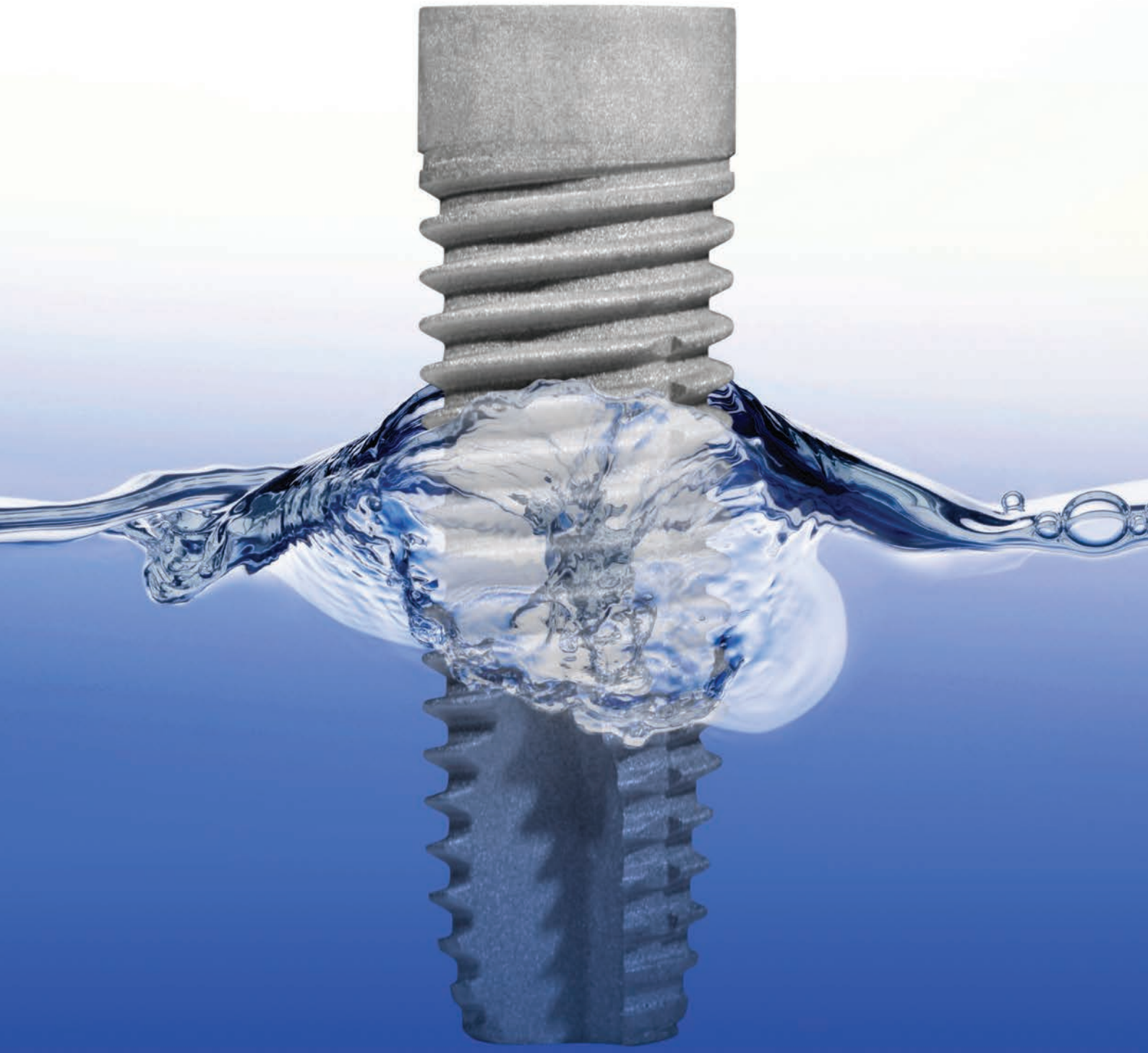
Neoss ProActive



Advancing the science
of dental implant treatment

NEOSS

Building on the proven design of the Neoss Bimodal implant

Single prosthetic platform

- Simplified instrumentation
- Reduced component assortment
- Optimised prosthetic flexibility

