

creative ceramic concepts & procedures zirconia



NobelRondo™

Zirconia



NobelEsthetics™

The ultimate... indication based beauty



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Procera[®], Strong, Beautiful, Proven

Plus other Procera[®] advantages:

- Accuracy
- Easy Handling
- Profitability
- Biocompatibility

Procera[®] Crowns – Alumina & Zirconia

Procera[®] Bridge Zirconia

▶ Procera[®] Bridge Zirconia 25×60 mm

▶ Procera[®] Bridge Alumina

▶ Procera[®] Implant Bridge Zirconia

Procera[®] Laminate

Procera[®] Abutments

Procera[®] is Nobel Biocare's unique system for the manufacturing of esthetic and functional dental restorations. Since its commercial introduction in 1994, more than 7,000,000 Procera[®] restorations have been produced. Additionally, there are Procera[®] Network Laboratories in approximately 65 countries around the world.

With Procera[®] frameworks, now available in zirconia, Nobel Biocare offers the optimal restorative system for all indications – crowns, bridges and abutments.

The combination of beauty and strength gives you a simple and predictable clinical procedure, excellent esthetic results and improved long-term performance.

new

▶ NobelRondo™ Gingiva Ceramics

new



Procera® Forte

Advanced Scanning made easy
for your every need

new
new

- ▶ Bridge Zirconia & Alumina
- ▶ Crowns Zirconia & Alumina
- ▶ Abutments
- ▶ Laminates
- ▶ Implant Bridge

Frameworks in alumina and zirconia for copings, abutments and bridgework are manufactured with extreme accuracy to ensure a perfect fit.

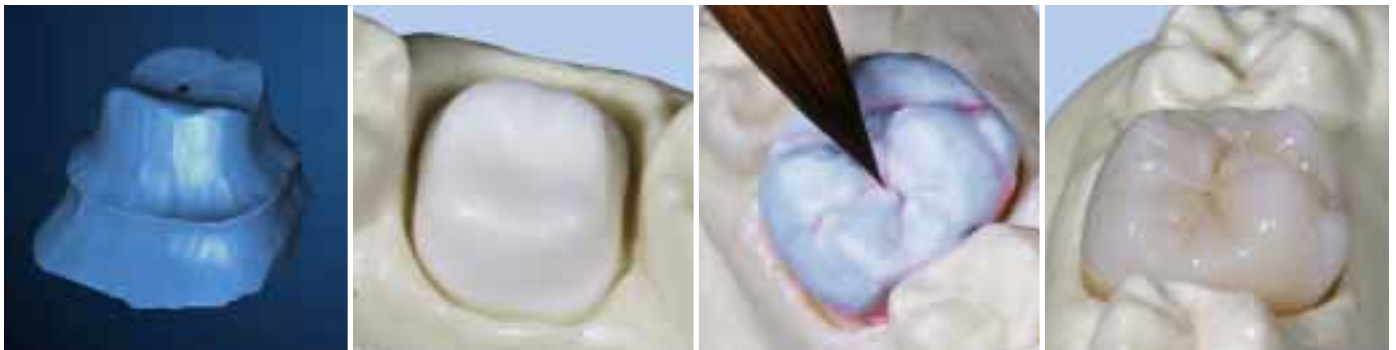
NobelRondo™ Zirconia – the porcelain with the most advanced ceramic technology (120 MPa flexural strength) for veneering of zirconia substructures – is an unbeatable solution for quality dental restorations.



Procera® Zirconia... Ultimate Strength and Outstanding



Procera® Crown Zirconia



Procera® Abutment Zirconia



Fit of Crowns, Abutments and Bridges



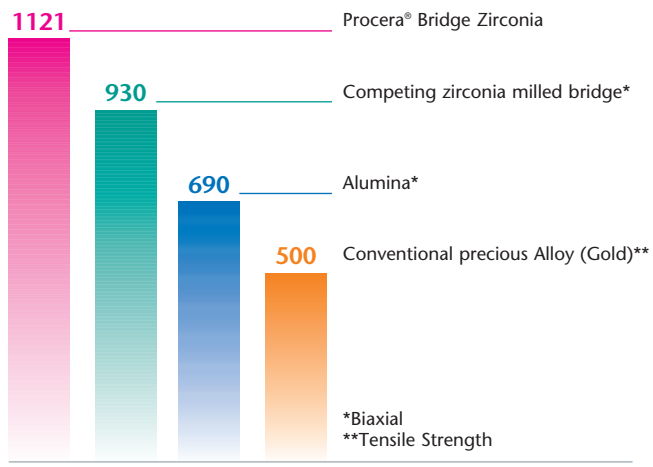
Procera® Forte is a mechanical scanner designed to provide the highest accuracy and precision fit. It is optimized to handle larger cases, such as bridges with incorporated soft tissue margin and adjacent teeth. Easy to use, and controlled from a PC interface, including an integrated on-screen tutorial, the entire scanning procedure takes only 6–10 minutes. The high quality scanning data is subsequently transferred to the Procera® Software CAD application, where the design is finalized before being sent to the production facility.

Procera® Zirconia is ideally suited as an esthetic solution in the anterior zone.

A recent study on the bridge performed at the University of Michigan’s “Center for Excellence” demonstrated a marginal fit of 15 microns.



Material Information
Procera® Bridge Zirconia
Flexural Strength Comparison in MPa



Source: Data on file Literature: Michigan University

Procera® Zirconia Y-TZP

Components	ZrO ₂ +Y ₂ O ₃ +HfO ₂	Y ₂ O ₃	HfO ₂	Al ₂ O ₃
Chemical composition	> 99%	4.5%–5.4%	< 5%	< 0.5%
Density	> 6.05 g/cm ³			
Grain Size	< 0.5 μm			
Vickers Hardness	1200			
Melting temperature	2700°C			
Flexural Strength	1121 MPa			
Young’s modulus	210 GPa			
Fracture Toughness K _{1C}	10 MPa√m			
Thermal Expansion	10.4·(10 ⁻⁶ /°C) (500°C)			

"Zirconia ceramics have several advantages over other ceramic materials due to the transformation toughening mechanisms operating in their microstructure that can give very interesting mechanical properties to the components made of them."

C. Piconi, G. Maccauro, Zirconia as a ceramic biomaterial, Biomaterials 20, 1999



Zirconia – a Fascinating Biomaterial

Zirconia is one of the latest materials introduced to restorative dental technology. Given the features and characteristics of this biomaterial, Zirconia has a substantial advantage compared to other dental materials: mechanical resistance, biocompatibility and a fracture strength two times greater than Alumina.

Zirconia – Origin and Evolution

Zirconia has been known as a gem from ancient times. The name of the metal, Zirconium, comes from the Arabic Zargon (golden in color), which in turn comes from the two Persian words Zar (gold) and Gun (color). Zirconia, the metal dioxide (ZrO_2), was identified in 1789 by the German chemist Martin Heinrich Klaproth. Modern research on Zirconia as a biomaterial is focusing on Zirconia-Yttria Ceramics, characterized by fine-grained microstructures, known as Tetragonal Zirconia Polycrystals (TZP).



Y-TZP-Zirconia – Yttria stabilized Tetragonal Zirconia Polycrystals

The reinforcing phenomenon via phase transformation was discovered by the British thermodynamics specialist, R.C. Garvie (Ceramic Steel, Nature 1975). His research provided the breakthrough for developing Zirconia with excellent mechanical properties. His research provided the breakthrough for achieving Zirconia with excellent mechanical properties.

When stress is applied to a Zirconia dental restoration, due to its material characteristics, crack propagation is slowed down and eventually obstructed. During the formation of a crack, the tetragonal phase transforms to its monoclinic phase, increasing the materials volume at the crucial stage of the crack. As the material swells, internal stress from compression is superimposed onto the crucial point of the fracture, adding strength and ultimately preserving the integrity of the material.

Y-TZP-Zirconia exhibits this unique physical property called “transformation toughening”.

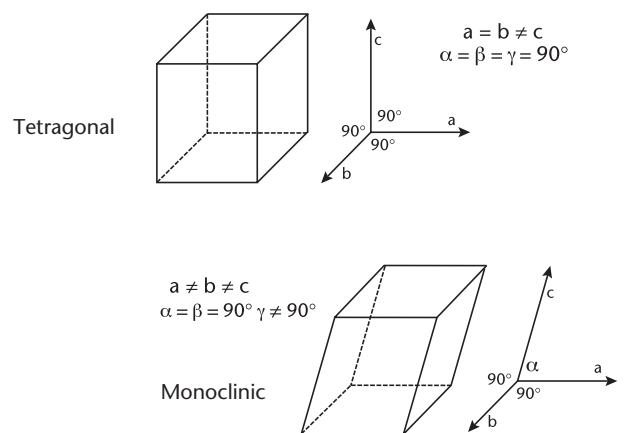
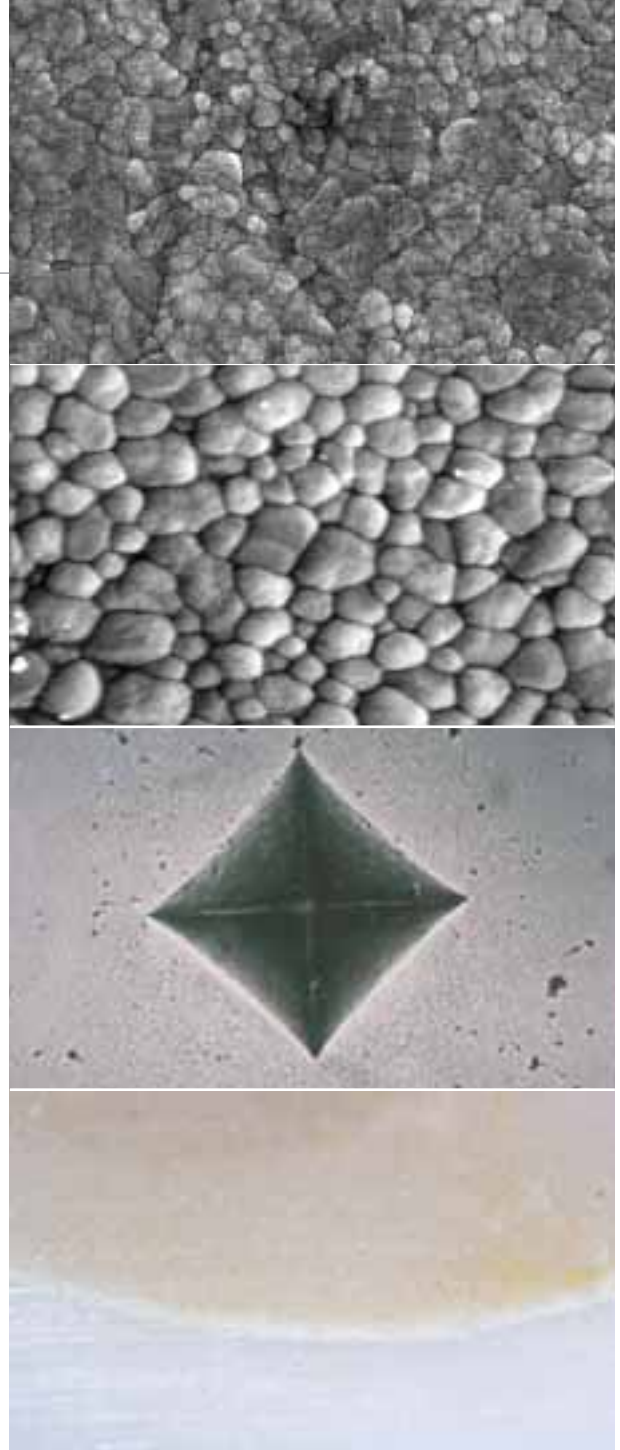
According to all available research, Zirconia is an optimal solution for an all-ceramic bridge – especially in the posterior region.

