ZIROX NR Veneering Ceramic
Expect the difference!
ZIROX NR

A perfect balance of functionality and aesthetics

As zirconium oxide is increasingly being used as a key material for dental frameworks, veneering ceramics are similarly playing an ever more important part in the creation of restorations which combine outstanding biocompatibility and strength with stunning aesthetics. ZIROX NR therefore delivers a perfect shade match. When used as part of this coordinated system together with CAD/CAM frameworks in zirconium oxide from the ZENOTEC system or Nobel Procera®, ZIROX NR guarantees the best possible light dynamics, which in turn gives you perfectly natural colour properties. First class aesthetic and physical values make this ceramic into a comprehensive system solution for the veneering of zirconium oxide frameworks. All the accessories you need and with processes and a range of applications which are compatible with NobelRondo™ Zirconia. Aesthetics and functionality thus complement each other to produce perfect results.

ZIROX NR veneering ceramics for zirconium oxide frameworks are based on the unique leucite-free HDAM*.

ZIROX NR allows you to express your dental expertise to tangible perfection. Its leucite-free microstructure gives a homogeneous surface which is both kind to the gingiva and plaque resistant. In addition, this structure is a boon for all your daily dental restoration jobs since it combines minimal shrinkage with extremely stable firing properties, enabling you to create perfect and affordable dentures with a high degree of reproducibility.

“When designing the tooth colour, the aim is not only to reproduce the basic shade, but to imitate the structures of natural dentition.”
Master Dental Technician Ernst A. Hegenbarth in Quintessenz 1990

* High Density Advanced Microstructure
Masterpieces of natural brilliance and durability

For many years now, WIELAND X-Type ceramics have been amongst the preferred veneering ceramics in dental labs all over the world. Years of investment in the development of materials expertise that is second to none and cooperating in matters of design with dental technicians such as E. A. Hegenbarth have laid the foundations for a sophisticated range of models and the very best in manufacturing quality. Our manufacturing facilities at locations in Germany set such high standards that other suppliers such as Nobel Biocare also make their NobelRondo™ ceramics here. As a user of ZIROX NR ceramics, you, too, can rely on a truly leading standard which will benefit your customers in terms of patient comfort, aesthetics and durability.

- Very smooth and homogeneous surfaces thanks to HDAM
- Aesthetically reproducible shade matching, light dynamics and natural colour properties
- Exceptionally good bonding and high strength
- Ideal working properties with reliable colour reproduction using the classical three-layer build-up technique opaque (liner) – dentine – incisal

Using X-Type veneering ceramics gives ideal physical properties and covers a broad range of indications.

Whether you use the WIELAND 3-layer technique or any other established process, you can obtain aesthetic restorations in harmonized colours. This ensures that you can obtain perfect colour results without changing your technique.
Nature knows no bounds when it comes to the interplay of light, shape and colour. In dental technology, it is our task to use technical means to recreate this vivid world. With ZIROX NR you can meet the challenge of zirconium oxide frameworks with elegance.

ZIROX NR veneering ceramic is suitable for veneering hard sintered all-ceramic frameworks based on ZrO₂ with a CTE of approx. 10.5 x 10⁻⁶ K⁻¹ (25 - 500°C).

In addition to the working properties of conventional materials, ZIROX NR offers you a much greater range of design options which you can adjust to suit your needs by varying the chroma, brightness and transparency:

- Specifically designed contrasts and unique colour depth with Chromatix
- Characterization effects at the dentine core with Dentine Modifiers and Flu Dentes
- Light dynamics and reflections in the incisal area with Incisal Modifiers and Opale Effect materials

The stains then provide the finishing touch for even the most extreme indications. The result can be seen in the fine difference revealed by the sophisticated ZIROX NR veneering ceramic.
Concept and structures for the colourful world of dental technology

Transparence and reproducibility are not only needed for your restorations but above all in the design concept of your ceramic materials. The ZIROX NR concept, which is based on the Hegenbarth Principle of a dynamic, harmonized colour system, is easy to understand and just as easy to implement.

The colour scheme of the labels is easy to follow and built up on a strictly defined principle.

The basic layer build-up of both complex and low-cost jobs can quickly be transferred and implemented. The materials are allocated on the basis of harmonized colour segments, the products are coordinated and the results can clearly be seen in the evident success of the close cooperation between industry and laboratory.