Low roughness flange

High levels of coronal implant surface roughness have been implicated as an aetiological factor in Periimplantitis.[1] The low surface roughness (Sa 0.4) of the Bimodal implant flange has been designed to reduce marginal bone loss.[2]

Optimal combination of tapered geometry and secondary cutting face

A major challenge in modern implant dentistry is achieving the maximum stability in all bone qualities.[3] The Neoss Bimodal implant addresses this issue in a simple and predictable manner by the provision of a varying taper and secondary cutting face.[4]

Clinical Success

Loading: An 18 month prospective clinical study reported a 98.5 % success rate for Neoss Bimodal implants immediately loaded and placed in extraction and healed sites. The authors concluded that immediate and early function with Neoss Bimodal implants is a reliable and predictable method.[5]

Marginal bone levels: Changes in marginal bone level were measured in a retrospective clinical study of 183 Neoss implants. A mean decrease of 0.3mm was measured following the first year of placement and 0.09 in the second year.[6] It was concluded that the surface topography and geometry of the Neoss Bimodal implant flange resulted in a favourable bone response.

Warranty Data: A randomly selected population of 100,000 implants was sampled from the Neoss warranty registry. Statistical analysis indicated a 3 year cumulative survival rate rate of 98.2 % .
Of the1.8 % of failures the major aetiological factors were smoking, a combination of poor bone quality and quantity and immediate loading.[7]

Added features of ProActive

Low roughness flange

The surface characteristics of the Bimodal flange are retained for ProActive implants.

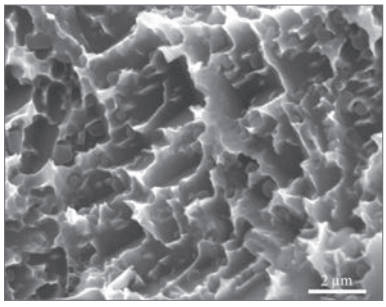
Hydrophilic implant

Rapid wetting of an implant surface enhances protein aggregation and can accelerate fibrin network formation.[9] The ProActive surface topography exhibits a high level of wetting.[10]

Ultraclean low carbon surface

Manufacturing, storage and handling all contribute to surface contamination of a dental implant. Carbon adsorption reduces surface energy and effective wettability thereby impairing healing and bone formation.[8]

The ProActive production process further minimises the already low carbon Bimodal surface maximizing surface energy.



SEM of ProActive surface

Accelerated and increased strength of osseointegration

The etched and blasted ProActive implant surface stimulates bone to form more rapidly and with a greater strength at the implant interface.[11]

ProActive implants can optimize implant stability and osseointegration for implants used in immediate and early loading protocols.

Extraordinary early r

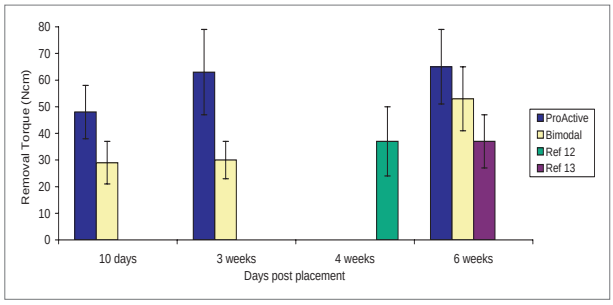
In-vivo studies

ProActive test implants and Bimodal control implants placed in the rabbit tibia were followed for 10 days, 3 and 6 weeks. Removal torque (RTQ) tests were performed together with histomorphometric measurements. In addition, implant stability was assessed using Resonance Frequency Analysis (ISQ) for each implant at placement,10 days, 3 and 6 weeks.

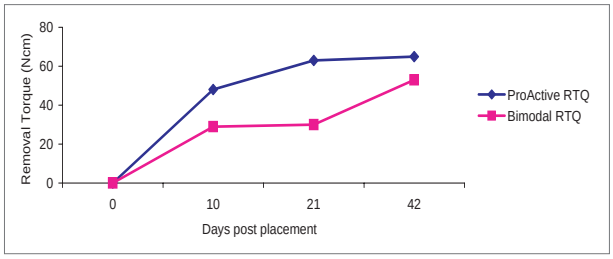
In-vivo removal torque tests reported an increase in peak removal torque (RTQ) of greater than 65 % 10 days after insertion and more than 105 % three weeks post placement for ProActive test implants compared with Bimodal control implants.

