

Newsletter



In this issue: NeedleOff - Safe Sharps Disposal, Gamma-Wopla Magic box, Product innovation: today more than ever (!)

NeedleOff – Safe Sharps Disposal

Since a couple of years, the replacing of the cap on a syringe needle (so-called "re-capping") is been prohibited. This has been done to limit the chance of a needlestick accident. Anyone that has their skin penetrated by a needle that has been used in a procedure, must go through an extensive protocol before work may be resumed. This may cost several weeks during which someone is not able to work. This legislation means that the removal of dental needles from syringes by hand is not possible anymore. To be able to still remove those needles, Sharpfield BV assigned BPO to develop the NeedleOff. BPO executed the complete development of this product, from idea sketches, engineering, 3D printed prototypes with integrated electronics up to the support of the start of the production.

Safe disposal of needles with NeedleOff.

The portable and intuitive NeedleOff works with any dental syringe with screw thread. The design makes it possible to safely remove the needle using only one hand. The needle is put into the NeedleOff after the last injection by the practitioner. NeedleOff clamps the needle and automatically screws it off the syringe. After taking the syringe out, the needle is released and falls into the integrated Sharptainer. This sharptainer has a capacity of 400 needles and because of its smart design it is automatically closed upon removal from the NeedleOff. Later, the Sharptainer can be sealed permanently for further safe disposal.



Removing NeedleOff container

Because BPO emphasized the designing of a reliable unscrewing mechanism, its performance has been verified by making fully working 3D printed prototypes and testing them in dental practices. Next the complete apparatus was fully engineered by BPO, including the heading of the development of the electronics and software. By using RFID tags in the Sharptainers it is impossible to overfill the containers with too many needles. The safe contents have been maximized to 400 needles, then a new Sharptainer must be placed to reactivate the NeedleOff.

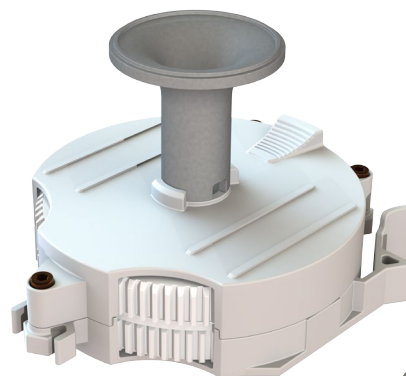
BPO has made multiple series of 10 fully functional prototypes during development, so that these could be tested in dental practices. Using these fully functional apparatuses, it was possible to judge the reliable functioning and the user interaction in an early stage and to improve the design accordingly. More than 25 original designed parts have been engineered by BPO to ready for manufacturing stage. Finally, BPO has been involved with the final review and approval of the components as well as the final assembled product. After successfully going through the last stages, NeedleOff is now ready for market introduction!

Commissioned by Sharpfield BV, BPO has done the complete development of NeedleOff. Competing products that were already on the market all had very important disadvantages: they either did not work reliably or were only compatible with a limited number of types of needles. For NeedleOff it was very important that all dental needles with screw threads could be removed and then stored safely and reliably. At the beginning of the project, BPO placed the emphasis of the development on ideas for the gripping, clamping and unscrewing of the needles. The patented unscrewing mechanism was therefore developed, that is mounted in the gripper-cassette. This part is interchangeable, making it possible to use a clean and uncontaminated gripper-cassette for each treatment during the day.

NeedleOff can now be ordered. For more information, please go to: www.needleoff.com



Insert needle and unscrew



Unscrewing mechanism



Opened NeedleOff

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we know how

Magic box

BPO has developed a new type of folding box, which is produced in one shot and made from one-piece; the Magic box. BPO developed the product on behalf of Gamma-Wopla and took care of the entire process: from initial sketches to delivery of the 3D data to the Italian mould maker. An advanced mould optimized for film hinges with 22 cascade injection points is used for the production of the plastic part. The part is injection moulded in PP on an 800 ton Gamma-Wopla machine and weighs only 790 grams in the 400x300x200mm version with an internal volume of 20L.

