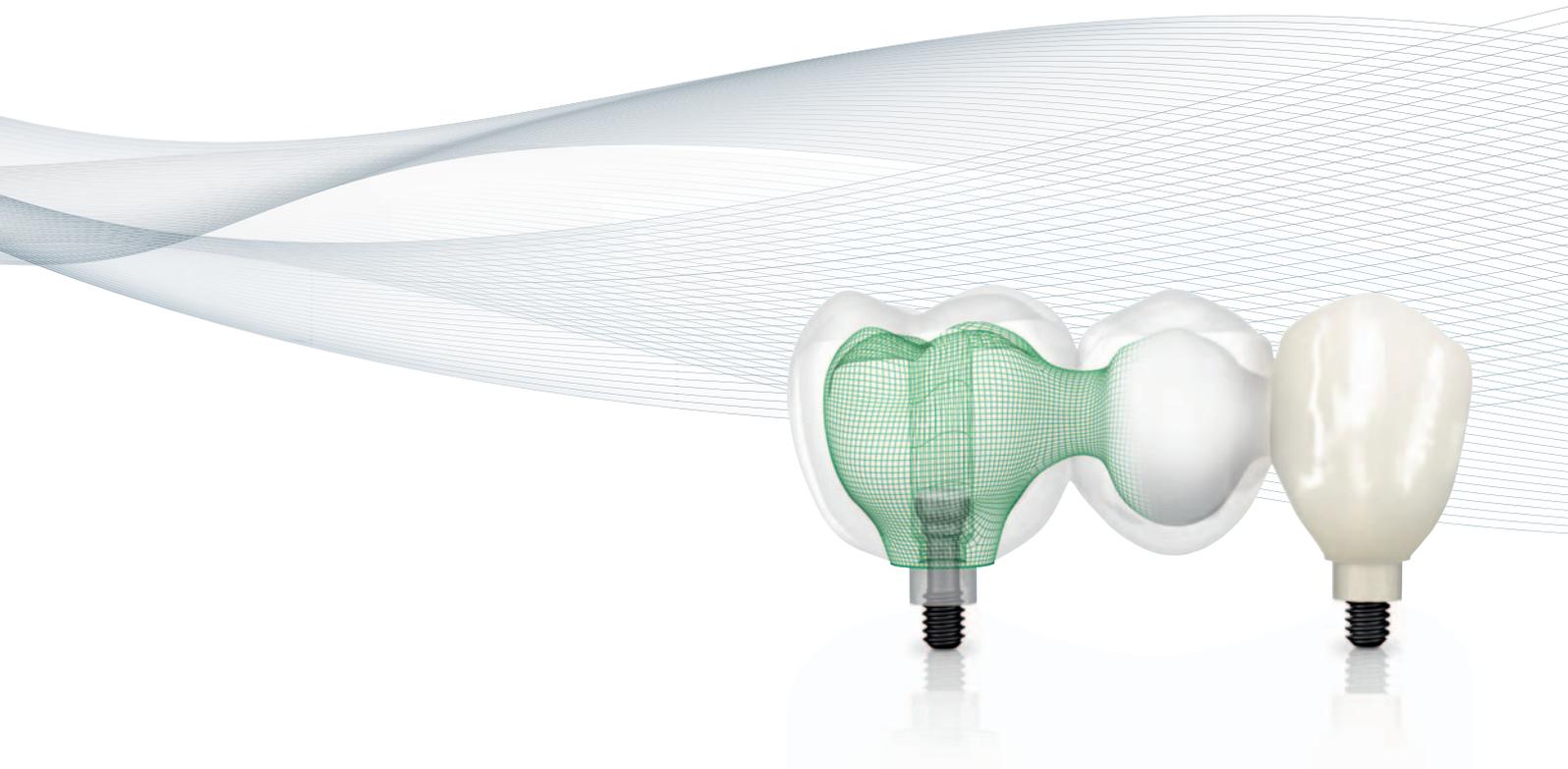




NobelProcera™

EXPERIENCE THE NEW WORLD OF CAD/CAM DENTISTRY



At a glance.

Highlights	<p>All indications</p> <ul style="list-style-type: none"> – On natural teeth – On implants and abutments <p>Computer-assisted design and -aided manufacturing – CAD/CAM – accuracy</p> <p>Best precision of fit</p> <ul style="list-style-type: none"> – production accuracy < 10 μm – internal fit < 50 μm <p>High material biocompatibility and homogeneity</p> <p>Proven and sound clinical outcomes</p>
Materials	<p>Zirconia (ZrO₂)</p> <ul style="list-style-type: none"> – 1120 MPa average flexural strength <p>Alumina (Al₂O₃)</p> <ul style="list-style-type: none"> – 600–700 MPa flexural strength <p>Titanium</p> <ul style="list-style-type: none"> – 345 MPa and 860 MPa tensile strength
Colors	<p>Zirconia</p> <ul style="list-style-type: none"> – white, light, medium, intense <p>Alumina</p> <ul style="list-style-type: none"> – translucent, white
Versatility	<p>Zirconia</p> <ul style="list-style-type: none"> – crown copings – cement- and screw-retained bridges, up to 14 units – abutments <p>Alumina</p> <ul style="list-style-type: none"> – crown copings and laminates – cement-retained bridges, up to 4 units <p>Titanium</p> <ul style="list-style-type: none"> – screw-retained bridges, up to 14 units – abutments

NobelProcera™ – experience the new world of CAD/CAM dentistry.

Modern-day dentistry was revolutionized in 1983 by the development of a system that applied standardized industrial manufacturing processes to the production of individualized dental prosthetics. This system, named Procera®, created a paradigm shift in dentistry by producing high quality, individually fitting, biocompatible prosthetics for patients. Since its introduction, Procera has led the computer-aided design (CAD) and computer-aided manufacturing (CAM) dental industry.

Now, Nobel Biocare introduces the new world of CAD/CAM dentistry that will set new industry standards for materials, products, services and support – welcome to NobelProcera!

NobelProcera offers dental professionals a highly comprehensive portfolio of individualized dental prosthetics produced from materials of excellent homogeneity. Prosthetics are designed using cutting-edge scanning and software technologies, then manufactured at state-of-the-art production facilities employing strategies which maximize quality, safety and precision of fit.

Ultimately, NobelProcera prosthetics provide long-term clinical performance and patient satisfaction¹⁻³, which is supported by a 5-year product warranty.

- **Comprehensive CAD/CAM dental prosthetics for all indications**
- Excellent materials and production for **best precision of fit and safety**
- Cutting-edge **3D software** and **optical scanner** offer optimum versatility
- Exclusive **5-year product warranty** against material breakage or defects
- **State-of-the-art production centers for high quality**
- Global **expert network of 4,000 dental labs and professionals**
- Backed by more than **15 years of clinical experience and research**



1. Dentist

The restorative clinician begins the NobelProcera process by following conventional crown and bridge preparation and impression routines for the proposed restoration.

2. Laboratory

The dental laboratory scans the physical impression with a NobelProcera scanner and, using cutting-edge CAD software, designs an accurate digital restoration. When completed, the lab sends the completed design/data package via the Internet to a NobelProcera production facility.

3. Nobel Biocare

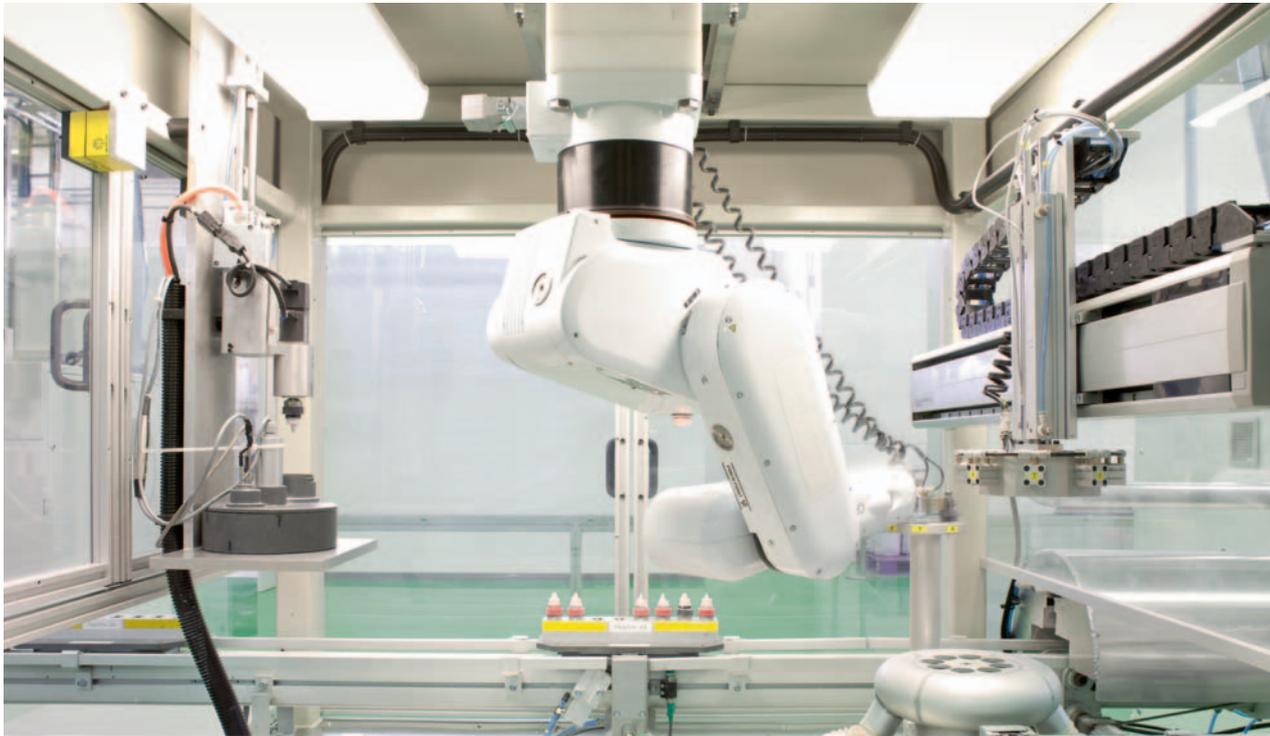
Using advanced milling strategies and high-end finishing techniques, the NobelProcera production facility produces a precision framework. Following a rigorous quality control check, the framework is shipped back to the dental laboratory.