Implant stability measured using RFA demonstrated increasing stability for both test and control groups with a mean increase of ISQ over 6 weeks of 20 ISQ.

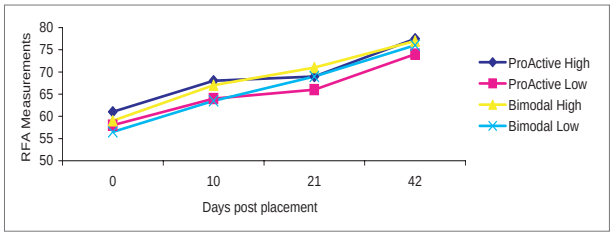
Building on the already excellent performance of the Bimodal implant this clearly demonstrates the accelerated osseointegration and interfacial strength of the ProActive implant and surface.[11]



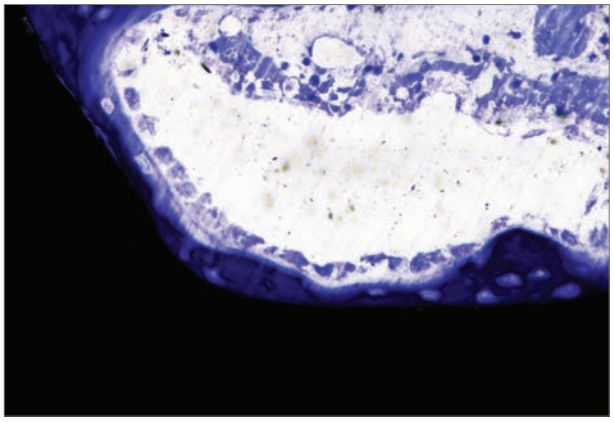
In-vivo removal torque values for Neoss ProActive and Bimodal implants



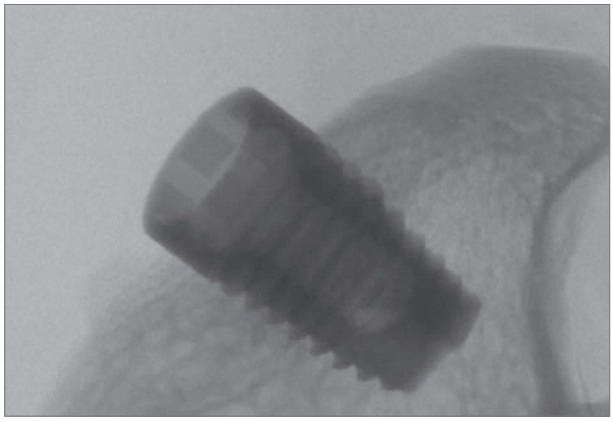
In-vivo removal torque for Neoss ProActive and Bimodal implants



In-vivo RFA measurements for Neoss ProActive and Bimodal implants



In-vivo histology for ProActive – Bone formation at 21 days showing osteoblast palisades



In-vivo micro CT of ProActive implant in Rabbit tibia

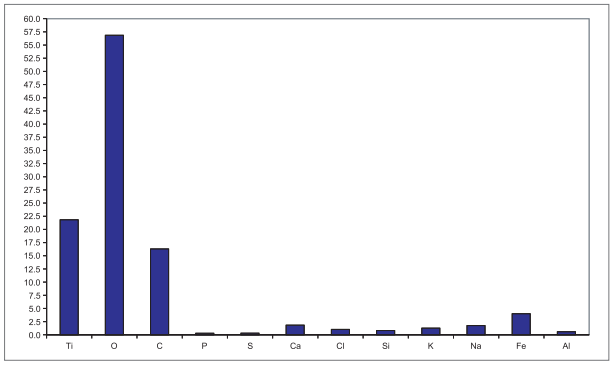
esults with ProActive

Chemistry

Surface chemistry provides an important insight into the cleanliness of an implant production process and the presence of surface contaminants.

