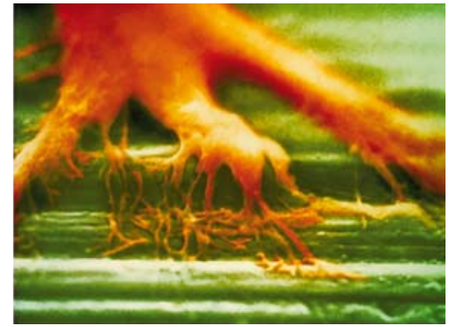
# THE OSPOL WHITE BOOK

A dental implant system unveiled



*Courtesy of Professor Per-Ingvar Brånemark*

# Preface

The picture above shows how bone tissue grows onto a titanium surface. You may recognize it. Professor Per-Ingvar Brånemark has used it in many of his lectures around the world.

We first met Professor Brånemark in December, 1985. The meeting changed our lives in more ways than one.

First and foremost, he led us to fascinating careers introducing a therapy that would forever change the nature of dentistry – and improve the quality of life of millions of patients.

Professor Brånemark also made us realize that no matter how well implant hardware is designed, it will always be secondary to the competence, dexterity and experience of the dentist using it.

Finally, he taught us the importance of balancing our business ambitions with a strong sense of integrity and respect: Respect for the patient, for nature and biology, and for Hippocrates' oath.

At Ospol, the harmony between living tissue and titanium symbolizes our commitment to this important balance. Some 20 years later, we now have a chance to show Professor Brånemark that his philosophy remains our guiding light.

*Hans Berglund,*
*Göran Urde, Lennart Carlsson*
*– founders of Ospol*

# Ospol's vision

We strive to give every person who needs to replace missing teeth access to professional treatment with dental implants.

Our contribution to such a development is to make implant technology easier to use, manage and provide. By becoming a preferred therapy among more dentists, implants will become more accessible to more patients.

# Ospol's business mission

Everything we do is aimed at accommodating our customers in their dual roles as clinicians and businesspeople. We will provide a modern implant system with excellent clinical performance. To this we add unique business tools and support that will benefit each dentist and each patient.

The work in our company is geared at enhancing our customers' ability to treat patients and run an effective practice. Their success is a prerequisite for our own success, and we view them as partners rather than customers. We share the same goal – to successfully treat more patients with dental implants.

By providing business tools and support, we wish to invest in dentists whose ambition is to develop the implant treatment aspect of their practice, with Ospol as their partner.

# Ospol's quality policy

- Ospol will always deliver products that fulfil legal and regulatory requirements, regardless of sales channel.
- Our products will have an error incidence that is so low as to not to be disruptive to dentists or patients.
- All Ospol employees will work continuously to improve quality in all processes, in order to bring error incidence as close to zero as possible.
- Ospol will aim to keep promised delivery dates and will implement systems to avoid delays.
- In order to fulfil this quality policy, Ospol will inform and educate all employees. The company operates with preventive improvement of all internal processes, and all employees are evaluated frequently against established quality goals.
- Everyone in the Ospol organization is encouraged to suggest quality improvements or new measurements of quality goals. The CEO is responsible for evaluating, prioritizing and implementing these suggestions.

# Why we wrote this whitebook.

This is not a whitebook in the academic sense of the word. Its aim is not to provide exhaustive scientific documentation of our implant system, based on lengthy studies establishing every aspect of its effectiveness and safety.

The reason is simple: these studies have already been completed by others and, as such, are abundantly documented.

Over the years, the groundbreaking work by Professor Per-Ingvar Brånemark and his co-workers has been validated in thousands of scientific papers demonstrating the reliability of the therapy.

The true biological mechanisms behind osseointegration may still be unknown in part. Yet a predictable outcome can be achieved by following a well-documented protocol that covers aspects like the surgical procedure, the design of the implant hardware, and the material used to manufacture it.

In other words, the quality of the treatment has come to rely on common and accepted knowledge and science. If an implant system uses a well-known design and material composition, and is loaded according to known and accepted principles, it can be expected to behave clinically in a certain predictable way.

