

In this issue: Stand-on Expo Floor – FitCar PPV: A car controlled by pedaling – Doowitt protection cap: invisible protection against head injuries – Kunststoffen & Fakuma 2018

Stand-on Expo Floor

In cooperation with ABC Display Systems BPO has developed a modular exhibition flooring solution. Important themes for this project were esthetics, ease of laying, compact transport, personalization and finally the integration of a solution for the cables. The final product consists of modular floor elements that can be used for multiple exhibitions, while the configuration and appearance can be changed for each individual event.

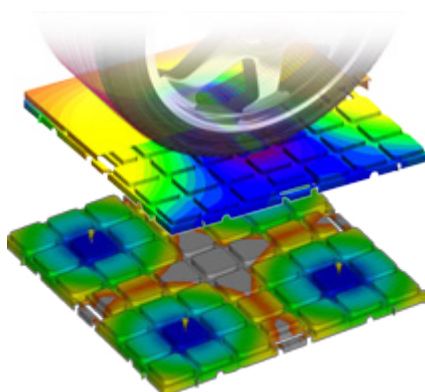
The modular floor is made of ABS and consists of three elements: (1) the base tile, with integrated cable guides, (2) the clicking elements and (3) the outer edge elements. Using the clicking elements the base tiles can be connected to each other in any configuration without having to use any tools. An optional transparent covering plate, made of polycarbonate, makes it possible to transform the floor into an advertising space. The base tiles are nestable during transport, while the covering plates can be interstacked so scratches during transport can be prevented.

The strength of the floor tiles has been simulated by BPO using finite element analyses. This way BPO has simulated what happens if a car is driven over an assembled expo floor. Also, BPO has minimized

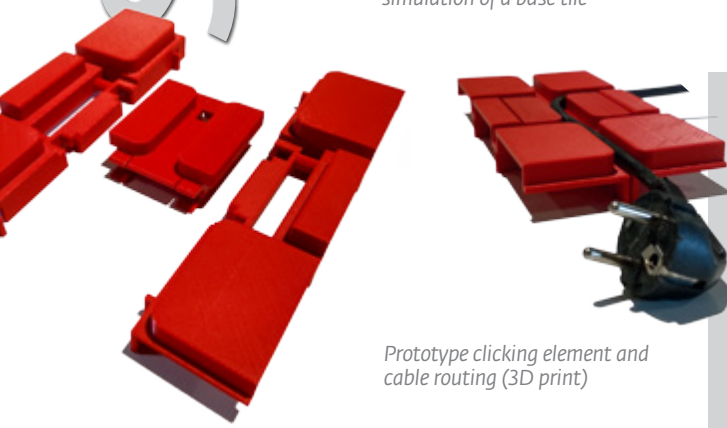
the risk of warping of the tiles during production, using injection moulding (moldflow) simulations. By optimizing the design before production is started, it was possible to produce straight and flat tiles right from the start.

BPO has gone through the complete design process together with ABC Display Systems, from idea generation to the validation of the first production series. During the development, multiple 3D prints were made of principles and details of the design, to get a quick insight into the functioning of the clicking system and the cable guidance. Thanks to the in-house prototypes the total development, from initial idea to first production run, could be realized very quickly.

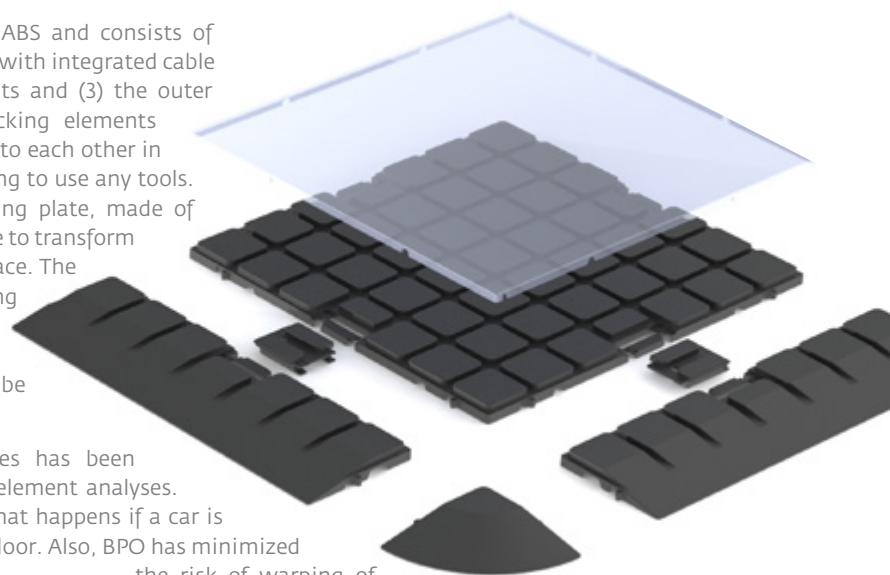
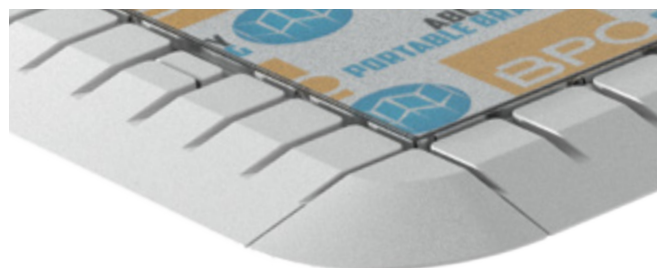
With the Stand-on Expo floor ABC Display Systems has created an innovative product, with a broad range of accessories and personalization options. For more information on the floor and its possibilities, please visit www.abcdisplay.nl/producten/stand-on-expo-vloer/.



