

LIQUIDS FILLING AND PACKAGING

Liquids can be either thin (eg oils, milk, syrups and juices) or thick and viscous (eg sauces, pickles, hot jams and confectionery). The type of filler used is different for each group of liquids. The packaging requirements of different liquids are similar in that the liquid must be contained but they differ according to whether the liquid is spoiled by air, light, bacteria etc.

Filling

Low viscosity (thin) liquids

The simplest filler is a jug but this is often too slow for small businesses. A simple filler can be made by fitting one or more taps to the base of a bucket, see Figure 1. The bucket should be stainless steel for hot acid liquids (eg fruit juices) or food grade plastic for cold filling. Iron and copper should not generally be used in food handling. A more sophisticated system in which the volume of liquid filled into each container is controlled, is obtained using a piston filler, see Figure 2. This is made from glass or the materials described above.

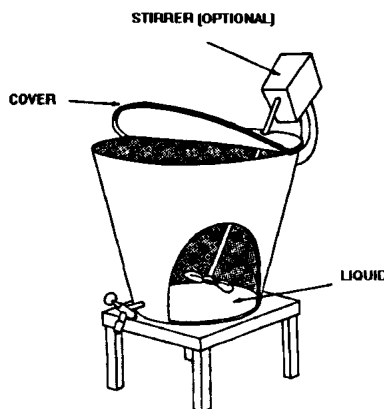


Figure 1

Viscous liquids

Because these liquids do not flow easily, the piston filler is the preferred option.

Liquids that contain particles

Both low and high viscosity liquids may contain particles of food (eg fruit, pips, sauces and pickles). The fillers described above will tend to become blocked by particles and a simple filler made from a stainless steel or plastic funnel is more suitable, Figure 3.

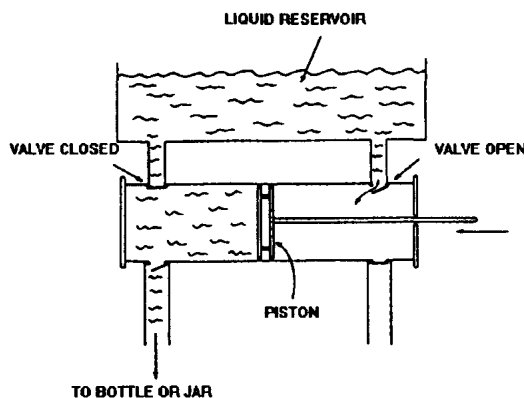


Figure 2

Packaging

Different foods require protection against different environmental factors such as light, heat, air, moisture and against microbial and insect contamination. The extent of the protection will also depend on the shelf life required. In Table 1, selected liquid foods are grouped into 'long' and 'short' shelf life for convenience.



Figure 3

Sealing

Jars

Screw caps are usually hand fitted. Omnia caps can be fitted using a simple manually operated capper, see Figure 4

technical brief

Bottles

Roll on screw caps can be fitted using the manual capper, Figure 5.

Corks can be inserted by hand after soaking overnight in clean water. Crown caps can be sealed using the equipment shown in Figure 6.

Cans

A small manually operated can seamer is available to form the double seam needed to seal cans.



Figure 4

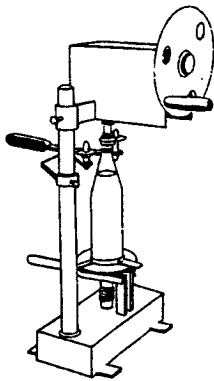


Figure 5

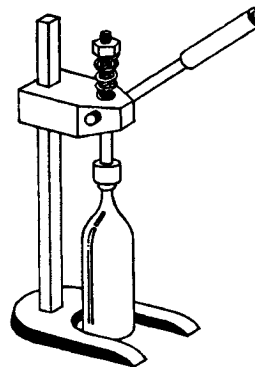


Figure 6

Plastic films

Although it is possible to seal plastic bags by folding the film over a used hacksaw blade and fusing it with a flame, the quality of the seal is variable and forms a relatively poor barrier to air and moisture. Also the appearance is not as good. A better (and faster) option is to use a bar type heat sealer. If electricity is not available, it is possible to modify the sealer to heat the bar directly with a flame. The seal formed with this equipment is broader and hence has better barrier properties and a better appearance. Sachets can be made by either purchasing film in the form of a tube or cutting the film and sealing the long side to make a tube. The end is sealed and liquids are filled through a long tube, see Figure 7. It is important that liquids do not adhere to the inside of the film as they may then become trapped in the seal and reduce its strength.