Bonding of NobelRondo™ Zirconia porcelain to Y-TZP Zirconia

The interface between Y-TZP Zirconia and NobelRondo™ Zirconia porcelain (Fig. 1) shows no pores and excellent wettability of the zirconia surface with NobelRondo™ Zirconia Base Liner.



Figure 1.



Lattice parameter relationships and figures showing unit cell geometries.

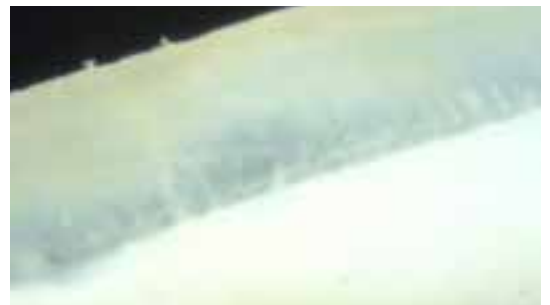


Natural enamel under the microscope

Dental Bionics

Dental Bionics – The goal of NobelRondo™ is to combine biology and technique into a technological implementation that emulates nature. The structure of natural teeth is unique, so use of this structure as the paradigm to strive for optimization is optimal. The dental enamel – prisms of hydroxylapatite crystals – displays resistance as well as adaptability. Fascinating optical phenomena, such as opalescence and fluorescence and translucence and color emitting from within, are ideal when developing ceramic materials.

Although our restorative effort is influenced by colors, color is a sensory impression and thus remains subjective. For a color to be perceived, the presence of visible radiation, i.e., light, is absolutely necessary. The color of a tooth depends on the interplay amongst between light, reflection and absorption. The prismatic structure of the dental enamel and the dentine structure lead to specific dispersions of the light, which can now be imitated through modern dental ceramics.



The fascination of natural teeth

Ceramic Technology

Handling

The very fine, homogeneous microstructure of NobelRondo™ ceramics produces outstanding color stability during layering, and a homogeneous structure to the fired ceramic. The consequence: high stability after multiple firings and corrections, outstanding antagonist-friendly surface quality, and excellent polishability.

Stability and Confidence

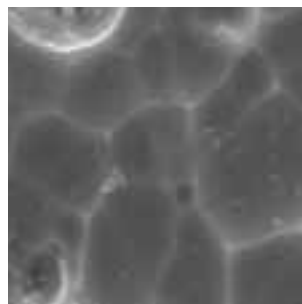
The high flexural strength of NobelRondo™ ceramics is outstanding (120 MPa)! The technological background for this is the exceptionally complex ceramic production process. With this value, which exceeds other comparable ceramics by 20% to 70% (see graph on page 42), NobelRondo™ ceramics offer even greater success in patient therapy, and increased confidence for the dental laboratory.

Biocompatibility

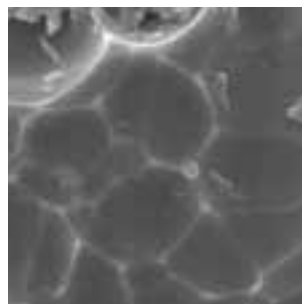
Ceramic materials have proven their value in dentistry for decades. Thanks to limited solubility, good biological compatibility guarantees indefinite durability for NobelRondo™ ceramics in the oral environment. Patient safety is a key ethical requirement for all Nobel Biocare products.



NobelRondo™ opalescence



Rough structure of conventional ceramics (5000x)



Homogeneous structure of NobelRondo™ – superior flexural strength

Opalescence

NobelRondo™ ceramics' special production process also contributes to achieving natural opalescence, even after multiple firings. Very fine particles, distributed homogeneously throughout the structure of the ceramic, create an unusually beautiful, soft opal effect. Above all, the recent development of "Mother-of-Pearl" modifiers makes very natural opalescent contrasts possible.

You will find more technical information on Pages 42–43.



Homogeneous surface property – healthy gingiva



High strength – stable occlusion





"The opalescence, fluorescence and natural transmission of light are important features for the esthetics of natural teeth. Opalescence is the result of dynamics of light in enamel, giving to the colors of natural teeth a vivid appearance. The dynamics of light in natural teeth will create life."

Dr. Dario Adolfi.
Natural Esthetics. Quintessence Sao Paulo 2002



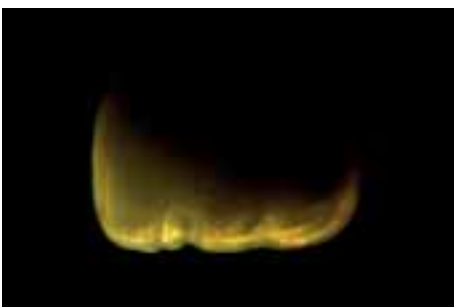
Natural opal in reflected light ...



... and transmitted light (opal from Coober Pedy, Australia)

Opalescence

One of the most beautiful optical phenomena with natural teeth is the opalescent gleam of the enamel. This opalescence comes about through the dispersion and refraction of daylight into the smallest particles or structures. The dental enamel reflects the shortwave-length blue portion of light, transmits warm, long wavelength orange-colored light, and glows in the transmitted light almost like amber. In mineral opals, this iridescent, milky lightness in reflected light, and the reddish color play in transmitted light, are caused by tiny water inclusions and impurities. In natural teeth, it is the prisms of the inorganic enamel that bring forth this effect.



NobelRondo™ opalescence in reflected and transmitted light



Fluorescence

The natural fluorescence comes from the depths of the tooth. Ultraviolet light, as electromagnetic radiation from the non-visible spectrum of daylight, stimulates this particular form of luminescence. The emitted radiation has a longer wavelength and less energy than the absorbed light radiation. The impinged light increases the energy of an electron so that it rises to an excited and unstable energy level and then falls back to a lower energy level by emitting radiation. Sir George G. Stokes discovered this phenomenon in fluorite, a fluorescing mineral, in 1852. The ceramic compound that is built up in the inside of the crown is also dosed with additional fluorescing material. This produces a natural glow from the center of the crown, even in varying light conditions.



NobelRondo™ Shoulder Ceramics in UV-Light



Section through natural premolar – reflected and UV-Light



NobelRondo™ molars – reflected and UV-Light



Natural fluorescence



Ernst A. Hegenbarth

Ergonomics, logic and creativity – NobelRondo™

“The goal in creating tooth color is to reproduce the basic color tone through imitation of the structures of the natural teeth and the creation of well-balanced color harmonies and nuances using contrasts and individual characteristics.”

Ernst A. Hegenbarth, MDT Ceramic Color: A practical system Quintessence 1990

The Philosophy

With NobelEsthetics™, Nobel Biocare establishes a new philosophy for comprehensive treatment for patients. The future belongs to dental esthetics. Focusing on the personal wishes of each patient is of paramount importance, as the desire to be attractive has become a very natural one in our time. NobelRondo™ is Nobel Biocare’s solution for “Dental Esthetics Unlimited!”

The outstanding characteristics of NobelRondo™ ceramics represent the culmination of ten years of experience with full ceramic Procera® restorations based on alumina and zirconia. The most modern materials from research and development in dental ceramics, together with exceptional optical and physical properties, make NobelRondo™ the material of choice for the highest quality esthetic restorations. Technology, ergonomics and creativity come together to achieve natural perfection.



The Concept

NobelRondo™ – Creative Circle is a dynamic color harmony system.

All tooth colors are divided into six harmonic color segments, logically grouped in a round tray of six overlapping circles. With a total of only 80 bottles and 12 paint colors, standard colors can be made very easily with simple dentine/enamel layerings using the Basic Circle, or a totally customized restoration can be made using options from the Master kit. The soft “Mother-of-Pearl” modifiers and the natural opalescent contrasts and color harmonies are created with the new “Colored Translucencies”, even on the finest of layers with no mixing.

NobelRondo™ – Creative Circle represents the latest developments in dental ceramics, with outstanding fluorescence, opalescence and color stability.

Experience creative freedom in a new and fascinating world of ceramics.



“Are so many ceramic compounds needed to create appealing crowns that appear natural? NobelRondo™ – Ceramics is creating a new pathway: optimization by adhering to the essentials – the art of minimizing is the basic principle!”

