

PRESS RELEASE | DENTSPLY FRIADENT

FRIADENT® plus: the implant surface inspired by nature

Unique surface structure confirmed to improve bone-implant contact

Mannheim, January 26, 2009 – **The FRIADENT® plus implant surface developed by DENTSPLY Friadent supports successful healing of the implant in the bone. As the developer of the first grit-blasted and acid-etched implant surface of all about 20 years ago, DENTSPLY Friadent is the center of competence for surface technology in the DENTSPLY group of companies. The innovative design of the FRIADENT® plus surface is the result of analysis of biological microsystems and following the successful example of nature. FRIADENT® plus is noted for a special, growth-activating structure, which causes the implant to heal faster and more easily. The surface guarantees proactive cell adhesion. It improves the contact between bone and implant, supports bone formation and increases the structural quality of the bone. The microdesign of the implants is based on BioPoreStructuring (BPS), a thermal etching process, a similar process to that which has only been used in microchip production previously. Nature was the model for the design of the FRIADENT® plus surface. The developers used surface patterns and designs from plants and animals as their inspiration.**

Osseointegration – the key to success

The optimum wetting properties of FRIADENT® plus make it possible: bone-forming cells (osteoblasts) are deposited quickly and in great numbers on the implant surface via a temporary network of connective tissue (fibrin network). This type of proactive cell adhesion forces cellular spreading and proliferation. Bone-forming cells differentiate faster on the homogenous FRIADENT® plus

microstructure than on conventional surfaces, thereby significantly accelerating bone formation. As the bone heals, cellular bridges are formed, which span distances greater than 100 times the actual size of the cells. Cellular bridges of this type have been confirmed for the first time on the FRIADENT® plus surface.

Comparative in-vivo trials have confirmed the increased bone-implant contact on the FRIADENT® plus surface. The homogenous, three-dimensional microdesign of the FRIADENT® plus surface guarantees an even density of initial cell deposition. In combination with the macrodesign it ensures that the implant is optimally inserted.

The accelerated deposition of the osteoblasts results in intensive bone formation in the early stages of osseointegration. This significantly improves the quality of the bone structure. Studies indicate that this ensures high secondary stability even in weak bone. This means that the FRIADENT® plus surface also ensures greater safety during treatment of the upper and lower jaw.

The three-dimensional, bimodular microstructure is manufactured in two steps. The corundum blasting in the endosseous section of implant initially forms a defined primary microroughness of the titanium surface. Then the grit-blasted implants are subjected to a specific etching process.

New etching process: FRIADENT® BioPoreStructuring

The unique microstructure of the FRIADENT plus surface is created in a special thermal etching process. BioPoreStructuring has been developed by DENTSPLY Friadent in close cooperation with the leaders in the technology of etching. This high-temperature etching process has previously been confined to the manufacture of computer chips. In this process various acid components are mixed fully automatically and added. Highly sensitive detectors monitor all

parameters during the process and automatically correct deviations from setpoint values immediately. The acid on the implant surface establishes ideal physical, chemical and biological conditions for recruitment of bone-forming cells. The precise control of the etching process also guarantees homogeneity of the surface.

Consistent orientation to the principles of bionics

DENTSPLY Friadent was inspired by nature in designing the FRIADENT® plus surface. DENTSPLY Friadent has consistently taken advantage of the synergies involved in combining **biology** and **technics** to develop the principle of bionics. "Using the basic principles of nature as a template for new products is a successful means of achieving intelligent technical solution for tomorrow," says DENTSPLY Friadent Managing Director Dr. Werner Groll. "Nature provides top performance that has been proven for millions of years."

Long-term clinical success rate

Numerous studies confirm outstanding clinical results achieved with the FRIADENT® plus surface and can point to success rates of over 99 percent. The [FRIADENT® plus Bibliography](#) lists the most important scientific studies on basic research and the successful preclinical and clinical application of the FRIADENT® plus surface.

The FRIADENT® plus surface has been in clinical use since July 2003. All implant systems from DENTSPLY Friadent, ANKYLOS®, XiVE® and FRIALIT®, now come with the FRIADENT® plus surface.

DENTSPLY Friadent company portrait

DENTSPLY Friadent is the implant division of the American company DENTSPLY International, the world leader in the dental industry with over 9,000 employees in total. At its company headquarters in Mannheim, Germany, the implant specialist employs a staff of around 450 and is one of the most innovative and leading companies in its industry. The company is represented around the world with its own subsidiaries, DENTSPLY sister companies and dealers.

The functionally and esthetically sophisticated implant-based dental solutions allow people a self-confident and natural smile. With its brand implant systems ANKYLOS[®], XiVE[®] and FRIALIT[®], as well as its FRIOS[®] line of surgical instruments and bone replacement materials, DENTSPLY Friadent offers a comprehensive portfolio of dental prosthetic solutions with excellent clinical results. Alongside the strong product brands, the successful product range is rounded off with innovative technologies, such as computer-aided implantation with ExpertEase[™], the surface technology FRIADENT[®] plus or zirconia technology CERCON[®] in association with the world market leader DENTSPLY, and a practice marketing and practice management program tailored to practices offering implantology under the *stepps*[®] service brand.

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Publisher:

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