ZIMMER BIOMET
Your progress. Our promise.®

The Osseotite® Implant

Documented Success

The Osseotite Implant Overview

Proven Clinical Success

The Osseotite Surface has more than 10 years of documentation from numerous global multi-center clinical studies[1-6] and meta-analyses.[7-8] Clinical studies on the Osseotite Surface continue to document the benefits of increased contact osteogenesis, especially in poor-quality bone.[6]

The Osseotite Implant features an acid-etched surface designed to facilitate osseointegration.

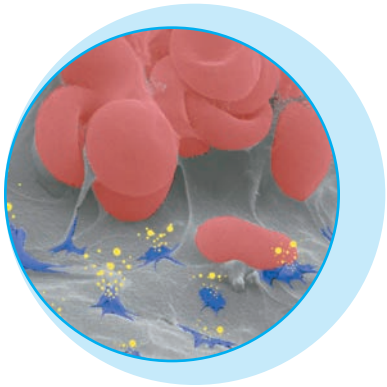


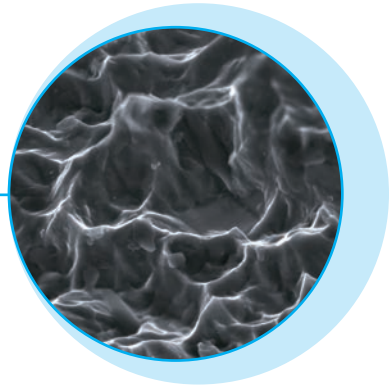
Image courtesy of Jun Y. Park, The Bone Interface Group.

Comprehensive Clinical Research

- One of the Most Well-Researched Dental Implant Surfaces on the Market Today
- Numerous Studies Report 98% Cumulative Success Rates[6]

The Osseotite Surface

- Facilitates The Osseointegration Process
- Demonstrates High Contact of Implant with New Bone
- Human Histology with Demonstrated High Bone-To-Implant Contact[9]



Osseotite Surface at 20,000x magnification

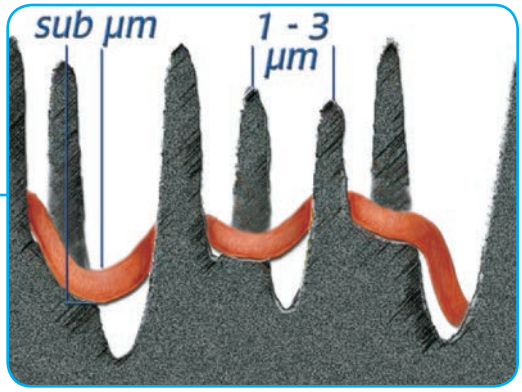
Full Osseotite Surface

- Five-Year Study[10] Showed No Increased Risk of Peri-implantitis vs. a Zimmer Biomet Hybrid Implant

The Osseotite Surface And The Healing Process

Blood Clotting And Implant Attachment

A blood clot attaches to an implant when its fibrin strands become intertwined in an implant's micro-surface features. The strength of the clot/implant attachment depends on how tightly the fibrin strands are entangled in the surface. Fibrin strands are typically sub-micron in diameter. Therefore, for the strongest bond, the implant surface features should create a maze of slightly larger spaces that can tightly capture the fibrin strands. Characterized by a 1 to 3 micron peak-to-peak surface created by a unique acid-etch process, the Osseotite Surface features are precisely sized to entangle the fibrin strands of the blood clot.



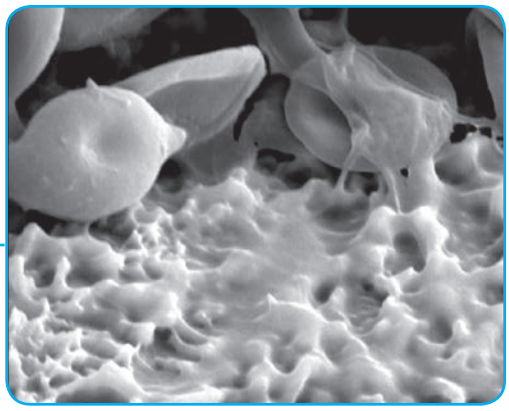
The Osseotite Surface Features Are Precisely Sized To Entangle The Fibrin Strands

