# Medical Wearable Dispensing Application

Dispensing of a high viscous grease with an eco-PEN330 preeflow dispenser

Most people think of smart watches when it comes to wearables. But there is much more! On the market of consumer electronics, you can find for example hearables, augmented & virtual reality glasses or smart rings. In the sports sector there are fitness trackers, sports watches, smart shoes, and smart belts. An obvious trend in fashion is smart clothing and e-textiles. But even that is only the tip of the iceberg.

One very important market of wearable devices is medical and healthcare. Here wearables already fulfill diverse functions of medical devices. Monitoring vital functions like heartrate, oxygen level, body temperature and respiratory rate are already standard applications. State-of-the Art wearables have a great reliability, precision and are small in space. This makes a medical wearable a multifunctional tool for the medical sector.

Especially the wear comfort, the flexible usability and the connectivity of wearables makes them superior to conventional medical devices. These technology advancements are possible through progress in sensor technology, power management and transmitter technology.

To achieve these advancements, the production method must also make progress - and with it the fluid management. In most production processes fluids must be applied fully automated with a high degree of repeatability. Processed fluids are for example adhesives, silicones, thermally and electrically conductive materials or greases.

Several dispensing applications for medical wearables are done with ViscoTec’s preeflow dispensers.

* Batteries are bonded inside the housing.
* In the power management thermally, conductive pastes are applied.
* Processors are coated or underfilled with an appropriate resin.
* RF-Modules are attached and bonded, also with electrically conductive materials if necessary.
* Actuators like displays are sealed and bonded.
* Sensors are sealed, encapsulated, and bonded.
* In general, Micro-Electronic-Mechanical Systems (MEMS) are bonded or encapsulated with a suitable adhesive.

The proven ViscoTec endless piston principle enables a purely volumetric and pulsation-free dispensing. Whether for low or high viscosity materials, with or without filler content. The high repeatability of more than 99 % ensures an optimal solution for typical dispensing applications in the production of medical wearables.

Application example medical wearables for diabetes management

One of the high potential segments for medical wearables is diabetes management. The U.S. digital diabetes management market size has a compound annual growth rate of roughly 20 %. This growth is mainly traced by continuous glucose monitoring, smart glucose meters and closed loop systems.

Frazel D’souza, Senior Sales Engineer at ViscoTec India, is responsible for an interesting application of a closed loop system: Such a system consists of a skin patch that measures the glucose level in the blood, a device that calculates the dose of insulin and a smart insulin pump that injects the drug. The application is to precisely dispense a defined volume of grease into a gearbox component of the electric motor of the insulin pump. The main issue of the customer was, to precisely dispense a 0.7 microliter dot of a high viscous grease. The high requirements could be fulfilled with the preeflow eco-PEN330. The dispensing system is used by a customer in Western India and the manufacturer of the closed loop system is in the United States.

Further information about the high-precision dispensers of the preeflow brand can be found here: <https://www.preeflow.com/produkte/>

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Pictures:



Digital headwear equipment sensor connected to the ear. Source: Adobe Stock



preeflow eco-PEN330

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Microdispensing to perfection!

preeflow® is a brand name powered by ViscoTec Pumpen- u. Dosiertechnik GmbH. ViscoTec primarily deals in systems required for conveying, dispensing, applying, filling and emptying medium to high-viscosity fluids. The headquarters of the technological market leader is in Töging (upper Bavaria, near Munich). In addition, ViscoTec has subsidiaries in the USA, in China, Singapore, Indie and in France and employs about 260 people worldwide. Established in 2008, preeflow® ensures precise, purely volumetric dispensing of liquids in the smallest of quantities. preeflow® products are appreciated worldwide, not to mention because of their unique quality - Made in Germany. An international distribution network offers professional service and support in all areas of preeflow® dispensing systems. The various fields of application include, among others, automotive, electrical and electronics industry, medical technology, aerospace, renewable energies, electrical and hybrid technology and measurement and sensor technology. The complete preeflow® portfolio can be easily integrated due to standardized interfaces. Worldwide more than 20,000 preeflow® systems are working in semi- or fully-automated dispensing applications ­ to the user’s and customer's complete satisfaction.

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