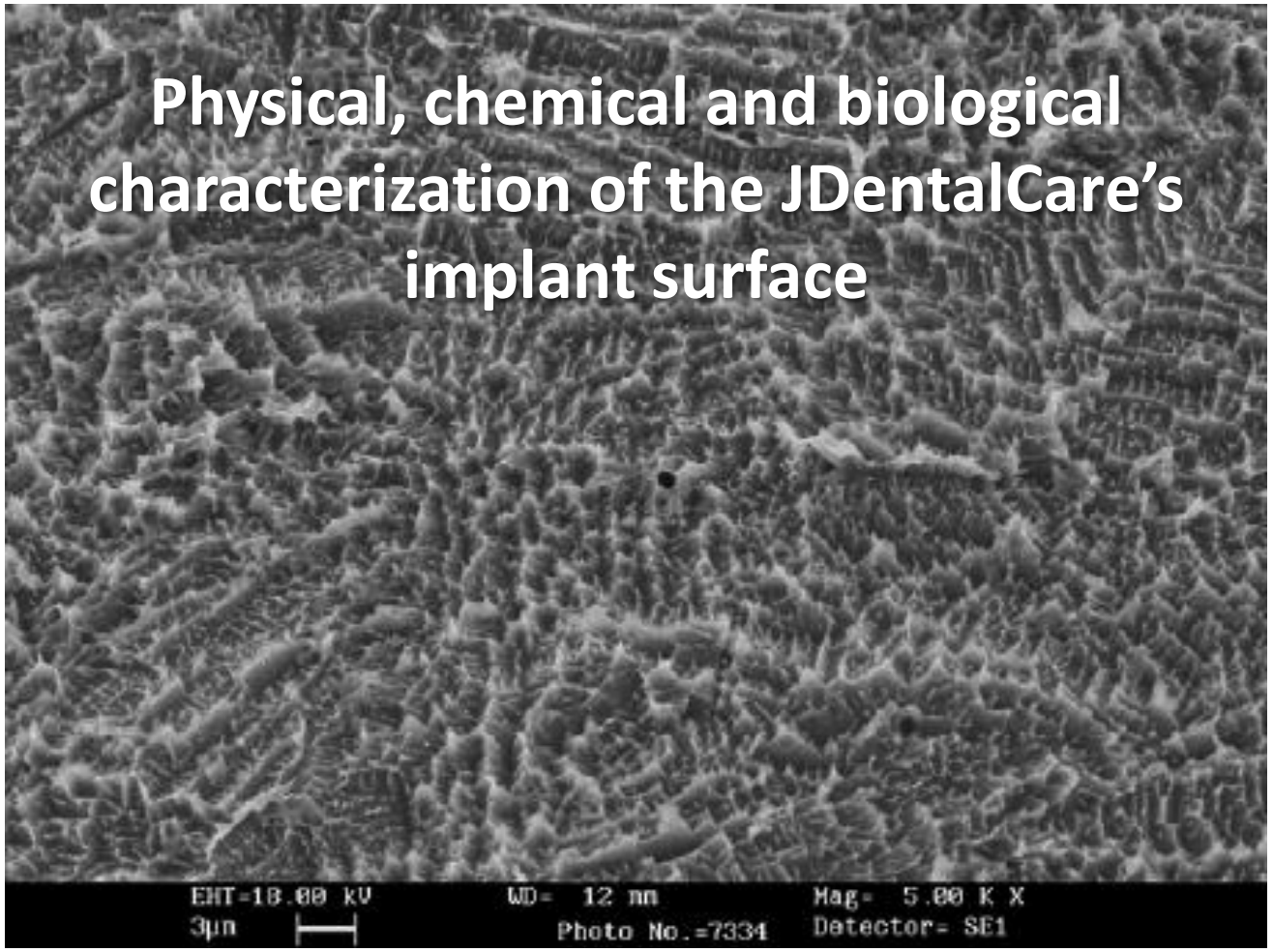
J DENTAL CARE

Physical, chemical and biological characterization of the JDentalCare's implant surface



