

Newsletter

30 Jaar
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BPO
we know how

In this issue: New flower container for Royal FloraHolland - Bioreactor for single use in 3D printing - BPO goes electric!

Flower container

At the start of 2019 Royal FloraHolland has introduced a new flower container to the market. The new container, the Fc588 with matching support shelving, is the successor to the large flower container Fc577. The new product has an optimal fit with both the CC-container (6 per layer) as well as the stacking trolley (10 per layer). Having an equal load per container, the loading efficiency is increased by 50% per CC-layer and by 11% on a stacking trolley and cage cart. This means that the chain costs are reduced significantly.

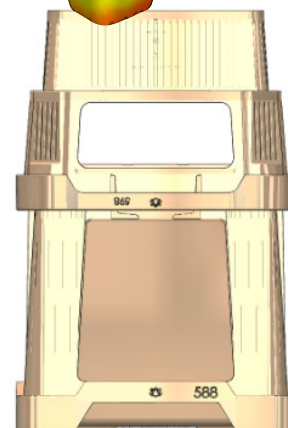
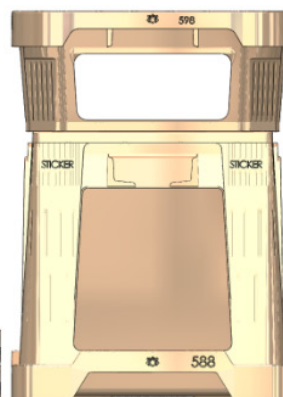
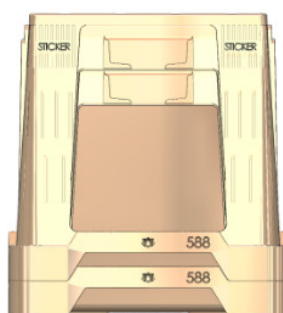
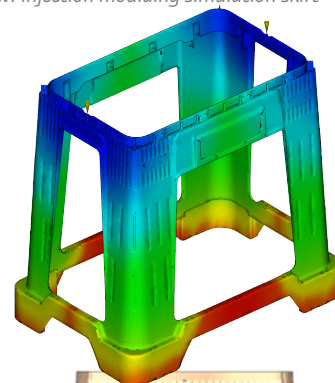
BPO has developed the new container and matching support shelving by assignment of FloraHolland. Together with them, the list of requirements was set up and first ideas were developed in 3D CAD. A real challenge proved to be the dimensioning: the outer dimensions needed to be significantly smaller than the current Fc577 for an optimal fit on the CC-container.

However, the inner dimensions could not be reduced too much, because the number of stems that can fit in the container must remain the same. The effect: a small construction space and vulnerable cores in the mould. Therefore, BPO executed a "core bending" simulation for the existing Fc577 (as a reference) and for multiple concept designs for the Fc588. Using "core bending" simulations, it is possible to calculate how much the mould is stressed during injection moulding and it can be assessed if this may lead to production problems. Production of the container in one piece was deemed too critical, because of the limited construction space. Therefore, in consultation with both manufacturers VDL Kunststoffen and Hollarts Plastic Group, it was decided to make the container out of two parts. The "skirt" and "bucket" parts are assembled together to one container using snap fit connections. This way it was possible to get the required dimensioning with minimal risks.

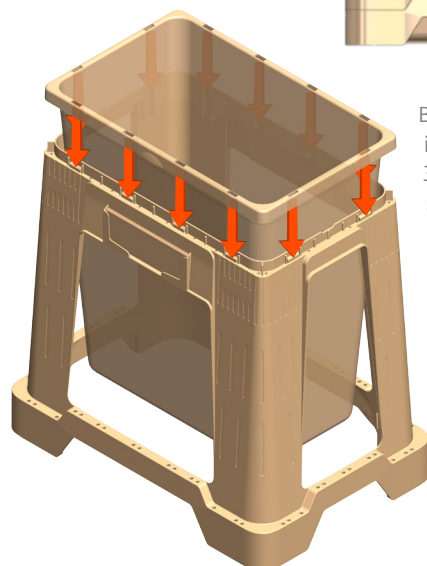


above: Efficient transport of Fc588

below: injection moulding simulation skirt



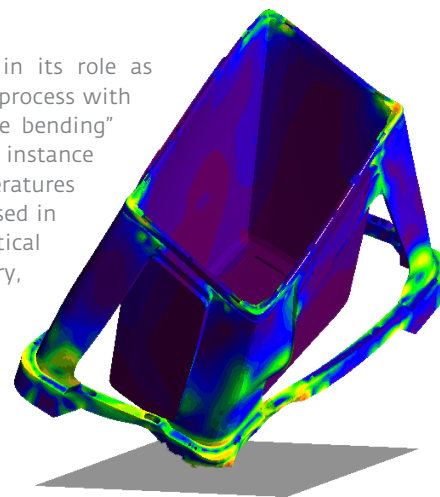
flower container with
support shelving in different
configurations



The bucket snaps to the skirt permanently

BPO has guided the complete development project and, in its role as independent adviser, has substantiated the decisions in the process with 3D CAD drawings and simulation results. Next to the "core bending" simulations different usage scenarios were analysed, for instance dropping from heights and stacking load at high temperatures during long periods of time. The geometry has been optimised in detail based on the simulation results. Furthermore, the practical requirements have been accounted for in the new geometry, like ticket holders, de-nesting under its own weight and grips without sharp (mould split) edges.

The new container is being introduced in phases per product group. For more information on (the introduction of) the new container, see: www.royalfloraholland.com.



Drop test simulation for strength calculations

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Bioreactor for single use in 3D printing

Applikon Biotechnology develops and produces advanced bioreactor systems, that are used in the pharmaceutical industry and industrial biotechnology. BPO has developed a mini bioreactor (500ml) for single use in cooperation with Applikon. The headplate of the newly developed bioreactor is manufactured using selective laser sintering (SLS).

Traditional Applikon bioreactors for similar uses are made of glass and stainless steel. However, for single use purposes a plastic version is needed. Together with Applikon BPO made a list of requirements and analysed the feasibility of different production techniques. The customizability of the design (tailor made solutions) is a very important theme and was the main driving factor in the decision to use an SLS headplate.

BPO and Applikon then optimised the geometry of the design for manufacturing in SLS. For this optimisation, one can think of even wall thicknesses to keep the shrinkage even, strategically placed cams and ribs that limit the tolerance chains, an adapted spindle opening and seals that are compatible with the surface roughness of the 3D printed material. Of course, all this without concessions to the user experience and functional requirements like the connection to the motor, the hoses, the sensors and other connections. Finally, BPO has integrated as many parts as possible and optimised the geometry for simple assembly.

Using 3D printing as a production technique, it is possible to deliver "customized mass production", a promising route that is not (yet) taken very often. With the realisation of the bioreactor headplate in 3D printing Applikon shows a ground breaking innovation, that came to be by combining the specific knowledge of the end user market of Applikon with the broad design and engineering experience of BPO.

For more information;
www.applikon-biotechnology.com



Top: STL and
geometrie mixed
image

Left: 3D printed
bioreactor in use
(helical model)



Custom impeller designs, Rushton, Marine, Hydrofoil & Helical.

BPO goes electric!

BPO has recently purchased two electric cars. And in line with those purchases, the BPO building will be equipped with around 100 solar panels this year. Electric charging stations have been installed on the parking lot for clients and the BPO cars. In this way we contribute to the energy transition, ***and this transition is also beneficial for you; from April 2019 we do not charge travel costs for the electrically driven kilometers!***

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