

ZENOSTAR 



ZENOSTAR Zr Translucent  
Material guidelines

**WIELAND**  
DENTAL

# ZENOSTAR

## ZENOSTAR Zr Translucent – very strong, translucent and aesthetic

Since the functional properties of the high-performance material zirconium dioxide have proven themselves magnificently since their introduction as a restorative material in dentistry, the demands that dental technicians and dentists place on the material have developed further.

Supplemental indications such as wide bridges and implant suprastructures made of zirconium dioxide require improved strength, resistance to breaking and ageing, so that the material can also offer sufficient safety when used for a longer period of time.

The use of zirconium dioxide as an aesthetic framework material for the ceramic veneer as well as the use of fully-anatomic functional prostheses requires high translucency and a starting material the same colour as teeth.

In addition to the selection of a suitable powdered raw material, perfect coordination of all stages in the process, shaping → debinding/presintering → final sintering is of primary importance in order to use the extraordinary material properties of zirconium dioxide optimally and thus create the basis for a high-quality, long-lasting prosthesis.



WIELAND Dental has, with the ZENOSTAR Zr Translucent, developed and introduced an innovative zirconium dioxide material which can be used to implement both economically-appealing monolithic crowns and bridges as well as aesthetic frames for individual ceramic veneers.

For the ZENOSTAR Zr Translucent blanks, the positive mechanical properties of the „white“ zirconium dioxide ZENOTEK Zr Bridge was combined with the positive optical and aesthetic properties of the known translucent zirconium dioxide ZENOTEK Zr Bridge Translucent. Furthermore, three basic colours were developed, with which all teeth colours can be recreated using the conventional shading technology of the ZENOSTAR Art Module (colour shading set and the Magic Glaze spray-on glaze).

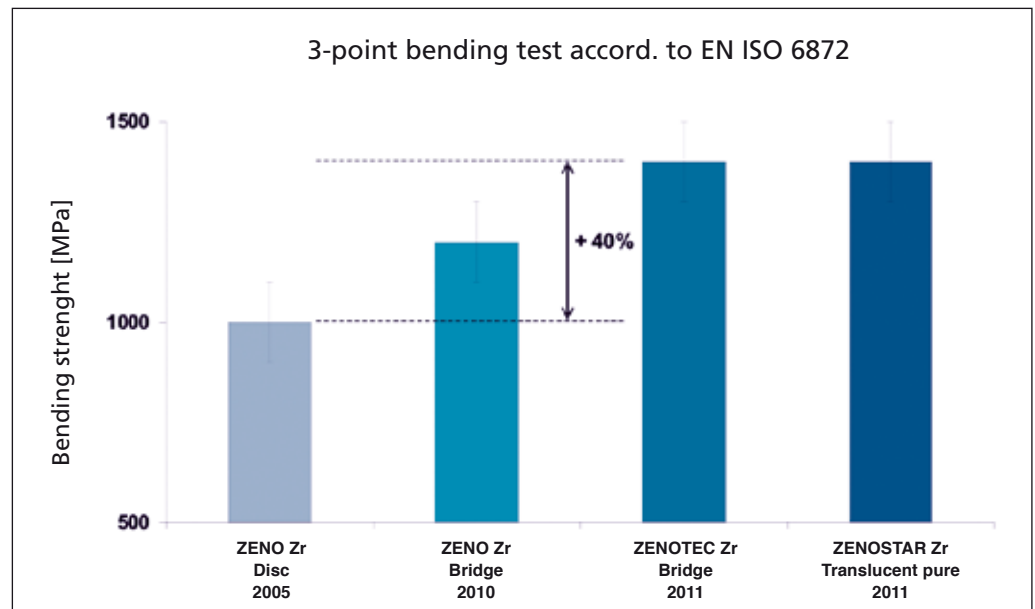


*ZENOSTAR Zr Translucent pure, light, medium and intense; Illustrated here: ¼ blanks with a fully-anatomic molar crown and a 5-link bridge frame for veneering with Zenoflex dimension ceramic.*

## The mechanical properties of ZENOSTAR

Since the introduction of zirconium dioxide materials in dentistry, the mechanical properties of the ceramic material, in particular the resistance to bending strength by modifying the powdered raw material and the optimisation of the process parameters, have been increased significantly.

