliers*
- *Talk to “used” and “new” suppliers and compare information*

TERMINOLOGY AND INFORMATION

Filling machines, or fillers, are equipment used in the processing industry to rapidly place product in containers at the correct weight. Most will fill a container based on product volume that has been correlated to a net weight. Here are some terms to help when selecting a filler for food processing operations.

- ***Piston-type filler:*** a piston is used to pull a constant volume of product into a cylinder, then push it into the container. Filling is done by volume, not measured weight. Fill volume must be related to fill weight, since the product weight must be displayed on the label. More than one size piston may be fitted to a filler, depending on the filler.
- ***Pump-type filler:*** a positive displacement pump places a volume of product into a container by pumping for a set period of time. Pump type fillers can fill a range of container sizes by varying the time that the pump runs. Pumps may not be compatible with some chunkier food products, and performance should be verified.
- ***Brewer type:*** filler used for water-thin products only, such as beverages.
- ***Single Head:*** unit has one filling mechanism to fill a single container. Large, high capacity (more expensive) equipment may have multiple heads and fill several containers simultaneously.
- ***Semiautomatic:*** means that the jar is placed manually under the filler spout, then a switch is tripped and the filler goes through a single cycle to fill the jar. This speeds filling operations over manually starting and stopping a filler.
- ***Hopper:*** Fillers usually come with a hopper to hold the product during filling operation. Some hoppers have agitators attached to keep ingredients suspended.
- ***Fill volume:*** A variety of piston and cylinder diameters result in a range of fill volumes. One piston and cylinder may be all you need; make sure additional sizes are still available if you buy a used filler.