High surface energy and hydrophilicity are essential to the adsorption of proteins and biomolecules onto implant surfaces thereby facilitating healing and bone formation.

ProActive titanium implants were manufactured by blasting with an inert media, acid etching and cleaning using a proprietary cleaning technique. Implants were stored in sealed glass transport packaging and the surface chemistry analysed using a Scanning Auger Microprobe (SAM).

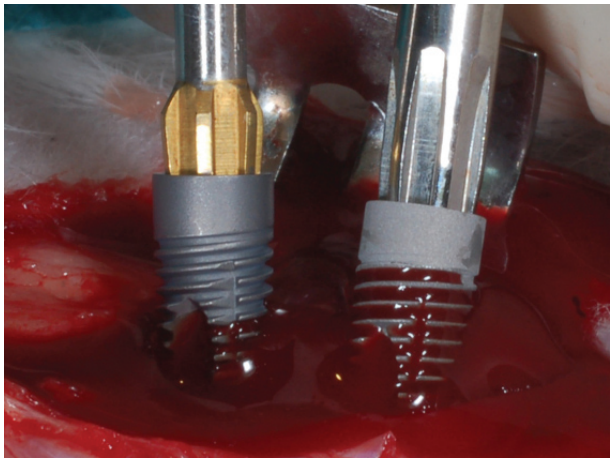


Auger surface analysis of ProActive implant demonstrating low carbon levels

Auger analysis indicated that the Neoss ProActive production process minimises the adsorption of Carbon onto the implant surface thereby preventing contamination and maximising surface energy. Furthermore the Neoss glass packaging resulted in significantly lower carbon levels than proprietary plastic containers.[16]

Hydrophilicity

Surface energy and hydrophilicity are essential to the adsorption of proteins and biomolecules onto implant surfaces thereby facilitating healing and bone formation. Contact angle measurements are sensitive to only the outermost Angstroms of a surface and provide an almost unique sensitivity.[14,15]



Implant placement in Rabbit tibia – left: Bimodal; right: ProActive.

Clinical Trials

An open, prospective, observational study is in progress to measure the clinical outcome of the Neoss ProActive implant in extraction sites, poor bone qualities and immediate loading. Over 500 implants are being placed in more than ten countries. Implants will be followed for a period of five years.[17]

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Product Information

The ProActive implant is fully compatible with all existing Neoss instrumentation and prosthodontic components. It is available in the following sizes:

21181 Implant Kit, ProActive Ø 3.5 mm x 7 mm
21182 Implant Kit, ProActive Ø 3.5 mm x 9 mm
21183 Implant Kit, ProActive Ø 3.5 mm x 11 mm
21184 Implant Kit, ProActive Ø 3.5 mm x 13 mm
21185 Implant Kit, ProActive Ø 3.5 mm x 15 mm
21186 Implant Kit, ProActive Ø 3.5 mm x 17 mm

21187 Implant Kit, ProActive Ø 4.0 mm x 7 mm
21188 Implant Kit, ProActive Ø 4.0 mm x 9 mm
21189 Implant Kit, ProActive Ø 4.0 mm x 11 mm
21190 Implant Kit, ProActive Ø 4.0 mm x 13 mm
21191 Implant Kit, ProActive Ø 4.0 mm x 15 mm
21192 Implant Kit, ProActive Ø 4.0 mm x 17 mm

21193 Implant Kit, ProActive Ø 4.5 mm x 7 mm
21194 Implant Kit, ProActive Ø 4.5 mm x 9 mm
21195 Implant Kit, ProActive Ø 4.5 mm x 11 mm
21196 Implant Kit, ProActive Ø 4.5 mm x 13 mm
21197 Implant Kit, ProActive Ø 4.5 mm x 15 mm
21198 Implant Kit, ProActive Ø 4.5 mm x 17 mm

21199 Implant Kit, ProActive Ø 5.0 mm x 7 mm
21200 Implant Kit, ProActive Ø 5.0 mm x 9 mm
21201 Implant Kit, ProActive Ø 5.0 mm x 11 mm
21202 Implant Kit, ProActive Ø 5.0 mm x 13 mm
21203 Implant Kit, ProActive Ø 5.0 mm x 15 mm

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