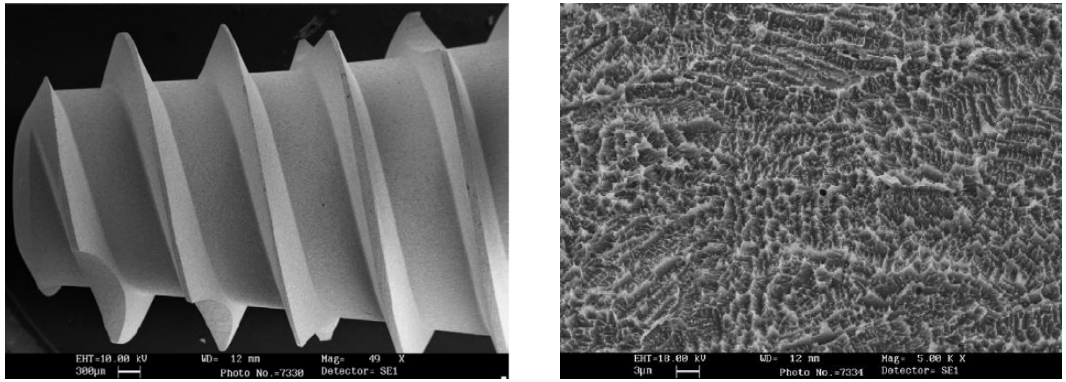
The quality system of JDentalCare Srl is certified with respect to EN ISO 13485. The dental implants and the surgical instruments of IIA class are certified by TUV Product Service CE 0123

JDentalCare's implant surface

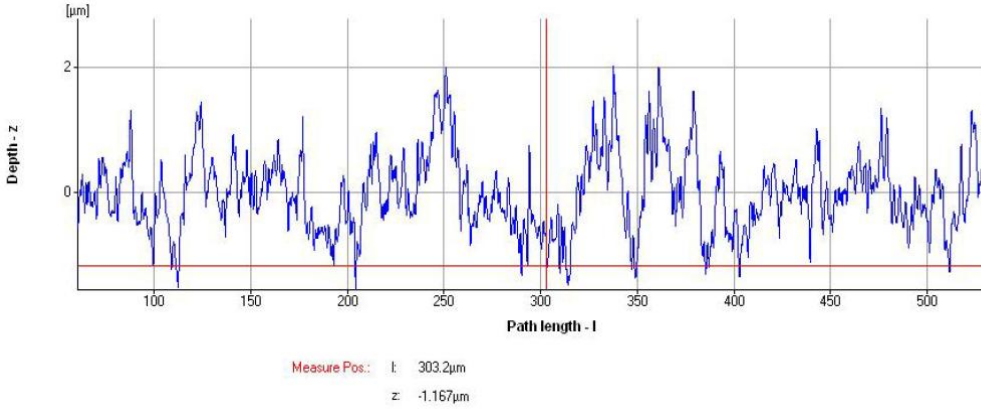
Double Acid Etching with hydrofluoric acid and sulfuric-hydrocloric acid followed by a decontamination process with solvents and final treatment with cold plasma

SEM study of the surface morphology

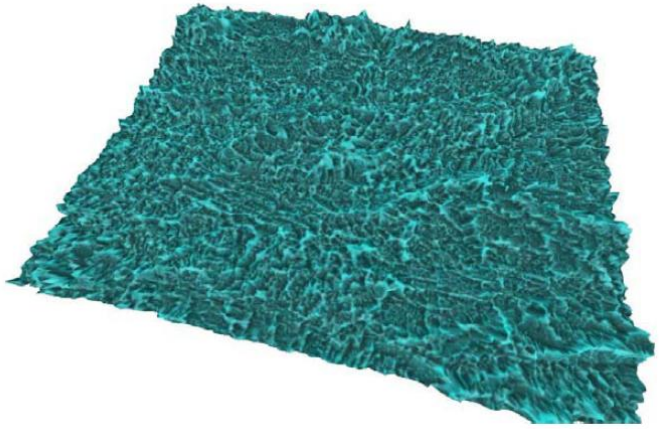
The SEM study of the surface morphology shows the microtexture which allows fibrin retention and increases blood cells activity, particularly the activation of platelets and leuckocytes, to speed up osteogenesis.



