

PET-HOTFILL

E-proPLAST GmbH

PET-Verpackungen PET-Packaging

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Fruit Juice in PET-bottles



The company E-proPLAST which is located in the south of Thuringia / Germany is specialized in the production of stretch blow moulded PET bottles.

The share of fruit juice, filled in PET-bottles, has risen in the past years. Glass bottles and carton-box packaging have lost substantial marked shares.

The world of fruit juice bottlers is split apart.

The main marked share is dominated by a low amount of bottlers. One of the main reasons lies in the existing filling technology. In Europe large quantities of fruit juices are filled with cold aseptic filling equipment. Depending on the output, the investment of such filling lines can easily exceed 10 million Euros. Therefore this technology requires large filling quantities.

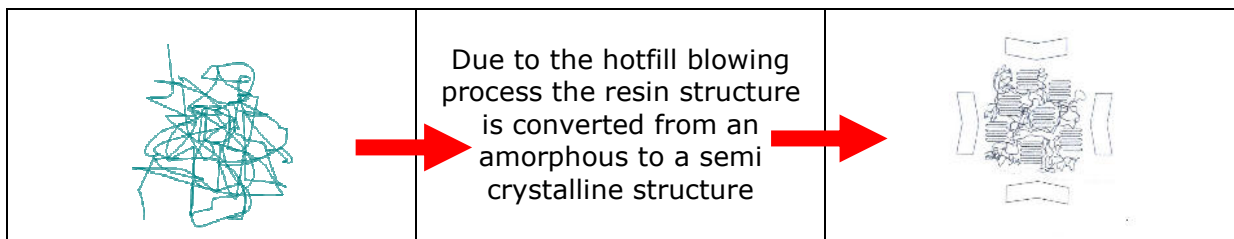
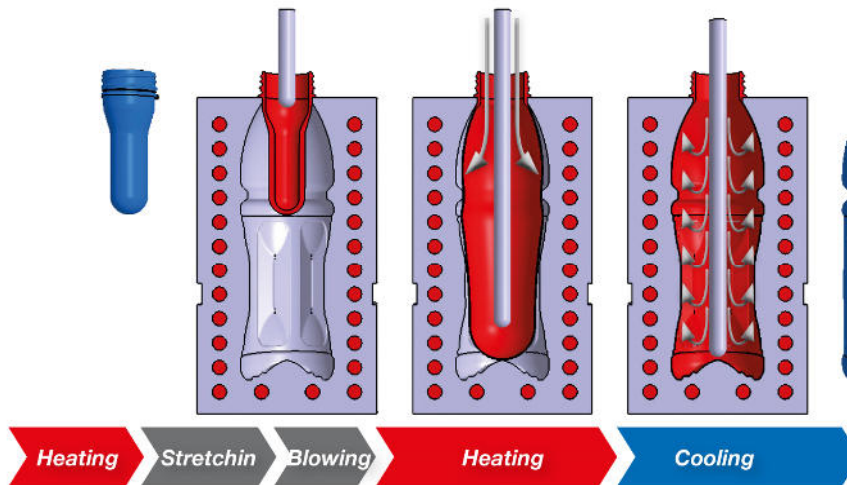
To maintain a sterile environment within the aseptic lines, equipment suppliers and the operators face major challenges in maintaining and running such lines.

Due to the simplicity of hot filling, the process is much more represented in other regions of the world, such as Asia.

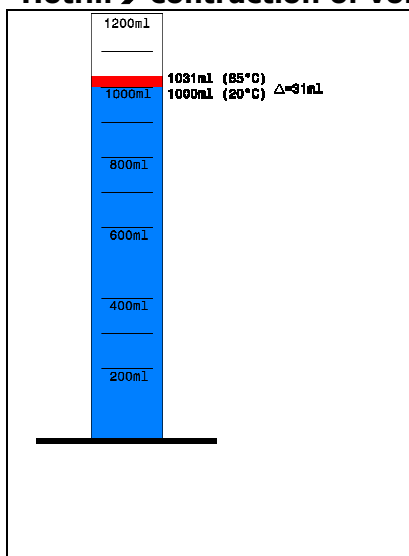
For hot filling of PET special bottles are needed. To withstand filling temperatures of up to 87 °C, the bottles have to be blown in a special stretch blow moulding process. Besides the stretch induced crystalline, the bottles require an additional heat induced crystallinity.