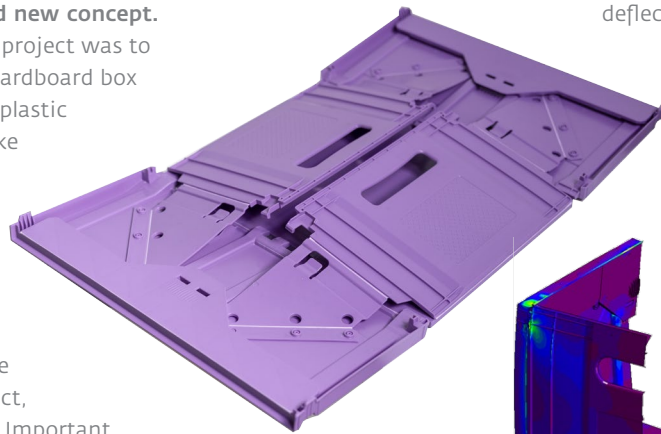
Innovative and new concept.

The aim of the project was to get close to a cardboard box solution using plastic instead, to make it suitable for a multi-way system of 5 to 10 cycles of use. The result is an innovative and new product, the Magic box. Important themes in the project for BPO were - literally - 'Out of the box' idea generation, concept development with functional prototypes, one-piece, focus on simple and unambiguous use, return system, stacking on pallets, film hinges and various closing systems.

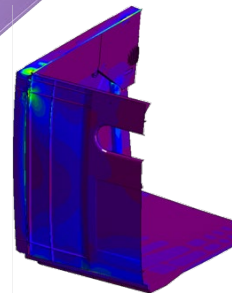
In less than 3 seconds. The result is a one-piece plastic box with two manifestations. The box can be folded from flat (empty return) to box (full transport) by utilizing film hinges. Folding and unfolding can be done in less than three seconds without the use of additional parts or tools. In addition, the box is stackable in both versions, flat as well as folded to box. The bottom is also suitable for use on a conveyor belt by using an optimized bottom shape. The Magic box is more sustainable because it lasts several cycles of use (return system), is made from a single material and fully recyclable at end-of-life.

Simulation. Using finite element analysis (FEA), BPO simulated what happens in a stacked configuration and also analysed the bottom

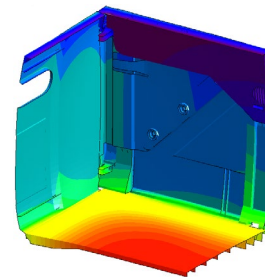
deflection of the box. The results of these simulations were used to make choices in concept development. In this way, optimal balance was achieved between maximum load and product weight.



Folded box



Stress simulation in stacked load

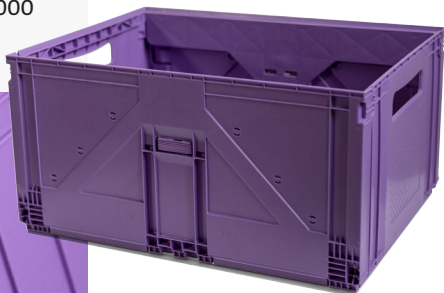


Bottom deflection

Moldflow. For the Magic Box, with its large projected surface, the number and location of the injection points have been extensively analysed and optimized. Among other things, the many film hinges (18) were challenging for the manufacturability of the part. Our results were discussed and optimized in close consultation with Gamma-Wopla and the mould builder. The resulting product can be produced without problems, providing an excellent balance between product quality and lifecycle length.

With the Magic box, Gamma-Wopla has acquired an innovative and new product with countless possibilities for expansion, such as different box sizes. For more information about the box and its features, see: https://www.gamma-wopla.com/en/magic-box_2

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Unfolded box



Unfolding the box

Product innovation: today more than ever (!)

Your company's needs may have evolved drastically during these past challenging months. At BPO, we have found that often, the 'new normal' requires a new approach to product innovation. Are you juggling an idea for a new product? Wondering how to go about developing it? We are happy to think along creatively and innovatively, provide expert advice and make your idea producible.

BPO offers over thirty years of knowledge and experience in product development and as an independent company has a large global network of manufacturing partners. Our expert engineers are only a phone call or e-mail away, we gladly invite you to connect and discuss your ideas and questions with them.