# Polymer Delivers High Heat Resistance to Improve Performance of Dental Bite Stick

Victrex

**When Dentronix, a Coltene/Whaledent subsidiary, was designing its new "High Heat" bite stick, it needed a material that could withstand the high temperature requirements of dry-heat sterilizers. It chose Victrex Peek (a high performance polymer used in many high-end medical applications) because of the material's superior combination of properties.**

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A bite stick is an orthodontic instrument used to seat bands on a tooth. The orthodontist places the band on a patient's tooth and then positions the bite stick so that when the patient bites down on the top portion, the metal insert helps slide the band in place. "Impact strength is important because the bite stick is used to mechanically seat a band on a tooth," explained Mark Van Meter, Engineer at Coltene Whaledent. "We needed a material that was strong enough to withstand the forces associated with the bite, and Victrex [1] Peek polymer meets the bite pressure requirements."

According to Van Meter, "The most important requirement for the new design was

the ability of the stick to withstand multiple cycles in a dry-heat sterilizer. A dry-heat sterilizer heats the chamber up to 190°C. Within the chamber, however, temperatures can go up to 216°C. Victrex Peek polymer gives the stick the ability to withstand at least 50 cycles in the dry-heat sterilizer with no loss of properties, or change in shape or color."

In addition to being able to withstand the high temperatures of the dry-heat sterilizer, the bite stick also needed to be able to withstand sterilization in an autoclave, as well as sterilization in solutions such as glutaraldehyde, peracetic acid, and hydrogen peroxide. "Using Victrex Peek polymer has enabled us to produce a stick with excellent chemical resistance, as well as the ability to withstand autoclaves and dry-heat sterilization," said Van Meter.

When designing the new Dentronix bite stick, the company tested a variety of materials including polyphenylene sulfide (PPS) and found that Victrex Peek polymer had the best combination of material properties for this application. Van Meter commented on the technical support of the Victrex team during the design phase. "They sent samples for us to try in our own injection molding machines and helped out with processing parameters," he said. "When it became apparent that we were not going to be able to run the material on our presses, they put us in touch with Performance Plastics, Ltd., a high performance injection molding specialist."

According to Joe Simmons, Sales Engineer with Performance Plastics, "We've successfully used Victrex Peek polymer in a wide range of applications over the years. Its superior combination of properties, including temperature performance, chemical resistance, and impact resistance make it a highly cost-effective solution for improving performance."

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[1] http://www.victrex.com