4. Laboratory

The framework received by the dental laboratory is “ready to use” and therefore does not require extensive finishing/polishing before veneering layers are applied. Once the restoration matches the patient’s adjacent teeth, in color and shape, the technician sends the finished product to the restorative clinician.

5. Dentist

Depending on the type of restoration, the restorative clinician will cement or screw the received finished product in the prepared patient restoration site.



Centralized industrial manufacturing process.

NobelProcera™ – leading CAD/CAM dentistry.

With NobelProcera, dental professionals gain access to a state-of-the-art world of CAD/CAM dentistry, including modern production facilities, for all types of restorations and treatment options.

Latest production technology

The new world of NobelProcera represents the next generation for prosthetics in terms of precision of fit, material homogeneity and mechanical stability compared to conventional casting techniques.

With worldwide modern production facilities and innovation centers in Stockholm, Mahwah, Tokyo, Quebec and Mechelen, Nobel Biocare streamlined industrialized NobelProcera fabrication processes beginning with highly homogeneous raw materials. After sintering and milling, products demonstrate exceptional internal and marginal precision of fit,^{4,5} mechanical stability and biocompatibility,⁶⁻⁸ and provide years of safe and reliable service.^{1,9}

Prosthetics for all indications

NobelProcera produces ready-to-use abutments, copings and frameworks with high esthetics and biocompatibility, based on CAD information received from partnering NobelProcera dental laboratories.

NobelProcera offers dental professionals the full range of prosthetics for both natural-tooth and implant-retained restorations. The NobelProcera prosthetics portfolio is the largest and most versatile of all currently available CAD/CAM systems.

Cutting-edge technology

Nobel Biocare dedicates itself to the constant refinement of NobelProcera.

This includes developing new materials, enhancing CAD/CAM software, production and scanning technologies.

The latest NobelProcera innovation is a completely new optical impression scanner and cutting-edge software package that will streamline and improve the design/production workflow of NobelProcera partners.

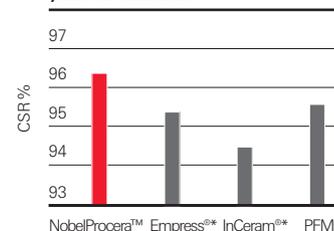
Global network of dental experts

All NobelProcera partners benefit from the support of the largest established digital dentistry network in the world, comprised of three global production facilities and 4,000 laboratories in 75 countries.

Proven safe and effective

Fifteen years of cumulative clinical experience and research have demonstrated the long-term success and efficacy of NobelProcera individualized solutions, which are often superior to other dental ceramics systems and conventional crown and bridge restorations.

NobelProcera™ on teeth – cumulative Survival Rates after 5 years in function



* Empress is a registered trademark of Ivoclar Vivadent, InCeram is a registered trademark of Vita Zahnfabrik.

Pjetursson BE, et al. A systematic review of the survival and complication rates of all-ceramic and metal-ceramic reconstructions after an observation period of at least 3 years. Part I: Single crowns. *Clin Oral Implants Res* 2007; 18 Suppl 3:73–85.

15 years of clinical experience with Procera Alumina. A Review. Haag P, Andersson M, Vult von Steyern P, Odén A. *Appl Osseointegrat Res* 2004;4:7-12. A review containing description of clinical studies and in vitro studies performed on clinical criteria.

NobelProcera™ Crown for natural-tooth or implant-retained restorations.

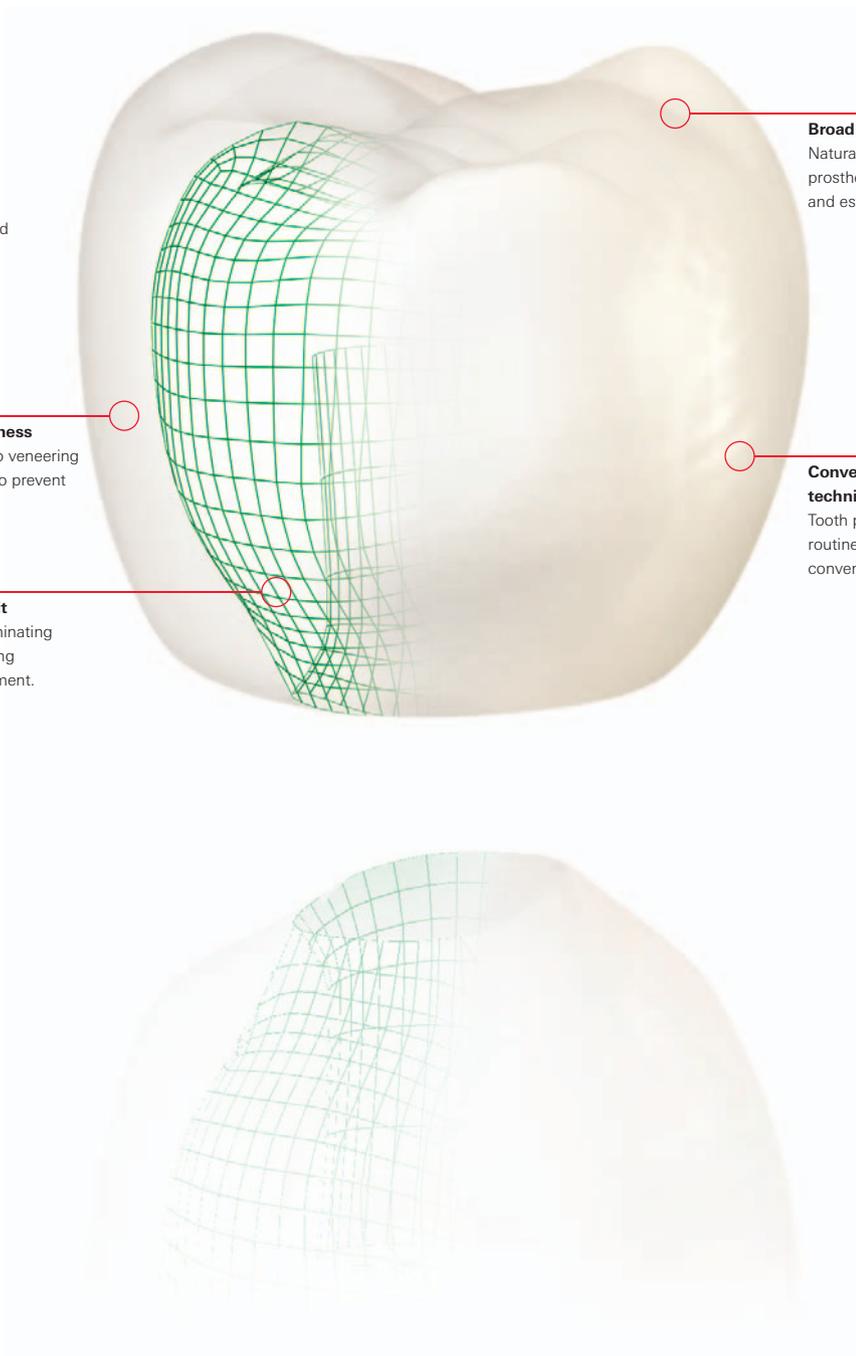
Industrial fabrication
For high product quality and long-term success.

Optimal veneering thickness
Prosthetics are designed so veneering layer thickness is uniform to prevent chipping.

CAD/CAM Precision of fit
Increases efficiency by eliminating the need for time-consuming adjustments prior to placement.

Broad prosthetic versatility
Natural-tooth or implant-retained prosthetics for all patient clinical and esthetic needs.

Conventional crown and bridge techniques
Tooth preparation and cementation routines are similar to those used for conventional cast restorations.



NobelProcera™ – preferred solutions for all indications.

Dental clinicians benefit from a comprehensive range of advantages that NobelProcera brings. These include a highly effective process for handling and production of the prosthetics, a comprehensive range of materials and products for all indications, as well as very high functionality and highly esthetic outcome.

Solutions for all patient needs

NobelProcera provides customized solutions that satisfy all clinical, esthetic and budgetary requirements of the patient, and delivers highly esthetic and natural-looking results:

- Crown^{10–12} and bridge frameworks
- Implant abutments¹⁰
- Laminates^{23,24}
- Implant superstructures, such as bars and telescopes

Wide selection of materials

Prosthetic components are currently produced from three highly biocompatible materials: zirconia, alumina and titanium. Zirconia and alumina are also available in different colors to assist in matching neighboring dentition. Additional materials are currently in development and are scheduled for release during 2009.

Highly effective restorations

NobelProcera precision of fit greatly influences the efficiency of crown and bridge restoration procedures; this efficiency is often expressed in reduced patient chair time, which means more time for more patients and greater profitability.