- It is easy to transfer your working practices from one system to the other because the product names are similar
- The colours and physical properties are identical
- The materials are compatible with WIELAND carving liquids.

And should any questions still remain unanswered, WIELAND ZIROX NR will enable you to experience what a customer-friendly approach can actually achieve in everyday practice. Simply contact your regular WIELAND representative or team member or call our ceramic specialists direct on our technical hotline: +49 60 07/91 76-222

Allocating ZIROX NR materials to NobelRondo™

<table>
<thead>
<tr>
<th>Super Bright</th>
<th>High Value</th>
<th>Warm Chroma</th>
<th>Sunny Chroma</th>
<th>Pearl Chroma</th>
<th>Low Value</th>
</tr>
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<tbody>
<tr>
<td>Liner</td>
<td>Super Bright</td>
<td>High Value</td>
<td>Warm Chroma</td>
<td>Sunny Chroma</td>
<td>Pearl Chroma</td>
</tr>
<tr>
<td>Dentine</td>
<td>A0 B0</td>
<td>B1 A1</td>
<td>A2 A3 A3.5 A4</td>
<td>B4 B3 B2</td>
<td>D2 D3</td>
</tr>
<tr>
<td>Incisal</td>
<td>010 010</td>
<td>011 011</td>
<td>012 13 14 14</td>
<td>14 13 03</td>
<td>012 13</td>
</tr>
</tbody>
</table>

The dentine colours C4 and D4 can be mixed as follows:
- C4 = 1 part Dentine C3 + 1 part Modifier Taiga
- D4 = 1 part Dentine C2 + 1 part Dentine B4

**Important!**
- All materials from the ZIROX NR range are compatible with NobelRondo™ Zirconia and can therefore be mixed.
- WIELAND guarantees all restorations which are made in accordance with the processing recommendations set out here.

The carving liquids for the WIELAND X-Type ceramics are ideally suitable for use with ZIROX NR materials.
Contraindications

- Veneering of zirconium oxide frameworks with defects in the form of cracks, fissures or cavitations.
- Unsuitable preparation types (e.g. tangential preparations)
- Cases where space is restricted
- If the patient suffers from parafunctional habits (such as bruxism)
- Major grinding work carried out by the dentist or the dental technician on the restoration (interior and exterior of ZrO₂ framework or the veneering ceramic) with rotary instruments without water cooling and with the exertion of considerable contact pressure.

Note!

- All-ceramic frameworks should only be finished with suitable grinding tools (medium-grain diamond burs) applied at a low contact pressure and making use of water cooling.
- As a rule, avoid grinding the restoration (framework and veneering ceramic) to any great extent or using a cutting disc to separate the units.
- After using rotary instruments on the veneering ceramic, a glaze bake must always be carried out. This process reduces stress and microcracks in the veneer. These recommendations apply to both the dental technician and the practitioner.
- We recommend the use of zirconium oxide frameworks from the ZENOTEC system.
Designing the framework

The framework must be anatomical in shape and above all should support the veneer in the area of the cusps. This principle should also be observed when designing restorations in the incisal area. Under no circumstances should the wall thickness be less than the minimum of 0.4 mm – 0.6 mm. Any excessive absence of tooth substance must be made up for by the framework design and not compensated for by a correspondingly thicker veneer. Please ensure that the cross-section of the connector is suitably large. In the posterior region, this should be 9.0 mm² and in the anterior region 7.0 mm². In addition, ensure that the occlusal/incisal veneering ceramic has a minimum thickness of 1.0 mm and a maximum of 2.0 mm. The basal surfaces should be designed with a minimum thickness of 1.0 mm and a maximum of 1.5 mm.

Conditioning the framework prior to veneering

Gentle sandblasting of the zirconium oxide framework is recommended. This cleans the surface of the framework and helps the veneering ceramic to cover better. The zirconium oxide framework should therefore be blasted with approx. 110 µm aluminium oxide abrasive at approx. 1 bar. Carrying out additional heat treatment (cleaning bake) on the hard sintered framework delivers no further benefits. Ensure that the surface to be veneered is free of dirt and grease.
ZIROX NR

