THE POWER OF WEARABLE TECHNOLOGY

Go ahead, count how many battery-powered devices are around you right now. We live in a world where we are not only surrounded by electronic devices - they are attached to us, and we are attached to them. We even bundle ourselves up in technology, wearing a heated jacket on a chilly day or when hiking away on our holiday in the mountains. Such wearables are strapped to us, sometimes 24/7, monitoring our heart rate during a walk on the beach, tracking how many calories we have consumed at the all-inclusive buffet, or displaying our latest messages and calls.

Devices can make life easier, and to do so, they need a power source. Lithium-based batteries are the main power source for wearable technology today. Wearable batteries come in different shapes and sizes: clothing with LED lights is usually powered by lithium coin cells that are not rechargeable, while fitness tracking devices use small, rechargeable lithium-ion pouch cells. In contrast, a heated winter jacket requires a larger power source, similar to a laptop battery, because it supplies power to a bigger device and needs to last for longer periods of time.

HOW SAFE IS WEARABLE POWER?

Batteries used in electronics such as laptops, tablets, mobile phones or medical devices are tested against rigorous standards to reduce the risk of fire and explosions, and ensure their safety for consumer use. Some of the testing procedures for batteries include overcharge, forced discharge, short circuit, mechanical durability, and abnormal heating.

Similar safety standards for batteries powering wearable technology are currently unavailable or are not enforced, which leaves the door open for product failures, and worse - injuries to consumers. The list of potential risks that wearable technology poses to consumers is not a short one: radio frequency exposure, electric shocks, burns and cuts, chemical reactions, fire and explosion.

In contrast to their batteries, wearable technology products themselves have to pass various testing procedures and performance evaluations covering product safety, EMC (electromagnetic compatibility), SAR (specific absorption rate), wireless interoperability, hazardous chemicals, sustainability, energy efficiency and privacy and security.

SAFE POWER REQUIRES SMART DESIGN

A heated jacket is a useful product that would keep its owner warm on cold days, while reducing the need to wear a multitude of layers of clothing. However, if the battery powering it should short circuit and not be equipped with relevant safety mechanisms, overheating would occur, potentially causing an explosion or a fire. Depending on the positioning of the battery within the clothing item, the consumer’s ability to notice and react to a battery fire, leak or explosion could be significantly reduced and would increase the risk of injury.

Such hazards to consumers should not be ignored by manufacturers (and retailers) of wearable technology, who need to consider all the risks associated lithium batteries, and make smart product development decisions starting from the design phase. Depending on the type of product developed various use case scenarios need to be considered. What happens if the product gets in contact with water through rain exposure or washing?
What if the product is dropped or is subjected to significant pressure from the human body weight? Or if the product is exposed to sunlight, excessive temperatures or chemical compounds? The consequences of poor product performance or failure caused by battery issues could lead to the product being returned, but more importantly they could be more dramatic and harmful, such as the heated jacked catching fire while being worn by an unaware consumer. Manufacturers need to consider all these scenarios in addition to current battery standards, and adapt the designs of their wearable tech products to ensure that consumers are never at risk.

The SGS team of battery experts can help you develop a test plan that aligns with your particular product and its intended use. SGS offers cell and battery testing services and teams in Suwanee (Atlanta), GA, USA, Shenzhen, China, Shanghai, China, Munich, Germany and Taipei, Taiwan. SGS experts have extensive experience in the regulatory compliance industry and in the field of renewable energy sources. Several of our specialists are voting members and hold management positions with many different battery standards development bodies.

Find more info on SGS Battery Testing Services for consumer product batteries.

Jody Leber
Battery and Accumulator Global Technical Manager
SGS North America, Inc.
jody.leber@sgs.com
t +1 770.570.1838
LinkedIn SGS Consumer Goods & Retail