Enter the Creative Circle

NobelRondo™ – Shade Guides

To further optimize ergonomics, all original ceramic samples are arranged on transparent rings in exactly the same way as the bottles in the NobelRondo™ tray. These color samples allow for quick selection and

arrangement of the ceramic bottles, immediate orientation by color characteristics, as well as optimized shade selection and coordination.

NobelRondo™ – Master Circle – Stain kit

The 12 fluorescent stains, glaze powder and correction powder are arranged at the top of the rotating tray for the “Final Touch”.

NobelRondo™ – Master Circle – Master kit

The spectrum of this new arrangement of ceramic modifiers ranges from the very subtle layering of natural-appearing tooth structures from the interior of the crown, to the artistic, creative discovery of all possibilities. Again only 6 Intensive Liners, 6 Shoulder

Ceramics, 6 Colored Translucencies, 4 very natural Mother-of-Pearl compounds and 10 Internal modifiers are required. Together they represent all the individual characteristics that can be expected in the creation of a ceramic restoration.

NobelRondo™ – Basic Circle

With 16 colors in 6 color groups, from Super Bright and High Value through Warm Chroma and Sunny Chroma, Pearl Chroma and Low Value, the colors are geared to the basic characteristics of the tooth type. Great emphasis is placed on lighter colors. Two rarely used colors (C4 and D4) are not included, and only one simple mixed formula is given (see page 21 for instructions on creating these colors using other elements). This basic principle of NobelRondo™ ceramics allows a reduction to only 6 base liners for coloring the Procera® substructures, such as crowns, laminates, bridges and abutments, 6 inner core compounds for the inner structure of the tooth, and 4 chromaticizers for gradual variations of color intensity (chroma).

This simplification alone leads simultaneously to an enormous expansion of the color spectrum within each color group, and to a reduction of compounds. In the third circular segment of the NobelRondo™ tray all the Enamels, Opal Enamels and Transpa variations are ergonomically assigned to the appropriate color segments according to their area of use. With the NobelRondo™ – Basic Circle, only 48 compounds, and often only the simplest 2-layer technique, can quickly and easily create many standard conditions in accordance with the shade guide. The color coding of the bottle labels, along with the smiles on them simplify the classification to the respective color segments.



- the bottle fits perfectly into your hand
- the powder inside fits your needs
- the result will meet your expectations



Ergonomics, Logic and Economy

Ergonomics and logic attain true symbiosis with NobelRondo™ – increased efficiency and economy are the natural outcome!

Shade selection and communication using the NobelRondo™ form is directly related to the arrangement of the color segments and ceramic bottles in the NobelRondo™ tray. The experienced ceramist immediately knows how much he/she needs and what layering technique will be used for each individual tooth design.

The assignment to the three expectation profiles, **Standard**, **Professional** and **Premium**, immediately indicates the level of effort that will be required, as well as the technical and creative demands. The cost for a restoration can also be determined according to these criteria. The more exact definition of quality and cost structure offers patients and dentists a coordinated service and provides a fair basis for successful and profitable work for the dental laboratory.



NobelRondo™ Starter-Set



NobelRondo™ Quality Levels

Standard

Easy and predictable: with just two layers of dentin and enamel, good standard results can be achieved by matching to Shade Guide Samples.

Professional

Individual layering with standard build-up and several modifiers, straight from the bottle.

Premium

Customized restoration utilizing the ceramist's full creative potential and all the options of the NobelRondo™ – Creative Circle , including unique "Thin-Layer-Effects", colored translucency, mother-of-pearl effect etc.

NobelRondo™ Gingiva Set



Standard



Professional



Premium



Base Liner

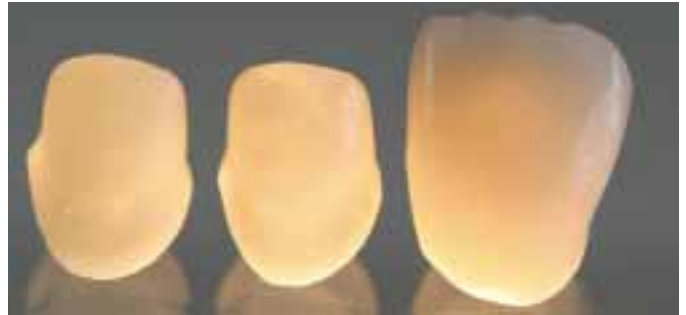
The Base Liner serves to color the Procera® substructures according to the 6 groups of the NobelRondo™ concept. This very fine-grained, almost glass-like material is already slightly fluorescent and is applied only in a very thin layer with a fine brush.



Procera® Zirconia Coping



Procera® Zirconia Base Liner and Intensive Liner after firing (930°)



Thin application of Base Liner results in translucent restorations

In the light color groups “Super Bright” (A0, B0) and “High Value” (B1, A1), the base liner effects a somewhat greater lightness; and with “Warm Chroma” (A2, A3, A3.5, A4) and “Sunny Chroma” (B2, B3, B4) shades it creates a somewhat increased color intensity (chroma) from the depth of the veneering. In colors of the “Pearl Chroma” (D2, D3) and “Low Value” group (C1, C2, C3), the Base Liner reduces the lightness (value) somewhat.

For simple reproduction according to the shade guide, it is even possible to do without the Base Liner completely. A slightly lighter basic color would then be expected. For individual configuration of the Base Liner, especially for very thin layers, one can work with the Intensive Liners of the Master Kit.

For all intensive colors and displaced roots, use of strong coloring with intensive liner Crème or Orange in the cervical area is recommended. Coloration of the base liner in the lingual and occlusal areas of the posterior teeth is also advantageous.

Intensive Liner Grey-Violet is used in thin areas with dark or very transparent shades in the labial-incisal area of the substructure without dilution. This prevents the zirconia oxide substructure from shining through and gives the illusion of more depth and translucency through absorption of the incident light.

The NobelRondo™ base liner melts at 920 °C to 930 °C very thinly onto the Procera® substructure and lends an individual color according to the chosen color group. The translucency of the substructure is retained with a one-time, thin application and correct firing.





Procera® coping with Base Liner



Dentine Build-Up



Cut-Back



Enamel layering according to type of tooth



Completed enamel build-up



NobelRondo™ crown after glazing



Standard Build-up

After firing the Base Liner at 920 °C to 930 °C, the dentine is built up according to the desired form of the tooth. The NobelRondo™ modeling liquids enable a plastic layering of the ceramics with excellent color stability. To achieve the desired consistency “Quick” and “Soft” Liquids can be mixed in any proportion. A certain shrinkage of the ceramic during firing should be taken into consideration at this point. The reduction of the dentine build-up is related to the type of tooth or the given shade guide sample. For a natural effect, enamels should be layered according to natural teeth. After the first firing (900 °C to 910 °C), correc-

tions to the shape are undertaken with the appropriate Enamel or Transpa compound. The second firing should be fired only about 5 to 10 degrees lower (890 °C to 900 °C). The original glaze firing (875 °C to 890 °C) with fluorescent NobelRondo™ stains can be done with or without glazing powder (Glossy Pearl). Detailed information regarding firing programs is contained in the back of this brochure.

The dentine colors C4 and D4, which are very seldom used, are produced with simple mixes:

C4 = C3 50% + Taiga 50%

D4 = C2 50% + B4 50%

	Super Bright		High Value		Warm Chroma				Sunny Chroma			Pearl Chroma		Low Value		
Base Liner	Super Bright		High Value		Warm Chroma				Sunny Chroma			Pearl Chroma		Low Value		
Dentin	A0	B0	B1	A1	A2	A3	A3,5	A4	B4	B3	B2	D2	D3	C3	C2	C1
Enamel	OE0	OE0	OE1	OE1	OE2	EN3	EN3	EN4	EN4	EN3	OE3	OE2	EN3	EN4	EN3	EN2

Professional Build-up

With the inner core materials and chromitizer options for individualizing dentine compounds, as well as the various opalescent enamel compounds and Transpa variations, the NobelRondo™ Zirconia – Basic Circle offers excellent possibilities for individual veneering.



1. Inner Core and Dentine cervical



2. Dentine Build-Up

Optional:
Mamelons
Internal Modifier (IM)

Optional:
Secondary Dentin
Internal Modifier (IM)

Transpa

Inner Core

Enamel

Mother-of-Pearl (MOP)

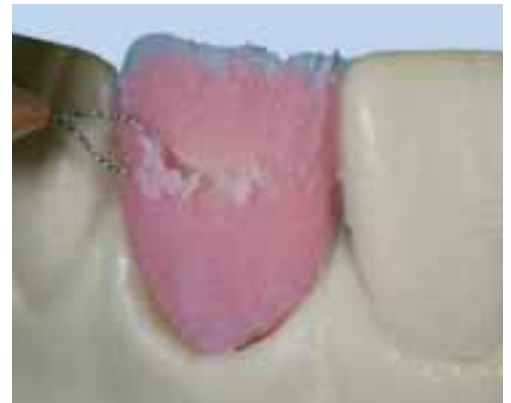
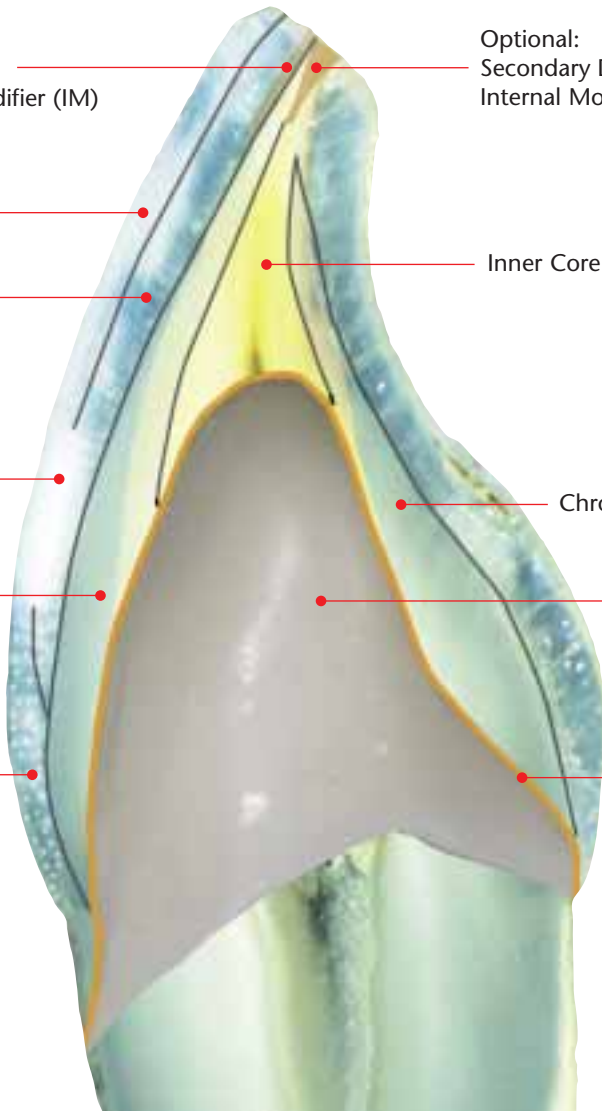
Chromitizer

