AVANT POWER leaps to the forefront of innovative battery technology

Avant launches two new electric loader models in Bauma 2022

The capacity of electric loaders enters a whole new level as Avant's new subsidiary, Avant Power, starts producing battery packs for fully electric Avants in 2023. Two new fully electric loader models, the Avant e527 and Avant e513, will be equipped with Avant OptiTemp batteries (27kWh and 13kWh) which feature a globally unique thermal management system. With a fully charged battery in the Avant e527, you can in most cases work the whole day with one single charge, the battery capacity being twice the size of other manufacturers' products.

"We have been doing research and development related to electric loaders since the 1990s, and our first fully electric loader was introduced in 1997. After working with electric loaders and batteries for decades, we realized that there was no battery pack in the world that would be perfectly optimized for compact loaders. That's why we decided to start making such products ourselves," says *Mikko Piepponen*, Chief Operating Officer at Avant Power Oy.

As a team of engineers started designing these new generation batteries in-house, the target was set high: the new batteries had to be 100% safe, their capacity had to be high and the production costs low. Since Avants are sold in all parts of the world, the batteries needed to be suitable for all

"An innovative thermal management system makes the new Avant OptiTemp batteries completely unique on a global scale," says Mikko Piepponen, COO of Avant Power and the mastermind behind the new technology.

markets. Not an easy task, one might say, but the team loves challenges.

"Creating solutions that seem impossible at first is what gets us going," says Piepponen.

After years of intense work, Avant Power is now launching two new OptiTemp battery packs. These batteries will be used in Avant e527 and Avant e513, bringing efficiency and safety of electric loaders to the next level.

Temperature always in control

The new OptiTemp battery packs feature a globally unique immersion lithium-ion technology offering Avant users several benefits.

Thanks to the great power-to-volume ratio of the new batteries, it is now possible to work with an electric loader more efficiently than ever.

> Avant OptiTemp batteries bring the capacity of electric loaders to the next level. Work all day with one charge!

As the name of the batteries implies, a unique thermal management system, OptiTemp, keeps the temperature optimized when the loader is used or plugged into a charger. In the batteries' submersible structure, all the cells are surrounded by a special liquid. The immersion cooling system controls the temperature and lets you work just as efficiently in the summer and winter. In cold weather conditions, the battery automatically pre-heats itself before use, and during operation of the loader, the temperature management system maintains the operating temperature.

"Many battery manufactures tend to forget cold working conditions, but Avant OptiTemp batteries work very well in freezing conditions – all the way down to -30°C/-22°F, when preconditioned," Piepponen says.

"The cooperation with Avant Power, and the batteries they have developed, allow us to build the kind of electric loaders that the market has been longing for. Longer working time and more affordable pricing have been key issues with electric loaders until now. With the new e5 models, we intend to tackle them both," says Jani Käkelä, CEO of Avant Tecno.

The OptiTemp system also makes the batteries extremely safe. The specially designed liquid inside the battery modules controls heat transfer from one cell to another. As the cells won't be overheated, the batteries are extremely safe to use. Another safety solution is the multi-level protection system. All cells inside the battery are protected by fuses and isolated from each other on several different levels.

"The world of battery technology is still quite wild regarding safety regulations. For us, safety is an absolute priority. We make batteries which guarantee zero incidents," Piepponen says.

Avant users looking to acquire a new fully electric Avant e513 or Avant e527 can expect a longer operation time, getting heavier work done, faster charging, longer battery life, working in extreme weather conditions and absolute safety. All this comes with affordable pricing yet unseen in the market. Production of the batteries starts in the first quarter of 2023.

A short history of electric Avants

Electric Avant 1.0

Avant introduced the first fully electric loader in 1997. Technically the machine worked well, but effective operation time was only 1–2 hours. Therefore, the loader was suitable only for very few specific jobs. Since global demand was somewhat low back then, the project was put on hold. However, our faith in the future of electric machines didn't waver and we kept this possibility in mind.

Electric Avant 2.0

Development was restarted. The basic structure of the Avant loader was modified and optimized for an electric model. The next generation electric Avant was introduced in 2017. Development had taken quite a leap; the capacity of the lithium-ion battery was three times bigger than in the first Avant e-series. This was already sufficient for quite versatile work, but it was clear that an even greater capacity of the battery would improve and expand the usability of the loader significantly.

Electric Avant 3.0

In this phase, Avant took the reins in developing batteries. Due to a successful product development project, Avant is now introducing an entirely new Avant battery series. This power source optimized for loaders clearly beats competitors on many important levels.

CHARGING

The e5 series has three charging options. The loader has a built-in onboard charger which allows you to charge with any 220V outlet. The onboard charger is intended mainly for overnight charging.

The 400V rapid charging stations (16A and 32A versions) are available as an option. The station is easy to move from jobsite to another because it has the Avant quick attach. Rapid charging is intended for charging during the workday.

Charging times:

Loader model	Avant e513	Avant e527
Onboard charger	5 h	10 h
Rapid charger 400V/16A	1 h 30 min	2 h 45 min
Rapid charger 400V/32A	-	1 h 30 min

Avant e513 & Avant e527 in a nutshell

Loader model	Avant e513	Avant e527
Voltage	44V	44V
Capacity	13 kWh	27 kWh
Operation time*	3 hours	6 hours
Lift capacity	900 kg	900 kg
Lift height	2 790 mm	2 790 mm
Drive speed	10 km/h	10 km/h
Auxiliary hydraulics	30 l/min	30 l/min

*In medium duty loading work; no hydraulic attachments used.

The benefits of Avant OptiTemp batteries

- **High capacity: up to 27 kWh.** The Avant e527 has twice the capacity of other loaders in its size class. You can work the whole day with one single charge.
- **OptiTemp system inside.** The innovative thermal management system keeps the temperature optimized and gives you the same capacity in hot and freezing weather. The key benefit of the OptiTemp battery is that it works very well even in very cold conditions (-30°C/-22°F), when preconditioned. As the battery is plugged into a charger, the temperature control system is automatically switched on. When the workday starts and the loader is unplugged, the battery temperature is already optimized for hard work – adjusted to the prevailing weather conditions.
- **Rapid charging stations available.** Thanks to the structure of the battery, you can charge your battery in just 1,5 hours with a rapid charger, which enables long workdays.
- **Absolute safety.** No other battery manufacturer in the world has similar solutions for safety. In Avant OptiTemp batteries, there is no risk of propagation – meaning thermal runaway from one cell to another – or flame leakage outside the battery device. Absolute safety is guaranteed by the structure and the immersion cooling system of the battery.