Even the FDA concurs that as long as the implant hardware conforms to specific basic requirements, companies can refer to "substantial equivalence" for obtaining registration:

> *"FDA believes that special controls, when combined with the general controls, will be sufficient to provide reasonable assurance of the safety and effectiveness of a root-form endosseous dental implant or endosseous dental implant abutment device. Thus, a manufacturer who intends to market a device of either of these generic types should [1] conform to general controls of the Federal Food, Drug and Cosmetic Act (the Act), including the premarket notification requirements described in 21 CFR 807, Subpart E; [2] address the specific risk to health associated with root-formed endosseous dental implants or endosseous dental implant abutment devices identified in this guidance; and [3] obtain substantial equivalence determination from FDA prior to marketing the device".*
>
> Quote from the FDA document: *Guidance for Industry and FDA Staff*

With the Ospol Implant System, we are claiming such equivalence (based on specific FDA and CE guidelines for substantial equivalency) for a long list of previously validated features and properties. The clinical documentation of these "generic" features and properties is readily available from a myriad of scientific sources.

To assist anyone interested in penetrating that documentation – as it pertains to the Ospol system – we have identified and compiled a great number of papers. Rather than reprinting the complete content in each instance, we summarize it in this whitebook. We also provide detailed information about each source, and how to access it on the Internet.



# Why we divided it into two parts.

The Ospol Implant System is presented in two sections of this whitebook. In the first section, we review existing documentation of those "generic" features of the system hardware for which we claim "substantial equivalence."

Hence, Part One covers macro-design aspects such as the overall implant design and the conical abutment connection.

We also discuss factors influencing the implant behavior in bone – for example the roughness and oxidization of the surface.

All in all, Part One summarizes 112 scientific papers documenting these and other key properties of the Ospol Implant System.

In Part Two, we introduce a number of proprietary features of the system based on the clinical demands on a modern implant system. These are innovations (some of which are patented) developed by our team of implant designers. Though new in the context of implant design, these innovations are in no way entering uncharted biological territory. They all rest firmly on well-known mechanical principles. For example:

To improve primary stability, we have combined the advantages of a cylindrical screw and a conical core. To optimize the bone fill around the implants, we have improved their cutting properties. To secure stability in marginal bone, we have threaded the implants all the way to the top. To give the joint between implant and abutment optimal stability, we have made it conical.

And to facilitate early bone apposition by biomechanical bonding, we've oxidized the titanium surface with calcium, a Bioactive Surface Chemistry in accordance with Dr Y-T Sul's thesis "The role of microporous structure and chemical composition of the surface oxide in enhanced osseointegration". [99]

Because they are new, the clinical documentation of these enhancements is not as extensive as for the generic features. They have all, however, undergone either thorough mechanical testing, independent benchmarks against other systems, or pre-clinical studies performed on animals.

Part Two presents these tests, benchmarks and studies in detail.

We trust this will give implant dentists the confidence they need to use the Ospol system for improving the quality of life of their patients.

Our whitebook is founded on three simple but important principles:

1. The content reflects our commitment to honesty, completeness and transparency.

2. All validation of product effectiveness is based on accepted science, regulatory requirements and benchmarking of specific features.

3. Future clinical results will be continuously monitored through the process of post market clinical follow-up. Just like other modern implant systems, ours has all the proven characteristics you'd expect.

# Part I.

**IMPLANT DESIGN**

**CONICAL ABUTMENT CONNECTION**

**TITANIUM IN BONE**



## Generic features of the Ospol system

As we learn more about the unique biological inter-relationship of the dental implant restoration and the surrounding hard and soft tissues, implant dentistry steadily evolves. Nevertheless, if you scan clinical reports published in the major scientific journals, it quickly becomes clear that most of them deal with screw-shaped titanium implants – implants that are essentially similar to the Ospol Implant System.

The original Brånemark implant system has, for many years, shown safe and highly predictable clinical results for all indications. And implant systems that are substantially equivalent to the Ospol System have been proven in study after study to be at least as successful as the Brånemark System®*. The conclusion can therefore safely be drawn that the Ospol Implant System can be expected to exceed acceptable success rates – as defined by Albrektsson, et al in 1981 & 1986,[3, 4] consistently.

Indeed, guidelines provided by the FDA give manufacturers of dental implant devices an opportunity to submit simplified premarket notification processes if the products can provide logical reference to predicate devices. The same principle of equivalency exists for achieving CE certification. The generic features of our system for which we claim "substantial equivalence" are described on the pages of this section followed by a review of the existing documentation of those features.