Dentin

Procera® Coping

Colored Translucency

Base Liner



3. Incisal edge (Enamel), Cut-Back for lighter area in center



4. Brighter area centrally (Mother-of-Pearl Oyster White)



5. Mamelon structure (Internal Modifier Ivory)



6. Incisal layering (Opal Enamel 2, Opal Blue Light)

The options of the NobelRondo™ Zirconia Master kit expand these possibilities significantly for the creative ceramist. Even without difficult ceramic-compound mixtures, highly individual layerings can be efficiently created. The ten Internal Modifiers serve for layering internal structures, such as mamelons (Ivory, Flamingo, Bamboo, Creme); colors in the center of the tooth (Honey, Caramel, Amber, Pearl, Peach, Taiga); or even the creation of contrasts in the interior of the tooth, between the dentine and the enamel. The particular development of the Special Enamels (Opal Blue, Opal Blue Light, Opal Grey, Opal Smoky) offers additional possibilities of individual and contrasting composition of the enamel layer.



7. Colored translucency cervical (CT Papaya)

General Firing Program NobelRondo™ Zirconia Ceramics

	Pre-heating temp.	Drying time (min)	Heating rate	Firing temp.	Dwell time (min)	Vacuum (hPa)	Extended cooling
Shoulder firing 1	575 °C	8	45 °C	980 °C	1	50	–
Shoulder firing 2	575 °C	8	45 °C	960 °C	1	50	–
Liner firing	575 °C	8	45 °C	930 °C	1	50	–
Dentin firing 1	575 °C	9	45 °C	910 °C	1	50	–
Dentin firing 2	575 °C	8	45 °C	900 °C	1	50	–
Glaze firing	575 °C	5	45 °C	890 °C	1–2	–	–
Corrections	575 °C	5	45 °C	850 °C	1	50	–



8. Thin layer transpa (Transpa Opal)





1. Procera® Zirconia coping



2. Procera® coping with Base Liner after firing (930 °C)



5. Enamel Build-Up: Opal Enamel 3



6. Second bake: Opal Enamel 3 – Mother-of-Pearl Pale Shell

Molar Build-up

“Procera® Zirconia crowns and bridgework for posteriors are a viable alternative to porcelain fused to metal restorations. High fracture toughness of Procera® Zirconia frameworks will guarantee reliability, longevity and safety for patients. The outstanding strength and wear characteristics of NobelRondo™ Zirconia porcelain are additional material features, which will lead to esthetically pleasing and functionally successful dental restorations.”

Ernst A. Hegenbarth MDT





3. Inner Core Warm Chroma – Fossa: Internal Modifier Amber



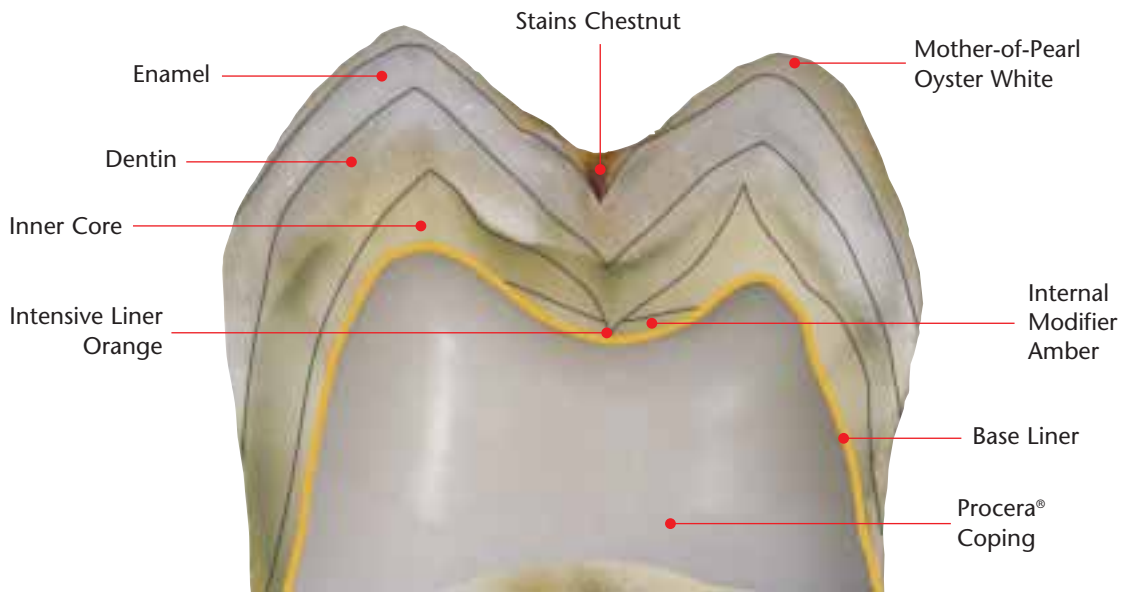
4. Dentin Build-up (A 3,5)



7. "High Lights" with white stains



8. NobelRondo™ Zirconia molar after glazing (890° in 80 sec.)

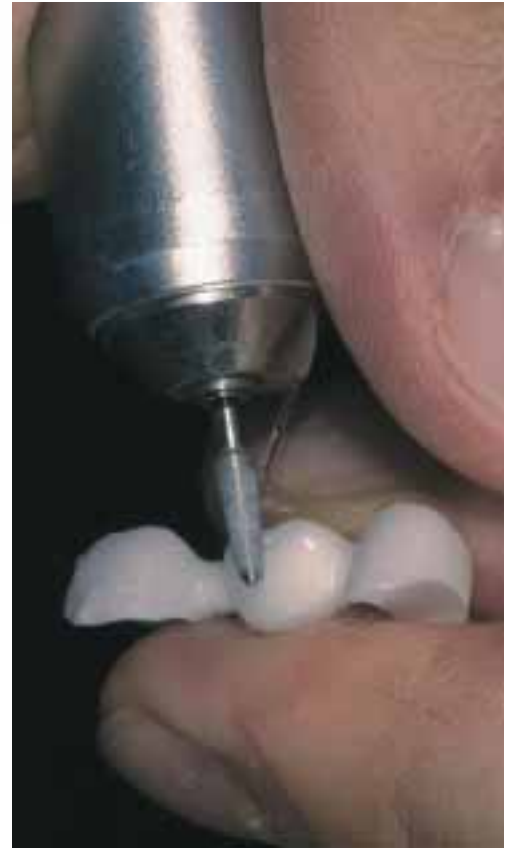




Procera® Bridge Zirconia

To prepare the Zirconia framework, all grinding MUST be done at high speed, using diamonds and water irrigation. This procedure avoids the formation of microcracks and thermal tension during the subsequent baking of the veneering ceramics.

To clean the Zirconia substructure, sandblast using 2 to 4 bars of pressure utilizing 110–250 µm aluminum oxide, at an approximate distance of 10 mm. Then clean in an ultrasonic bath.



1. Procera® Bridge Zirconia



2. Liner Application



3. Customized Liner after Firing (930 °C)



4. Inner Core-High Value Fossa: JM Peach



5. Dentin Build-up

Base Liner/Intensive Liners

Procera® Zirconia substructures are semi-translucent but appear more whitish due to the more reflective nature of the Zirconia surface. The reflective index of light of Zirconia is higher than Alumina, natural enamel and dental porcelain. For that reason a more customized Liner application with mixtures of Intensive Liners at the margins and fossa areas are suggested. At thinner parts of the restoration, labially or occlusally, mixtures of Base Liner and Intensive Liner Grey- Violet will create the illusion of more depth and translucency by changing the absorption and reflection of incident light.

Reflective Index of light

Water	1.3
Ceramic	1.5
Enamel	1.6
Alumina	1.8
Zirconia	2.3



6. Enamel Build-up



7. Procera® Bridge on Firing Tray
(Final Temp. 910 °-915 °C)



8. Second Bake (910 °C)



9. Firing Result



10. NobelRondo™ Zirconia-Bridge after Glazing
(895 °C in 80 sec.)

The **Thermal Conductivity** of Zirconia frameworks is relatively low, and the material behaves almost like an insulator. For that reason it is recommended to bake NobelRondo™ Zirconia on thin wires to avoid thermal tension and thus to raise the firing temperature of the first bakes by 10° to 15 °C for bridges. This also will help to achieve a maximum of compressive forces and excellent bonding strength.

Please see page 44 for additional information regarding firing temperatures on Procera® Bridge Zirconia.



