

[Battery101] Innovation Creates Batteries for Wearables

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101[ωίνουwίν] means basic knowledge of a topic or collection of introductory materials to a topic. Our Battery 101 series talks about all things battery: the history, technical aspects (basic principles and mechanisms), industrial aspects (IT, electric vehicles, ESS, etc.), and next-generation technologies that SAMSUNG SDI will innovate while opening up its future. Batteries have infinite potentials that exceeds our wildest imagination. Through Batteries 101 series, you will have a chance to see the entire spectrum of the battery's possibilities and to conjure SAMSUNG SDI's pivotal role in it.

Wearable batteries

Not too long ago, wearable gadgets like smartwatches, smart bands, and smart glasses were only a thing of sci-fi movies. Now we can see them everywhere. Battery companies are working hard to develop products to accommodate such surging needs. Wearable devices, as the name suggests, are devices that we wear on our bodies. That's why battery makers focus on "SF" in their development of batteries for wearable devices. Small, smart, flexible and fashionable.

SAMSUNG SDI has a long streak of working on batteries for wearable devices. In 2014, we unveiled a curved battery with the highest capacity of the time. We were the first to apply the stacking technique to this

ultra-small battery with a curved surface, achieving the maximum energy density while setting ourselves apart from the rest of the market that only had flat batteries. This success served as a catalyst for our battery innovation as the rapid growth of wearable devices was expected at the time. And this curved battery was first applied to SAMSUNG Gear Fit, which was released in 2017.



[SAMSUNG SDI's batteries for wearable devices]

In 2015, we also released "stripe battery" and "band battery" lineups with high flexibility and a highly integrated energy density. The stripe battery boasts impressive versatility of applications such as necklaces, hair bands, and T-shirt decorations in various shapes. We implemented advanced materials technologies for the interior and exterior materials designs. Increasing the energy density and efficiency was also our main focus, which we made it by minimizing the sealing width, even at the ultra-slim thickness of 0.3 mm. The

band battery was successfully verified through rigorous testing of more than 50,000 times bending within the curvature range of wrist circumference.



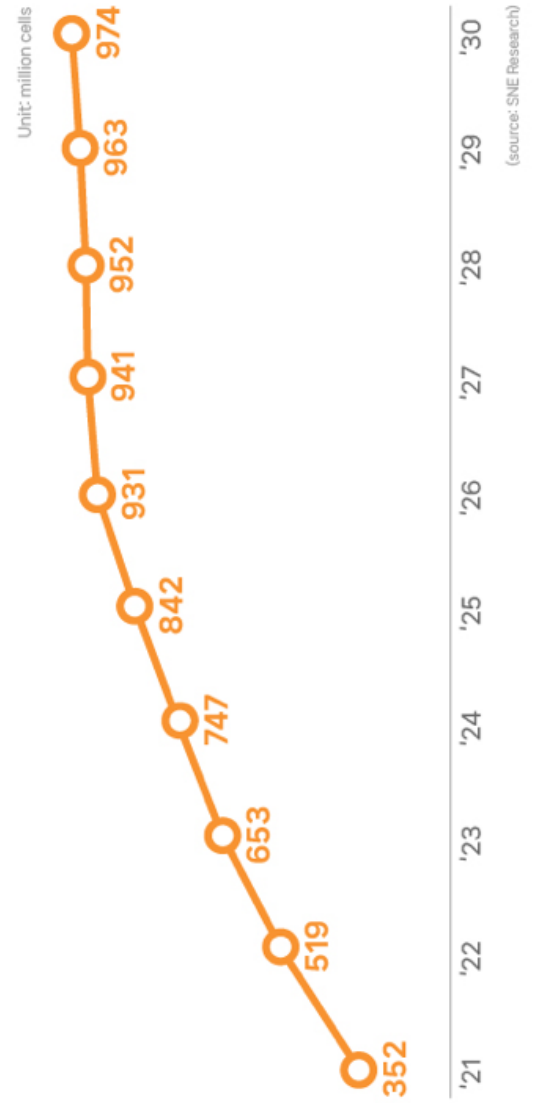
[SAMSUNG SDI's stripe battery and band battery]

Coin cells are all the rage

The batteries for small wearable devices should carry substantial capacity in a compact size as they should operate for an extended time. Also known as a button cell, a “coin cell” is a coin-shaped battery where those features are materialized. The most common dimensions of coin cell are only 12 mm in diameter and 5.4 mm in height with one-twentieth of the volume of standard cylindrical batteries (diameter: 18 mm, height: 65 mm). SAMSUNG SDI's coin cells are installed in a wide range of wireless earbuds including the SAMSUNG Galaxy Buds series.



[SAMSUNG SDI's battery for wireless earbuds]



[The growth of the coin cell market for wearable devices]

Many latest smartphone models come out without any headphone jack as more people have begun to use wireless earbuds instead of wired audio devices. The rising popularity of wearable devices like smartwatches and fitness trackers is really remarkable. According to SNE Research, the coin cell market will expand from 352 million cells in 2021 to 974 million cells in 2030, showing a compound annual growth rate

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