* More information can be found in the following references: 9, 10,11, 17, 20, 22, 24, 28, 30, 57, 58, 63, 65, 68, 69, 70, 71, 82, 89, 94, 95, 110.

# IMPLANT DESIGN

### 1. Screw shape

The Ospol implant is screw shaped, which is by far the most common macro-shape for dental implants. It is threaded for mechanical stability during the sensitive initial healing phase, and the additional surface area provided by the threads increases the bone to titanium interface. This has been shown to be critical to long-term osseointegration.

### 2. Tapered body

The core of the Ospol implant is slightly tapered, while the outer threaded profile is cylindrical. This shape combines the ease of surgical placement typical of a cylindrical implant body with the higher mechanical stability of a tapered implant.

### 3. Self-tapping

The Ospol implant is self-tapping. It cuts into the bone and creates threads as it is inserted, thus preserving bone mass and optimizing bone fill of the threads, which improves mechanical stability and speeds up the osseointegration process.

### 4. Threads in marginal bone

The Ospol implant has a threaded shoulderless neck. In early screw designs, the neck was frequently countersunk into marginal bone. Countersunk implants often showed marginal bone loss to the first thread. Furthermore, in modern screw-type implants it has been proven that a threaded neck provides greater mechanical stability



**Substantial equivalency**

**Ospol's screw-shaped implant, with its self-tapping feature and shoulderless, threaded neck is substantially equivalent to systems designed by Nobel Biocare, Straumann®, 3i® and Astra Tech.**

## What does the documentation say?

### 1. About the screw shape

Proven to be safe and effective in numerous studies over the last 20 years, the screw shape is one of the most well-documented implant features. For example a study that spanned over 20 years on the screw-shaped Brånemark System® implants showed a 98.9% success rate [24]. And in an 8-year study of non-submerged ITI implants, screw-shaped implants showed a better cumulative success rate than hollow cylinder implants. [18]

### 2. About the tapered/cone-shaped body

A tapered/cone-shaped implant has proven to be highly successful even in early load situations. [67]

In another study, a slightly tapered implant and modified implant surface texture, anodized Cp Titanium, was shown to be a successful treatment alternative even in soft bone. [40]

Finally, the MkIV tapered Brånemark System® implant showed significantly higher resonance frequency value than standard cylindrical implants, indicating a higher interfacial stiffness at the implant-bone interface. [81]

### 3. About self tapping

In a prospective longitudinal multicenter study, excellent 1-year clinical results of 95.6% were shown after placement and restoration of Brånemark System® self-tapping implants using a one-step protocol in completely and partially edentulous patients. All implants were stable after placement. [12]

Another prospective multicenter study showed that self-tapping implants were easier to place. [22] And in a study of the influence of implant design and of overload on marginal bone loss and implant success in the Brånemark System®, standard implants clearly showed a higher failure rate than self-tapping implants, both before and after loading. [83]

### 4. About threads in marginal bone

In a study comparing marginal bone reaction to Astra Tech and Brånemark System® implants, the initial bone resorption was less for the Astra Tech implants compared to Brånemark System®. [26] Astra Tech implants feature a threaded neck.

In addition, an axisymmetric finite element analysis showed that a conical implant-abutment interface at the level of the marginal bone (combined with a threaded implant neck, sufficient implant wall thickness and modulus of elasticity) caused bone stresses resulting from axial load to occur lower down in bone. This minimizes the risk of marginal bone resorption due to accumulated microdamage in the bone. [47, 48, 49]

# CONICAL ABUTMENT CONNECTION

The Ospol system features an internal conical abutment connection with a separate center screw for cemented prosthetic restorations. From an engineering perspective, the cone form is one of the most stable mechanical connections between two parts. It also provides a tight seal and minimizes stress in marginal bone by distributing load.