Clinical precision and safety

All NobelProcera production steps are closely monitored and calibrated – around the clock, everyday. This level of precision guarantees the consistent high quality and safety of every NobelProcera product. In addition to the precision of fit of NobelProcera products, the high biocompatibility of NobelProcera materials^{6–8} reduces potential allergic reactions commonly associated with solutions created from non-homogeneous and dissimilar materials.

In combination with the customized shapes of the restorations, NobelProcera products support long-term soft tissue stability and produce high esthetic outcomes.^{10–12}

Additionally, the TorqTite screws, available for all screw-retained prosthetics, have been specially treated to ensure proper pre-load and reduce the incidence of component loosening.

Adopting NobelProcera is easy

Preparation and cementation protocols are similar to those used with conventional crown and bridge restorations. However, to ensure the ultimate success of each NobelProcera restoration, Nobel Biocare provides dental clinicians with detailed handling guidelines, developed in collaboration with a number of leading industry experts and universities.*

48-month data of a retrospective clinical evaluation of 86 Procera® AllCeram™ crowns

Surface and color

Excellent	82
Acceptable	3
Not acceptable	–

Anatomic form

Excellent	85
Acceptable	–
Not acceptable	–

Marginal integrity

Excellent	84
Acceptable	1
Not acceptable	–

Clinical evaluation according to California Dental Association (CDA) quality evaluation system.

Zarone F, et al. Retrospective clinical evaluation of 86 Procera AllCeram anterior single crowns on natural and implant-supported abutments. *Clin Implant Dent Relat Res* 2005;7 Suppl 1:95–103.

* Markus Blatz, University Pennsylvania; Jonathan Ferencz, New York University; Stefan Holst, University Erlangen; Mathias Kern, University Kiel; Hans Geiselhöringer, Dental X Laboratories Munich.

NobelProcera™ Bridge Alumina on natural teeth.

CAD/CAM manufacturing strategies

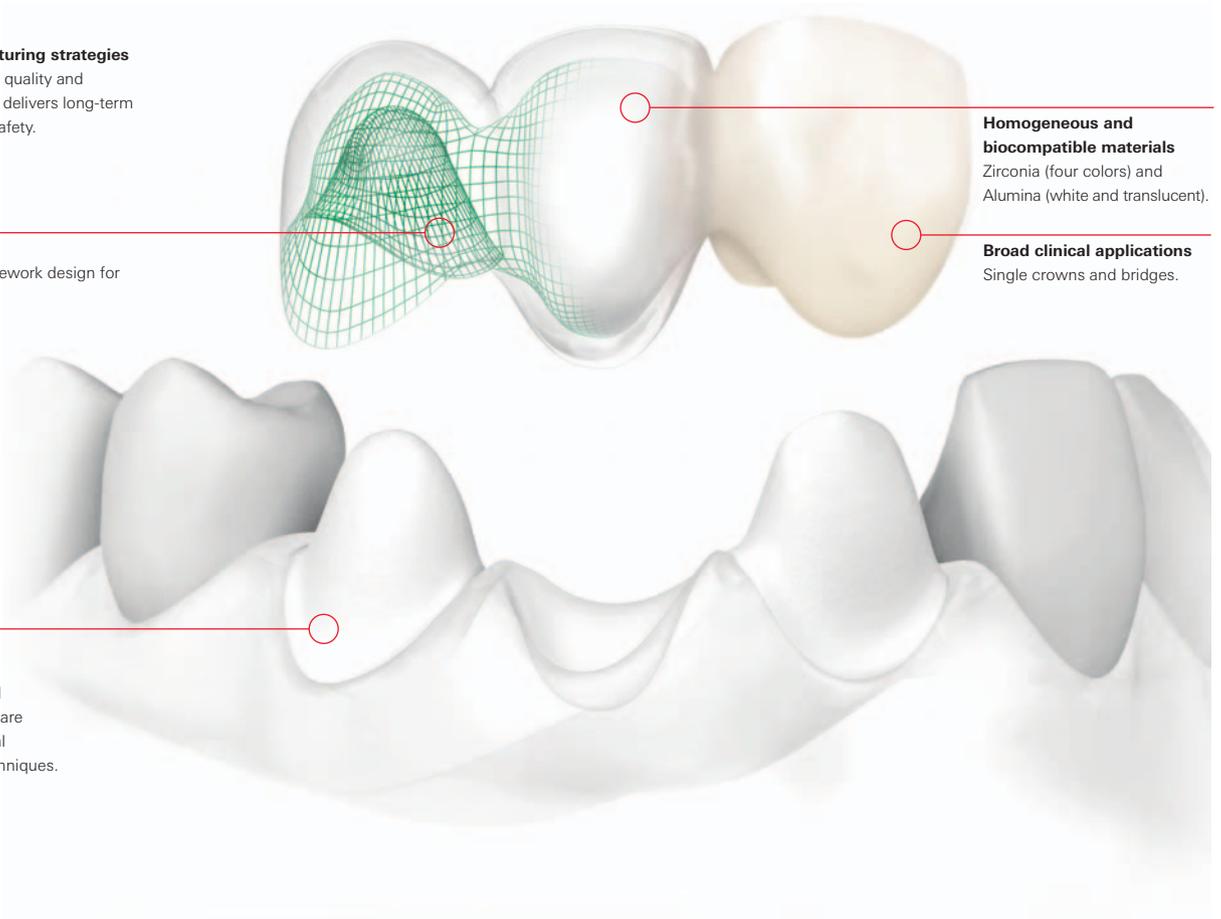
Produce high product quality and precision of fit, which delivers long-term clinical success and safety.

Individual design

Individual virtual framework design for better esthetics.

Easy to integrate into a practice

Tooth preparation and cementation routines are similar to conventional crown and bridge techniques.



Homogeneous and biocompatible materials
Zirconia (four colors) and Alumina (white and translucent).

Broad clinical applications
Single crowns and bridges.

NobelProcera™ on natural teeth.

The preservation and restoration of natural teeth with crowns, bridges and laminates is the daily business of dental professionals. For natural teeth, NobelProcera offers a complete range of prosthetics which demonstrates excellence in precision of fit, biocompatibility and esthetics.

Reproducible precision of fit

NobelProcera optimized milling and sintering strategies consistently producing copings and frameworks that are more precise than those created in conventional casting techniques.^{5,13} Additionally, the purity and homogeneity NobelProcera materials yield products of exceptional strength.^{14,15}

All-ceramic biocompatibility

NobelProcera natural-tooth restorations are metal-free solutions and highly biocompatible. This means there are neither corrosive phenomena nor potential allergic reactions, commonly associated with the presence of dissimilar metals and alloys in the oral cavity.

Individual design for better esthetics

All NobelProcera prosthetics are individually designed according to patient specifics, using cutting-edge 3D design software, or by scanning a wax-up.

Ceramic solutions on natural teeth deliver excellent esthetics^{11,12} and can effectively mask underlying tooth discoloration.¹⁶

Crowns in Zirconia and Alumina

NobelProcera offers crown copings in two materials and two thickness of each: NobelProcera Crown Zirconia (0.4 mm and 0.7 mm) and NobelProcera Crown Alumina (0.4 mm and 0.6 mm). Thickness selection is indication dependent and designed for providing uniform support for the veneering layers.^{1,3,17}

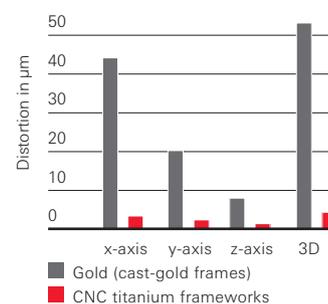
Bridges in Zirconia and Alumina

NobelProcera bridges for natural-tooth restorations are customized designed and milled from pre-sintered blanks of zirconia and/or alumina. The material homogeneity of these blanks delivers maximum biomechanical strength and allows for high precision of fit¹⁸⁻²², which assist in providing optimal soft tissue support and esthetics.¹⁰⁻¹² NobelProcera Bridge Zirconia is available in full arches (up to 14 units), whereas NobelProcera Bridge Alumina is perfectly suited for anterior use, up to 4 units. Both bridges follow conventional cementation techniques.

Laminates in Alumina

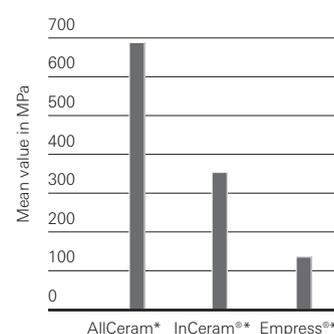
NobelProcera Laminates are 0.25 mm thin, veneers made from alumina that have been designed to cover only the outside of natural teeth. Laminates possess excellent masking capabilities and are applied using simple tooth preparation and bonding techniques.^{16, 23, 24}

Less distortion with CNC-milled Ti Frameworks



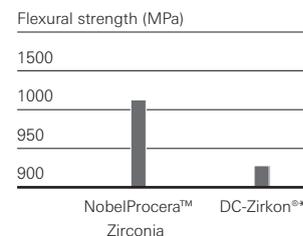
Örtorp A, et al. Comparisons of precision of fit between cast and CNC-milled titanium implant frameworks for the edentulous mandible. *Int J Prosthodont* 2003; 16 (2):194-200.

Biaxial flexural strength according to ISO 6872



Wagner WC, Chu TM. Biaxial flexural strength and indentation fracture toughness of three new dental core ceramics. *J Prosthet Dent* 1996.

Biaxial flexural strength according to ISO 6872



Sierraalta M, Oden A, Razzoog ME. Material strength of zirconia produced with two methods. *J Dent Res* 2003;82 (Spec Iss A):abstract #0450.