Platelet Aggregation

Platelet Activation Up-Regulates Healing Response

Osteogenic cell migration will occur through the blood clot and can be expected to be influenced by the release of cytokines and other growth factors from activated cellular components of the blood clot. In a study of red blood cell (RBC) and platelet interactions with implant surfaces, the amount of RBC agglomeration on the Osseotite Surface was 54% greater than as seen on a smooth-machined surface.[11]

In addition, platelet adhesion onto the Osseotite Surface was enhanced by 110% in comparison to a smooth-machined surface.[11] RBC agglomeration is known to enhance blood clot permeability, which can lead to enhanced wound healing. Increased platelet activity can also lead to enhanced wound healing by the release of cytokines and growth factors.[12] Taken together, both platelet adhesion and RBC agglomeration can therefore result in increased bone formation on the Osseotite Surface.

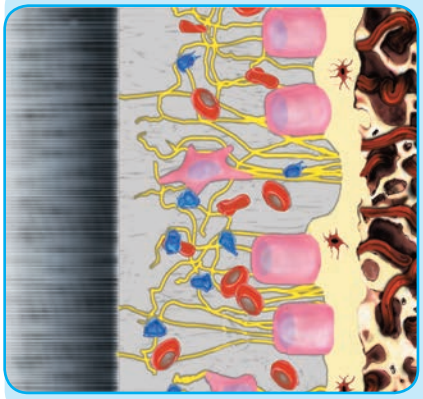


Enhanced microscopy image of the Osseotite surface showing platelet activation.

Clot Attachment Increases Contact Osteogenesis

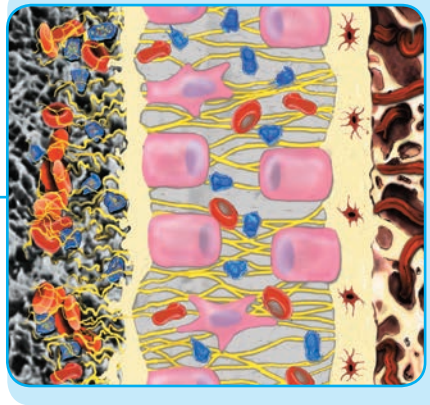
Contact Osteogenesis Facilitates Bone Healing

Bone heals around an implant through two distinct and overlapping phenomena: distance osteogenesis and contact osteogenesis. The rate and extent of healing around an implant is dependent on the degree of contact osteogenesis that occurs at the implant surface. The migration of osteogenic cells through the clot matrix causes contraction of the fibrin strands in the clot matrix, which can detach the strands from smooth-machined implant surfaces, disrupting or stopping contact osteogenesis and osteoconduction.[13]



Smooth - Machined Implant | Healing Bone | Existing Bone

Distance Osteogenesis – A gradual process of bone healing inward from the edge of the osteotomy toward the implant. Bone does not grow directly on the implant surface.



Osseotite Implant | Healing Bone | Existing Bone

Contact Osteogenesis – The direct migration of bone-building cells through the clot matrix to the implant surface. Bone is quickly formed directly on the implant surface.