FEM-Simulation and Injection moulding simulation of a base tile



Prototype clicking element and cable routing (3D print)



Kunststoffen 2018 & Fakuma 2018

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:

26 - 27 september

Veldhoven (NL), Stand 129

<https://kunststoffenbeurs.nl/home-en/>

Fakuma:

16 - 20 oktober

Friedrichshafen (DE), Stand B3- 3227

www.fakuma-messe.de/en



FitCar PPV: A car controlled by pedaling

What if commuting could be mixed with exercise? Saudi-based inventor Nasser Al Shawaf had the idea, BPO made it reality.

The FitCar PPV makes it possible to get your daily workout behind the steering wheel: the acceleration of the car is controlled by pedaling. For daily commuters, this will turn their tedious commute into active, healthy time. The FitCar PPV system has three settings; 'Drive Slow' – when in slow moving traffic, 'Drive Fast' for highway speeds and 'No Drive' for when stuck in stationary traffic but with the ability to continue exercising. The intensity of the workout can be regulated.

The FitCar PPV 'prototype #2' is based on a standard Audi A4 Avant 2.0L petrol TFSI auto, with the throttle replaced by a bicycle pedal mechanism mated to a flywheel to generate an electric pulse that engages the accelerator. The car is then powered as normal, delivering manufacturer specification performance and economy, but the speed governed by an active pedalling motion, as opposed to the conventional depressing of the accelerator. To make space for the bicycle and flywheel mechanism, the brake-pedal has been replaced with a simple off-the-shelf 'push hand control' conversion as used in motability vehicles.



The controls of the FitCar; pedals, smaller steering wheel and a manual brake lever

BPO explored several options before settling on pedals. A simple, rough model (mock-up) was built to demonstrate how the principle could work. The next step was the conversion of a real SmartCar. The SmartCar showed it was possible to control acceleration with pedals and that it allows for a precise and natural way of controlling a vehicle. The latest prototype, an Audi A4 Avant, is chosen for its cockpit ergonomics, allowing for a comfortable cycling position, with enough room for the physical action of pedaling.

FitCar PPV is patented internationally, and is awaiting RDW approval in the Netherlands for road use across Europe. Auto Express tested the prototype and reported: "The FitCar PPV clearly delivers on its promise. The idea of exercising as you drive appeals, and it's certainly one of the more original ideas in motoring".

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Doowitt protection cap: invisible protection against head injuries

The Doowitt protection cap offers protection against head injuries during sailing or bicycle riding, among other activities. The cap can be worn almost invisibly under any other type of head gear, like a knit hat or a baseball cap. The cap is adjustable and therefore fits anyone. Because of its compact shape the Doowitt never gets in your way.

Doowitt has developed the cap together with BPO. For instance, the impact properties of the cap were calculated by BPO. The largest challenge was to set up a simulation model for the high tech, extremely thin layers of foam that make the Doowitt possible. These materials were specially designed to lessen the effects of an impact. Using these plastics, it is possible to realize a previously unheard-of reduction of the thickness of head protection gear.

Together with Doowitt the list of requirements was set for the cap. This meant that in simulations a fall from a height of one meter against a sidewalk edge had to be considered. Such an impact was analysed by BPO using finite element method (FEM) calculations. It involves short, dynamic loads. These sort of loads in combination with the used advanced materials make the simulations a specialist job.