**Substantial equivalency**

**Ospol's conical abutment connection is substantially equivalent to systems designed by Astra Tech, Straumann® and Ankylos®, all of which have been proven in clinical studies to offer good mechanical stability. As compared to flat-to-flat connections, conical abutment connections have also been proven to limit bacterial leakage and to minimize stress in marginal bone. The latter is hypothesized to lower the risk of stress-induced bone resorption.**

## What does the documentation say?

### 1. About mechanical strength

The shape of an interface between components in the abutment connection greatly impacts the stability of that connection. In theory, an implant with a conical interface can resist larger axial and transversal loads than an implant with a flat interface. [47, 50]

Bridge performance is also closely related to load transmission both at the bone-to-implant interface and between components within the implant-abutment-bridge cylinder complex. An internal conical interface demonstrated increased resistance to bending moments at the fixture-abutment interface compared to flat-to-flat butt joint interfaces. [78]

### 2. About the biological seal

It has been shown that micro leakage can occur at the abutment-implant interface in osseointegrated implants and may cause malodor and inflammation of peri-implant tissues. [44]

A tight seal at the fixture-abutment interface has resulted in the maintenance of marginal bone around single tooth titanium implants. [78]

### 3. About load distribution

The design of the implant-abutment interface has a profound effect upon the stress state in the marginal bone: It has been shown that anchorage strength is maximized if an implant is designed in a way that minimizes peak bone stress (as is the case with a conical abutment connection). This facilitates obtaining a marginal bone level close to the crest of the implant. [47]

In addition, an axisymmetric finite element analysis demonstrated benefits associated with a conical implant-abutment interface at the level of the marginal bone in combination with a threaded implant neck and suitable values of implant wall thickness and modulus of elasticity. The analysis showed that the peak bone stresses resulting from axial load arose deeper down in the bone thus minimizing the risk of marginal bone resorption due to accumulated microdamage. [48, 49, 50]

# TITANIUM IN BONE

### 1. Surface roughness

There is evidence that the surface structure of the implant is of importance to successful osseointegration. Moderately rough surfaces such as those of the Ospol implant have proven to be better for osseointegration than the machined surfaces of the original screw-shaped implants.

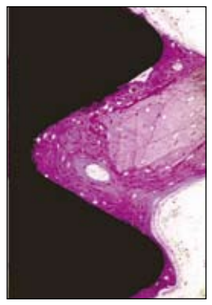
On the other hand, extreme surfaces roughness, such as occurs with etched or plasma sprayed, have an increased incidence of peri-implantitis because of the increased risk of retaining bacteria if exposed.

### 2. Anodization

Surface roughness can be achieved with etching, blasting, plasma spraying or anodization. All of these methods are well documented, widely used and considered safe. The Ospol Implant System's surface is first machined, and then anodized.

### 3. Commercially pure titanium grade 4

The Ospol Implant System is made of commercially pure titanium grade 4 (Cp Ti grade 4). Cp Ti grade 4 is stronger than commercially pure titanium grade 1 (Cp Ti grade 1) used in the original Brånemark implants. There is, however, no evidence in the literature that points to differences in osseointegration for the different grades of titanium.





**Substantial equivalency**

**Ospol's surface texture is substantially equivalent to the surface of TiUnite® and is achieved using a process that is substantially equivalent to the process used for that system.**

## What does the documentation say?

### 1. About surface roughness

In a review focusing on topographic and chemical properties of different surfaces, moderately rough surfaces showed stronger bone responses than smoother or rougher surfaces. [7, 8]

### 2. About anodization

Surface roughness and enlargement are greater for oxidized implants than for turned implants. This results in significantly higher bone-to-implant contact as well as more bone in the threads. A histologic evaluation demonstrated a significantly higher bone response for anodic oxidized titanium implants than for implants with turned surfaces. [55] In another multicenter study, a total of 478 TiUnite® implants were followed of which 357 were placed in the maxiallae. The one-year result showed a cumulative survival rate of 98.9%. [34]

### 3. About Cp Ti grade 4

In a retrospective multicenter analysis of 3i® endosseous dental implants placed over 5 years in endentulous and partially edentulous jaws using 3i® Cp Ti grade 4 threaded and cylindrical implants, the success rate was 97.0 % in the mandible and 93.8 % in the maxillae. [68]

# Part 2.

**PRIMARY STABILITY**

**STABLE AND TIGHT ABUTMENT CONNECTION**

**MODERN IMPLANT SURFACE**

**COMPACT FLEXIBLE SYSTEM**



## Special features of the Ospol Implant System

When we set out to create the design specifications for the Ospol Implant System, we began by examining current trends in implant dentistry and talking to active implant clinicians. We looked at smart solutions already in use and at areas that called for improvements. The messages we received from potential customers provided a clear direction for our design process, and the Ospol design team has focused on a limited number of important features.

