



WorkNC[®] DENTAL

WorkNC Dental CAD/CAM enables innovative prosthesis manufacture at FDZ



« WorkNC's machining wizards are so easy to use that even a dental technician without CAM experience can rapidly achieve good results. »

Manuela Giuliano, FDZ, Germany

Highlights

- WorkNC Dental's machining wizards have been designed to produce optimized toolpaths for each type of prosthesis and for each particular material type including the newest and most advanced
- As well as 4-axis machining, WorkNC Dental can machine undercut areas by generating safe collision free 5-axis simultaneous toolpaths that consider the milling machine's kinematics
- WorkNC Dental includes dedicated cutterpaths for complex parts, such as partial frameworks, expanding the range of products FDZ can offer to dental professionals

■ Specialists in new materials and processes

WorkNC Dental CAD/CAM software has helped skilled dental technicians, Manuela Giuliano and Peter Mielecke, to offer dental laboratories and dental surgeries the very latest prosthetic techniques. They formed FDZ in Neu-Ulm, Germany in 2009. FDZ's aim is to turn scanned data into accurately fitting bridges, crowns, and inlays through CNC machining of the most advanced prosthetic materials used in dentistry.

The company uses a 5-axis Kavo machining center combined with a scanner and WorkNC Dental CAD/CAM software, and specializes in the newest processes for plastics and silicone. As well as providing services to dental laboratories, the company

also focuses on the requirements of oral and orthopaedic surgeons. Peter Mielecke explains: "We are currently focusing on bridges, crowns, inlays and caps, specializing in machined semi-finished products. Implant technology is an important sector for us. We offer a complete service including planning, producing the scan and creating the drilling jigs. By combining our knowledge of CAD/CAM, CNC machining, and the properties of new plastic materials, we can offer innovative solutions for partial framework technology, making it possible to rectify dysfunctions in the temporomandibular joint."



■ Significant benefits of an open CAD/CAM system

Manuela Giuliano is a supporter of open systems for prosthesis manufacture and asserts that the ability of the company to offer its clients a digital process chain is key to its success. *"An open system enables users to work with a neutral data format such as STL, choose the most appropriate CNC machine, work from scanned data from many different sources, and machine a wide range of materials. It provides fertile ground for new ideas, and often produces a cost-saving."* With closed systems, the hardware and software come from a single vendor. Generally, they consist of a scanner with the relevant software, a proprietary CAD system and the milling machine. The job follows a predefined process, and uses a proprietary data format, which is not compatible with other machines or systems. Manuela Giuliano adds, *"Closed systems make it impossible for users to deviate from the predefined process and develop new ideas. Moreover, they are forced to purchase materials and tools from the system vendors, which can result in higher costs."*

■ The advantages of WorkNC Dental

FDZ evaluated many open dental systems before choosing Sescoid's WorkNC Dental. Manuela Giuliano explains *"WorkNC Dental imports and exports STL data, and includes direct interfaces for many different types of*

machining center. The software has numerous machining strategies enabling us to develop advanced manufacturing techniques, and its machining wizards are so easy to use that even a dental technician without CAM experience can rapidly achieve good results."

Sescoid helped FDZ to quickly set up WorkNC Dental to drive its Kavo machining centre. Programs prepared by Manuela Giuliano are downloaded via a network to the machine. As well as 3-axis machining, the software can machine undercut areas by generating safe 5-axis simultaneous toolpaths that consider the milling machine's kinematics. *"Collision control is a prerequisite for 5-axis simultaneous machining. With WorkNC, we are also able to view toolpaths and to carry out dynamic toolpath simulation."*

■ Optimized toolpaths for each prosthesis and material type

WorkNC Dental's machining wizards have been designed to produce optimized toolpaths for each type of prosthesis for example, crown, bridge or partial framework, and for particular material types such as zircon, titan, PEEK, chrome cobalt and PMMA. The user is guided through the program preparation process step by step, selecting the material blank size, the material type, the machining center, and the support pins. Material shrinkage can be allowed for in sintered materials such as zircon, and multiple prostheses can be nested in one blank to maximize material utilization.

New materials can be added to the WorkNC Dental material library, which is an important benefit for FDZ. Peter Mielecke says, *"There is a trend in the dental sector to move from traditional to new materials, through the use of*

state of the art hypoallergenic materials such as PEEK, which is often implanted during spinal disc and knee operations. We can achieve flawless results machining it in WorkNC Dental. Many of our competitors have significant problems when trying to cut PEEK."

■ Machining complex parts

Newly developed in WorkNC Dental is a set of machining strategies for partial frameworks. FDZ found that other systems could not offer this functionality or, if they did, that they did not work correctly. These complex parts are very different from crowns and bridges and hence require dedicated cutterpaths, expanding the range of products FDZ can offer to dental professionals.

Sescoid has worked with FDZ to develop extra capabilities for machining delicate parts. This allows the company to suspend machining to allow tools to be changed or so that the component can be secured by wax in a special mold for the subsequent machining operations. Using this innovative clamping method makes the use of support pins unnecessary, allows thinner walls to be produced, and enables the company to make full use of the 30 degree tilt angle available on the machine.

■ Support and partnership

FDZ is so satisfied with the WorkNC Dental software and the success of its cooperation with Sescoid that it has now become a reseller for the CAM software. Manuela Giuliano has the last word; *"The excellent technical support provided by Sescoid is very important to us. Its response times are fast and it is extremely competent."*