Newsletter

BPO
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September 2015
volume 22, number 2

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The complete range of suitcases by Samsonite Group

In the first few months of 2015 Samsonite Group released three new suitcases to the market. BPO has made essential contributions to the development of this range of suitcases. The Lite-shock, Neopulse and Lock 'n' Roll (under the brand name American Tourister) comprise examples of the complete product range in the "hardside" segment of the suitcase manufacturer.

Neopulse is a new suitcase in the polycarbonate range. The thermoformed shells are formed with extremely sharp corners, which gives a large internal volume as well as a modern design. The sensitivity of the sharp corners for denting has been simulated and optimised by BPO.

Lock 'n' Roll is the latest American Tourister suitcase, consisting of two injection moulded polypropylene shells with a three point locking system. The relation between the height of the upper and lower shell is more extreme than usual for suitcases in this product segment. This way the suitcase can be packed more easily, but it results in higher requirements concerning the strength and stiffness of both shells.

An important starting point for the conceptual phase of development was the construction of a solution that prevents the shells from deforming too much during impact loads and that prevents failure from excessive stresses. In the lower shell, an integrated tube is constructed that is part of the telescopic system of the pull handle. This method of construction stretches the limits of both the strength of the suitcase as well as the construction of the injection mould.

During the conceptual and engineering phases BPO supported the R&D department of Samsonite Group with simulations of different impact orientations and loads on components like the handle, locks, wheels and the aforementioned pull handle.

Lite-shock is made of Curv, a self-reinforced polypropylene composite material, and it is the lightest Samsonite suitcase ever made. The 75 cm variant weighs only 2.5 kg, 300 grams less than its very successful predecessor Cosmolite, while adhering to the same strict quality requirements.

The round, organic design has a unique shock-absorbing effect. BPO has assisted Samsonite Group with the design of the new suitcase by selecting the optimal shape for impact behaviour from a range of alternatives, using complex finite element simulations.

This way Samsonite Group continues to push the boundaries. An integral approach in combination with the knowledge, experience and simulation prowess of BPO enables the development of innovative, ever lighter, suitcases.

reddot design award

Lite-shock and *Lock 'n' Roll* were both awarded a *Red Dot Award* in 2015.

For more information on the new suitcases, please go to www.samsonite.com or www.bpo.nl/en/portfolio.

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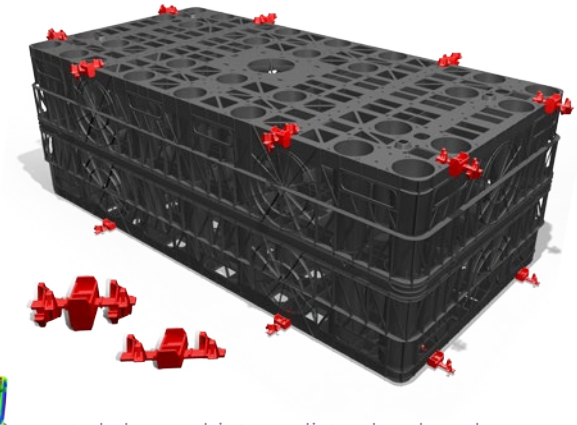
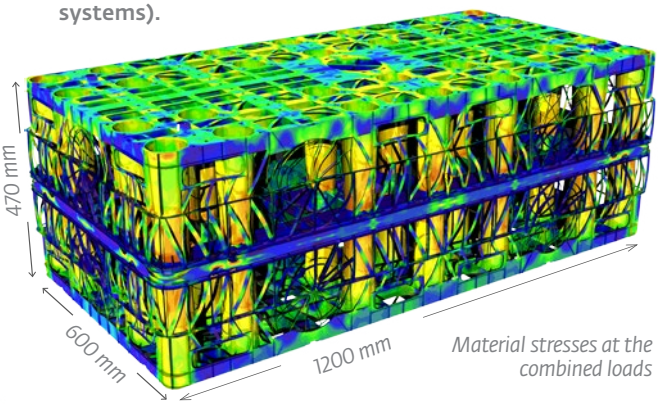
Infiltration crate for urban areas

More and more areas in urban environments have been paved, which can lead to rain water causing flooding. By using so called "infiltration crates", large volumes of water can be effectively drained.

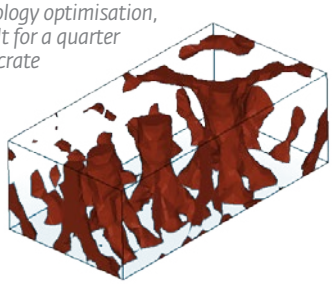
BPO has developed the RAINBOX®3S, the latest infiltration crate for use in urban green zones and areas with light traffic loads, for DYKA (manufacturer of plastic pipe systems).