The HOTFILL blowing process:

Thermic crystallization due to heated blow molds (120-150 °C)



Hotfill → contraction of volume

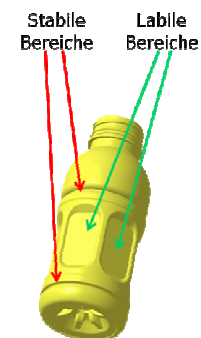


After cooling down from filling temperature of 87°C to room temperature, a volume of the liquid of 1000ml is shrinking by 31 ml.

With a glass bottle it will be no problem - an under pressure is developing inside the bottle.

In case of a PET bottle, this will trigger a deformation.

Solution:
Panel structure on the bottle body with rigid and soft areas.

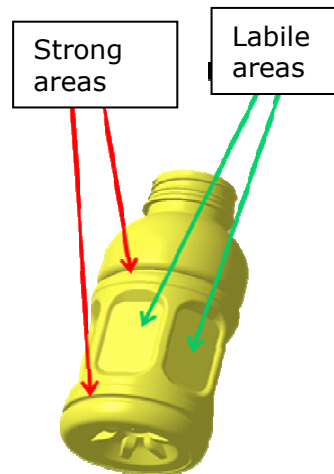


Design PET-Hotfill bottle conventional

PET-HOTFILL BOTTLES with Panel structure



Design PET-HOTFILL bottles conventional



A great disadvantage of the existing hot fill technology is that the special designed bottles require panel areas around the bottle body. The bottles are difficult for labelling and mostly use shrink sleeve technology. In comparison to paper labels, shrink sleeves are four times more expensive.

In addition the weight of such bottles is much higher compared to the panelless PET Hotfill bottles and bottles used in aseptic filling lines

Sample of PET Hotfill
Conventional with panels vs. panelless

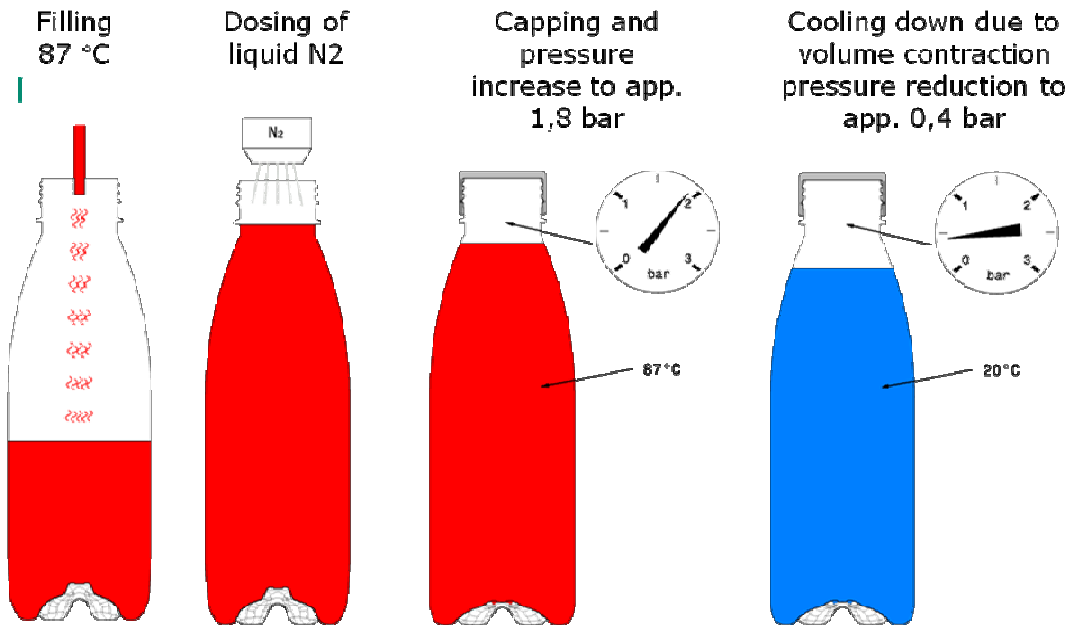


The panelless PET hotfill technique

E-proPLAST GmbH did develop a hot fill-able PET bottle which is free of panel structures. The appearance of these bottles is similar to the bottles filled in aseptic filling lines. The outside is free from any panel structure and can easily be labelled with standard paper labels.