Shoulder Ceramics



1. Isolation of the die



2. Reduced Procera® coping Zirconia



3. Layering of NobelRondo™ Zirconia Shoulder ceramics



4. Condensation with a dry brush



5. Shoulder ceramics after first bake (980 °C)



6. Marginal correction (960 °C)



7. Base Liner application



8. Base Liner after firing (930 °C)



9. Finished NobelRondo™ Zirconia Crown with ceramic Shoulder Glaze temperature (890 °C – 60–80 sec.)



Fluorescence of the Shoulder ceramics in UV-Light



NobelRondo™ Shoulder Ceramics

The six NobelRondo™ shoulder ceramic compounds are assigned to the appropriate color groups, but can also be mixed with each other. In contrast to the shoulder-technique in metal ceramics with a very reduced framework, ceramic shoulders for full-ceramic Procera® crowns can be kept very small. This simplifies control of the unavoidable shrinkage of the shoulder ceramics during firing.

NobelRondo™ shoulder ceramic is layered and removed in the standard manner. The first shoulder firing takes place at 980 °C, and the second at 960 °C (see firing table, page 23).

Note: The shoulder ceramic is fired before the Base Liner. Under good conditions, the Base Liner can be left out completely.



NobelRondo™ – Zirconia Gingiva Ceramics



1. Procera® Implant Bridge Zirconia – finished Zirconia framework



2. NobelRondo™ Zirconia Base Liner Warm Chroma and Intensive Liner Pink in the gingival area (firing temperature 930 °C)



3. NobelRondo™ Zirconia Ceramics A2 and Gingiva Ceramics after baking (firing temperature 930 °C)



4. Corrections with NobelRondo™ Zirconia Gingiva Ceramics and Opal Enamel 3, Transpa Opal and Colored Translucency Melon.



5. Multiple firings and additional modifications at 915 °C–920 °C can be performed easily. Slower cooling is advised in that case



6. Procera® Implant Bridge Zirconia after several correction bakes. Underfiring of the ceramics must be avoided

The six NobelRondo™ Gingiva Ceramics are created to mimic tissue shades and imitate missing papillae for both Procera® Bridge Zirconia on natural teeth and the Procera® Implant Bridge Zirconia.

In particular, screw retained and retrievable Zirconia Implant Bridges for edentulous patients require the replacement of missing tissue with gingival porcelain.

To mask the bright zirconia substructure the use of Intensive Liner Pink is suggested.

The six varieties of Gingiva Ceramics can be utilized purely, intensified with Modifiers from the Master Kit or diluted by mixing with Transpa Clear. In case of multiple firings the firing temperature is 915 °C to 920 °C. Slower cooling is advised in that case.



7. With a minimum of Glaze Powder and Stains Pink the Zirconia Bridge is ready for glazing



8. Cervical characterization of the Procera® Implant Bridge with NobelRondo™ Stains



9. Procera® Implant Bridge Zirconia after glazing at 895 °C



10. NobelRondo™ Zirconia Gingiva materials do not show fluorescence in UV-light



Procera® Implant Bridge Zirconia veneered with NobelRondo™ Zirconia and NobelRondo™ Zirconia Gingiva Ceramics

NobelRondo™ – Thin Layer Effects



Mother-of-Pearl-Effects

*"If the ceramist could apply a very thin layer of porcelain of approx. 1–2 micron thickness, then it may be possible by using a high reflective index material to obtain a multi-hued mother-of-pearl finish. This aspect of **thin layer effects** is worthy of further investigation."*

Dr. John Mc Lean, Nordic Light Meeting,
Skagen, Denmark 1998



Soft surface contrasts can be obtained using the new opalescent "Mother-of-Pearl" modifiers (MOP Oyster White, Light Coral, Pale Shell, Pink Pearl).

Contrasts of color intensity from the interior of the crown (Inner Core, Chromatizer) with bright Opal Enamels on the surface lead to harmonic depth and three-dimensionality, even with the thinnest layers.



Colored Translucency

The three color dimensions, hue, value and color intensity (chroma), must be seen in conjunction with the translucency of the tooth substances and ceramic materials in the process of creating a ceramic restoration.

But the real esthetics of dental colors can only be developed through the inclusion of contrasts: light – dark, warm – cold, opaque – transparent. Contrasts with warm-toned “colored translucencies” prevent grey effects through contrasting enamel and Transpas (Colored Translucency Lemon, Mandarin, Melon, Orange, Papaya, Plum).



“Those who wish to master color must see, feel and experience each individual color and its infinitely many combinations with all other colors. Colors are capable of mystical spiritual expression.”

Johannes Itten: Kunst der Farbe 1962

NobelRondo™ Shade Selection and Color Communication



NobelRondo™ is opening up new paths of communication regarding dental esthetics between patients, dentists and dental technicians. The patient is a major player and is intimately involved. It is the esthetic expectations of the patient that should be the focus, not a strict orientation to traditional color designs with all their limitations. Modern possibilities of image communication can be integrated simply into the concept.



6 steps of shade selection with NobelRondo™

1. Selection of the NobelRondo™ shade group (for example, Super Bright or Warm Chroma)
2. Selection of the basic hue (e.g., B0 or A3)
3. Variations of color intensity (e.g., A3 plus chroma 10% means the addition of chromatizer "Warm Chroma")
4. Inner structures of the tooth (e.g., mamelons "Ivory", secondary dentine "Caramel")
5. Variations of lightness (value) and contrasts (e.g., "High Value" = lighter; "Low Value" = darker)
This influences the selection of the enamel compounds (e.g., Opal Enamel 0 = light, EN 4 = darker)
6. Texture and shine of the tooth surface (e.g., Texture: smooth, shiny: matt).



When this simple procedure of shade determination is combined with digital photography, image communication on the Internet, or even with dental color measurement systems, there are unlimited possibilities for achieving customized esthetics.



11,21 Procera® Crowns
Courtesy of Dr. Stefan Wolfart University Kiel, Germany

“Vital looking All-Ceramic restorations require procedures where less emphasis is placed on just shade guide samples in favor of natural internal structures and surface properties and their replication in different dentin, enamel, transparent and colored translucent, as well as fluorescent and opalescent ceramics.”

Ernst A. Hegenbarth American Academy
of Esthetic Dentistry Washington 2002



Premium Esthetics

The prerequisites for professional custom layering are expanded color determination, exact information regarding possible characteristics of the teeth, photographs, and consistent use of the NobelRondo™ color determination form. It is always best if the shade determination and the esthetic customization of the restoration are

undertaken by an experienced ceramist. This opens up the almost unlimited possibilities of the NobelRondo™ Creative Circle. The layering technique is fully geared to the structures and characteristics of natural teeth. The ceramist can let his/her creative potential unfold and apply all of his/her experience.



Intraoral digital photography



The patient's smile



Communication – the foundation for successful dental esthetics



Shade taking with conventional shade guide



Detailed shade taking with NobelRondo™ Ceramic sample discs



“Knowledge of structures and optical phenomena, color and form, surface and shine comes from studying natural teeth. Our intuition and creativity are activated and stimulated. The visual recording of details acts symbiotically with the manual artistic talent of the ceramist.”



Successful ceramics – a matter of training and experience



Provisional restoration – the patient can visualize the treatment



Excellent preparations are essential



The final result – Procera® Crowns veneered with NobelRondo™

Clinical Examples

Procera® Abutment Zirconia



Procera® Abutments Zirconia



NobelRondo™ crowns after cementation



Customized Procera® Abutment Zirconia



Implant Restoration Procera® with single crown.



Clinic: Dr.S.Holst-University Erlangen/Germany Ceramic: E.A.Hegenbarth Zen-Line Dental

Procera® Bridge Zirconia



Preparation for Procera® Bridge Zirconia: Chamfer, rounded line angles, no undercuts



Procera® Bridge Zirconia: Framework Try-in



Procera® Crown Alumina on Procera® Abutment Zirconia veneered with NobelRondo™ Alumina (24) and Procera® Bridge Zirconia veneered with NobelRondo™ Zirconia Ceramics (25–27). Clinic: Dr. Carlos Moura-Guedes Clínica Malo Lisbon/Portugal, Ceramics: E.A. Hegenbarth Zen-Line Dental

Clinical Examples

Procera® Bridge Zirconia



Before



Procera® Bridges Zirconia and Copings: Try-in



Procera® Bridges Zirconia: Try-in



Procera® Bridges Zirconia and Crowns after cementation



Procera® Bridges Zirconia and Laminates after cementation



Clinic: Dr.S.Holst-University Erlangen/Germany Ceramic: Zen-Line Dental

"It's fantastic. It's like a great weight has been lifted off my shoulders. With my new smile I feel so much more confident... and I always wanted white teeth. My children and grandchildren tell me that I look ten years younger. And I've noticed that my husband smiles at me more often these days – just like he did 30 years ago!"



NobelRondo™ Color Harmony System

1 16 Dentine, 20 g, 100 g
A0 – C3

2 6 Base Liner, 20 g: Super Bright
High Value
Warm Chroma
Sunny Chroma
Pearl Chroma
Low Value