* InCeram is a registered trademark of Vita Zahnfabrik, Empress is a registered trademark of Ivoclar Vivadent, DC-Zirkon is a registered trademark of DCS Dental. AllCeram is a Nobel Biocare trade name for alumina.

NobelProcera™ Bridge Zirconia on implants.

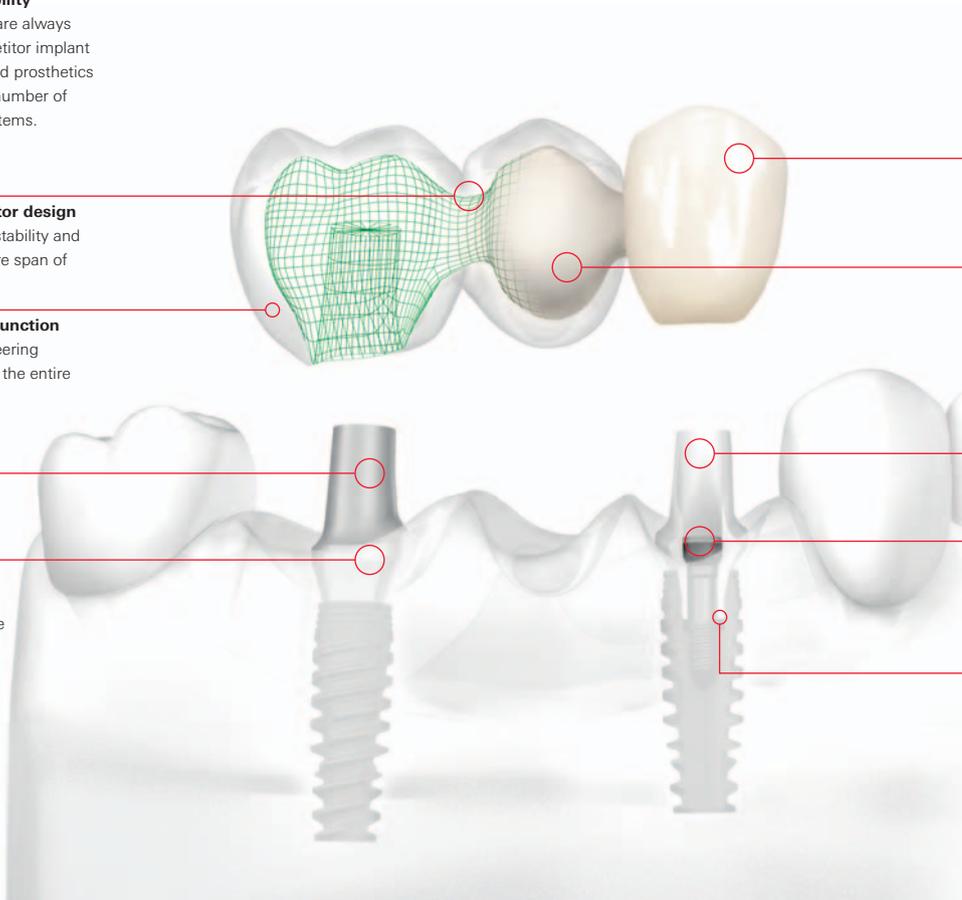
Competitor compatibility
Cemented prosthetics are always compatible with competitor implant systems. Screw-retained prosthetics are compatible with a number of competitor implant systems.

Morphologic connector design
Guarantees long-term stability and strength along the entire span of the bridge.

Automatic cut-back function
Ensures a uniform veneering material thickness over the entire prosthetic.

Titanium abutment
For increased strength when desired.

Customized transmucosal profile
For adequate soft tissue support and long-term hygiene maintenance.



Broad clinical applications
Single crowns and bridges, up to 14 units.

Three biocompatible materials
Prosthetics are available in zirconia, alumina and titanium, depending on the clinical and esthetic needs of the situation.

Zirconia abutments
For maximum esthetics and biocompatibility.

TorqTite abutment screw
Specially coated screw for ideal pre-torque and reduced screw-loosening.

Precision of fit
For ideal load transfer.

NobelProcera™ on implants.

One of the most important factors a dental professional must consider is the selection of proper materials. For implant-supported restorations, NobelProcera delivers a full range of highly biocompatible, strong and safe solutions, which also satisfy dental practitioner material requirements.

Material strength, biocompatibility and the precision of fit in superstructure components greatly influence long-term clinical success and patient satisfaction.^{2,12}

Optimum prosthetic flexibility

NobelProcera offers a broad range of prosthetic restorations, for all indications and clinical requirements. These include: screw- or cement-retained solutions for single and multiple-unit restorations, at abutment or implant level.

NobelProcera Solutions are easy to handle and are designed to meet the patient expectation and need. They provide excellent esthetic outcomes and meet all levels of affordability. To ease the restoration process, abutment-supported cement-retained solutions follow conventional crown and bridge techniques.

Supporting soft tissue health

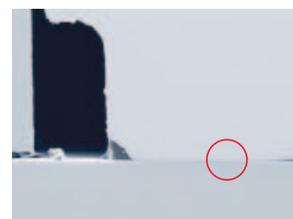
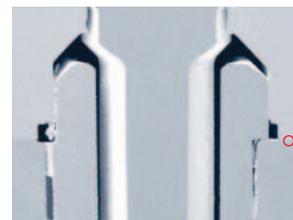
Scientific research has shown that implant abutment and superstructure material can affect both the amount and the quality of the surrounding tissues.^{6,7,25} This research has also shown that ceramic abutments minimize bacterial and plaque adhesion and improve soft tissue health.^{6,26}

Compatibility with other systems

NobelProcera is also a viable option for clinicians who restore other brands of implants. Restoring with screw-retained solutions NobelProcera is compatible with a variety of other implant brands* (see page 13).

Complete range of crowns and bridges

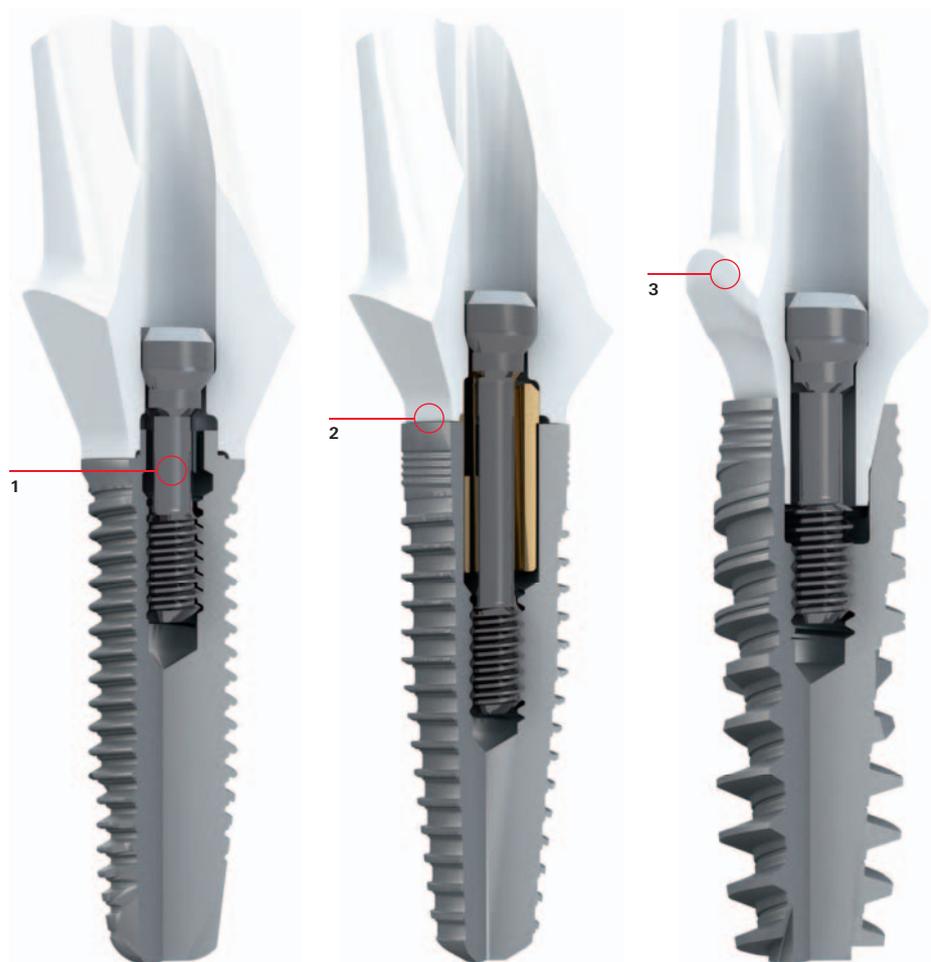
For cement-retained solutions on implants, NobelProcera offers a complete portfolio of crowns and bridges for use on NobelProcera abutments. Crowns and bridges are produced from the highly homogenous materials alumina and zirconia, in a number of colors and thicknesses.



NobelReplace™ Tapered Groovy RP Implant and NobelProcera™ Abutment Zirconia. Scanning electron microscope (SEM) images of abutment/implant interface (precision of fit <math><0.5\mu\text{m}</math>).

NobelProcera™ Abutment Zirconia on Nobel Biocare implants.

- 1 TorqTite screw**
Specially coated component screw ensures proper pre-load and reduces risk of loosening.
- 2 Precision of fit**
Excellent abutment/implant interface provides for ideal load transfer.
- 3 Customized transmucosal profile**
Improves soft tissue support and long-term hygiene maintenance.



