Battery solution 290 kWh

Battery solution 290 kWh

For on-highway vehicles, electrification is now seen as the way to go, but the future for electrified off-highway ones such as construction dozers, mining trucks and so on is less clear.

Off-highway mobile machines are often larger than the biggest on-road trucks, and vary widely in their size, power, cost, environmental harshness, and weight. For example, there are 0.5 t mini-excavators and 400 t haul trucks, and if you include non-terrestrial vehicles, there are 500 t aircraft and 55,000 t container ships in need of electrification. They are also usually supplied in tens of units or even single ones, even to major industrial operators.

So there"s a contrast between off-highway and on-highway automotive applications: for the latter, the problem of scarce batteries has arguably been "solved", as OEMs building road EVs in batches of 100,000 or so at a time are now supplied by high-volume, low-diversity pack manufacturers. Conversely, solving the problem of off-highway packs poses the challenge of optimising a production line around low-volume, highly diverse batches, potentially just a few packs at a time.

That challenge is what battery manufacturer Xerotech aims to solve. Based in Claregalway, in Ireland, it was founded by CEO Dr Barry Flannery in 2015, and the company now supplies packs to many off-highway EV OEMs. Dr Flannery began engineering battery packs in the early 2010s, and invented a new form of active thermal management, which is patented as Xerotherm.

Xerotech’s batteries are built around Xerotherm, using a scalable and modular product architecture called Hibernium (a reference to Hibernia, Ireland’s name during Classical Latin times).

As Dr Flannery explains, “Off-highway vehicle operators are some of the biggest companies on Earth, but even they don’t need more than a few, say, well-drilling vehicles or asphalt-grating trucks. So engineering batteries for that market means hundreds of different pack sizes, which can’t benefit from high-volume production as automotive packs do.”

Within each Hibernium module, typically there are cylindrical cells and the Xerotherm system of sidewall cooling, which consists of liquid-inflatable ultra-thin plastic ducts. The cells and ducts are held within a structural, insulative and fire-retardant foam. The modules come in six sizes and can be stacked up to 24 in a pack, sitting side by side and directly connected to one another via busbars.

On the front of each pack sits Xerotech"s battery disconnect unit (BDU), which contains the BMS, contactors and related safety and control subsystems, along with connections from the BMS master unit to module-level slave BMS boards for lower-level monitoring and commands.

But given the need for hundreds of pack sizes and the consequent length of Xerotech’s product catalogue - at the time of writing, it covered 678 different packs, each with its own eight-page datasheet - citing the exact specs for every Hibernium pack is cumbersome.

To date, its largest with a published datasheet is a 290 kWh solution weighing 1429 kg and measuring 2392 x 1201 x 430 mm, with a nominal voltage output of 691 V (480 V minimum, 805 V peak). Its smallest is a 10.4 kWh pack weighing 104 kg and with dimensions of 561 x 511 x 430 mm, and designed for a 60-101 V output range (86 V nominal).

Xerotech also records and publishes huge amounts of data from in-house testing, including charge and discharge maps across 0-100% SoH and 0-100% SoC (graphed in increments of 5% at a time) and also across full temperature ranges as tested for regulatory compliance.

These are published for cell, module and pack-level characteristics. It is also making public its IP on its pack engineering and science, aiming for openness on par with IC engine manufacturers.

Contact us for free full report

Web: https://www.hollanddutchtours.nl/contact-us/
Email: energystorage2000@gmail.com
WhatsApp: 8613816583346