Recommendations for firing

- Zirconium oxide is a poor thermal conductor. For this reason it should be pre-heated in the closed furnace for at least 3 minutes. It is absolutely essential to observe the recommended firing parameters.
- The heat rise must not exceed 45 °C per minute.
- Solid firing trays absorb more heat during firing and can therefore influence the effect of firing on the ceramic. For this reason and to obtain the best possible results, use honeycomb firing trays or if solid ones are used increase the firing temperatures by 10 °C. Best results are obtained by using honeycomb firing trays and fan-type firing pins.
- With larger framework designs, solid pontics or several small units, the firing temperatures for the first and second dentine bakes should be increased according to the following rule of thumb: The end temperature should be increased by 2° C for each additional unit of the framework (crown, pontic)!
  **Example:** 1. dentine bake
  6-unit bridge or 6 single crowns
  = 5 additional units
  -> 900 °C + (5 x 2 °C)
  => 910 °C end temperature
- Do not overfill the firing trays, since increasing the number of items necessitates a considerably higher firing temperature. (See rule of thumb.)
- In order to minimise the risk of thermal stresses caused by too rapid cooling, it is essential to open the firing chamber gradually (slow cooling). Following the ceramic bake, the veneered zirconium frameworks should be left on the firing tray and allowed to cool slowly to room temperature next to the furnace.

**Note!**
- Make sure that no draughts or cold air from outside can cause the work to cool too quickly, since this can also lead to thermal stress!
- The work should not be positioned in the centre of the firing tray but always aligned to the heating elements.
Firing programme for ZIROX NR with slow cooling

The ZIROX NR firing programmes with slow cooling for the DEKEMA dental ceramic furnaces can be called up from www.wieland-international.com. The firing temperatures given are for guidance only. Actual temperatures may differ depending on the furnace used.

Firing recommendations

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<tbody>
<tr>
<td>1st shoulder bake</td>
<td>575</td>
<td>8</td>
<td>45</td>
<td>980</td>
<td>1</td>
<td>100</td>
<td>–</td>
</tr>
<tr>
<td>2nd shoulder bake</td>
<td>575</td>
<td>8</td>
<td>45</td>
<td>960</td>
<td>1</td>
<td>100</td>
<td>–</td>
</tr>
<tr>
<td>Liner bake</td>
<td>575</td>
<td>8</td>
<td>45</td>
<td>930</td>
<td>1</td>
<td>100</td>
<td>–</td>
</tr>
<tr>
<td>1st dentine bake</td>
<td>575</td>
<td>9</td>
<td>45</td>
<td>900 + X</td>
<td>2</td>
<td>100</td>
<td>4</td>
</tr>
<tr>
<td>2nd dentine bake</td>
<td>575</td>
<td>8</td>
<td>45</td>
<td>890 + X</td>
<td>1</td>
<td>100</td>
<td>4</td>
</tr>
<tr>
<td>Glaze bake</td>
<td>575</td>
<td>5</td>
<td>45</td>
<td>880</td>
<td>1-2</td>
<td>–</td>
<td>4</td>
</tr>
<tr>
<td>Correction bake</td>
<td>575</td>
<td>5</td>
<td>45</td>
<td>850</td>
<td>1</td>
<td>100</td>
<td>4</td>
</tr>
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Calculating the value of X

Along with incorrect framework design, too low a setting on the furnace is the most common cause of failure. In other words, it is absolutely crucial to set the firing temperature of your furnace correctly. This is very easy to do by means of a firing sample with the aid of the ZIROX calibration set (Ref. No. 8595140SET). In order to adjust the firing temperature of each individual furnace used, the actual firing temperature of the furnace must first be determined, since this can differ from the temperature shown in the display. It is not unusual to find a deviation of 20 – 30 °C. To do this, a firing sample of ZIROX NR Transpa Clear is fired in the lab and compared with the reference sample supplied. Transparency values and surface roughness should be the same for the firing sample and the reference sample. If this is not the case, then the firing temperature must be adjusted until the required degree of firing is attained. The difference in temperature between the value indicated and the actual temperature corresponds to the value X and must accordingly be added to the value given in the table for each individual firing.

Technical specifications

<table>
<thead>
<tr>
<th>ZIROX NR</th>
<th>NobelRondo™ Zirconia</th>
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<tbody>
<tr>
<td>CTE25–500°C [10⁻⁶ K⁻¹]</td>
<td>9,3</td>
</tr>
<tr>
<td>Glass transition temperature Tg [°C]</td>
<td>570</td>
</tr>
<tr>
<td>3-point bending strength [MPa]</td>
<td>120</td>
</tr>
</tbody>
</table>

In order to avoid underfiring the veneering ceramic, the furnace should be calibrated at regular intervals. This can easily be done with the aid of the ZIROX calibration set (Ref. No. 8495240SET).
Additional information for dentists

Recommendations for handling all-ceramic restorations in zirconium oxide

Contraindications
If space is restricted or in the case of patients with parafunctional habits (e.g. bruxism), an alternative type of restoration should be chosen. Similarly, grinding the interior of the crown framework is contraindicated.