Brånemark System®
Mk III Groovy
external hexagonal connection

NobelReplace™ Tapered Groovy
Tri-channel (tri-lobe)
internal connection

NobelActive™
internal conical connection
with hexagonal interlocking

Abutments in Zirconia and Titanium

NobelProcera Abutments are milled from zirconia or titanium. Each NobelProcera Abutment is customized and highly biocompatible^{6,7,25}, delivering high esthetics and maximum long-term tissue stability. NobelProcera Abutments are also cost-effective, because no pre-fabricated abutments need to be stocked.

Largest choice in implant bridges

NobelProcera Implant Bridges are designable up to 14 units and are milled from a pre-sintered zirconia blank or solid block of titanium. This ensures material homogeneity, as well as eliminates the need for soldering or cementing of components.

The high quality material also delivers exceptional biocompatibility and ideal soft tissue interface.

Implant bridges in zirconia

NobelProcera Implant Bridge Zirconia is a CAD/CAM fabricated implant bridge available in zirconia for restorations up to 14 units.

Every NobelProcera Implant Bridge Zirconia is milled from the highest grade zirconia then sintered in a closely monitored and controlled process. Produced frameworks demonstrate exceptional biocompatibility^{6,7} and strength (1120 MPa average flexural strength^{28,29}) – making Implant Bridge Zirconia appropriate for nearly any clinical indication.²⁰

Implant bridges in titanium

Whenever material properties or the clinical situation limit the application of zirconia superstructures, titanium provides an excellent alternative solution.

Every NobelProcera Bridge Titanium is milled from a homogenous titanium block for high strength, in a closely monitored and controlled process.

Both NobelProcera Bridge Zirconia and NobelProcera Bridge Titanium are easily customizable, using either NobelProcera Software or by scanning a wax-up.

This added flexibility reduces time and cost for both dental laboratories and clinicians.

Finally, similar to NobelProcera Abutment Titanium, NobelProcera Bridge Titanium is compatible with a variety of other implant brands.*

Component screws

To increase success of screw-retained solutions, NobelProcera implant restorations are delivered with abutment screws that have been coated with a friction-reducing surface – TorqTite. This surface offers optimum pre-loading of the prosthetics and a long-term stable screw joint, which help reduce the incidence of screw loosening.

* NobelProcera™ Abutment Zirconia

Straumann® Regular Neck 4.8 mm implants. Camlog® Implant Systems 3.3, 3.8, 4.3, 5.0, 6.0 mm.

NobelProcera™ Abutment Titanium

Straumann® Regular Neck 4.8 mm implants. Camlog® Implant Systems 3.3, 3.8, 4.3, 5.0, 6.0 mm. Astra Tech® Implant System 4.5 ST, 5.0 ST mm.

NobelProcera™ Implant Bridge

Zirconia, implant level

3i® 3.75, Lifecore® Biomedical Restore 3.75, Sterngold Implamed® 3.75.

NobelProcera™ Implant Bridge

Titanium, implant level

Straumann® Regular Neck 4.8 and Wide neck 6.5. 3i® 3.75. Lifecore® Biomedical Restore 3.75. Sterngold Implamed® 3.75.

NobelProcera™ Implant Bridge

Titanium, abutment level

Ankylos® Implant System 3.5, 4.5, 5.5, 7.0 mm. Camlog® Implant System 3.3, 3.8, 4.3, 5.0, 6.0 mm. Astra Tech® Implant System 4.5 ST, 5.0 ST mm.

Astra Tech® 3.5, 4.0, 4.5, 5.0 ST are trademark products of Astra Tech®, Straumann® Regular Neck 4.8 is a trademark product of Institute Straumann. 3i® 3.75 is a trademarked product of Biomet Group Lifecore® Biomedical, Restore 3.75 is a registered product of Lifecore Biomedical, LLC. Sterngold® Implamed 3.75 is a registered product of Sterngold Dental, LLC. Astra Tech® is a trademark of AstraZeneca Group. Straumann® is a registered trademark of Institute Straumann.

NobelProcera™ colored zirconia.
Full zirconia assortment* in four colors.

Innovative coloring technique
Ensures consistency in material strength and consistent color throughout the framework.



white



light



medium



intense

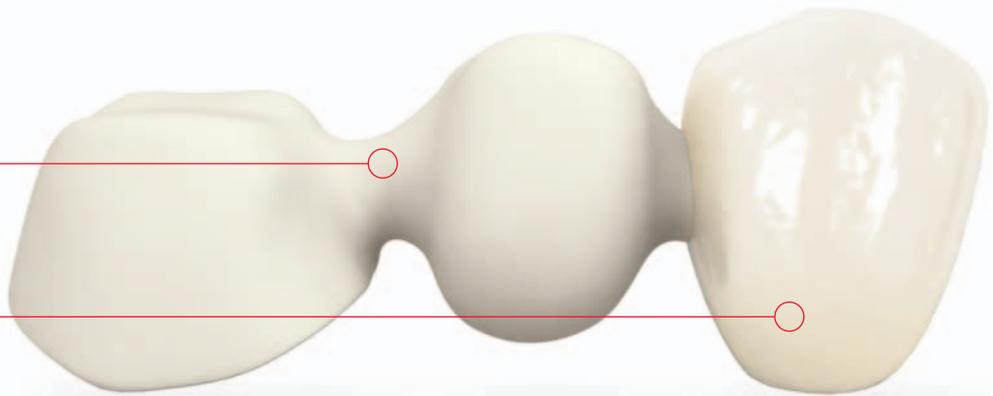
Excellent material homogeneity
NobelProcera Zirconia is certified for purity and homogeneity.

Excellent flexural strength

All colors of zirconia demonstrate exceptional flexural strength and show no degradation in strength compared to white zirconia.**

Excellent esthetic results²⁷

Supported by the coloring of the underlying framework.



* NobelActive™ product assortment currently under development.

** NIOM, Norway.

NobelProcera™ – full zirconia assortment in four colors.

Based on the market need for more esthetic options using zirconia copings, NobelProcera offers its full zirconia prosthetic assortment in four colors: white, light, mild and intense – from single crown and bridges (up to 14 units) restorations, cemented on natural teeth and screw-retained (fixed to removable) on implants*.

Improved esthetics

Ceramic restoration esthetics depend heavily on the translucency of the veneering materials, but also on the shade or coloring of the underlying framework.²⁷ This cooperation is similar to that of a natural tooth enamel and its underlying dentin.

Having a shaded framework greatly increases the chances of creating natural-looking restorations and matching neighboring dentition, especially in long span implant-retained superstructures. Moreover, the high biocompatibility with reduced bacterial surface adhesion make zirconia an excellent choice for implant-retained superstructures in close contact with surrounding soft tissues.³⁰

Innovative coloring technique

In contrast to immersion dyeing, NobelProcera uses an innovative coloring technique that ensures consistent color throughout frameworks, without sacrificing material homogeneity or strength.

Additionally, consistent color throughout frameworks eliminates the need for manual shading protocols and the “white collar” shine-through of implant abutments in cases where soft tissue recedes.

Excellent material homogeneity

Like all NobelProcera materials, the material homogeneity of NobelProcera colored zirconia remains consistent throughout the framework.

Likewise, the flexural strength of colored frameworks demonstrate no statistical difference in flexural strength compared to their white counterparts^{28,29}, which adds to the longevity of the prosthetic.

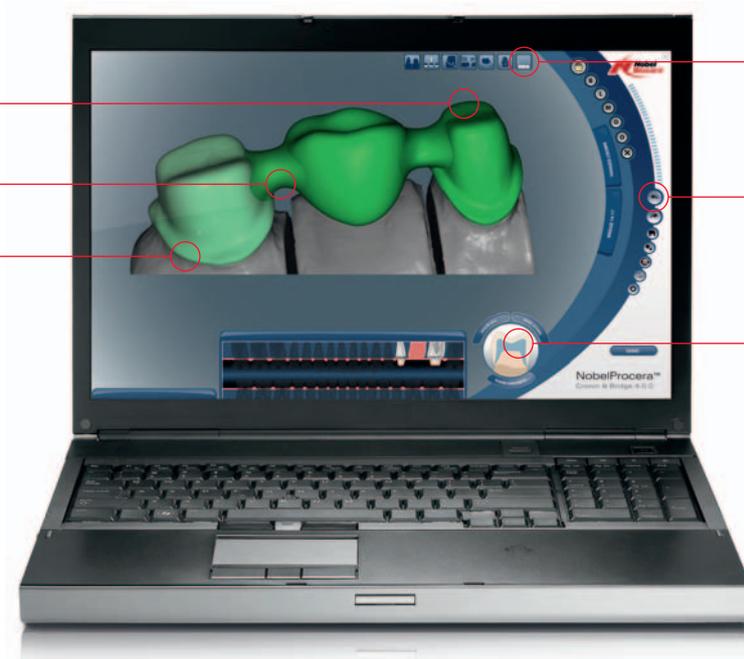
* NobelActive™ product assortment currently under development.

NobelProcera™ prosthetic software.

Automatic cut-back function
For ideal veneering material thickness.

Morphologic connector design
Assists long-term stability.

Automatic setting of finish line
Saving technician's time.



Intuitive software architecture
For easy application.

Anatomic tooth library
For time-saving design.

Visibility tool
To review the prosthetic design from every possible angle.

NobelProcera™ optical scanner.

Full and future product assortment
Scanner support for current and future advancements in materials and solutions.

Patented proprietary scanner technology
For fast and highly precise data acquisition.



High accuracy and shorter scanning time
Only minimal user intervention during scanning.

NobelProcera™ – tomorrow's technology, today.

NobelProcera adds a new level of efficiency and cost effectiveness through outsourcing and centralizing framework production processes.

