

10 Questions to Ask When Considering the Transition to Form-Fill-Seal for Dairy Products

The future looks bright for yogurt makers. According to Mintel's December 2011 report on yogurt and yogurt drinks, the market will grow by 49% to reach \$9.5 billion in 2016. U.S. sales shot up from \$4.7 billion in 2006, to \$5.5 billion in 2009, to an estimated \$6.4 billion in 2011, with refrigerated yogurt—premium Greek-style yogurt in particular—leading the way.

Due to this explosive growth in yogurt sales, many companies are vying to enter or expand their position in this market. And why not? The many health benefits attributed to yogurt consumption are widely publicized in today's media. Its alignment with the recent trends in healthy eating and its portability make it easy to see why yogurt is positioned to become the healthy snack of choice for many American consumers. Even with the explosive growth in recent years, per capita yogurt consumption in the U.S. remains only a fraction of that of their European counterparts.

Naturally, many brands and retailers are looking for ways to capitalize on this trend. With so many yogurt options on supermarket shelves today, brands must find unique ways to capture consumers' attention to incent a purchase and to ensure a user experience resulting in brand loyalty. As traditional marketing opportunities continue to decrease, brands rely more and more on shelf-differentiation. Brands are investing in packaging features that create a stellar first impression as well as a memorable brand experience. Packaging features including label design, package shape and technology innovations are critical in communicating brand value. When it comes to yogurt, brands seek packaging that provides convenience and mobility while also preserving freshness. Brands are moving to form-fill-seal packaging because it provides all these benefits while reducing overall packaging costs.

Whether you're a large player in this market, a smaller start-up, a private label yogurt producer, or a novice looking to capture some of the yogurt growth, you may be considering a transition to the increasingly popular form-fill-seal packaging. We've compiled a list of 10 questions you may ask when considering form-fill-seal plastic packaging for yogurt products.

1. First, an education. What is form-fill-seal (FFS)?

The form-fill-seal process is an assembly-line process used to package goods primarily in the food and medical industries. In the process, packaging material is fed off a roll, through a machine. The packaging material is shaped (or formed) into a package, filled with product and sealed with a lidding film all in one process.

There are two types of FFS processes—vertical (for flexible plastic packaging), in which plastic film is fed vertically through a machine, and horizontal (for rigid plastic packaging) in which more rigid film is fed horizontally.

2. What food products are ideal for the FFS process?

There are several foods commonly associated with the FFS packaging process, from yogurt to single-serve condiments like ketchup and soy sauce. High volume

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products are ideal for the FFS process. The high production rate, reduction in processing steps and equipment, and minimal manual labor requirements of the FFS process yield cost savings in the manufacturing process. These qualities also minimize the risk of contamination, making the FFS process ideal for operations where there's a need to manufacture in a controlled environment.

Finally, the FFS process is great for products where portion control or single-serve options are desired. This includes food products such as dairy creamers, pudding and yogurt.

3. Which FFS process is best for dairy packaging?

The type of FFS process used (vertical or horizontal) is based on a few factors, including the product being packaged, storage conditions and desired shelf-life. Shelf-life expectancies vary by product and brand standards of safety and desired consumer experience.

Pasteurization processing is required for refrigerated dairy products. Pasteurization is the process of heating a food product and then rapidly cooling it to kill the majority of the micro-organisms. The pasteurization temperature and processing time determine the amount of micro-organisms destroyed and the resulting shelf-life. Pasteurization differs from sterilization in that not all micro-organisms are eliminated. The preservation of live cultures is necessary in products such as yogurt and certain types of soft cheeses. Other candidates for the pasteurization process include single serve dairy condiments, including butter, salad dressings and sour cream.

Aseptic processing is required for shelf-stable dairy products. This is the process of fully sterilizing both the product and packaging materials then completing the packaging process in a controlled atmosphere to eliminate contamination by micro-organisms. Non-refrigerated pudding and single-serve coffee creamers are examples of aseptic FFS packaged food products.

4. What value does the FFS process provide the brand owner?

The FFS process produces at a much higher rate than the fill-seal process, translating into cost savings for the brand owner.

The FFS packaging also provides a yogurt brand owner the option to provide multipack products. Most commonly available in configurations of four or six, multipack packaging serves the needs and expectations of today's busy consumer, offering the on-the-go convenience of single-serve portions with the flavor variations and cost savings usually associated with bulk purchases. The multipack option also can eliminate the need for secondary packaging such as cardboard or shrink sleeves. Brand owners achieve a win-win by serving the needs of the modern consumer while reaping the cost benefits of high volume consumer purchasing.