The panelless design is realised due to a special heat set blowing process and a modified filling line.

The panelless filling process:



In comparison to the standard hot filled bottles, the PET panelless technology saves more than 16% in bottle weight. This reduces the bottle costs as well as the fee for the green dot label.

Due to the hot filling process, the oxygen barrier properties are improved by more than 14%. This will save special barrier materials and additives. Depending on the filled product, the shelf life ranges between 9-12 months.

The panelless hot fill technology is ideal for smaller production runs. A change over from one product to the next can be handled very effectively within the same filling line.



Examples of panelless hotfill bottles

The bottle sizes are varying between 100 and 1000ml
Depending on the product the shelf life varies between 9 and 12 month.

Advantage:

- Flat outside wall
- Easy to label
- Low bottle weight





The majority of medium and smaller sized fruit juice companies have existing glass filling lines. Many of these lines are not fully utilized any more. To convert an existing glass filling line into a PET hot fill line only a low investment is needed. Therefore PET hot fill offers small and medium sized fruit juice companies an attractive opportunity to implement PET packaging.

Comparing cold aseptic and PET Hotfill, it is obvious that in particular PET panelless Hotfill will be a more economic solution below 50 million fillings per year.

The advantages of hot filling are obvious:

- Cold aseptic filling lines with an investment of more than 8 Mio. Euros are paying back only when large production quantities are existing.
- The hot fill technology is save. The filling equipment is easy to handle.
- Glass filling lines can easily converted into PET hot filling.
- Existing filling lines can be more utilized. Therefore even small and medium sized fruit juice companies are able to step into the market of PET bottles



PET-panelless HOTFILL BOTTLE

All common fruit juices such as Orange-, Multi Vitamin-, ACE-, Appel-, etc. can be filled in the hot fill technology.

PET-hotfill bottles for sauces

Due to a better dosing, sauces are very often filled in conjunction with closures with integrated membrane valves.

Such kinds of bottles are typically not pressurized. Therefore some design features have to be considered.

The majority of such bottles are with oval shape. Therefore the labeling area can be used as panel surfaces.



DELI-HF 250 & 500ml

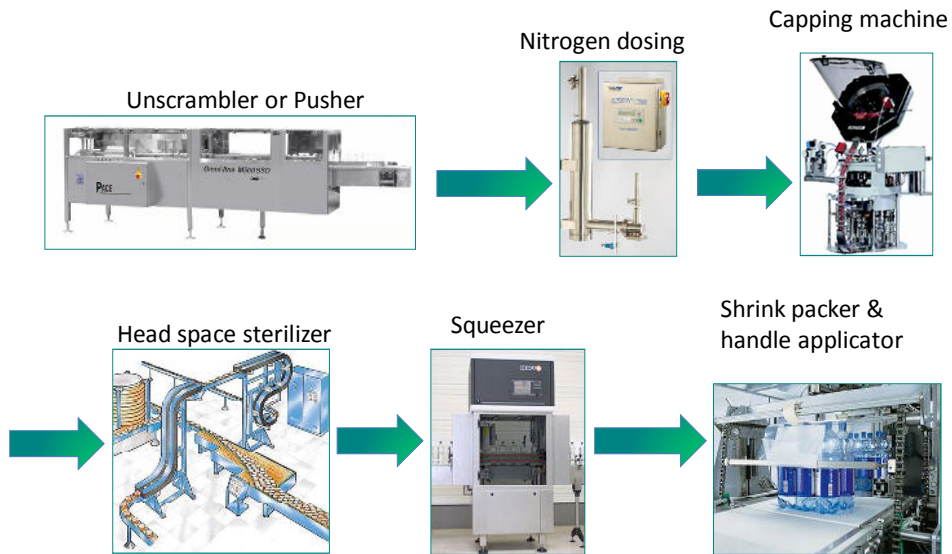


*SQUEEZER
for sauces 250ml*

Design Examples



Equipment needed for converting a glass filling line into PET panelless hot fill line



Depending on the kind of the glass filling line, individual conveyers are needed from the unscrambler to the filler and rinser.

For the rinser, filler and labeling machine, product depended parts are also needed.

Depending on the kind of the end palletizing equipment also for this part of the facility an investment is necessary.

Schmalkalden / Germany in Oktober 2015