These clinical requirements are defined on the pages of this section. Each definition is followed by a detailed explanation of the Ospol technical solutions and, when appropriate, there is information about how we have tested our solutions.

# PRIMARY STABILITY

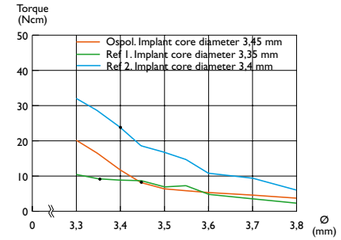
**The ability to achieve optimal stability at the time of surgery in different quality and quantity of bone.**

**The Ospol implant is designed to provide optimal primary stability (mechanical stability). Excellent self-cutting properties make it possible to dimension the osteotomi with the same diameter as the core of the implant for maximum bone fill in the threads. In order to use the dense marginal bone for stability, the implant is threaded all the way to the top and the core has a slight cone shape.**

### 1. Self-tapping feature

Today, a cutting edge is commonly placed at the tip of the implant so it can cut threads as it is installed in the prepared site. Mechanical stability is achieved through the balance between compression of the bone and the amount of bone in the threads.

The challenge, however, lies in cutting complete threads without using excessive torque. One way of reducing the torque requirement is to prepare a site that is larger in diameter than the core of the implant. This will, however, reduce mechanical stability and leave open spaces in the threads. Ospol´s solution is to optimize the cutting properties of the implant resulting in lowered torque and increased bone fill. The closer the diameter of the last cutting drill is to the core diameter of the implant, the more bone fill in the threads, which has a direct effect on mechanical stability. Our design team has been able to take advantage of the latest developments in machining techniques and has added geometry to the implant that was not possible to produce even a few years ago.




Graph comparing Ospol and competitors, showing threading torque for various drill diameters in a homogenous material. Dots show actual implant core diameter.

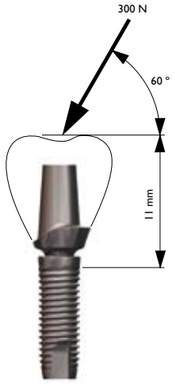
### 2. Conical implant core

In the upper third of the implant, the core has been made slightly conical. This means that the threads become gradually shallower. This design was chosen to improve stability by using the often denser bone quality in the marginal area. This design gives the desired stability effect without complicating the drilling and placement process as is the case with truly conical implants.

# STABLE, TIGHT IMPLANT/ ABUTMENT CONNECTION

**The ability to create a connection that is stable over time and tight enough to limit micro leakage.**

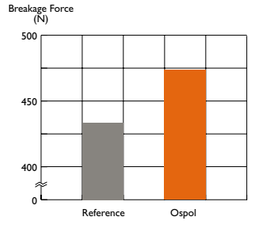
**The Ospol system is designed with a 17-degree internal cone connection between the implant and the abutment. An internal octagon in the implant has a dual purpose – to transfer torque during implant placement and as an indexing system when the abutments are used for single tooth replacements. The design of the abutment screw is "one-size-fits-all." With its long shaft and low friction coating, it delivers optimal pre-load with a minimum of torque.**



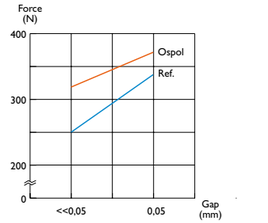

## Conical internal connection

Bending is the most unfavourable load for an implant and the most frequent cause of implant fracture. When a flat-to-flat interface, such as the original Brånemark external hex, is subjected to bending, more load is placed on the center screw than is the case with a conical abutment interface. A conical abutment also provides a tighter seal with less microleakage than a flat-to-flat abutment.

