Considerations for the Development of Wearable Devices in Fitness and Sports
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Since the mid-2000s, the sporting goods market has seen tremendous growth in wearable devices. This coincides with the advent of the smartphone, which has brought commodity-level pricing to the electronic components that wearable devices require. Smart phones have also solved the once-daunting challenge of how to display information collected by wearable devices to the user. Today, we use wearable devices to deliver information on everything from our heart rate and steps taken to our speed, acceleration, and power. This intertwining of health-and-performance-related data is melding the consumer products and medical device markets, where wearable devices initially targeted for a specific end use are being adapted to the needs and regulatory restrictions of other markets. While all this is welcome progress, sporting goods manufacturers will need to navigate important safety, regulatory, and supply-chain considerations when bringing a wearable device to market.

First, sporting goods manufacturers should consider whether a business case to bring a new wearable to market even exists. There is no denying the consumer demand for wearable devices in sports. Professional and recreational athletes alike have responded favorably to the opportunity to track relevant performance data and take action in real time. Many of us up our game by sharing data with coaches, trainers, or social circles. However, consumer demand alone is often not a sufficient reason for market entry. The key to understanding the business case may lie in answers to the following questions: What can a manufacturer offer that is new and different? Does it understand the timing and complexity of the wearable device R&D process? Does it have the appropriate partners and processes in place to support the development of a safe and regulatory compliant product? Some sporting goods companies have chosen to invest heavily in the wearable technology space and have actively built hardware into their products. Others, including many of the prevalent sporting goods brands, have acknowledged that they potentially lack the expertise required in the wearables space and have either walked away or partnered with electronic device companies.

Sporting goods manufacturers who do choose to invest in the development of wearable devices will typically conduct a wide array of tests to ensure their products are safe. Examples include materials testing for allergic skin reactions, electrical testing for shock and overheating, mechanical testing for wear and tear, testing for battery failure, and testing for immunity to electromagnetic interference (EMI). Beyond product safety, other factors to consider include data security and overall usability of the application itself.

Most wearable device manufacturers choose to outsource the electronic and other components used in their products, and it is critical that they select well-qualified, reliable supply-chain partners that can adhere to relevant safety and regulatory considerations. As the regulatory landscape is shifting to Hazard-Based Safety...
Engineering, safety standards based on IEC 62368-1 are superseding existing standards worldwide. Further, although no standard currently exists for the accuracy of output information from a wearable device, consumers are demanding accuracy in the information provided by their wearable.

Many companies making wearable devices choose to partner with an independent, third party to add efficiency and expertise on the front-end of the development process. Exponent’s multidisciplinary team of engineers, scientists, and sports technology experts can support wearable device developers with early-stage R&D, core technology development, battery and electrical testing, human factors assessment, supply-chain sourcing, manufacturing statistics, regulatory support, quality control, and more.