Preparation
Because of the physical properties of the zirconium oxide material, the tooth must be prepared with a pronounced chamfer or shoulder. A tangential preparation of the tooth stumps is contraindicated (cf. ZENO Preparation Guide).

Trimming the occlusal and approximal contact points
If correction work has been carried out on the ceramic veneer with rotary instruments, then it is absolutely essential to follow this by a glaze bake. This reduces stresses and may correct any damage that the veneer has suffered in the form of microcracks. The restoration should not be subjected to extensive grinding.

Ensuring that the framework is a good fit
There must be no discernible independent friction at the tooth stump. In order to prevent the ceramic from failing as a result of corrective grinding of the framework, e.g. on the inner surface of the crown, we recommend an initial try-in of the framework either before or just after firing. Furthermore, zirconium oxide workpieces must not be subjected to excessive contact pressure during grinding. Please use only the abrasives (fine-grain diamond burs) specifically recommended for zirconium oxide and ensure that there is adequate cooling (e.g. by using a water-cooled turbine handpiece).

Conditioning the inside of the framework before cementing
Gentle sandblasting of the zirconium oxide framework is recommended. This cleans the inner surface of the framework and guarantees a better bond for the veneering ceramic. The trimmed zirconium oxide framework should therefore be blasted with approx. 110 µm aluminium oxide abrasive at approx. 1 bar. Also ensure that the inner surfaces of the framework are free of dirt and grease.

Recommended fixing method
Zirconium oxide frameworks can be fixed conventionally with glasionomer or zirconium oxide phosphate cement, but they can also be fixed with composite bonding materials (e.g. RelyX Unicem from 3M ESPE or Panavia F 2.0 from KURARAY). We advise against using compomers, acrylic modified glasionomer cements with a high coefficient of expansion and temporary cements.

Note!
- If these recommendations for working with this material are not followed, this can cause the ceramic veneer to crack or flake off or can even cause the restoration to fracture!
ZIROX NR veneering ceramics at a glance

ZIROX NR was introduced in the autumn of 2009 as a WIELAND X-Type ceramic specially intended for design and tray systems. ZIROX NR is based on the materials technology of the proven WIELAND ZIROX veneering ceramics and the know-how acquired over many years through the development and manufacture of NobelRondo™ Zirconia ceramics by WIELAND Dental Ceramics. It is also backed by joint development work with Ernst A. Hegenbarth.

Ref. No  ZIROX NR
8507210012  Shoulder Super Bright  12g
8507220012  Shoulder High Value  12g
8507230012  Shoulder Warm Chroma  12g
8507240012  Shoulder Sunny Chroma  12g
8507250012  Shoulder Pearl Chroma  12g
8507260012  Shoulder Low Value  12g
8514510012  Liner Low Value  20g
8514610012  Liner Modifier White  12g
8514620012  Liner Modifier Creme  12g
8514630012  Liner Modifier Sunny  12g
8514640012  Liner Modifier Grey-Violet  12g
8514650012  Liner Modifier Pink  12g
8514660012  Liner Modifier Grey-Violet  20g
8514670012  Liner Modifier Grey-Violet  50g
8514680012  Liner Modifier Grey-Violet  250g
8514690012  Liner Modifier Grey-Violet  500g
As a major supplier of dental system solutions, WIELAND embodies both tradition and progress in matters of dental products and technology. Since our company was founded in 1871, we have stayed true to our corporate philosophy of combining tradition, innovation and quality with the best in customer care. Today, our core competencies and key strengths lie in the forward-looking integration of technologies and materials for dental prosthetics. This ensures that patients can trust in the quality of their dentures, and our partners in dental practices and laboratories can continue with confidence on the path to digitalisation and greater competitiveness.

WIELAND offers a wide range of products and services from CAD/CAM technologies and dental alloys to veneering ceramics and electroforming. Thanks to our worldwide presence and international network of regional branches and local agencies, WIELAND is never far away, and your contact person can always be located via the Internet.