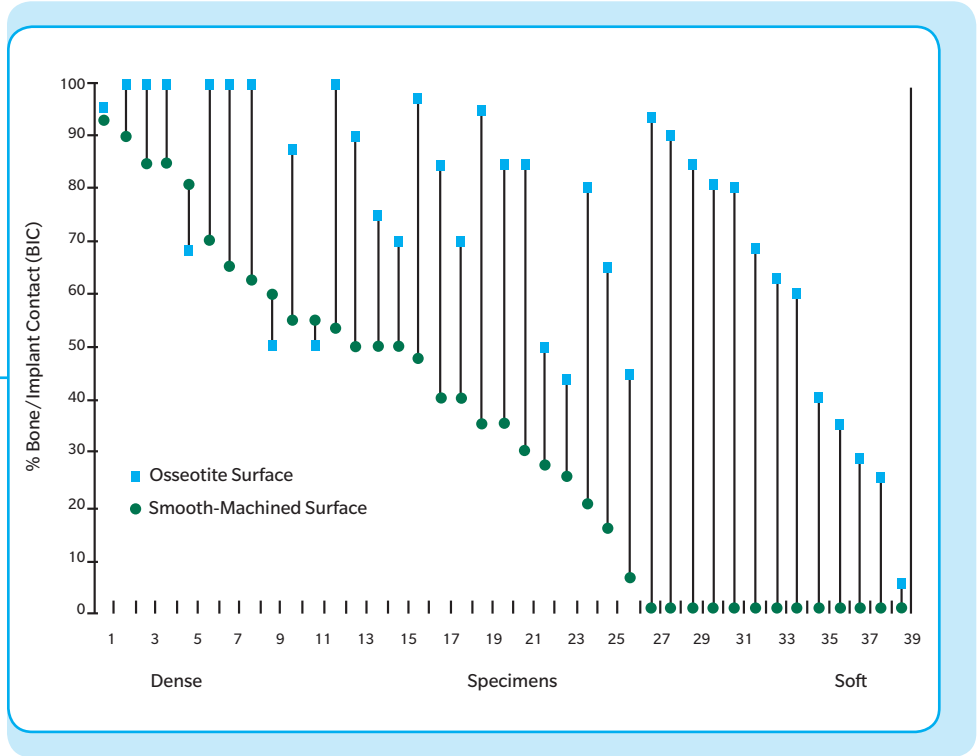
The Osseotite Surface And Bone Contact

Human Histologic Data

In a study on the effect of implant surface features on bone healing, human histologic data confirmed the increase in osteoconduction and contact osteogenesis with the Osseotite Surface as compared to a smooth-machined surface. Two 1-millimeter diameter screws, each having on one side an Osseotite Surface and on the other side a smooth-machined surface, were placed in the posterior maxilla and removed after six months of healing.

The thirty-nine histologic sections prepared showed a mean percent bone/implant contact for the Osseotite Surface of 72.96% as compared to 33.98% for the smooth-machined surface.[9]

Human Histology Matched Smooth-Machined And Osseotite Surface Pairs



Lazarra RJ†, Testori T†, Trisi P, Porter SS†, Weinstein RL. A Human Histologic Analysis of Osseotite and Machined Surfaces Using Implants with Two Opposing Surfaces. Int J Periodontics Restorative Dent. 1999 Apr;19(2):117-129.

Full Osseotite Implants And Peri-Implantitis

A Five-Year Study

A five-year prospective, multicenter, randomized-controlled study of the incidence of peri-implantitis for hybrid-DAE and fully-DAE implants.[10]

Full Osseotite Surface

Considerations for potential benefits of extending the DAE surface to the seating surface led to this prospective randomized-controlled study designed to assess the risk and incidence of peri-implantitis for fully-DAE-surfaced implants (Full Osseotite/FOSS).

Study implants, fully-DAE-surfaced "test" implants and hybrid-DAE "control" implants, were placed in a single-stage approach with the seating surface level with the crestal margin of the alveolar bone. The implants were allowed to heal for two months and were then provisionalized. Final restorations were placed at six months and patients were followed for five years at annual intervals. Follow-up evaluations included Sulcus Bleeding Index scores (SBI), probing for suppuration, assessments for mobility and periapical radiographs to identify radiolucencies and crestal bone levels.

Control Implant: hybrid-DAE

Test Implant: fully-DAE

One hundred twelve patients were enrolled and 165 test and 139 control implants were placed supporting 127 prostheses. No substantial differences in mucosal health outcomes between test and control groups were observed throughout the five year follow-up. For both groups, the bleeding-on-probing scores were no different. There was one case of peri-implantitis reported over the five years of observation and this was for a hybrid implant.

Radiographic analysis of crestal bone regression demonstrated that the mean change from baseline (provisionalization) is less for test implants in comparison to control implants ($P<.01$). The results of this five-year study showed no increased risk in adverse soft-tissue outcomes or peri-implantitis for fully-DAE-surfaced implants versus the control implants in this study.

Ordering Information

Certain® Internal Connection Implants Tapered

Osseotite Tapered Certain PREVAIL®

Commercially Pure Titanium

Length	4/3.0 mmP	5/4.0 mmP	6/5.0 mmP
8.5 mm	XIITP4385	XIITP5485	XIITP6585
10 mm	XIITP4310	XIITP5410	XIITP6510
11.5 mm	XIITP4311	XIITP5411	XIITP6511
13 mm	XIITP4313	XIITP5413	XIITP6513
15 mm	XIITP4315	XIITP5415	XIITP6515