6 Inner Core, 20 g: Super Bright
High Value, 20g, 100g
Warm Chroma,
20g, 100g
Sunny Chroma
Pearl Chroma
Low Value

4 Chromatizer, 20 g: Warm Chroma
Orange Warm Chroma
Sunny Chroma
Low Value

3 4 Enamel, 20 g, 100 g: Enamel 2
Enamel 3 (2x)
Enamel 4

5 Opal Enamel, 20 g, 100 g: Opal Enamel 0
Opal Enamel 1
Opal Enamel 2 (2x)
Opal Enamel 3

4 Special Enamels, 20 g: Opal Blue
Opal Blue Light
Opal Grey
Opal Smoky

3 Transpa, 20 g: Transpa Neutral
Transpa Clear
Transpa Opal

4 10 Internal Modifier, 12 g: Ivory
Peach
Bamboo
Taiga

6 Shoulder Ceramics, 12 g: Super Bright
Sunny Chroma

Flamingo
Caramel
Honey

High Value
Pearl Chroma

Crema
Amber
Pearl

Warm Chroma
Low Value

5 6 Colored Translucencies, 12 g: Lemon
Orange

Mandarin
Papaya

Melon
Plum

4 Mother-of-Pearl, 12 g: Oyster White
Pale Shell

Light Coral
Pink Pearl

6 Intensive Liner, 12 g: White
Sunny

Crema
Pink

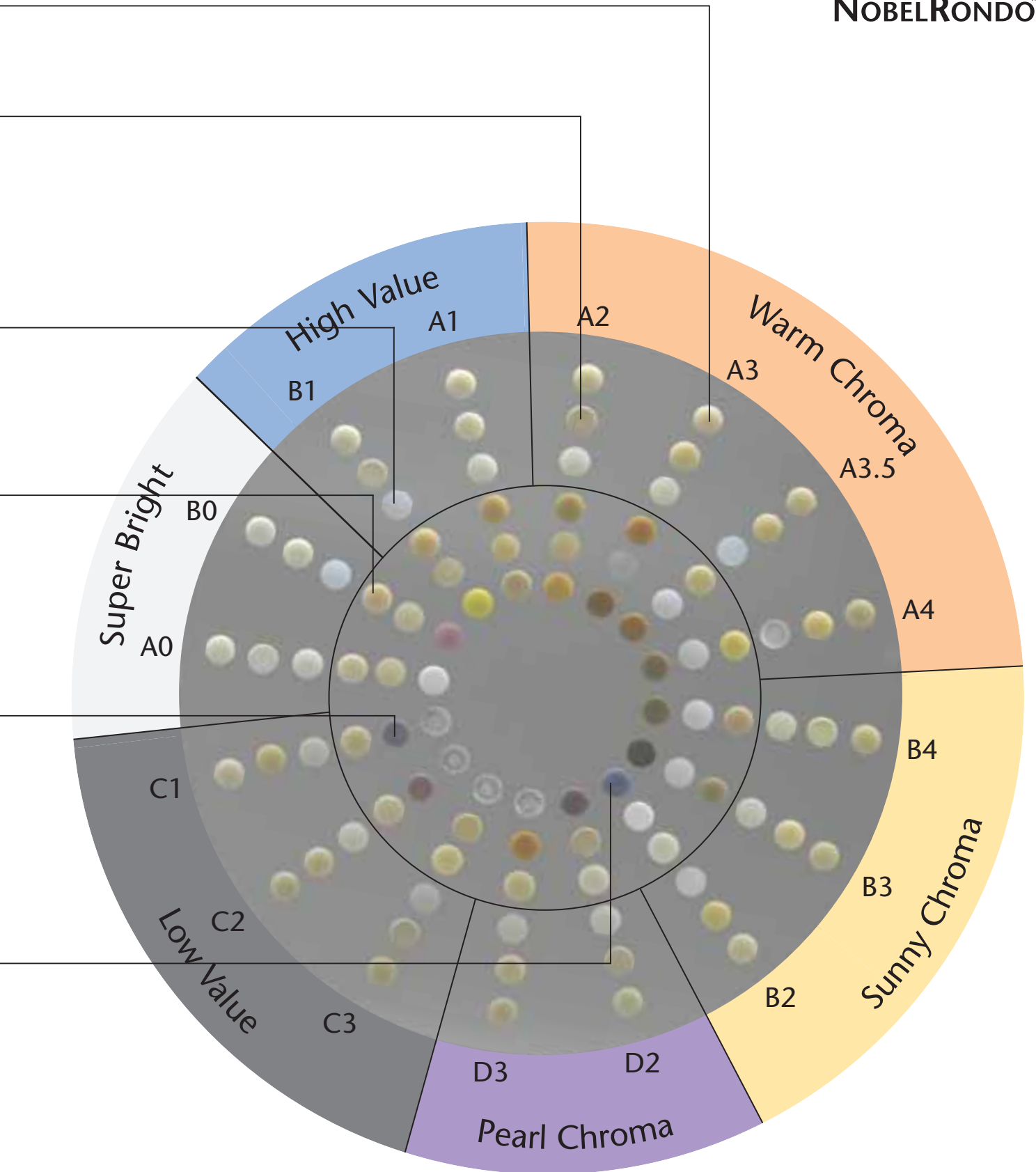
Orange
Grey-Violet

6 12 Stains, 3 g: White
Ivory
Orange
Chestnut

Pink
Peach
Khaki
Steel

Maize
Caramel
Olive
Violet

2 × Glace Powder (Glossy Pearl) 3 g
2 × Correction Powder 3 g



Technical Data

NobelRondo™ – Zirconia

Indication

NobelRondo™ Zirconia is a veneering ceramic for use with zirconium oxide substructures with a CTE of approx. $10 \times 10^{-6} \text{K}^{-1}$ (25–500 °C)

Contraindication

Veneering of substructures not within the CTE range

Improper preparations

Lack of veneering space

Bruxism

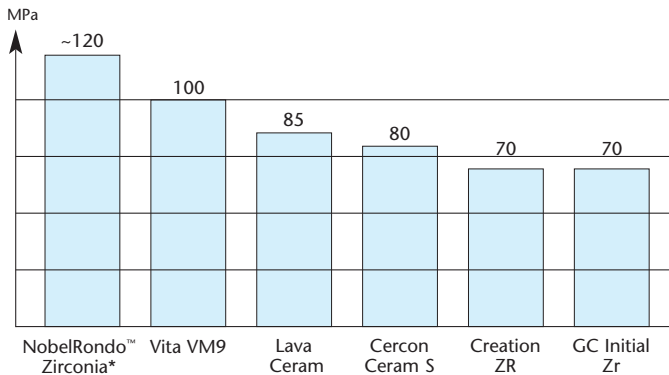
Processing advantages

The very fine, homogeneous microstructure of NobelRondo™ Zirconia ceramics produces outstanding stability during layering, and a homogeneous structure of the fired ceramic. The consequence: high stability after multiple firings and corrections, outstanding antagonist-friendly surface quality, and excellent polishability.

Flexural strength

The flexural strength of NobelRondo™ ceramics is surprisingly high (120 MPa)! The technological background of this is the exceptionally complex ceramic production process. With this value, which exceeds other comparable ceramics by 20% to 70%, NobelRondo™ ceramics offers even greater success in patient therapy, and increased confidence for the dental laboratory.

Flexural strength data



Vita VM®7 is a registered trademark of Vident.
LAVA™ is a registered trademark of 3M ESPE.
Cercon® is a registered trademark of Dentsply.
Creation® is a registered trademark of Jensen Industries.
GC Initial™ is a registered trademark of GC Corporation.

* Study performed by University of Michigan
A.A.Herrero, M.Sierralta, M.E.Razzoog; Journal of Dental Research; March 2006

Solubility

Ceramic materials for dentistry have proven their worth for decades. Thanks to limited solubility, good biological compatibility guarantees NobelRondo™ ceramics indefinite durability in the oral environment.

Color stability

NobelRondo™ ceramics' special production process also contributes to achieving an almost natural opalescence, even after multiple firings. Very fine particles, distributed homogeneously throughout the structure of the ceramic create an unusually beautiful, soft opal effect. Above all, the recent development of "Mother-of-Pearl" modifiers makes possible very natural, mother-of-pearl opalescent contrasts. Tests performed in accordance with the ISO 7491 standard show that in a simulated intraoral environment over five years the NobelRondo™ dentin shades exhibited no distinguishable color change.

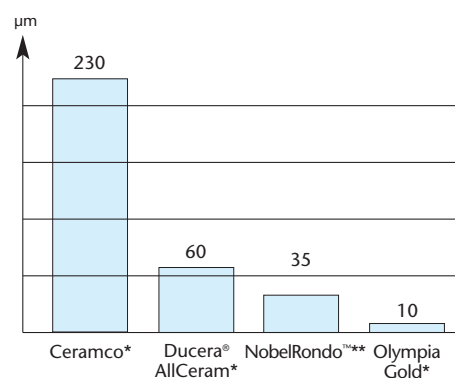
Abrasion

Comprehensive comparative studies have been carried out to examine enamel wear of various porcelain materials. The porcelain materials included in the studies were:

- NobelRondo™
- Ducera® AllCeram
- Ceramco (feldspathic porcelain)
- Olympia Gold

The results shown in the figure demonstrate a 42% reduction in enamel wear achieved by NobelRondo™ compared to the aluminium oxide porcelain, Ducera® AllCeram.

Abrasion data



* An in-vitro investigation of the wear of the enamel on porcelain and gold in saliva. J Prosthet Dent 1996;75:14-17

** Study performed by University of Michigan

Thermal expansion coefficient (WAK/CTE)

Component	CTE (25–500°C) [x 10 ⁻⁶ K ⁻¹]	Transformation Temperature T _g [°C]
NobelRondo™ Zirconia	9.3 x 10 ⁻⁶ K ⁻¹	570

Warning

There are general potential health hazards associated with inhaling ceramic dust.


Contraindications

NobelRondo™ dental ceramics cannot be mixed with other dental ceramics. Neither can it be used on materials with different thermal expansion coefficients.