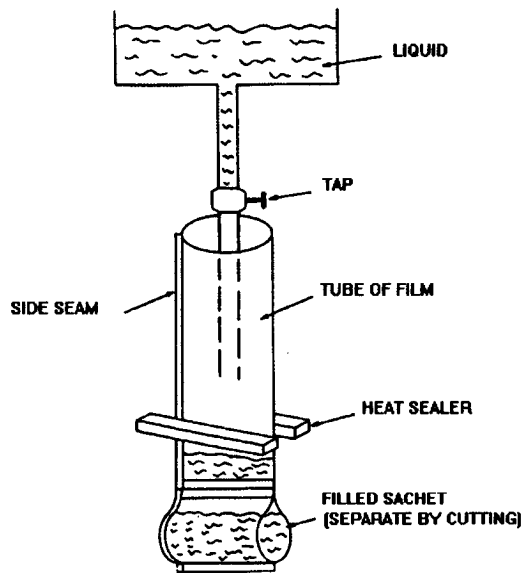


Figure 7

technical brief

Food	Protection required against						Packaging			
	Light	Air	Heat	Micro-organisms	Insects	Other*	Glass bottle	Metal can	Plastic film pot	Ceramic pot
Short shelf life										
Milk	/		/	/	/		/		/	/
Cream	/	/	/	/	/		/	/	/	/
Yoghurt	/	/	/	/	/		/	/	/	/
Long shelf life										
Honey					/		/	/	/	/
Sugar syrup					/		/	/	/	/
Fruit juice/cordial/puree	Some	/	/	/	/		/	Lacquered	/	/
Beer	/	/	/	/	/	/	Coloured	Lacquered	/	/
Wine	/	/	/	/	/		/		/	/
Spirits	/	/	/	/	/		/		/	/
Soft drinks	/	/	/	/	/	/	/	/	/	/
Cooking oil	/	/	/	/	/		Coloured	/	/	/
Vinegar	/	/	/	/	/	/	/	Lacquered	/	/
Sauces	/	/	/	/	/		/	/	/	/

Table 1

* Carbonated beverage containers must be properly sealed to prevent loss of carbon dioxide and vinegar must also be sealed to prevent loss of acetic acid.

technical brief

A semi-automatic heat sealer is available for sealing film lids onto plastic pots at up to 100 pots an hour, but it is expensive and requires a source of compressed air. A cheaper and simpler sealer is available which will seal 60 pots/hour or alternatively an electric iron can be fitted to a suitable stand and pressed down onto the surface of the pots to seal the film. Ceramic pots may be sealed with a cork stopper covered with candlewax or beeswax.

Equipment suppliers

Note: This is a selective list of suppliers and does not imply ITDG endorsement.

Jar sealer

Thomas Hunter Limited
Mill Road
Omnia Works
Rugby
Warwickshire
United Kingdom

IDB
615 Galle Road
Kabubedda
Moratuwa
Sri Lanka

Bottle sealer

AMBESCO
5600 W Raymond Street
Indianapolis
IN 46241
USA

Can seamer

MB Group
Apex Plasa
Forbury Road
Reading
RG1 IAX
United Kingdom

Heat sealer

Thames Packaging Equipment Company
Senate House
Tyseen Street
London
E82ND
United Kingdom

Pot sealer

Chadwicks of Bury Limited
Villiers Street
Bury
BL9 6BS
United Kingdom

Piston filler

AMBESCO
5600 W Raymond Street
Indianapolis In 46241
USA

technical brief

References and Further Reading

Packaging food in Glass, Technical Brief, ITDG

Packaging Materials, Technical Brief, ITDG

Small-scale food Processing: A guide to appropriate equipment, Edited by Peter Fellows & Ann Hampton, ITDG Publishing/ CTA 1992

Appropriate Food Packaging by Peter Fellows & Barry Axtell, ILO/TOOL 1993

Packaging, Food Cycle Technology Source Book, ITDG Publishing/ UNIFEM 1996

technical brief