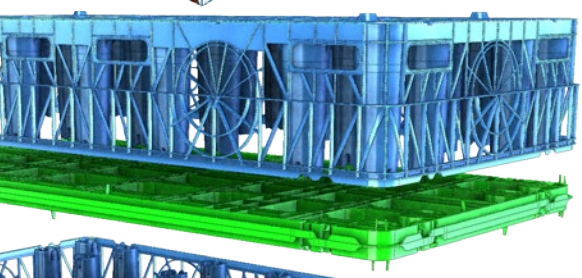
Material stresses at the combined loads

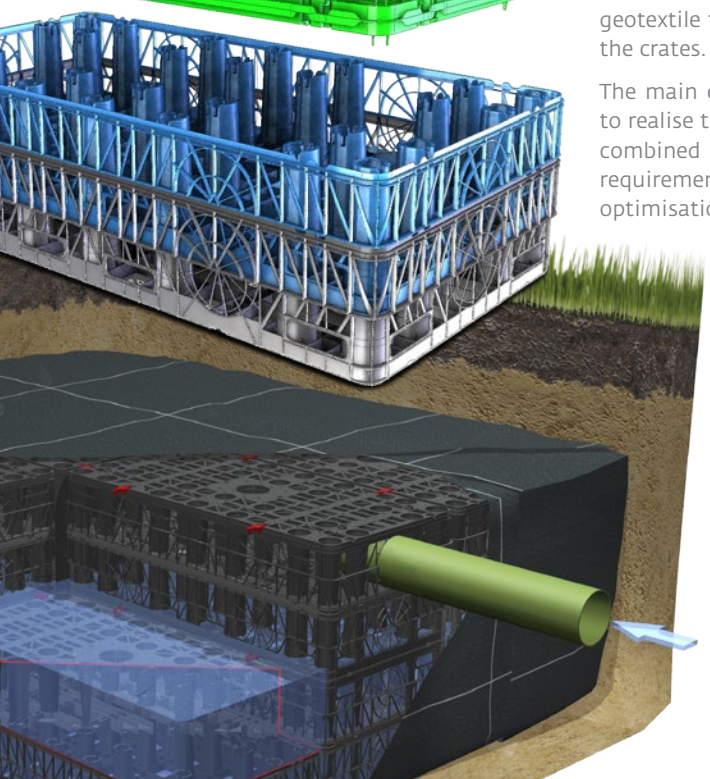
Topology optimisation, result for a quarter of a crate



An infiltration crate is a strong and water permeable box in which water can be stored underground. The accumulated water can then slowly drain or "infiltrate" into the ground. This reduces the load on the sewers, improves the water management of the ground and causes less drought and less land subsidence.

The RAINBOX®3S is made of two crate halves and an intermediate plate. The new infiltration crate has a very good weight/volume ratio: it weighs only 11 kilograms with a capacity of approximately 290 liters. For a large retaining volume the crates can simply be stacked and connected using clips to form a large field of crates. The assembled total is than covered in geotextile to prevent soil from entering the crates.



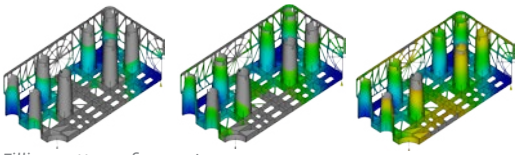


The main challenge in the project was to realise the strict weight requirement combined with the strict loading requirements. BPO has used topology optimisation software to design the main structure of the crate. This way the most optimal structure to lead the pressure of the ground through the crate could be found. The results were translated to a geometric structure with pillars.

In between the pillars, "lanes" have been kept open for a remote camera to inspect the underground field of crates. Sidewalls, connections for pipes and the connection between the crate halves and intermediate plate have been integrated into the design. Also the possibility to stack, nest and connect the crates were important requirements that have been met. Because of the nestable crate halves, an improvement of 50% in transport and storage can be achieved for larger projects.

Using finite element simulations the wall thickness of the columns and ribs were balanced for vertical, lateral and combined load cases simultaneously. The used material has been developed specifically for this application. The material model used for the simulations took into account the temperature underground as well as a lifetime of 30 years.

Wall thicknesses were subsequently further refined using injection moulding simulations, in order to make sure the crate half and intermediate plate can be produced on DYKA's injection moulding machine with 1700 tonne clamp force. To achieve this, BPO sought the right combination of mould filling, short cycle time and minimal warpage.



Filling pattern of a quarter

The patented RAINBOX®3S has been tested successfully and is introduced to the market in May 2015.

More information on the RAINBOX®3S and DYKA? www.dyka.nl

Kunststoffen 2015 & Fakuma 2015

This autumn, BPO can again be found at the plastics fair "Kunststoffen" in Veldhoven (Netherlands) and the Fakuma fair in Friedrichshafen (Germany). We cordially invite you to our booth.

Kunststoffen: 23- 24 september,
Veldhoven (the Netherlands)
Stand 129
www.kunststoffenbeurs.nl

Fakuma: 13 - 17 october,
Friedrichshafen (Germany)
Stand B3- 3227
www.fakuma-messe.de/en

Fakuma