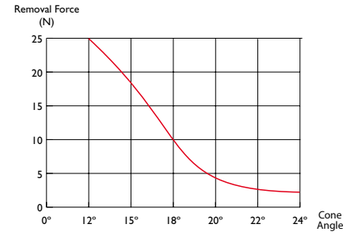
With a conical abutment, the amount of load placed on the center screw depends on the angle of the cone. The more aggressive the angle, the less the load on the screw. On the other hand, an aggressive angle causes locking between the parts, which makes separating the components difficult.




Load test comparison between Ospol and competitor implant indicating load force at breakage.




Comparison between Ospol and competitor showing applied load force (according to ISO/DIS 14801) in relation to gap width between abutment and implant.




Graph showing abutment removal force in relation to different cone angles.

### Special abutment removal tool

The Ospol Implant System includes a specially designed tool for dismantling components. We have, therefore, been able to select an optimal angle with regards to loading and microleakage, while maintaining easy abutment removal.

### Impression-taking technique

Conical interfaces demand much greater precision in the impression chain to achieve the same repeatability in height position as a flat-to-flat system, although repeatability is better for a conical system in every other direction. This is a problem shared by all implant systems with conical interfaces.

The Ospol Implant System however uses a conical/flat-surface combination, which means that height information for the implant and the implant replica uses a flat reference surface rather than the conical portion. This, in combination with modern machining technology, minimizes the problem of precision.



### Abutment screw design

To prevent loosening, screws must be tightened properly. When a screw is tightened, it becomes elongated and the material supporting it is compressed. This happens as a result of torque being converted to longitudinal force by the pitch of the screw threads. Elongation of the screw is necessary to achieve a screw joint that will maintain its tension over time when its parts are subject to micromovement.

LONG SCREW STEM

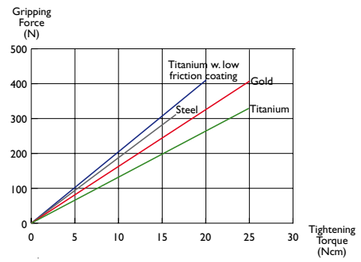
In addition, the longer a screw is to begin with, the longer it becomes when a given force is applied and the better the ability of the screw joint to maintain force over time. The Ospol abutment screw has therefore been designed to be as long as possible. (See the table below.)

LOW-FRICTION COATING

When designing a screw, the selection of material is critical to maintaining the tension in the screw joint. Titanium is a highly appropriate material because it stretches more than, for example, steel, when a given force is applied.

The drawback of titanium compared to steel or gold is, however, that titanium has higher friction. The coefficient of friction between two titanium parts may be as high as 0.5, while the comparable value for steel is approximately 0.1.

High friction can in part be compensated for by higher torque, but increasing torque is not ideal because it increases torsion stress in the screw stem. Instead, the Ospol Implant System is treated to reduce friction.




Graph of abutment screws of different materials and coatings showing the Ospol material and coating choice gives a higher gripping force at less tightening torque.

# MODERN SURFACE

**Calcium-oxidized commercially pure titanium surface, to facilitate early bone apposition.**

**The Ospol Implant System features a patented calcium-deposited, oxidized titanium surface, which is in accordance with the results of Dr Young-Taeg Suls research. The Ospol implant surface consists of a thin layer of micro porous titanium oxide saturated with 11% calcium that will optimize the tissue response.**



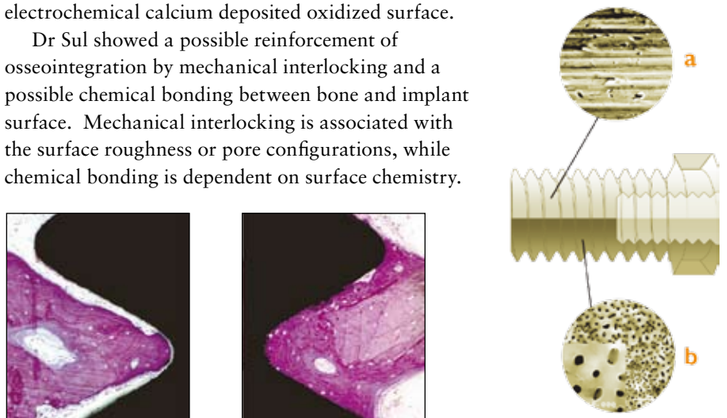
**Thesis of Dr Young-Taeg Sul**

On Bone Tissue Response To Oxidized Titanium Implants
*"The role of micro-porous structure and chemical composition of the surface oxide in enhanced osseointegration"*

Dept of Biomaterial Sciences / Handicap Research, Institute for Surgical Sciences, Faculty of Medicine, University of Gothenburg, Sweden Gothenburg 2002 (99)

Dr Sul used clinical screw type oral implants of 18 mm in length and a diameter of 3.75 mm for his in vivo studies. One side of the implant (the control) had a non-modified, turned surface, and the other side of the same implants had an electrochemical calcium deposited oxidized surface.

