

Project Note

Hormone release with patches instead of injections

A medical technology company wanted to increase the permeability of the skin with a hand laser device. Zühlke developed the device housing, the disposable unit, and the deflection unit for the laser.

Task

The hormonal treatment for in-vitro fertilisation (IVF) shall be handled in future with medical patches instead of injections. In order to achieve this pain-free form of medication, Pantec developed a manual device that creates tiny pores in the skin - a condition precedent for the therapeutic efficacy. A laser renders the skin permeable for the active ingredients on the patch. Along with IVF, Pantec has several large molecular active ingredients in the pipeline that have to be injected over extended periods of time.

Zühlke was asked to develop the housing and plastic disposable units for this highly miniaturized system as well as a moving deflection unit for the laser (scanner). The scanner deflects the laser beam in five seconds, enabling up to 900 pores to be created in a defined pattern in the skin.

Implementation

Zühlke engineers worked with the customer in reviews and FMEA's to identify the biggest risks for mechanics, electronics and optics throughout the system and to determine how to proceed. After the system architecture was optimised, the housing was designed in collaboration with an external designer and the free form surfaces were modelled in CAD. To achieve high strength values with minimal wall thickness for the disposable unit, the Zühlke experts conducted FEM calculations and simulated injectability with mould-flow filling studies. The existing approaches were checked and new mechanical solutions were developed to stay beneath the budgeted limits for scanner production costs. Along with development, Zühlke assisted the customer in writing the specifications for submitting the product to the FDA.



Technical Data

Solid Works 2008

Ansys

Moldflow Plastic Advisor

ProE Wildfire 4

Customer benefits

- The team's interdisciplinary collaboration yielded innovative solutions for integrating the required functions in a minimal space.
- The ambitious deadlines were met thanks to the experts' flexibility.
- Zühlke coordinated the interfaces with design and plastic injector so the customer had only one contact partner with whom to deal.

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