



Intelligent drilling machine made with igus bearings improves bone fracture operations

University students used iglide L500 plain bearings in the “Smart Drill” project

In a project called “Smart Drill,” students from Germany’s Bremen Institute of Measurement Technology, Automation and Quality Science (BIMAQ) developed an attachment for a medical drill with the goal of improving the safety of bone fracture operations. When fixing a fracture in osteosynthesis, or by means of surgically uniting the ends of the fracture, it is often necessary for doctors to make screw connections inside of the bone. In this process, the length of the screw must be precise in order to avoid injuring the surrounding tissue structure, and simultaneously to ensure sufficient strength. Determining the bone diameter and depth of the hole can only be ascertained in advance and is established during operation with a gauge. This is currently dependent on the operator’s experience and can lead to errors in screw selection. Thus, to make this process more secure, students at BIMAQ developed an attachment for the existing medical drill that properly measures the length of screws. During the drilling process, the attachment measures the depth of the hole in order to determine the correct screw. Self-lubricating igus bearings made of high performance polymers are used at the bearing points of the drive shaft.

iglide L500 demonstrates high wear resistance

The medical drilling machine required an optimal bearing to be developed in different speed and vibration frequency ranges without putting a negative influence on the system. “The combination of rotary drive and axial vibration requires the use of high-quality plain bearings, not only to implement freedom of movement in the axial direction, but also to achieve the most accurate signals possible at high vibration frequencies,” said Michael Sorg of BIMAQ. To cover these requirements, various iglide bearing materials were compared and iglide L500 was selected as the best option. The material offers low friction values and high wear resistance, allowing for both rotary and axial movement in bearing applications. The iglide L500 is far from its load limit at speeds of up to 900 revolutions per minute, and is able to withstand the extreme temperatures of medical sterilization processes. Additionally important, the iglide L500 material is moisture resistant, absorbing only slight amounts, and is completely self-lubricating. Therefore, there is no

risk of contamination of the wound or premature bearing failure due to lubricant washout. The bearing thus meets the hygienic requirements of medical technology. The low installation sizes and the very light weight of iglide L500 compared to bearings made of metallic materials are also ideal.

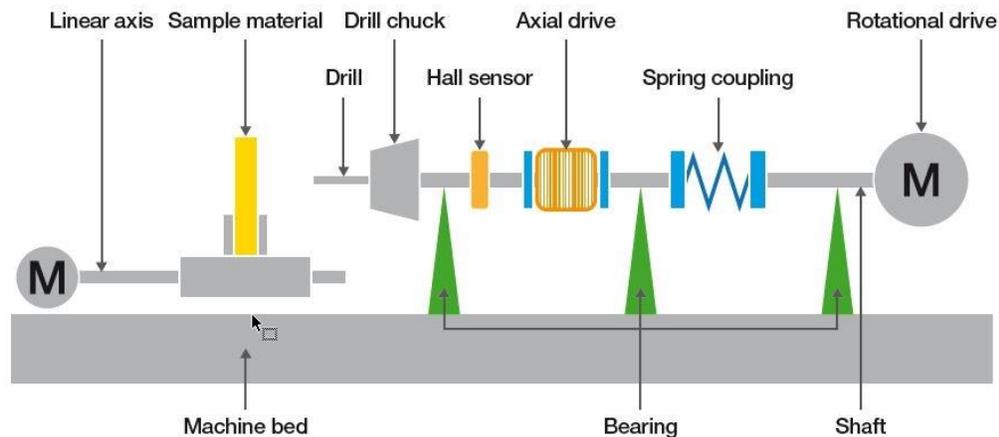
Captions:



Picture PM5717-1

In an attachment for a medical drill that measures the depth of the resulting hole during the drilling process, the developers rely on the self-lubricating iglide L500 bearing from igus.

(Source: igus GmbH)



Picture PM5717-2

Maintenance-free iglide L500 plain bearings are used to mount the shaft on the drill chuck, on the axial and rotational drive. (Source: igus GmbH)

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