ACMIT

Austrian Center for Medical Innovation and Technology

Hauptstandort	Wiener Neustadt, Niederösterreich
weitere Standorte	
Thematische Schwerpunkte	R&D for instruments, robots and sensor-systems for surgical minimal invasive procedures

Success Story Kurzversion

Idle Speed Limiter for dental drills goes easy on patient, doctor and instrument.

High rotation speeds of air driven dental instruments are generating undesirable noise which are a disturbance for doctors and patients. At the same time high speeds are reducing material lifetime of highly stressed instrument components. With the development of an electromagnetic break system, which operates without external energy source, it was possible to reduce operating noise and significantly prolong the lifetime expectancy.

Success Story Langversion

Air driven dental drills can reach idle rotation speeds of 400.000 rpm. When during a treatment the drill comes into contact with the teeth, rotation speeds drop to approx. 250.000 rpm - which is the optimal cutting speed. The difference between idle and cutting speed is required to have enough energy to cut the hard dental enamel.

However, such high rotation speeds have considerable disadvantages. A high pitch sound is generated during idling which is perceived as displeasing by patients and can in long term cause hearing problems for doctors. At the same time the slightest unbalance of the drill at these speeds will introduce high stress to the bearings and other parts of the instrument thus shorten service intervals.

ACMIT's goal was to develop a system to effectively counter the above mentioned problems. As part of instrument improvements this task was assigned to ACMIT Research Area 1, which in return was able to develop a prototype of a self-sustaining electromagnetic speed limiter in less than 12 months. The prototype has been integrated into an instrument head with 9mm diameter, consisting of magnetic materials with a thickness of 0.075mm and wires with diameters of 0.1mm. The prototype limits idle speeds to a range close to the optimal cutting speed without sacrificing the required power for cutting. Actual speed limitation is controlled by miniaturized electronics which are encapsulated and sterilisable.

A series of tests have verified the applicability of this technology.

Advantages of the new system

Besides improving treatment quality for patients and reducing noise exposure of doctors this new system can also significantly reduce wear and thus maintenance cost for the user.

ACMIT services

The development of the prototype takes place in close co-operation with W&H Dentalwerk Bürmoos GmbH and the competence center **"Austrian Center for Medical Innovation and Technology" (ACMIT)**. ACMIT was responsible for technical research and development tasks as well as the production of prototypes and pre-testing for further functional and sterilisation tests.

contact:	ACMIT – Austrian Center for Medical Innovation and Technology www.acmit.at DI. Christoph KMENT, Research Area Manager, Research Area 1 Viktor Kaplan Str. 2, 2700 Wiener Neustadt Christoph.Kment@acmit.at