Full Osseotite Tapered Certain

Commercially Pure Titanium

Length	3.25 mmD	4.0 mmD	5.0 mmD	6.0 mmD
8.5 mm	XIFNT3285	XIFNT485	XIFNT585	XIFNT685
10 mm	XIFNT3210	XIFNT410	XIFNT510	XIFNT610
11.5 mm	XIFNT3211	XIFNT411	XIFNT511	XIFNT611
13 mm	XIFNT3213	XIFNT413	XIFNT513	XIFNT613
15 mm	XIFNT3215	XIFNT415	XIFNT515	XIFNT615

Certain Internal Connection Implants Parallel Walled

Osseotite 2 Parallel Walled Certain

Commercially Pure Titanium

Length	3.25 mmD	4.0 mmD	5.0 mmD	6.0 mmD
8.5 mm	XIFOSM385	XIFOSS485	XIFOSS585	XIFOSS685
10 mm	XIFOSM310	XIFOSS410	XIFOSS510	XIFOSS610
11.5 mm	XIFOSM311	XIFOSS411	XIFOSS511	XIFOSS611
13 mm	XIFOSM313	XIFOSS413	XIFOSS513	XIFOSS613
15 mm	XIFOSM315	XIFOSS415	XIFOSS515	XIFOSS615

External Hex Connection Implants Tapered

Full Osseotite Tapered

Commercially Pure Titanium

Length	3.25 mmD	4.0 mmD	5.0 mmD	6.0 mmD
8.5 mm	FNT3285	FNT485	FNT585	FNT685
10 mm	FNT3210	FNT410	FNT510	FNT610
11.5 mm	FNT3211	FNT411	FNT511	FNT611
13 mm	FNT3213	FNT413	FNT513	FNT613
15 mm	FNT3215	FNT415	FNT515	FNT615

Osseotite Tapered

Commercially Pure Titanium

Length	3.25 mmD	4.0 mmD	5.0 mmD	6.0 mmD
8.5 mm	NT3285	NT485	NT585	NT685
10 mm	NT3210	NT410	NT510	NT610
11.5 mm	NT3211	NT411	NT511	NT611
13 mm	NT3213	NT413	NT513	NT613
15 mm	NT3215	NT415	NT515	NT615

External Hex Connection Implants Parallel Walled

Osseotite 2 Parallel Walled

Commercially Pure Titanium

Length	3.25 mmD	3.75 mmD	4.0 mmD	5.0 mmD	6.0 mmD
6.5 mm	XFOSM365	XFOS365	XFOS465	XFOS565	XFOS665
8.5 mm	XFOSM385	XFOS385	XFOS485	XFOS585	XFOS685
10 mm	XFOSM310	XFOS310	XFOS410	XFOS510	XFOS610
11.5 mm	XFOSM311	XFOS311	XFOS411	XFOS511	XFOS611
13 mm	XFOSM313	XFOS313	XFOS413	XFOS513	XFOS613
15 mm	XFOSM315	XFOS315	XFOS415	XFOS515	XFOS615

Full Osseotite Parallel Walled

Commercially Pure Titanium

Length	3.25 mmD	3.75 mmD	4.0 mmD	5.0 mmD	6.0 mmD
7.0 mm	FOSM307	FOS307	FOS407	FOS507	FOS607
8.5 mm	FOSM385	FOS385	FOS485	FOS585	FOS685
10 mm	FOSM310	FOS310	FOS410	FOS510	FOS610
11.5 mm	FOSM311	FOS311	FOS411	FOS511	FOS611
13 mm	FOSM313	FOS313	FOS413	FOS513	FOS613
15 mm	FOSM315	FOS315	FOS415	FOS515	FOS615

Osseotite Parallel Walled

Commercially Pure Titanium

Length	3.25 mmD	3.75 mmD	4.0 mmD	5.0 mmD	6.0 mmD
7.0 mm	—	—	—	OSS507	OSS607
8.5 mm	OSM385	OSS385	OSS485	OSS585	OSS685
10 mm	OSM310	OSS310	OSS410	OSS510	OSS610
11.5 mm	OSM311	OSS311	OSS411	OSS511	OSS611
13 mm	OSM313	OSS313	OSS413	OSS513	OSS613
15 mm	OSM315	OSS315	OSS415	OSS515	OSS615
18 mm	OSM318	OSS318	OSS418	OSS518	0SS618
20 mm	—	OSS320	OSS420	—	—

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† Clinicians have or had a financial relationship with Zimmer Biomet Dental resulting from speaking engagements, consulting engagements and other retained services.

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