NobelRondo™ Zirconia Firing Programs

General Firing Program, NobelRondo™ Zirconia Ceramics	Preheating temp.	Preheating drying time (min)	Heating rate	Firing temp.	Holding time (min)	Vacuum (hPa)	Extended cooling
Shoulder firing 1	575 °C	8	45 °C	980 °C	1	50	–
Shoulder firing 2	575 °C	8	45 °C	960 °C	1	50	–
Liner firing	575 °C	8	45 °C	930 °C	1	50	–
Dentin firing 1	575 °C	9	45 °C	910 °C	1	50	–
Dentin firing 2	575 °C	8	45 °C	900 °C	1	50	–
Glaze firing	575 °C	5	45 °C	890 °C	1–2	–	–
Corrections	575 °C	5	45 °C	850 °C	1	50	–

Austromat 3001			
Shoulder firing	C575 T120 T180	• L9 T180 V9 T045	• C980 V0 T60 C0 L0 T2 C575
Liner firing	C575 T120 T180	• L9 T180 V9 T045	• C930 V0 T60 C0 L0 T2 C575
Dentin firing 1	C575 T180 T180	• L9 T180 V9 T045	• C910 V0 T60 C0 L0 T2 C575
Dentin firing 2	C575 T120 T180	• L9 T180 V9 T045	• C900 V0 T60 C0 L0 T2 C575
Glaze firing	C575 T60 T120	• L9 T120 T045	• C890 T60 C0 L0 T2 C575
Corrections	C575 T60 T120	• L9 T120 V9 T045	• C850 V0 T60 C0 L0 T2 C575

Austromat M	Start temp.		↑	→	Vacuum level	Temp. min. ↗	End temp.	→	1 ↘	2 ↙
Shoulder firing	575 °C	2	3	3	9	45 °C	980 °C	1:00	0	0
Liner firing	575 °C	2	3	3	9	45 °C	930 °C	1:00	0	0
Dentin firing 1	575 °C	3	3	3	9	45 °C	910 °C	1:00	0	0
Dentin firing 2	575 °C	2	3	3	9	45 °C	900 °C	1:00	0	0
Glaze firing	575 °C	1	2	2	0	45 °C	890 °C	1:00	0	0
Corrections	575 °C	1	2	2	9	45 °C	850 °C	1:00	0	0

Multimat MC MCII/Mach 2	Preheat temp.	Drying time (min)	Preheating time (min)	Vacuum time (min)	Holding time (min)	Firing temp.	Heating rate	Vacuum (hPa)
Shoulder firing	575 °C	4.0	3.0	1.0	2.0	980 °C	45 °C	50
Liner firing	575 °C	4.0	3.0	1.0	2.0	930 °C	45 °C	50
Dentin firing 1	575 °C	6.0	3.0	1.0	2.0	910 °C	45 °C	50
Dentin firing 2	575 °C	5.0	3.0	1.0	2.0	900 °C	45 °C	50
Glaze firing	575 °C	3.0	3.0	0.0	1.0–2.0	890 °C	45 °C	–
Corrections	575 °C	3.0	3.0	1.0	2.0	850 °C	45 °C	50

Vacumat 100 / 200 – 2500	Ready temp.	End temp.	Predrying time (min)	Heating time (min)	Holding time (min)	Vacuum time (min)
Shoulder firing	575 °C	980 °C	7.0	7.0	1.0	7.0
Liner firing	575 °C	930 °C	6.0	7.0	1.0	7.0
Dentin firing 1	575 °C	910 °C	8.0	7.0	1.0	7.0
Dentin firing 2	575 °C	900 °C	7.0	7.0	1.0	7.0
Glaze firing	575 °C	890 °C	5.0	7.0	1.0–2.0	–
Corrections	575 °C	850 °C	5.0	7.0	1.0	7.0

Austromat press-i-dent			
Shoulder firing	L1 C575 T120 T180	• L9 T180 V9 T045	• C980 V0 T60 C0 L1 T2 C575
Liner firing	L1 C575 T120 T180	• L9 T180 V9 T045	• C930 V0 T60 C0 L1 T2 C575
Dentin firing 1	L1 C575 T180 T180	• L9 T180 V9 T045	• C910 V0 T60 C0 L1 T2 C575
Dentin firing 2	L1 C575 T120 T180	• L9 T180 V9 T045	• C900 V0 T60 C0 L1 T2 C575
Glaze firing	L1 C575 T60 T120	• L9 T120 T045	• C890 T60 C0 L1 T2 C575
Corrections	L1 C575 T60 T120	• L9 T120 V9 T045	• C850 V0 T60 C0 L1 T2 C575

Programat® X1	Preheating temp.	Heat rate	Firing temp.	Preheating time (min)	Holding time (min)	Vacuum ON	Vacuum OFF
Shoulder firing	450 °C	45 °C	980 °C	5	1	550 °C	979 °C
Liner firing	450 °C	45 °C	930 °C	5	1	550 °C	929 °C
Dentin firing 1	450 °C	45 °C	910 °C	9	1	550 °C	909 °C
Dentin firing 2	450 °C	45 °C	900 °C	8	1	550 °C	899 °C
Glaze firing	450 °C	45 °C	890 °C	5	1–2	–	–
Corrections	450 °C	45 °C	850 °C	5	1	550 °C	849 °C

Programat® P90 / P95	Ready temp.	Temperature increase	Firing temp.	Closing time (min)	Holding time (min)	Vacuum ON	Vacuum OFF
Shoulder firing	300 °C	45 °C	980 °C	6	1	575 °C	979 °C
Liner firing	300 °C	45 °C	930 °C	4	1	575 °C	929 °C
Dentin firing 1	300 °C	45 °C	910 °C	9	1	575 °C	909 °C
Dentin firing 2	300 °C	45 °C	900 °C	7	1	575 °C	899 °C
Glaze firing	300 °C	45 °C	890 °C	5	1–2	–	–
Corrections	300 °C	45 °C	850 °C	5	1	575 °C	849 °C

The temperatures given are target values. Deviations from these are possibly due to kiln variations.

NobelRondo™ Zirconia Firing Programs

Austromat D4 Zirconia	Drying Time (min:sec)	Closing (min:sec)	Preheating Temperature	(min:sec)	Firing Temperature	Heating Rate (°C/min)	Holding Time (min:sec)	Vac. (idle /level/ hold)	%
Shoulder firing	2:00	3:00	575 °C	3:00	980 °C	45 °C	1:00	980 °C	100
Liner firing	2:00	3:00	575 °C	3:00	930 °C	45 °C	1:00	930 °C	100
Dentin firing 1	3:00	3:00	575 °C	3:00	910 °C	45 °C	1:00	910 °C	100
Dentin firing 2	2:00	3:00	575 °C	3:00	900 °C	45 °C	1:00	900 °C	100
Glaze firing	1:00	2:00	575 °C	2:00	890 °C	45 °C	1:00	–	–
Corrections	1:00	2:00	575 °C	2:00	850 °C	45 °C	1:00	850 °C	100

The temperatures given are target values. Deviations from these are possibly due to kiln variations.

General firing recommendations

Note: First apply the shoulder material (960–980°C), followed by the Base Liner (930°C).

Note: With larger bridge frameworks it may be necessary to raise the firing temperature by approximately 10 °C, as bridge frameworks with large pontics may absorb more heat.

Note: Pre-drying and oven closing time may also be extended with large bridgework.

Note: In order to reduce thermal tension a slow cooling of bridgework may be advised.

The firing temperatures stated are guidelines only. Deviations may occur due to differing oven performance and must be adjusted accordingly where indicated. The drying and closing times should be extended appropriately for larger cases.

Some products may not be available in all markets. Please contact your local Nobel Biocare office for current product assortment and availability.

Nobel Biocare is in compliance with
ISO 13485:2003 and Council Directive 93/42/EEC
Canadian Medical Devices Regulation



For USA only: Federal law restricts this device to sale by or on the order of a licensed dentist or physician.
All products are subject to change without notice.

