



tag dental

Micro surface

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T.A.G Dental implant surface treatment is a result of extensive experience and research which resulted in obtaining the best biological response.

The success and safety of dental implants is influenced by the surface composition. TAG's multi-stage cleaning process removes undesired residues derived from processing contamination.

T.A.G Dental, produces implants from medical biocompatible Titanium (Ti 6AL 4V ELI), according to ASTM F136. The surface quality is monitored by X-ray spectroscopy method and scanning microscopic analysis.

The surface of the implant is processed mechanically and chemically by: particles blasting and acid etching, with roughness from 1.8μ up to 2.2μ and morphology of the cavities from 2μ to 40μ .

The micro surface morphology roughness increases bone to implant contact.

This results in improvement of mechanical anchorage for better primary stability that favors the cellular adhesion.

Modification of the surface energy at the nano level to an osteoconductive and hydrophilic surface promotes an active ion interaction with the blood plasma for faster osseointegration and Bone to Implant Contact (BIC) distribution.





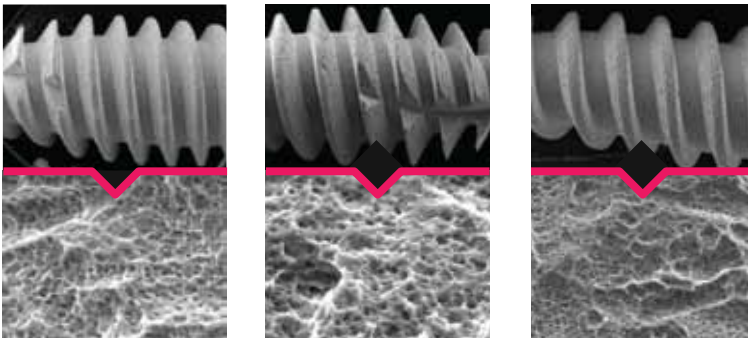
Analyses

The surface quality is evaluated using XPS and SEM showing typical chemical elements.

TAG implants quality has been checked by different Institutions. They confirm the high level cleaning and success of the repeatability in the process.

Technion, Institute of Technology- Israel

In higher magnification the micro porosity and roughness becomes clear. It shows an inhomogeneous image with elongated depressions of different sizes and crater formations. In the crater formations a more uniform microstructure shows with even smaller wells.



Scanning electron microscopy



Technion-Typical (XPS) that characterize the surface of the TAG Dental implant

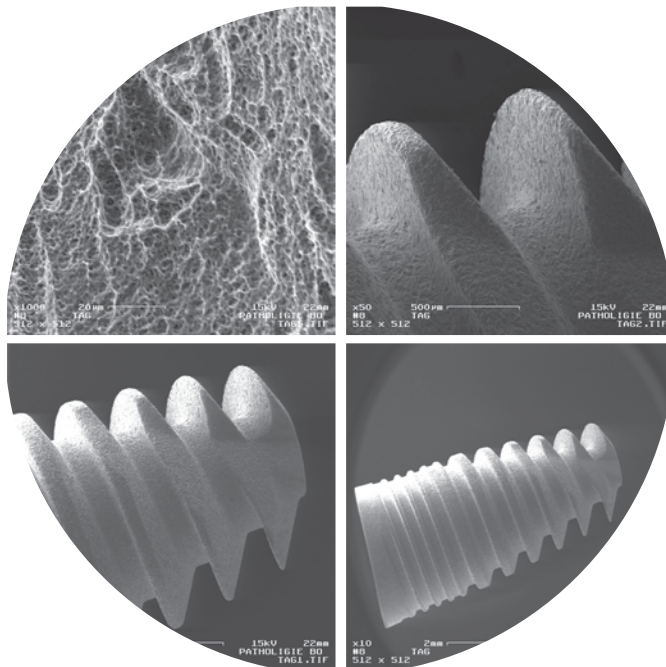
Implant	Area	C	Ti	O	N	Ca	Si	S	V	Cl	P	K	Al	Na	Mg	Zn
tag dental	#1	29.57	15.18	52.58	0.21	0.24	-	0.08	0.29	-	-	-	0.84	0.34	-	-
	#2	27.86	16.32	53.54	0.84	0.31	-	-	0.54	-	-	-	0.63	-	-	-

The surface quality is evaluated using XPS showing typical chemical elements without any unexpected elements.



Bochum University, Institute of Pathology- Germany

The qualitative elemental analysis (EDX) showed carbon, oxygen (carbon and oxygen are present in the analysis system is always detected), titanium and aluminum. The titanium peak (characteristic double peak) is attributable to the material. The sodium peak is negligible. The peaks for carbon and oxygen are at the beginning of the spectrum and are not labeled. No evidence of further elements.



In Vivo Testing Objective



Histological and histomorphometry analyses

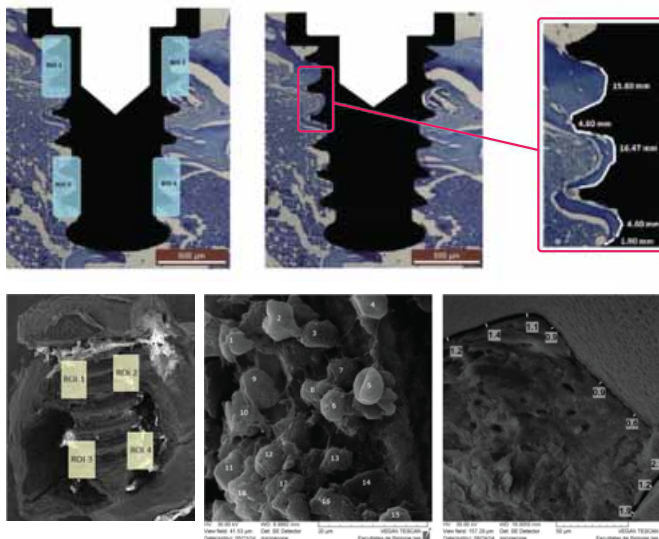
Histomorphometry was performed using digital image analysis software (Leica Qwin Proimage Leica Imaging Systems, Cambridge, UK).

Tests were performed after 12 weeks.

Four regions of interest (ROIs) for the evaluation of

A- Number of the osteoblasts

B- Bone implant interface



Results of the analysis of electron microscopy scanning

Scanning electron microscopy of surface samples with endosseous implants prepared by sandblasting and etching revealed that the implant was covered with new bone formed over a wide area in direct contact with the implant.

Summary and opinion

Surface analysis from 2 different institutes confirm that the surface quality of TAG implants and the repeatability in the process.

The results show clean implants having a microporous inhomogeneous surface structure. The irregular surface structure, micro porosity and roughness promote the ingrowth of bone cells.

Macroscopic examination of endosseous implant surface samples prepared by sandblasting and etching revealed that they were fully covered by bone and the microscopic images detected the presence of newly formed bone.

The new generation of implants developed by TAG Medical Company in Israel is a state of the art surface procedure. This treatment creates macro, micro and Nano surface structure, enlarging the Bone to Implant Contact (BIC), thus enabling fast healing and early restoration that contribute to high success rates.



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