Self collapsible large size dispenser bottle

Target

The target was to develop a **self collapsible structure** for the **large size dispenser** bottles in PET.

Weight: 110 - 140 g

Volume: 12L

Neck Finish: 55mm

Development

- SIPA has been working on various projects for clients in determining a collapsible structure for a large volume dispenser bottle.
- The main problems with these large collapsible containers are the irregularity of the collapsing mechanism and the volume that remains in the container.
- Supported by particle experimental results, simulations were done with FEM analysis.
- The purpose of this was to find the buckling mechanism that would best suit a client's request, that allows the bottle to collapse with a hold-up of water the least possible.

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Results & Packaging Features

Different bottle shapes from square to round of these large containers were analyzed along with the shape of the ribs and base. The curves of the volume vs. pressure and the base center displacement vs. pressure, reported in Fig. 1 and the photograms (Fig 2) of the simulation helped in understanding the collapsing phenomena and how to modify the structure in order to have a good performance. Comparison was done with prototyping results.

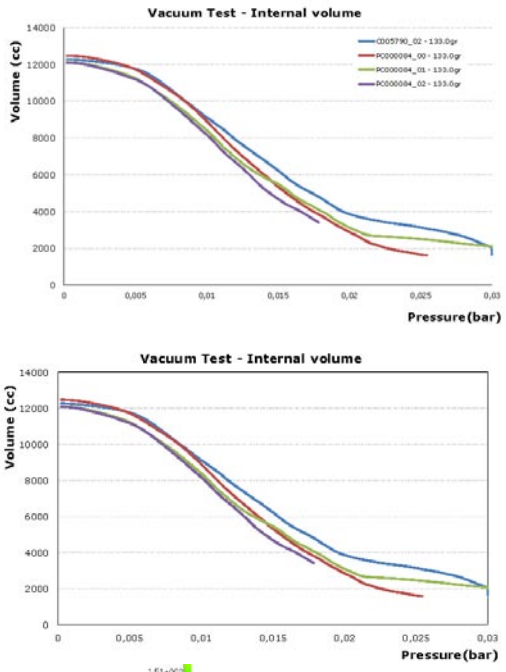

Fig. 1 Curves obtained from FEM analysis with various shape dispernser bottles

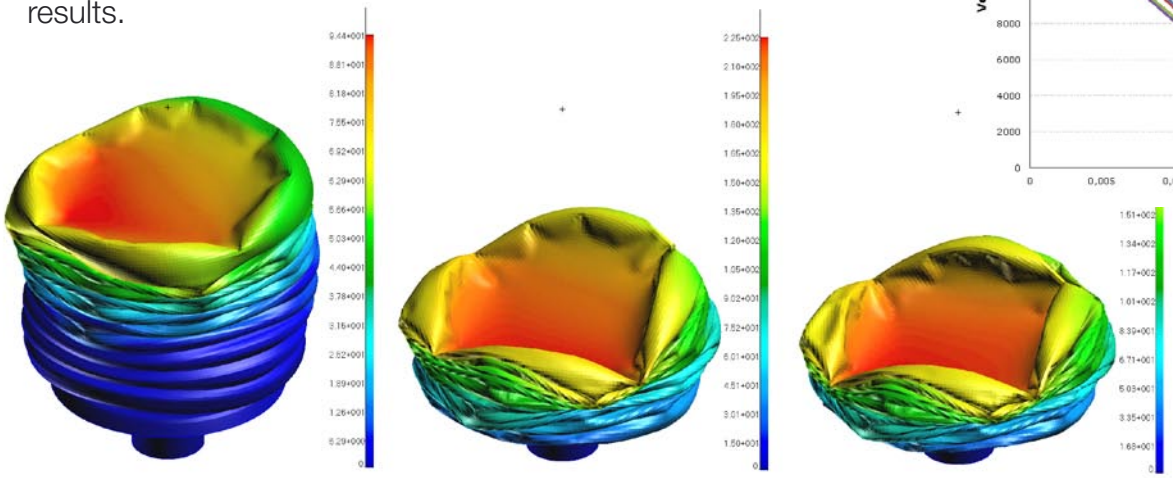

Fig 2 Photograms of collapsing simulation (absolute deformation-mm-in failure sequence)

Advantages

This packaging gives you the following advantages:

- Self collapsible containers do not need any mechanical crushing to collapse and could therefore be collected for recycling or be placed in a bin in a much easier and compact way once water volume has gone down
- The use of FEM analysis to find the best shape for the dispenser bottle of large volume and the ribs is possible due to the comparison with experimental results.
- FEM analysis accelerates the time of investigation and reduces the number of trials aiming at the correct solution
- The FEM analysis also aids in determining a minimum weight at which the collapsing mechanism is still functional.

For further information on this packaging, contact Dino Zanette: dino.zanette@zoppas.com