SEM images with different magnifications of the JDentalCare's implant surface



Roughness profile



Three-dimensional reconstruction of the surface (Mex 4.2, Alicona Imaging)

The evaluation of roughness according to ISO 4287 provides the following data (the table shows also the values of the most famous Double Acid Etched surface reported in the litarature).

Campione	Ra	Rq	Rt
JDENTALCARE	0.465±0.091	0.712±0.045	4.91±1.10
DAE*	0.489±0.079	0.619±0.097	5.29±1.21

** = Da: Park JY, Gemmell CH, Davies JE, Platelet interactions with titanium: modulation of platelet activity by surface topography, Biomaterials, 2002; 22:2671-2682*

DAE shows the values measured in the cited article on the surface Double Acid Etched 3i, ie the Osseotite™ surface.
The values of Ra and Rq are not significantly different than the parameters reported in the literature.

Quantitative XPS chemical analysis of the surface

XPS analysis shows a great decontamination of the implant surface.

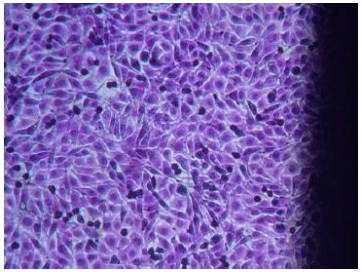
Composizione superficiale (% atomico) del campione analizzato

C	O	Ti	N	Si
36.5	42.5	19.0	0.9	0.3

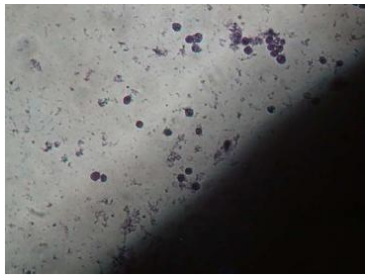
The high percentage of titanium on the implant surface and the low percentage of carbon confirm the considerable degree of the surface decontaminanion induced by cold plasma process.
The cold plasma technology causes the removal of the contaminants from the surface and allows for cleaning levels not achievable by other treatments.

Cytotoxicity test of the JDentalCare's implant surface

The cytotoxicity tests were conducted according to the protocols contained in EN ISO 10993-5: 1999 and in the international literature. The cells used for testing cytotoxicity are fibroblasts of the muscle tissue.

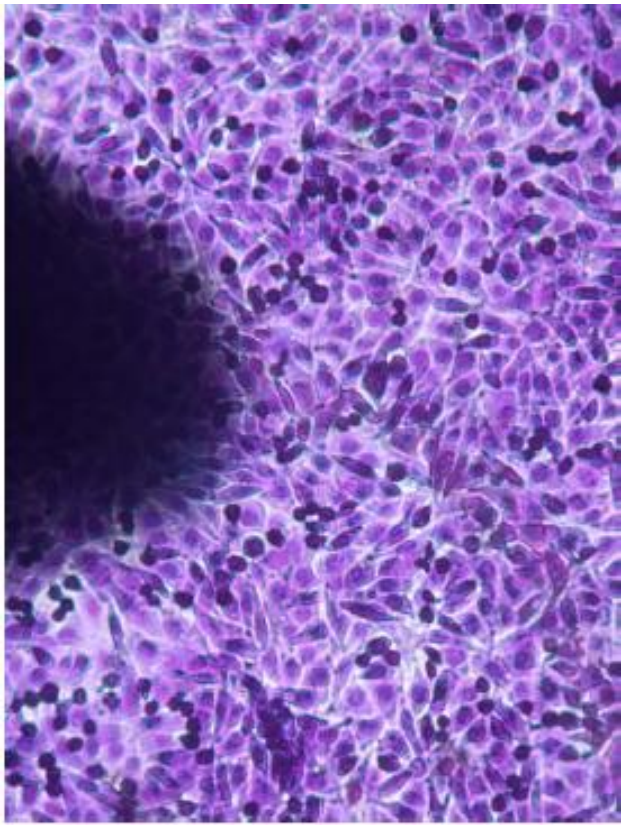


Negative control
(gold cylinder)



Positive control
(gutta-pherca cylinder)

JDENTALCARE DENTAL IMPLANT



The microscopic observations show the absence of cytotoxic effects and the high biocompatibility of the JDentalCare's implant surface.