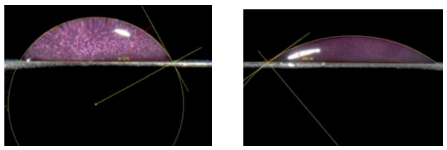
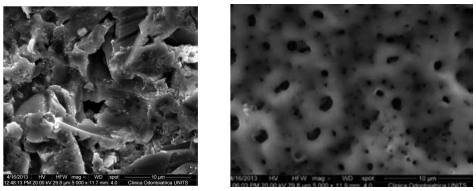
TRAITEMENT DE SURFACE :

University of Trieste carried out several tests ondental implants manufactured by GiesseTechnology.
The surface of Giesse implantsis processed by performing the HSS(High SpeedSurface)treatment. It consists of afirst step of sand blasting and sub sequently in an acid treatment.
HSS allows to havea greater wettability of the implant surface and ahomogeneous roughness produced by sand blasting and consequently a better bone regeneration,compared to a system with only sand blasted surfaceas we can seein the pictures below.



Wettability comparison bet ween implantonly san ded (left) and HSS treated (right). The lower contact angle be tween drop of serum forcell cultures and surface corresponds to better wettability.



Implant surface comparison: sand blasted only (left) and HSS treated (5000X magnification).

The homogeneity of the asperities and their better distribution on the HSS surface compared to only sandblasted.

The observations made by SEM are confirmed by the quantitative data supplied by surface profile.

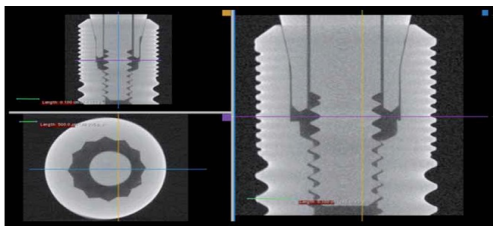
	Sandblasted samples	HSS samples
Ra (μm)	1.043±0.123	2.151±0.202
Rsk	- 0.143±0.589	- 0.038±0.168
Rku	4.488±1.656	2.887±0.258

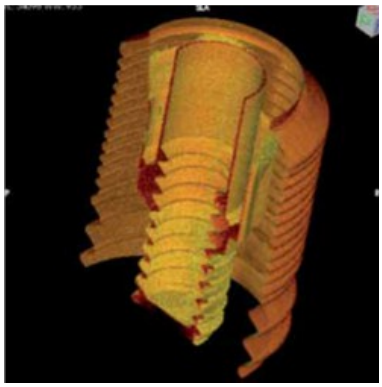
The average roughness, Ra, shows a value statistically lower than the sandblasted surface treatment compared to the HSS. The roughness generated by the sand are lower than those generated by the HSS treatment.

The standard deviations of the two roughness Kurtosis are high different for the two surface treatments. This is a further indication of the greater uniformity of the HSS treatment.

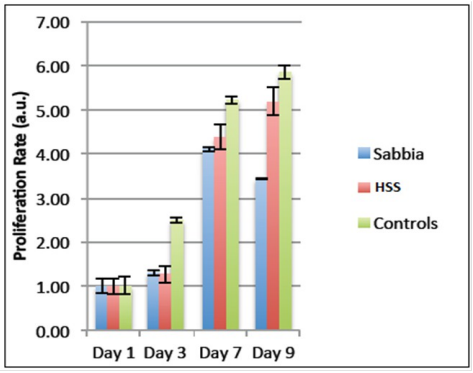
The samples treated HSS have a better purity compared to only sandblasted surface and a marked presence of phosphorous due to acid action performed on the surface. According to the literature this action could promote cell adhesion by the osteoblasts and increase quality osseointegration.

As regards the evaluation of the fixture-abutment fitting, tests allow to conclude the connection abutment-implant is highly coupled, with few and very reduced spaces between abutment and implant collar. These spaces are not sufficient to ensure penetration of bacterial agents. For these tests were considered implants with conical connection, technologically more complex to manufacture.





Finally it was performed a test of cellular proliferation where it's clearly visible the high level of adhesion to the substrate by the osteoblasts and the presence of many filopodia (in greater amounts as compared to implants only sandblasted). This allows a fast and excellent osseointegration of HSS implant (in red in the graph below) especially in the first days after surgery, thus increasing the chances of success, compared to a standard implant only sandblasted (in blue), both compared to a control (green).

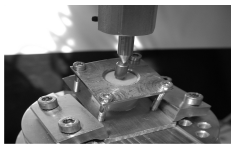


Conditions de réalisation des actes d'implantologie orale

N. 001 VALIDATION METHODE DE STERILISATION

N. 141 TESTS COMPARATIFS TECOM NOBEL BIOCARE SURFACES

N.408 ETUDE COMPARATIF SURFACES VERSUS STRAUMANN



MECHANICAL TESTS

N. 337 ADHESION CELLS SANDBLASTED IMPLANTS TEST

N. 357 CYTOTOXICITY TEST

N. 362 ADHESION CELLS TU IMPLANTS TEST

N. 435 BIOBURDEN TEST

N. 437 REALTIME PCR TU IMPLANTS TEST

N. 440 XPS TEST

N. 538 REALTIME PCR SANDBLASTED IMPLANTS TEST

N. 852 PYROGEN FREE TEST

N. 12527 BIOBURDEN TEST

N. 13391 STERILITY TEST

PRODUCTION PLAN

In vitro studies

Our cell culture lab offers cytotoxicity testing, evaluation of cell adhesion and growth, evaluation of cellular activity on implant materials surfaces, using the most suitable cell lines. Characterization involves optical and phase contrast microscopy, SEM and fluorescence microscopy. Cell activity and metabolism are evaluated through specific microplate tests or by gene expression through RT-PCR and PCR arrays

Adherent endotoxin on dental implant surfaces: a reappraisal.
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Effects of type I collagen coating on titanium osseointegration: histomorphometric, cellular and molecular analyses.
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