Product list

Description	Article #	Description	Article #
NobelRondo™ Zirconia Base Liner		NobelRondo™ Zirconia Glaze Powder	
NobelRondo™ Zirconia Base Liner Super Bright 20 g	32451	NobelRondo™ Zirconia Glaze Powder Glossy Pearl 3 g	32525
NobelRondo™ Zirconia Base Liner High Value 20 g	32452	NobelRondo™ Zirconia Inner Core	
NobelRondo™ Zirconia Base Liner Warm Chroma 20 g	32453	NobelRondo™ Zirconia Inner Core Low Value 20 g	32462
NobelRondo™ Zirconia Base Liner Sunny Chroma 20 g	32454	NobelRondo™ Zirconia Inner Core High Value 20 g	32458
NobelRondo™ Zirconia Base Liner Pearl Chroma 20 g	32455	NobelRondo™ Zirconia Inner Core High Value 100 g	33358
NobelRondo™ Zirconia Base Liner Low Value 20 g	32456	NobelRondo™ Zirconia Inner Core Pearl Chroma 20 g	32461
NobelRondo™ Zirconia Colored Translucency		NobelRondo™ Zirconia Inner Core Sunny Chroma 20 g	32460
NobelRondo™ Zirconia Colored Translucency Lemon 12 g	32497	NobelRondo™ Zirconia Inner Core Super Bright 20 g	32457
NobelRondo™ Zirconia Colored Translucency Mandarin 12 g	32498	NobelRondo™ Zirconia Inner Core Warm Chroma 20 g	32459
NobelRondo™ Zirconia Colored Translucency Melon 12 g	32499	NobelRondo™ Zirconia Inner Core Warm Chroma 100 g	33359
NobelRondo™ Zirconia Colored Translucency Orange 12 g	32500	NobelRondo™ Zirconia Intensive Liner	
NobelRondo™ Zirconia Colored Translucency Papaya 12 g	32501	NobelRondo™ Zirconia Intensive Liner Creme 12 g	32508
NobelRondo™ Zirconia Colored Translucency Plum 12 g	32502	NobelRondo™ Zirconia Intensive Liner Grey-Violet 12 g	32512
NobelRondo™ Zirconia Correction Powder		NobelRondo™ Zirconia Intensive Liner Orange 12 g	32509
NobelRondo™ Zirconia Correction Powder 3 g	32526	NobelRondo™ Zirconia Intensive Liner Pink 12 g	32511
NobelRondo™ Zirconia Chromatizer		NobelRondo™ Zirconia Intensive Liner Sunny 12 g	32510
NobelRondo™ Zirconia Chromatizer Warm Chroma 20 g	32463	NobelRondo™ Zirconia Intensive Liner White 12 g	32507
NobelRondo™ Zirconia Chromatizer Orange Warm Chroma 20 g	32464	NobelRondo™ Zirconia Internal Modifier	
NobelRondo™ Zirconia Chromatizer Sunny Chroma 20 g	32465	NobelRondo™ Zirconia Internal Modifier Amber 12 g	32486
NobelRondo™ Zirconia Chromatizer Low Value 20 g	32466	NobelRondo™ Zirconia Internal Modifier Bamboo 12 g	32487
NobelRondo™ Zirconia Dentin		NobelRondo™ Zirconia Internal Modifier Caramel 12 g	32485
NobelRondo™ Zirconia Dentin A0 Super Bright 20 g	32435	NobelRondo™ Zirconia Internal Modifier Creme 12 g	32483
NobelRondo™ Zirconia Dentin A0 Super Bright 100 g	33335	NobelRondo™ Zirconia Internal Modifier Flamingo 12 g	32482
NobelRondo™ Zirconia Dentin A1 High Value 20 g	32438	NobelRondo™ Zirconia Internal Modifier Honey 12 g	32488
NobelRondo™ Zirconia Dentin A1 High Value 100 g	33338	NobelRondo™ Zirconia Internal Modifier Ivory 12 g	32481
NobelRondo™ Zirconia Dentin A2 Warm Chroma 20 g	32439	NobelRondo™ Zirconia Internal Modifier Peach 12 g	32484
NobelRondo™ Zirconia Dentin A2 Warm Chroma 100 g	33339	NobelRondo™ Zirconia Internal Modifier Pearl 12 g	32489
NobelRondo™ Zirconia Dentin A3 Warm Chroma 20 g	32440	NobelRondo™ Zirconia Internal Modifier Taiga 12 g	32490
NobelRondo™ Zirconia Dentin A3 Warm Chroma 100 g	33340	Kits	
NobelRondo™ Zirconia Dentin A3.5 Warm Chroma 20 g	32441	NobelRondo™ Zirconia – Basic Circle (Basic kit, 3 Shade Guides, 3 Liquids: Build-up Soft, Build-up Quick, Liner)	32528
NobelRondo™ Zirconia Dentin A3.5 Warm Chroma 100 g	33341	NobelRondo™ Zirconia – Creative Circle (Basic kit, Master kit, Stain kit, 6 Shade Guides, 4 Liquids: Build-up Soft, Build-up Quick, Liner, Stain)	32527
NobelRondo™ Zirconia Dentin A4 Warm Chroma 20 g	32442	NobelRondo™ Zirconia – Master Circle, add-on kit to Basic Circle (Master kit, Stain kit, 3 Shade Guides, 1 Liquids: Stain)	32529
NobelRondo™ Zirconia Dentin A4 Warm Chroma 100 g	33342	NobelRondo™ Shade Guides	31885
NobelRondo™ Zirconia Dentin B0 Super Bright 20 g	32436	NobelRondo™ Zirconia Starter Set	32531
NobelRondo™ Zirconia Dentin B0 Super Bright 100 g	33336	Liquids	
NobelRondo™ Zirconia Dentin B1 High Value 20 g	32437	NobelRondo™ Build-up Liquid Quick 250 ml	31873
NobelRondo™ Zirconia Dentin B1 High Value 100 g	33337	NobelRondo™ Build-up Liquid Soft 250 ml	31881
NobelRondo™ Zirconia Dentin B2 Sunny Chroma 20 g	32445	NobelRondo™ Liner Liquid 50 ml	31874
NobelRondo™ Zirconia Dentin B2 Sunny Chroma 100 g	33345	NobelRondo™ Stain Liquid 15 ml	31880
NobelRondo™ Zirconia Dentin B3 Sunny Chroma 20 g	32444	NobelRondo™ Zirconia Mother-of-Pearl	
NobelRondo™ Zirconia Dentin B3 Sunny Chroma 100 g	33344	NobelRondo™ Zirconia Mother-of-Pearl Light Coral 12 g	32504
NobelRondo™ Zirconia Dentin B4 Sunny Chroma 20 g	32443	NobelRondo™ Zirconia Mother-of-Pearl Oyster White 12 g	32503
NobelRondo™ Zirconia Dentin B4 Sunny Chroma 100 g	33343	NobelRondo™ Zirconia Mother-of-Pearl Pale Shell 12 g	32505
NobelRondo™ Zirconia Dentin C1 Low Value 20 g	32450	NobelRondo™ Zirconia Mother-of-Pearl Pink Pearl 12 g	32506
NobelRondo™ Zirconia Dentin C1 Low Value 100 g	33350	NobelRondo™ Zirconia Opal Enamel	
NobelRondo™ Zirconia Dentin C2 Low Value 20 g	32449	NobelRondo™ Zirconia Opal Enamel 0 Super Bright 20 g	32467
NobelRondo™ Zirconia Dentin C2 Low Value 100 g	33349	NobelRondo™ Zirconia Opal Enamel 0 Super Bright 100 g	33354
NobelRondo™ Zirconia Dentin C3 Low Value 20 g	32448	NobelRondo™ Zirconia Opal Enamel 1 High Value 20 g	32470
NobelRondo™ Zirconia Dentin C3 Low Value 100 g	33348	NobelRondo™ Zirconia Opal Enamel 1 High Value 100 g	33355
NobelRondo™ Zirconia Dentin D2 Pearl Chroma 20 g	32446	NobelRondo™ Zirconia Opal Enamel 2 20 g	32471
NobelRondo™ Zirconia Dentin D2 Pearl Chroma 100 g	33346	NobelRondo™ Zirconia Opal Enamel 2 100 g	33356
NobelRondo™ Zirconia Dentin D3 Pearl Chroma 20 g	32447	NobelRondo™ Zirconia Opal Enamel 3 Sunny Chroma 20 g	32476
NobelRondo™ Zirconia Dentin D3 Pearl Chroma 100 g	33347	NobelRondo™ Zirconia Opal Enamel 3 Sunny Chroma 100 g	33357
NobelRondo™ Zirconia Enamel		NobelRondo™ Zirconia Gingiva	
NobelRondo™ Zirconia Enamel 2 Low Value 20 g	32479	NobelRondo™ Zirconia Gingiva 1 20g	33386
NobelRondo™ Zirconia Enamel 2 Low Value 100 g	33353	NobelRondo™ Zirconia Gingiva 2 20g	33387
NobelRondo™ Zirconia Enamel 3 20 g	32472	NobelRondo™ Zirconia Gingiva 3 20g	33388
NobelRondo™ Zirconia Enamel 3 100 g	33351	NobelRondo™ Zirconia Gingiva 4 20g	33389
NobelRondo™ Zirconia Enamel 4 Sunny Chroma 20 g	32475	NobelRondo™ Zirconia Gingiva 5 20g	33390
NobelRondo™ Zirconia Enamel 4 Sunny Chroma 100 g	33352	NobelRondo™ Zirconia Gingiva 6 20g	33391
NobelRondo™ Zirconia Gingiva		NobelRondo™ Zirconia Gingiva Set	33437
NobelRondo™ Zirconia Gingiva 1 20g	33386	NobelRondo™ Zirconia Gingiva Shade Guide	33439
NobelRondo™ Zirconia Gingiva 2 20g	33387		
NobelRondo™ Zirconia Gingiva 3 20g	33388		
NobelRondo™ Zirconia Gingiva 4 20g	33389		
NobelRondo™ Zirconia Gingiva 5 20g	33390		
NobelRondo™ Zirconia Gingiva 6 20g	33391		

Product list

Description	Article #
NobelRondo™ Zirconia Shoulder	
NobelRondo™ Zirconia Shoulder Low Value 12 g	32496
NobelRondo™ Zirconia Shoulder High Value 12 g	32492
NobelRondo™ Zirconia Shoulder Pearl Chroma 12 g	32495
NobelRondo™ Zirconia Shoulder Sunny Chroma 12 g	32494
NobelRondo™ Zirconia Shoulder Super Bright 12 g	32491
NobelRondo™ Zirconia Shoulder Warm Chroma 12 g	32493
NobelRondo™ Zirconia Special Enamel Opal	
NobelRondo™ Zirconia Special Enamel Opal Blue Light High Value 20 g	32469
NobelRondo™ Zirconia Special Enamel Opal Blue Super Bright 20 g	32468
NobelRondo™ Zirconia Special Enamel Opal Grey Low Value 20 g	32478
NobelRondo™ Zirconia Special Enamel Opal Smoky Low Value 20 g	32480
NobelRondo™ Zirconia Stain	
NobelRondo™ Zirconia Stain Caramel 3 g	32518
NobelRondo™ Zirconia Stain Chestnut 3 g	32522
NobelRondo™ Zirconia Stain Ivory 3 g	32516
NobelRondo™ Zirconia Stain Khaki 3 g	32520
NobelRondo™ Zirconia Stain Maize 3 g	32515
NobelRondo™ Zirconia Stain Olive 3 g	32521
NobelRondo™ Zirconia Stain Orange 3 g	32519
NobelRondo™ Zirconia Stain Peach 3 g	32517
NobelRondo™ Zirconia Stain Pink 3 g	32514
NobelRondo™ Zirconia Stain Steel 3 g	32523
NobelRondo™ Zirconia Stain Violet 3 g	32524
NobelRondo™ Zirconia Stain White 3 g	32513
NobelRondo™ ZI Transpa	
NobelRondo™ Zirconia Transpa Clear 20 g	32474
NobelRondo™ Zirconia Transpa Opal 20 g	32473
NobelRondo™ Zirconia Transpa Neutral 20 g	32477



our qualifications are

your security

Achievements

- Inheritors and developers of the work of Professor Bränemark – founder of modern implantology. World leaders in the field
- Providers of the most comprehensive and flexible crown, bridge and implant solutions in the world
- Creators of unique biocompatible material TiUnite® for optimal osseointegration, Immediate Function™ and Soft Tissue Integration™
- Creators of unique Procera® System and CAD/CAM dentistry

- FDA cleared for Immediate Function™ (except 3.0 and Zygoma)
- FDA cleared for Teeth-In-An-Hour™ in 2004

Quality

- Zero non-conformities in 2004 FDA inspection of Nobel Biocare production units in Göteborg, Karlskoga and Stockholm

Research

- Formal collaboration with over 50 academic institutions and 600 independent scientists around the world

- More clinical studies on immediate or early loading than all other competitors combined (Medline April 2006)
- More prospective clinical studies with at least 5-year follow-up than all other competitors combined (Berglund et al 2002)

Support

- 250,000 customers trained in 40 countries during 2005
- Own sales organizations with local Nobel Biocare staff in 30 countries

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Nobel Biocare cares about the environment and all production units are certified according to Environmental Management System ISO 14001

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