There are very few package design limitations (based on traditional yogurt packaging) associated with the FFS process. A package design firm with a good knowledge of materials and manufacturing can assist a manufacturer in determining shapes suitable for the FFS process, helping to determine the most optimal shape based on the product and the filling process. Such a firm can also

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provide decorating options, such as embossing and labeling, for increased shelf differentiation.

It is important to note that in the case of FFS packaging, unlike in some other packaging options, the design options are affected by the equipment used. Therefore, to achieve more optimal designs, it is important to consult with their selected rollstock provider and package design firm before selecting FFS equipment.

5. What value does the FFS process provide the consumer?

As mentioned above, FFS packaging satisfies the consumer need for mobility, convenience and portion control. The elimination of secondary packaging with multipacks offers flavor variations and meets a growing consumer preference for less packaging waste.

6. Is my volume high enough to justify FFS packaging?

Because of the high production rate, the FFS process reduces overall packaging costs as volumes increase. This, however, does not eliminate the FFS packaging option for low volume producers. Equipment manufacturers have built in flexibility in volume to accommodate production rates as low as 10,000 packages per hour to 100,000 packages per hour.

Co-packaging opportunities have become increasingly available as more low volume producers enter the market. This is a great option for start ups and private label brands.

7. What companies supply FFS manufacturing lines?

As the yogurt trend continues to gain steam, more equipment manufacturers are designing manufacturing lines to meet the demand. ARCIL®, OYSTAR Hassia®, Bosch® and ILLIG® are just a few of the companies offering FFS lines for dairy applications.

8. What are the materials and structural options available?

Material and structural options are determined by many factors, including the product, filling temperature, bacteria sensitivity, sterilization method, storage conditions, desired consumer experience, desired shelf-life, and package design. Material selection can have a significant impact on the FFS process. Materials with a wide processing window and low shrinkage rate are most conducive to the FFS process. These typically include amorphous polymers. Amorphous polymers can be heated more rapidly and formed more easily than more crystalline polymers.

Low shrinkage is a desirable characteristic in FFS packaging since there are many steps that must align in the FFS process. Materials with higher shrinkage rates are more affected by the cumulative shrinkage.

For shelf-stable packaging requiring a gas barrier, multi-layer sheet structures containing EVOH, polyethylene and polypropylene are commonly combined with polystyrene for processibility and barrier performance.

9. Are there any sustainability benefits of FFS?

While sustainability initiatives and measures vary by brand, FFS packaging can provide benefits that meet some of the most commonly recognized sustainability

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objectives. On average, polystyrene FFS yogurt containers (without labels) use 40% less plastic by weight than polypropylene thermoformed yogurt containers. Also, one truckload of FFS rollstock could produce the approximate equivalent of four truckloads of pre-formed yogurt containers.

A brand can also work with its materials supplier to use rollstock in formulations that meet specific sustainability requirements. Spartech partnered with Danone to develop EnviroAir™ technology which reduces the density of thermoplastic rollstock and sheet by adding microscopic air bubbles into the core of the sheet. The FFS rollstock created using EnviroAir technology reduces the weight of Danone's FFS yogurt containers by approximately 20% and costs less per unit sold than containers made using solid sheet.

10. Who should be included on the project team?

Your project team should consist of:

- a reputable equipment supplier with vast experience in developing FFS equipment,
- a lidding supplier with knowledge of lidding materials that perform optimally in the FFS process,
- a label supplier with knowledge of label materials that perform optimally in the FFS process,
- a plastics sheet supplier with extensive material sciences knowledge, recognized for high quality and consistent FFS sheet performance, and
- a package design and engineering firm with experience in designing FFS structures and a knowledge of the opportunities and possible limitations presented by the FFS process.

Now what?

With a more comprehensive understanding of FFS packaging and the many ways it can add to your brand value, it's time to make some calls. Spartech Packaging Technologies is recognized for producing high quality FFS sheet with innovative custom formulations and consistent product performance. Winner of the 2010 Danone Canada 'Supplier of the Year' and 'Raw Materials and Packaging' awards and the 2011 Danone North America 'Supplier of the Year – Raw Materials and Packaging' award for the development of EnviroAir foamed sheet for FFS packaging, Spartech and IQ PKG (Spartech's integrated package design engineering firm) can help you make the transition to FFS packaging. Spartech leverages creative design, material sciences, an extensive knowledge of processing techniques and supply chains and strategic partnerships with other trusted vendors in the industry to deliver a product that increases a brand's speed to market as well as brand equity. Call us today to see how we can transform your brand and meet the needs of your modern consumer.

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