Outsourcing for profitability

First, outsourcing framework production eliminates the investment in different in-house systems, as well as the time and money spent updating, maintaining, and training on these systems.

Second, NobelProcera eliminates the need to maintain an extensive assortment of standard products, commonly used in conventional casting techniques.

Third, the time previously spent creating in-house frameworks can now be used for processing additional orders – leading to extra revenue for the laboratory. NobelProcera production is “on-demand” and available twenty-four hours a day, with an average three business day product turn-around time.

Fourth, NobelProcera production facilities employ optimized milling and finishing routines – according to material prerequisites – therefore prosthetics received are “ready to use” and rarely require time-consuming finishing and polishing.

State-of-the-art CAD/CAM

NobelProcera is setting new standards with a cutting edge scanner and software package – developed by technicians for technicians. Patented optical scanning methods, and ground-breaking intuitive 3D design software version will expand the capabilities of dental clinicians and labs for producing and delivering high-class quality individualized prosthetics. Simultaneously, these new tools will increase efficiency and reduce in-house costs.

Comprehensive prosthetic portfolio

NobelProcera customizes and produces everything from fixed to removable solutions, from single tooth to long span frameworks for meeting clinical and esthetic expectations¹⁰⁻¹² with excellent precision of fit^{5,13} – production accuracy <10µm and internal fit <40µm.²⁹

Certified raw materials

The highly homogeneous raw materials used in the NobelProcera fabrication process demonstrate excellent precision of fit and do not distort during veneering.⁵

For added peace of mind, every NobelProcera product is delivered with a certificate of authenticity, verifying the purity of the raw materials.

Easy integration of NobelProcera™

To ensure the ultimate success of each NobelProcera restoration, Nobel Biocare provides dental laboratories with detailed handling guidelines, developed in cooperation with a number of leading industry experts and universities.*

* Markus Blatz, University Pennsylvania; Jonathan Ferencz, New York University; Van Thompson, New York University; Stefan Holst, University Erlangen; Mathias Kern, University Kiel; Peter Rammelsberg, University Heidelberg; Hans Geiselhöringer, Dental X Laboratories München.

NobelProcera™ Optical Scanner.

Impression scanning capability
Increased laboratory efficiency and future model production.

Unique conoscopic holography technology
Co-linear scanning technology for improved data acquisition efficiency.

Open air design
For ease of access, set-up and use.

Moving object table
High speed, stable platform for fast and accurate scanning.



Intuitive holder design
Option for batch scanning of single copings.

NobelProcera™ – innovative scanner technology.

NobelProcera introduces the next advancement in optical scanning technology for CAD/CAM dentistry: a new scanner that uses a unique and patented proprietary scanner technology – conoscopic holography – for fast and highly precise data acquisition.

Leading conoscopic holography

Conoscopic holography is superior to other optical scanner techniques, such as triangulation, in that the projected and reflected beams travel the same linear pathway to and from the scanned object, respectively (see on the right). This “co-linearity” allows measurements of steep angles and deep cavities, such as those found in dental impressions.

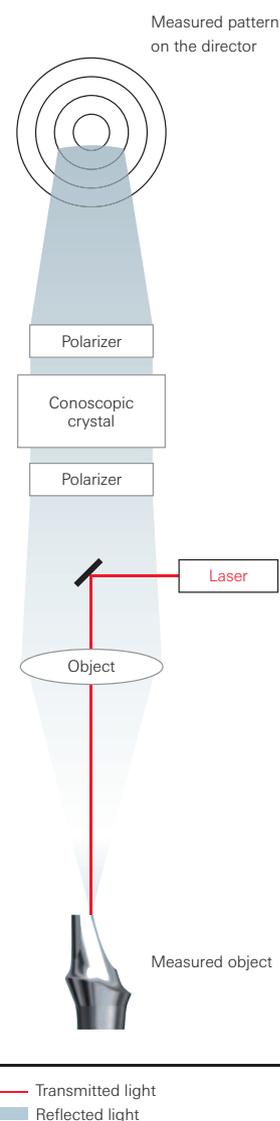
Innovation that adds clear benefits

For each measured point, a large amount of information is retrieved using conoscopic holography; therefore, accuracy of the scans is very high and scanning times are shorter.

Due to co-linearity scanning, steep slopes – up to 85° – can be measured, compared with the limited capability of triangulation scanners, 40° to 60°. Additionally, using this methodology, basically every material can be scanned – only very shiny metal or translucent wax/acrylic objects cannot be scanned.

The set-up and operation of the scanner has also been simplified – one set-up per case – and only minimal user intervention is required during scanning. This simplification has also resulted in a reduction in the time needed to train users.

Conoscopic holography – working principle



Latest software technologies used for NobelProcera™.

Virtual framework design
Eliminates the need for wax/
set-ups.

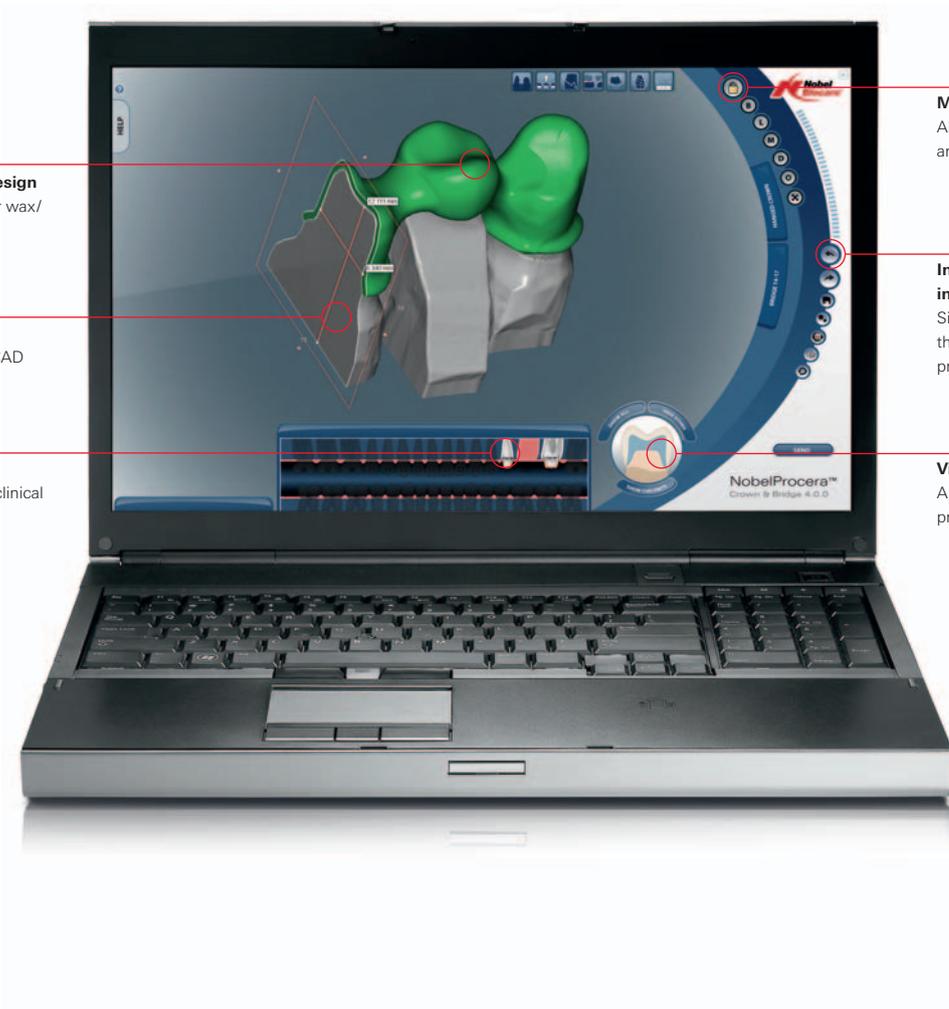
Cross section tool
Accurately measures CAD
framework.

2D view
Good overview of the clinical
situation.

Material selection
Alumina, Zirconia, Titanium
and other materials.

**Intuitive user-friendly
interface**
Simple icons guide the user
through the complete design
process.

Visibility editor
A simplified preview of the
prosthetic design.



NobelProcera™ – cutting-edge prosthetic software.

Supporting the expansive capabilities of the state-of-the-art NobelProcera optical scanner is a completely new, user-friendly NobelProcera Software package for 3D designing of prosthetic frameworks.

By technicians for technicians

This new NobelProcera software version – engineered by industry leading dental technicians and 3D software experts – simplifies prosthetic design by guiding users through each step of a predictable design workflow.

Within the clean and intuitive environment and a “click of a button,” technicians are able to choose the desired material, define prefabricated retentive elements, and select automated CAD options for customized crowns and bridges, and in the future telescope abutments/crowns and bars.

The easily navigable interface is embedded with highly advanced CAD dentistry tools, which offer technicians nearly limitless design possibilities, and more flexibility and efficiency. Here are only a few:

- Anatomic tooth library: base shapes are available so prosthetic designs are not “from scratch” each time. Base shapes shave considerable time from and maximize the efficiency of the initial design phase.
- Automatic cut-back function: framework designs are optimized for uniform veneering material thickness. Uniform layering helps reduce potential chipping or cracking of the veneering material under daily patient use.
- Automatic setting of the finish line: when completing the design, the new software version can automatically determine the appropriate finish line for the prosthetic. This editable finish line automation saves technicians the time of creating one by hand.
- Morphologic connector design: pontic connectors are easily customizable and viewable. Proper connector design is paramount for creating and veneering a prosthetic that will provide long-term safety for the patient.
- Visibility tools: simplified buttons change to visual aspect of the design. These tools enable technicians to review the prosthetic design from every possible angle. As well, a 2D editor provides a cross-section of the final prosthetic.