Dr Sul showed a possible reinforcement of osseointegration by mechanical interlocking and a possible chemical bonding between bone and implant surface. Mechanical interlocking is associated with the surface roughness or pore configurations, while chemical bonding is dependent on surface chemistry.

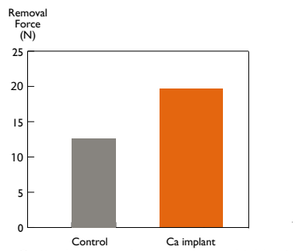



SEM pictures showing a typical turned machined (control[a]) implant surface compared to the thin layer of microporous titanium oxide saturated with calcium on the calcium implant (Ca implant[b]).

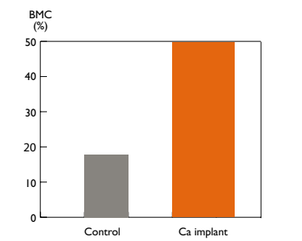


Histology showed that the control had less bone in close contact to the implant surface, compared to the Ca Implant.

In Dr Sul's study, oxidized microporous implants showed significantly stronger bone response as compared to nonporous machined implants. Calcium deposited, oxidized titanium implants showed that osteoconductivity was more pronounced and thus generated a faster, stronger ossoeintegration as compared to machined implants and other oxidized surfaces tested.




The Ca implant also demonstrates a highly significant early increase of mean removal torque values (Ncm) compared to the control (machined surface).




Calcium deposited, oxidized microporous titanium implants showed significantly improved bone response as compared to machined (control) and other oxidized titanium implants. An in vivo study of Ca implants demonstrated a highly significant increase of the mean BMC (Bone to Metal Contact) value after a 6-week follow up as compared to the control.

# COMPACT SYSTEM WITH MINIMAL COMPONENTS

**The ability to treat many indications with few components.**

**The Ospol 85+ series has around 50 components total and, according to our reference group of active clinicians, those components will cover at least 85% of the clinical situations in a normal implant practice.**
**The following technical solutions contribute to make the Ospol system compact and easy to handle.**

### Focus on cemented solutions

Because of the simpler protocol associated with cementing for single tooth and short partial bridge indications, cementation is the most common restorative solution. For full mouth reconstructions, Ospol recommends the Procera® Bridge Adapter, which will allow a traditional screw-retained treatment protocol.

### One-size abutment screw

The interior design of each Ospol abutment is altered to accommodate a single size of abutment screw. The retention properties of the abutment screw are largely dependent on the length of the "stem." Thus, using one screw size regardless of the length of the abutment keeps performance consistent.

### Efficient screwdriver system

Because the same screwdriver is used for cover screws, healing abutments, abutment screws and the guide-pin for the impression coping, the Opsol system has a low number of different screwdrivers. In addition, the implant inserter incorporates a friction grip tip for picking up and placing cover screws and healing abutments without changing the machine tool.

### A single abutment design for all indications

The entire range of Ospol abutments is equipped with the same octagonal design for correctly indexing the abutment in the implant. Consequently all abutment designs can be used for single tooth replacements as well as all other indications.

### Unique packaging and storage solution

A streamlined packaging and in-practice storage solution also help keep the Ospol system compact. All Ospol products come packed in a unique container that will simplify storage and handling. And the implants themselves are enclosed in a double-barrier cylinder that can be easily transferred to the surgical tray. The product containers are organized in a binder storage solution that holds up to 42 individual containers.

# List of references

This is a list of some of the most relevant articles, studies and text books on modern dental implantology including those referenced in this whitebook.

Abstracts on most of these can be found on internet at the following addresses:
www.pubmed.com, www.medline.cos.com, www.embase.com
You can also find links to these sources at our website www.ospol.com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