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the boundaries of possible

LIFE SCIENCE CASE STUDY

DENTAL ROOT CANAL EQUIPMENT DESIGN & SUBASSEMBLY

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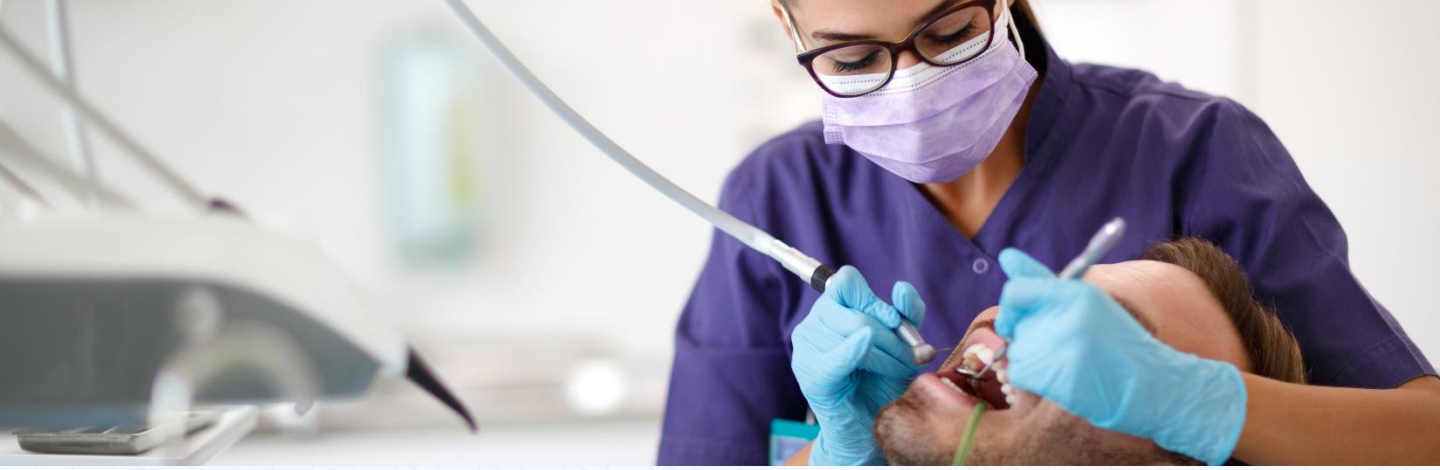

MELDIN® HT THERMOPLASTICS

Dental Root Canal Equipment Design & Subassembly

Clara Soueve March 2023

TIGHT SPECIFICATIONS COMPLETE DESIGN & TOOLING SERVICES CLEAN ROOM SUBASSEMBLY

Environment

Root canals are complex dental procedures that require specialized tools including equipment such as endodontic burs, excavators, files, reamers, drills and ultrasonic instruments. In this unique application, a single-use, disposable head handpiece is used to integrate rinsing and suction for cleaning and disinfection. The hand-held, medical device operates with a 0.4 mm amplitude vertical vibration and 5,000 rpm motor. The handpiece head is designed to sustain prolonged exposure to sodium hypochlorite and fits a wide variety of low-speed motors used in current endodontic handpieces.

Challenge

Customer was looking for a trusted partner with tooling, injection molding, production and assembly capabilities but also support with ISO 13485 certification. Their precision requirements included: 1) Material selection that was medical and food grade as well as being autoclave capable; 2) Co-development and design optimization for 12 unique parts with each component having a unique, defined tolerance; 3) optimizing the manufacture and assembly of the components along with testing adhesion options; and 4) Running tests and assembly options for operating conditions at one hour runtime per system use.

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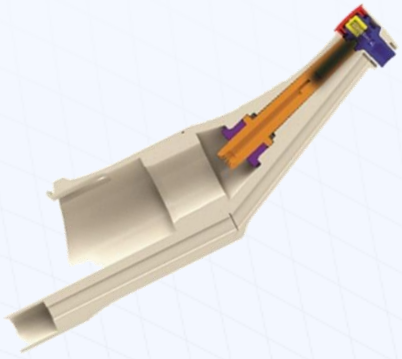

Solution

Our technical team developed a final assembly and design with custom and extraordinary functionality for this unique dental root canal equipment. Using our engineering support and expertise for multiple material selections and medical grade options, we were able to select the right materials that included PEEK, polycarbonate, polybutylene terephthalate, and polyoxymethylene.

Each part was designed to meet a tight tolerance, manufacturing repeatability and quality standard. Since a prototype was needed very quickly, our capability to design the solution and manage tooling / production inhouse allowed us to meet the quick turnaround successfully. Due to this rapid response and agility, the finished solution not only met the operating condition targets but also, component tolerances to 0.02 mm were achieved and quality was approved.

Precision dental tools need precision solutions! Go beyond with sealing and material experts in life science engineering.

Benefits

- High-performance polymers: Meldin ® thermoplastics, PVDF, ETFE, PAI, PEEK, and thermoplastic elastomer options
- In-house research & development, tool fabrication and design, compounding, processing inspection and material testing labs (full-service abilities)
- Online process monitoring and control, 100% visual inspection and 100% functional inspection
- Clean room manufacturing from production, finished subassemblies and packaging
- Custom designs with wide range of sizes and materials, compliant with FDA and USP Class VI requirements

Omniseal Solutions
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Design Expertise & Tailor-made Solutions for Your Critical Applications

Omniseal Solutions™ is a global engineering leader with over 65 years of historical legacy, relentlessly dedicated to the design and manufacture of precision sealing and material solutions that protect critical applications in the most demanding environments and passionately driven to push *Beyond the Boundaries of Possible*.

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Let's go BEYOND the boundaries of possible

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