Pre-sintering phase of NobelProcera Alumina Crown coping production.

NobelProcera™ – materials for all needs and indications.

Currently, three materials are used in NobelProcera. NobelProcera Zirconia and Alumina are ceramic materials primarily used for copings, bridges, and abutments, whereas NobelProcera Titanium is a suitable alternative for bridge frameworks and bar-retained removable overdenture* solutions. Additional materials are under development and scheduled for release during 2009.

All NobelProcera materials provide:

- High biocompatibility⁶⁻⁸
- Homogeneity – no luting/soldering/welding of different components
- No local corrosive phenomena

NobelProcera non-silica-based ceramics offer the following additional benefits:

- Ease of use with conventional cementation protocols
- High esthetic result – all-ceramic restorations appear more natural-looking than those with metal cores
- Longevity – dental ceramic research has resulted in materials that perform equally as well as cast restorations⁹

Zirconia

For long span and posterior restorations, NobelProcera Zirconia is the ceramic material of choice. Zirconia is a safe and reliable alternative to casting alloys for crowns and implant-retained superstructures, such as abutments and bridges.

NobelProcera Zirconia is based on zirconium partially stabilized by the addition of 4.5–5.5% yttrium oxide (Y_2O_3). The very fine grain structure and chemical composition of this material (0.3–0.5 μm) contribute to its high flexural strength (1120 MPa average^{28,29}) and fracture resistance (6–9 MPa \sqrt{m}).³¹

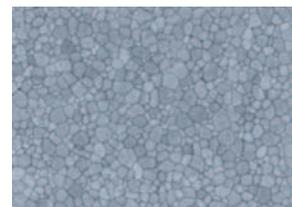
The material fracture strength of NobelProcera Zirconia means it is suited for all areas of the oral cavity where the primary requirements are strength and stability.³¹

NobelProcera Zirconia:

- All locations using 0.7 mm thick coping
- Esthetic region using 0.4 mm thick coping
- Available in white and three colors: light, medium and intense
- Natural teeth or implant restorations – single crowns and multi-unit bridges
- Customizable (CAD) using double scan/wax-up models

NobelProcera Zirconia has satisfied the following standards and tests:

- The iron content of colored Zirconia is within the span given in ISO 13356:1997 Implants for Surgery – Ceramic materials based on yttria-stabilized tetragonal zirconia (Y-TZP)
- Radioactive emission, flexural strength, and chemical solubility according to ISO 6872:1995
- In vitro cytotoxicity according to Biological evaluation of medical devices – Part 5: Tests for in vitro cytotoxicity (ISO 10993-5:1999)



SEM cross-section of densely sintered NobelProcera™ Zirconia. 20,000 x magnification.

* Available in specific markets.



SEM cross-section of densely sintered NobelProcera™ Alumina. 5,000 x magnification.



SEM Grade 2 c.p. titanium turned surface. 500 x magnification.

Alumina

NobelProcera Alumina is best suited for solutions in esthetically demanding areas, such as the anterior dentition, due to its superior optical properties. NobelProcera Alumina in single-tooth restorations has been clinically proven for long-term clinical success.^{1,3,33}

NobelProcera Alumina copings are fabricated from a high-purity aluminum oxide (Al_2O_3) powder. This ensures high flexural strength values (600–700 MPa).¹⁵

NobelProcera Alumina:

- Anterior and bicuspid region using either 0.4 mm or 0.6 mm thick copings
- Available in: translucent and white
- Natural teeth restorations – single crown up to 4-unit bridges
- Customizable (CAD) using double scan/wax-up models

NobelProcera Alumina has satisfied the following standards and tests:

- Radioactive emission, flexural strength, and chemical solubility according to ISO 6872:1995
- In vitro cytotoxicity according to biological evaluation of medical devices – Part 5: Tests for in vitro cytotoxicity (ISO 10993-5:1999)

Titanium

Since the discovery of titanium integrating with living bone, titanium has become the standard for dental implants. Titanium is highly biocompatible and produces excellent soft tissue response.

Currently, two types of titanium are used in NobelProcera production: unalloyed Grade 2 titanium is used for the majority of abutments and bridges produced; and an alloyed Grade 5 titanium is used for NobelActive implant system abutments.

Grade 2 titanium is a commercially pure (c.p.) grade titanium used primarily in surgical implant applications, and alloyed Grade 5 is 90% titanium, 6% aluminum, and 4% vanadium (Ti6Al4V), which was developed for excellent strength.

Both forms of NobelProcera Titanium have satisfied to the following general and specific standards and tests:

General

- Tensile strength, proof stress of non-proportional elongation, percentage elongation according to ASTM E8

Specific

- Unalloyed titanium grade 2: Chemical Composition for Unalloyed Titanium for Surgical Implant Applications according to ASTM F67-06
- Alloyed titanium: Standard Specification for Wrought Titanium-6Aluminum-4Vanadium ELI (Extra Low Interstitial) Allow for Surgical Implant Applications according to ASTM F136-02a

NobelProcera™ – guaranteed and certified quality.

All NobelProcera frameworks and copings delivered are covered against breakage and/or defect, and NobelProcera provides certificates of material authenticity.

Guaranteed quality

Nobel Biocare offers a comprehensive 5-year warranty on all NobelProcera products. The homogeneity of materials and industrial fabrication processes guarantee high product quality with superb fit and surface finish for long-term clinical performance and patient satisfaction.

With NobelProcera, meeting dental professionals' expectations regarding delivery time, quality, safety and versatility is the ultimate guarantee.

Warranty Terms and Conditions can be found on the NobelProcera website: www.nobelbiocare.com/nobelprocera/warranty

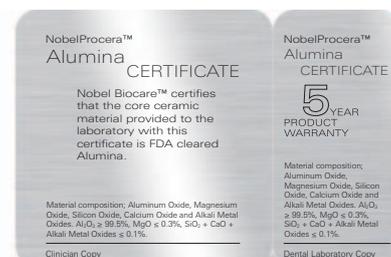
Material purity

NobelProcera provides certificates of material authenticity to dental laboratories on all frameworks and copings. These authenticity certificates are further illustrates of how Nobel Biocare and NobelProcera are dedicated to providing dental professionals with highly homogeneous materials and proven alloys upon which patient demands for esthetics and functionality can be met.

Fulfilling high quality standards

These certificates verify for the laboratory, dental professional, and ultimately the patient, that the NobelProcera materials, used in the productions of frameworks and copings, have been FDA cleared and satisfy all appropriate ISO and ASTM standards for materials used in dental devices.

Each certificate comes in two parts: the laboratory that receives the original framework or coping retains one portion, and the dental professional who receives the final prosthetic retains the other portion with the patient treatment record.



NobelGuide™ complete treatment concept for dental implant rehabilitations.

Complete treatment flexibility

Single- and partial-unit to fully edentulous dental implant rehabilitations can be planned and performed.

Excellent communication tool

Tools make sharing planning information and facilitating decision-making within the cross-functional team easy.

Fully integrated supply chain

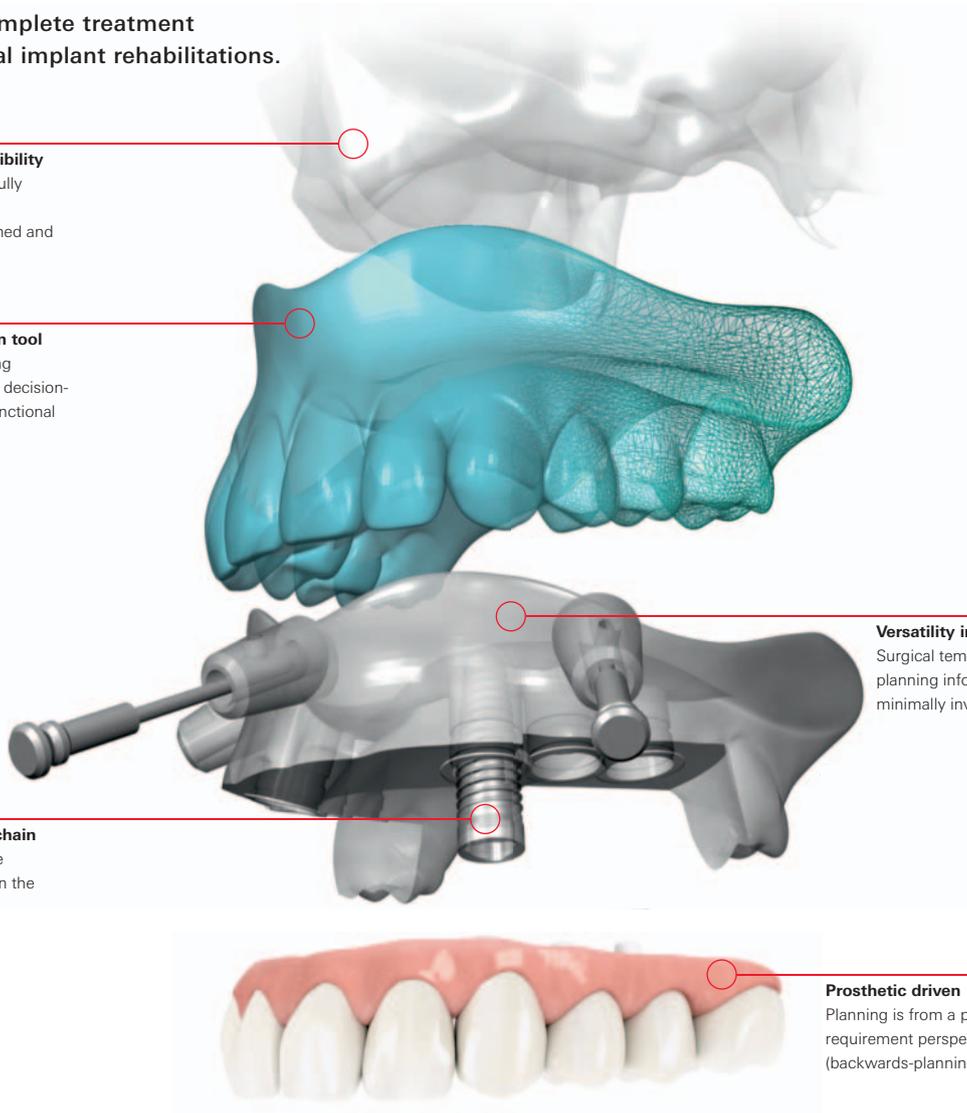
All components for a single treatment can be ordered in the same order.

