

### Bosch eBike Systems sets new benchmarks in battery safety

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#### How Bosch technology makes batteries safer

- ▶ Combined battery safety mechanisms provide additional protection
- ▶ In some cases, test procedures exceed legal requirements
- ▶ Testing throughout the value chain and a high degree of automation ensure good production quality

Stuttgart/Reutlingen - Bosch eBike Systems continuously optimises its products, and processes, to ensure high component quality. The same applies to battery production. This is because lithium-ion batteries are complex, finely tuned systems with a high energy content, whose ingredients can, in principle, be flammable in certain circumstances. For this reason, eBike batteries must undergo extensive legally prescribed tests and may only be brought to market once they have passed these. Bosch eBike Systems goes beyond the already stringent legal requirements, paying special attention to the issue of battery safety at every point along the value chain: Bosch sets new benchmarks in battery safety with a combination of various technological safety mechanisms, additional tests, and a high degree of automation in manufacturing.

#### Combined safety features: BMS, mechanical, electrical and thermal isolation

A Bosch battery consists of numerous high-quality lithium-ion battery cells arranged within a robust housing. A seal prevents the ingress of splash water and dust to an extent that the battery is prevented from any resulting damage. Bosch batteries are equipped with a **Battery Management System (BMS)**. This continuously monitors the battery, detects potential fault sources and protects the cells from overloading. If the system detects a problem, such as excessive temperature, it automatically shuts down the battery.

The BMS is combined with other safety technologies built into the battery, such as mechanical, electrical and thermal isolation.

The individual cells of an eBike battery from Bosch eBike Systems are encased in flame-retardant plastic - the **mechanical isolation**. In the rare event of a short circuit within a cell, this casing provides protection for the other cells. The **electrical isolation** serves as an integrated fuse. It provides electrical interruption if the current flow between the cells becomes too high. The individual cells are also protected by **thermal isolation**. The fully encased cells, and additional separators, reduce the risk of both overheating in the battery and a potential thermal chain reaction between the individual cells. This enables a controlled process in the event of gas evolution in the battery: The gas is able to escape in a controlled manner via a predetermined breaking point, preventing it from spreading to further cells.

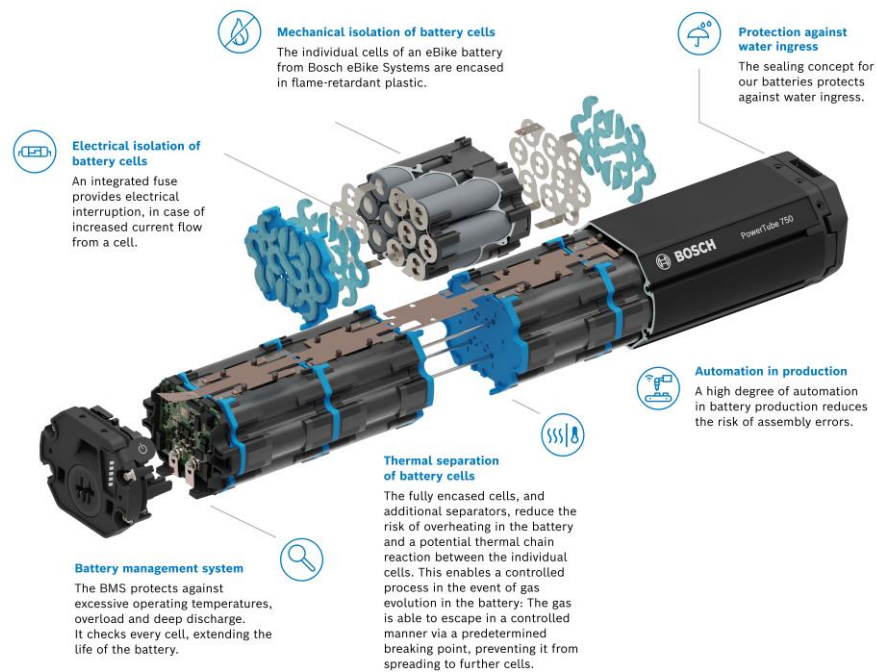
### **More tests, more automation in production: How Bosch optimises battery safety**

Furthermore, numerous test procedures and safety tests are employed, which have been tried and tested, and continuously expanded over many years. Here, Bosch eBike Systems tests the batteries in-house and, in some cases, more stringently than required by law. Among other things, they are tested for short-circuit protection, protection against overcharging and resistance to external mechanical stresses. Bosch also tests the batteries without BMS, despite this not being a legal requirement. Safety tests are also carried out by suppliers along the value chain.

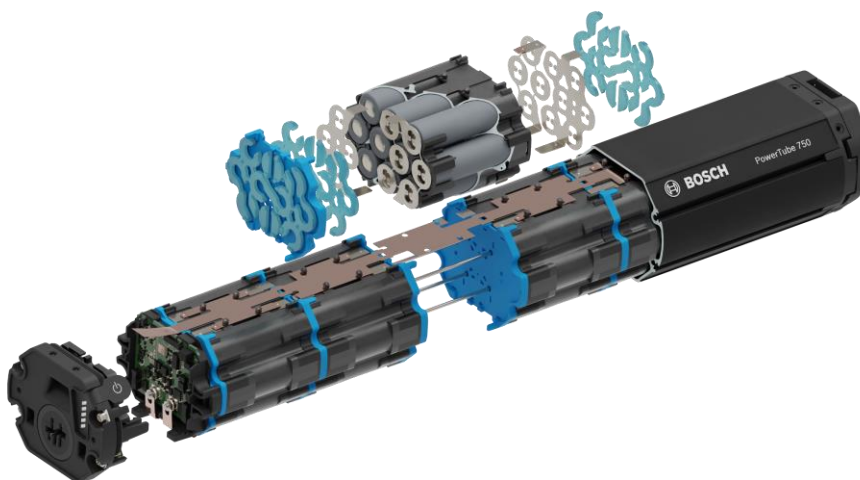
The result: Bosch eBike Systems batteries set high benchmarks for quality and safety. Not only do they comply with the legal requirements, but also exceed them in many respects. In the case of the batteries for the latest-generation "smart system", the degree of automation has also been further increased in production. This further enhances precision in the production process.

Despite the higher safety requirements that Bosch eBike Systems places on its batteries, a battery could still become damaged. Risks can be further minimised through careful battery handling. Batteries should not, for example, be stored near heat sources and should not be cleaned with a direct water jet or even a high-pressure cleaner. Nor should the batteries be opened under any circumstances. All information on the correct handling of Bosch eBike Systems batteries can be found in the [Battery Guide](#).

## Press photo 1:



## Press photo 2:



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