



Aseptic Packaging - Boon for fruit processing industry

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India currently produces about 50 million tonnes of fruit (about 9% of the world's production) and about 90 million tonnes of vegetables (11% of the world's production). The Indian food processing industry is primarily export-oriented. India's geographical situation gives it the unique advantage of connectivity to Europe, the Middle-East, Japan, Singapore, Thailand, Malaysia and Korea.

Products that have growing demand in the export market are pickles, chutneys, fruit pulp, canned fruits and vegetables, concentrated pulps and juices, dehydrated vegetables and frozen fruits and vegetables along with processed animal-based products.

Aseptic packaging tends to cost more, but it also allows for more delicate processing of foods than do alternative methods like canning. The technology for commercial aseptic processing has been available for half a century and took hold in Europe in the early 1960s. The process involves sterilising the packaging and the food product separately and then filling and sealing the containers in a sterile environment. That allows the food to retain more colour, texture, taste and nutrition than it does when subjected to the more heat-intensive conventional methods used in canning and bottling.

Aseptic processing has been a boon to the food & fruit processing industry, enabling both growth and innovation. Food industry operators face shorter menu development cycles as they juggle labour supply, increased costs, regulatory requirements and new competitors. So they turn to aseptically packaged food products to resolve a number of pressing issues.

Food industry operators are now ordering fewer commodity / ingredient items and more prepared items. Pre-made stocks, sauces and bases are the foundation of many signature menu items. Ultra high-temperature (UHT) processing is crucial to ensure commercial sterility for aseptic, shelf-stable food products and beverages. Hence it is critical that the process must be performed in a sterile environment, from the handling of the package until it is sealed.

In practice, generally there are two specific fields of application of aseptic packaging technology:

- Packaging of pre-sterilised and sterile products. Examples are milk and dairy products, puddings, desserts, fruit and vegetable juices, soups, sauces, and products with particulates.
- Packaging of non-sterile product to avoid infection by micro-organisms. Examples of this application include fermented dairy products like yoghurt.

The three main advantages of using aseptic packaging technology are

- Packaging materials, which are unsuitable for in-package sterilisation, can be used. Therefore, light-weight materials consuming less space offering convenient features and with low-cost such as paper and flexible and semi-rigid plastic materials can be used gainfully.
- Sterilisation process of high-temperature-short time (HTST) for aseptic packaging is thermally efficient and generally gives rise to products of high quality and nutritive value compared to those processed at lower temperatures for longer time.
- Extension of shelf-life of products at normal temperatures by packing them aseptically.

Bulk Aseptic Packaging

Aseptic Bag-In-Box system caters to packaging of 'high' as well as 'low' acid products and products containing particles for filling range from 25 litres up to 1,140 litres. Typical packaging applications are Fruit juices, concentrates, purees; tomato products; milk and cream; coconut products; and jam.

Working Principles of Bulk Filling Machine: The packages are manufactured from a variety of laminates to match the product and required shelf-life. The packages are provided with patented spouts designed for aseptic filling. The inside of the package is sterilised before delivery; the packages are supplied flat preventing the entry of air or gas. They are available in volumes from catering size up to sizes intended for shipping of product from manufacturer / grower to processor / packer / distributor. All packages are intended to be supported, when filled, by an outer container, for instance, a drum or heavy-duty box.

● Advantages of Bulk Aseptic Packaging:

It offers the following advantages:

Safety

Steam sterilisation of spout, and sterilisation effect can be controlled and recorded; No chemical sprays used to sterilise the chamber; Spout is tamperproof; Safer sterilisation and easier to monitor; No risk of adding chemicals to the product; and No risk of laminate material relating with chemicals.

Reliability

The filling machine is uncomplicated as there is no sterile chamber; Filling is controlled by weight. This ensures accuracy as no adjustments for specific gravity need to be made; and Customer will have one partner with worldwide service organisations and long experience in processing and packaging technology.

Extended Shelf-life

- High oxygen barrier of the laminate. Laminate is less susceptible to flex cracking.
- Secure spout with limited possibility of oxygen permeation. Spout is made of HDPE, which has three times less oxygen transmission rate compared to LDPE.
- There is no head space in the bag.

Product quality

- Chemical browning is minimised due to high oxygen barrier properties of pouch material.

Bulk Aseptic Bags

A bulk aseptic bag is a multi-layer structure consisting of an outer barrier laminate and an inner bag in contact with the product. All bags are pre-sterilised using gamma irradiation and supplied flat. The level of gamma irradiation is specifically selected to facilitate packaging of high as well as low acid products.

The bag has three distinctive features as below: Highly secure spout; Outer bag barrier; and Inner bag barrier.

- Types and Sizes of Bulk Aseptic Bags: Depending upon the choice of barrier material employed, the bags are classified as: Super Barrier and Medium Barrier.

Metallised Polyester is the conventional barrier for aseptic bags and is used in medium barrier bags. Aluminium foil as barrier material is used if the products are extremely sensitive to oxidation and loss of aroma and is used in super barrier bags.

The bags are available in sizes of 25 litres, 200 litres and 1,140 litres. The 1,140 litres bag is also available with separate emptying spout.

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