Versatility in loading strategy

Surgical templates contain all the planning information and allow for minimally invasive procedures.

Prosthetic driven

Planning is from a prosthetic requirement perspective (backwards-planning).



NobelGuide™ – digital precision for all indications.

NobelGuide is a complete treatment concept for diagnosing, planning and placing dental implants, developed to work in harmony with the requirements of the future prosthetic restoration.^{34–36} NobelGuide is the perfect partner – assisting the entire team in making the appropriate treatment decisions and executing the planned result with high predictability. The digital integration of a conventional diagnostic tooth setup and full 3D view of the patient's anatomy in the software offer a profound basis for evaluating and defining implant positions for long-term success.^{35,36}

For all indications

NobelGuide provides diagnosis, planning and implementation of dental implant rehabilitations for all indications* – small partial-unit to fully edentulous cases. Functional, esthetic and biomechanical prosthetic considerations are optimized during the implant treatment planning phase. In fact, dental professionals can decide all elements of the treatment path, including the stage of implant loading (immediate or delayed loading), far in advance of the surgical procedure.³⁷

Prosthetic-driven planning

The NobelGuide workflow benefits from a prosthetic-driven, backwards-planning approach. Based on the proposed final restoration, and a clinically evaluated tooth setup, a radiographic guide is generated. This radiographic guide serves as a template for attaining the expected function and esthetics of the final restoration.

Integrated complete supply chain

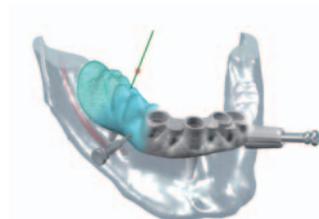
Based on the planning, a surgical template is automatically designed and ordered via the Internet from a NobelProcera™ production facility. The surgical template is produced with consistent quality and shipped back to the dental professional within a few working days. In the same order, implants, anchor pins to secure the template, drills and prosthetic components can be included.

Minimally invasive

The surgical template guides all implant treatment steps from drilling to implant insertion, and allows for safe flapless surgical protocols, which help minimize patient discomfort as well as pain and swelling.

Safe and predictable treatment

Careful diagnostics, optimized assessment of bone and prosthetic considerations allow for alignment of the entire treatment team, including the dental lab, and clear communication with the patient – all of which lead to a treatment that is optimized for safety and meeting the high esthetic demands of the patient.



Powerful indication-based diagnosis and treatment-planning platform.



NobelProcera™ prosthetics.

* Malo, P., M. de Araujo Nobre, and A. Lopes, The use of computer-guided flapless implant surgery and four implants placed in immediate function to support a fixed denture: preliminary results after a mean follow-up period of thirteen months. *J Prosthet Dent*, 2007. 97(6 Suppl):26–34.

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Achieving excellent results with NobelProcera™.

NobelProcera™ Crowns Alumina

Dr. Stefan Holst and DentalX GmbH, Germany.

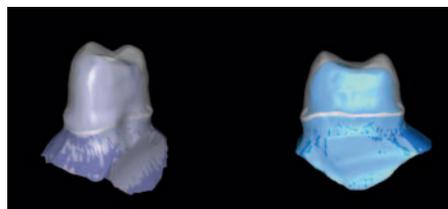
Three NobelProcera™ Crowns Alumina used to restore #14, #15 and #16, following endodontic treatment. Alumina was chosen for its excellent esthetics and biocompatibility.



Occlusal intraoral view of maxillary bicuspid and premolars with extensive temporary core built-ups following endodontic treatment.



Conventional preparation guidelines apply. A slight chamfer preparation and rounded edges are ideal for long-term clinical success.



NobelProcera Software allows for ideal contour of copings to support veneering ceramics.



NobelProcera Crown Alumina frameworks were chosen for esthetic and long-term success guarantee.



Veneering can easily be achieved with conventional layering or press techniques.



Final result showing an excellent soft tissue interface and natural-looking esthetics.

NobelProcera™ Implant Bridge Zirconia

Dr. Eric Van Dooren, Luc and Patrick Rutten, Belgium.



65-year-old female patient with unesthetic restorations and extensive periodontal breakdown combined with recurrent decay.

To correct this patient's extensive periodontal deficiencies, a complete jaw rehabilitation was necessary. Two NobelProcera™ Implant Bridges Zirconia were chosen for their excellent esthetics and biocompatibility.



Implants were inserted with a provisional restoration.



Occlusal intraoral view of abutment wax up, which will be scanned for CAD creation of the final prosthetic.



For the final restoration, two NobelProcera Implant Bridges Zirconia (4-unit and 8-unit) were chosen. Note the soft tissue health and stability.



Occlusal intraoral view of the restorations in place. Screw recesses are easily filled, but are accessible should bridges ever need to be removed.



Three months after the placement, note the excellent soft tissue integration and stability.



High precision milling units produce high quality NobelProcera™ products.

Testimonials.

“The wide range of clinical applications and positive patient response has made NobelProcera an important part of our practice for some time. NobelProcera offers us a level of predictable esthetics with amazingly consistent fit and its cost effectiveness enables our group of four in-house technicians to focus on veneering, while leaving core production to NobelProcera.”

Dr Jonathan Ferencz, USA

“NobelProcera is the perfect tool for creating dental excellence. NobelProcera restorations have not only improved my professional value and increased my number of patients, they have strengthened the workflow within our entire team – from impressions, provisionals, abutment design, material selection to final restoration.”

Dr Enric Pintado, Spain

“NobelProcera has been our choice for CAD/CAM technology since 1998. We specialize in producing single unit and bridge prosthetics for implant restorations. Products such as NobelProcera Implant Bridge for partial and full arch offer us an extensive choice of restorative options; and, the titanium bars/frames and zirconia subframes always fit perfectly. These products create savings in time and materials, which make them the most cost-effective, predictable and functional choices available.”

Mr Robert Hill, Australia

“NobelProcera provides dental technicians the complete solution they need to get involved in serious CAD/CAM – from the most efficient crown and bridge design tools to the more complex implantology-related applications. The new NobelProcera CAD software version is going to unveil a whole new world of exciting projects for all Nobel Biocare customers.”

Mr Jean Robichaud, Canada

Dr Jonathan Ferencz, DDS, FACP

Private practice limited to prosthodontics in New York City and Clinical Professor at NYU College of Dentistry, USA.

Dr Enric Pintado, DDS

Private practice in esthetics, prosthodontics and implant dentistry, and Director of Centre Dental Enric Pintado in Manresa, Spain.

Mr Robert Hill

Director of Robert Hill Ceramics Pty Ltd, a full-service NobelProcera laboratory in Melbourne, Australia.

Mr Jean Robichaud, CDT, Fellow and Master of the ICOI

Founding President of BioCad Medical Inc, developers of precision scanning and CAD design software in Quebec City, Canada.

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Support, Education and Guarantee.

Partner Support

To support the nearly 4,000 NobelProcera laboratories already existing around the world, a tightly woven network of customer services representatives has been created, which is underpinned by the three NobelProcera production centers.

All NobelProcera customers are automatically connected to the NobelProcera Network that provides:

- Information access
- Marketing support
- Educational materials
- On-line education
- Contact with laboratories all over the world

Technical support

NobelProcera scanners and equipment are covered under a NobelProcera Service Contract. Additionally, any necessary remakes are free of charge and come with the same 5-year warranty carried by every NobelProcera product (see below).

Educational Programs

The complete education offer for NobelProcera – from evening seminars, one or more days programs to World Tour congresses, inexperienced to advanced users, and around the globe – is available at www.nobelbiocare.com/education. Training and education activities are led by international and local experts.

Warranty – Terms and Conditions

NobelProcera products on teeth and implants are guaranteed for five years against breakage or defect; the NobelProcera product warranty only covers the NobelProcera products and does not include any additional costs.

Dental professionals must have complied with the handling and material instructions of Nobel Biocare as published at the time of preparation, design and finishing. Non-compliance with the procedures and instructions published by Nobel Biocare will make the warranty null and void.

Dental professionals must ensure that patients comply with generally accepted standards of good oral hygiene. Implants and NobelProcera restorations that fail as a result of poor hygiene maintenance and/or infections may not be covered under the warranty. For implants, oral hygiene maintenance examinations twice a year are recommended.

Nobel Biocare shall not be obliged to furnish benefits under this warranty with respect to any Nobel Biocare implant if the failure of such an implant or NobelProcera product is caused by trauma or by the patient in whom such an implant was installed.

This warranty is exclusively for the benefit of eligible dental professionals and is not for any other person or entity, including any patient.

Nobel Biocare worldwide.

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