Manufacturing Source Provides Product Enhancements And Precision Machining Of 22 Different Components

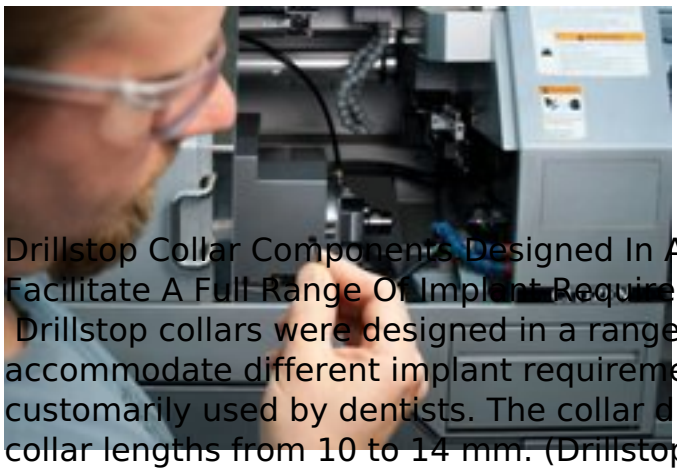
Liam Quirke

Marshall Manufacturing Company was chosen by Dr. Emil Verban to manufacture the patented Drillstops®, which increase the safety and precision of dental implant procedures. In use, a tiny set-screw locks the stop to the drill bit, the stop rotates with the drill bit while avoiding tissue damage as the drill penetrates the bone.

“Drillstops®” provides a precise method of drilling for accurate implant placement avoiding drilling too deep.

Dr. Emil Verban chose Marshall Manufacturing [1] to machine Drillstops because they were a registered medical device component manufacturer with complete Swiss machining capabilities. Marshall Manufacturing's newer multi-function Swiss machines were best suited because Drillstops equipped numerous turning and milling operations. Their machines could perform all of the needed operations on one machine in a single setup. Marshall Manufacturing’s medical device manufacturing expertise allows them to suggest process changes that make the product easier to manufacture and improve product performance.

“We chose Marshall Manufacturing because of their up-to-date capabilities and willingness to help us with our early prototypes,” reported Dr. Verban. “These included the efficient planning of the machining for all 22 components in a Drillstops kit. Marshall’s manufacturing experience resulted in improvements to the component finishes and the addition of laser marking for permanent product identification.”



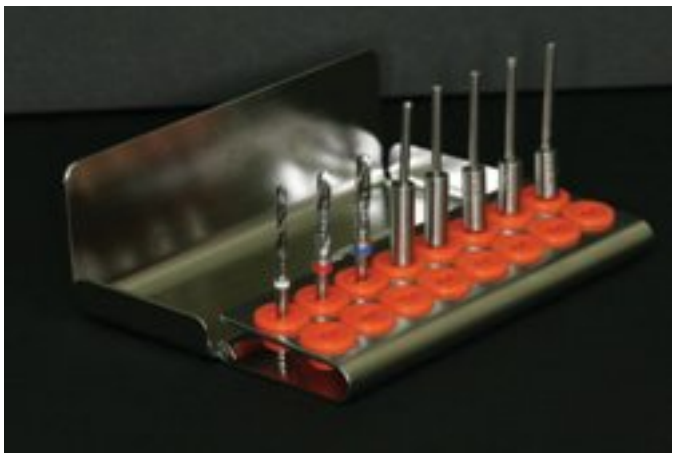
Marshall Manufacturing's single setup machining operation on its Citizen L20 machine include over a dozen milling, drilling, boring and finishing operations.

Drillstop Collar Components Designed In A Range Of Diameters And Lengths To Facilitate A Full Range Of Implant Requirements

Drillstop collars were designed in a range of diameters and lengths to accommodate different implant requirements and to fit the range of drill bit sizes customarily used by dentists. The collar diameters range from 6 to 13 mm and collar lengths from 10 to 14 mm. (Drillstops do not include drill bits which are purchased separately).

Marshall Manufacturing machines these collar components on their Citizen L20 Swiss machines equipped with CAV20-IS bar feeders. Designed for ultra-precision, high productivity work, these machines have a main spindle and secondary spindle that share machining operations. The main spindle offers maximum rotational speed of 10,000 rpm while the secondary spindle offers 8,000 rpm.

The Citizen CNC Swiss machine that Drillstops components are machined on are specifically designed for small-diameters. The components are machined from 303 stainless steel in 12-foot bar stock lengths in 3/16 and ¼ inch diameters. 303 stainless steel is an FDA approved material used in the manufacture of dental instruments.



A Drillstops kit has collar diameters from 6 to 13 mm and lengths from 10 to 14 mm.

Marshall's single setup Swiss machining operation of the Drillstops include: turning O.D. to size by the machine's primary spindle, followed by facing, drilling and boring to specified depth. A cross hole is drilled and tapped for the Drillstop set-screw. A flat is milled on the part with the machine's end mill. The machine's secondary spindle then collets onto the part at which point the part is cut from the bar stock. The secondary spindle then faces off the back-side of the part, puts a radius on the part's outer diameter and the part's inner diameter through-hole.

Spindle speeds vary according to the operation and ramp up to the machine

maximum where possible. The machining process takes less than two minutes per part. Accuracy on critical surfaces is .0005 inch. Certain parts in the kit of Drillstops components are bead blasted to a matte finish to minimize glare when in use while others in the kit are laser marked for easy identification. As a final step, all collar components are passivated to remove impurities on surfaces to avoid corrosion.

“We’re pleased with Marshall Manufacturing’s help in this success and are now working with them on another unique dental instrument we hope to announce soon,” reports Dr. Verban.

Liam Quirke works for the Connectivity Group and he has produced detailed market analysis on Bluetooth Headsets and Indoor Positioning. In addition, Liam has developed end-user surveys for the Bluetooth Headset and Sports & Fitness markets. Moving forward, he will be responsible for the Connectivity Group's Bluetooth research. Liam also holds a first class bachelor's degree in Economics.

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Links:
[1] http://www.marshallmfg.com