## TRANSPORTATION REDESIGNED Delft Hyperloop Pod

SUCCESS STORY

The Hyperloop concept is a futuristic high-speed ground transport and transit system, with pods travelling in a system PARIS. of near-vacuum tubes **PLATFORMS** Full Composite Delft Hyperloop Pod Launcher, **Second Place at SpaceX Hyperloop Pod Competition III** 



## TRANSPORTATION REDESIGNED

Full Composite Delft Hyperloop Pod Launcher, Second Place at SpaceX Hyperloop Pod Competition III

Unveiled by Elon Musk in 2013, the Hyperloop concept is a futuristic high-speed ground transport and transit system, with vehicles/pods traveling in a system of near-vacuum tubes at speeds over 1000 km/h (800 mph). To demonstrate the feasibility of these speeds, student teams from across the world competed in the SpaceX Hyperloop Competition III in July 2018 at SpaceX's Hawthorne facility, testing designs in a 1.9-meter (6-foot) diameter tube and 0.6-km (1 mile) long test track.



Delft Hyperloop's Atlas 01 pod won second place, coming in under the winner's speed top speed of 467 km/h (290 mph). Delft Hyperloop was the first team to design their pod shell using carbon fiber composites and was the overall winner of the inaugural competition in January 2017, where the feasibility of the Hyperloop concepts of design, scalability, efficiency, and speed were judged.

## GO FASTER. NO PRESSURE.

Delft Hyperloop's Atlas 01 pod launcher design features a full composite  $2350 \times 300 \text{ mm}$  chassis and carbon fiber battery case.



The pod's launcher was manufactured with epoxy-based carbon fiber woven and uni-directional prepregs, donated by Toray Advanced Composites' European Centre of Excellence for thermoset systems, based in Langley Mill (Nottingham, UK).

The Toray 8020 range of prepregs was selected for its ability to effectively reduce the Delft Hyperloop pod's mass while providing a high stiffness-to-weight ratio, resulting in a strong yet lightweight chassis weighing only 15 kg. The epoxy-based prepreg offers a low and flexible cure schedule (temperatures start at 70°C/158°F), enabling design and processing freedom. Toray's 8020 30-day out time at ambient temperatures and good drapability were also well suited to the team's shop floor environment.



To hear an interview with the Delft Hyperloop team, Toray Advanced Composites, and Composites World, please listen to the podcast here:

https://www.compositesworld.com/podcast/episode/episode-20-delft-hyperloop