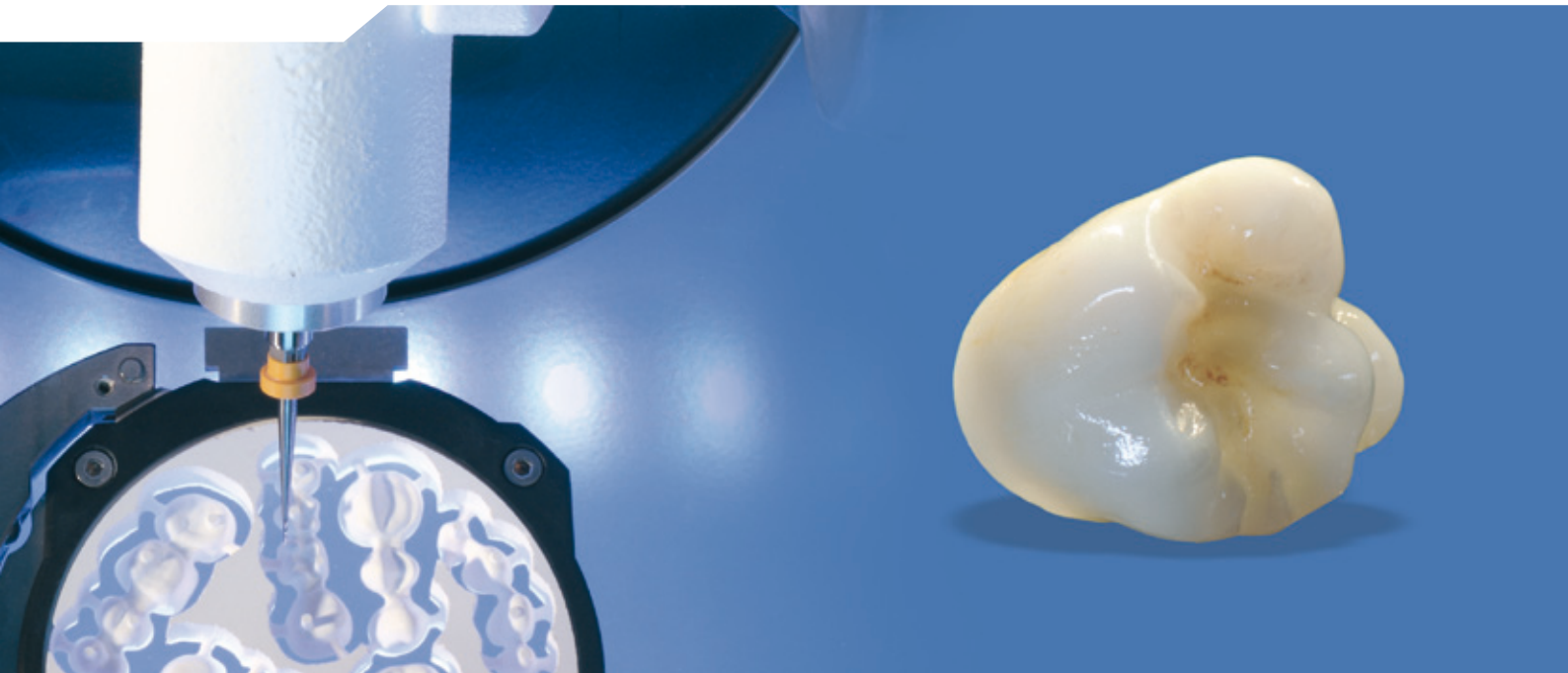
It can be seen from the graph that the average strength of approximately 1000 MPa in 2005 was increased to 1400 MPa, approximately 40 %, with the current materials. This means more safety when using the material as a prosthetic restoration material.



Because the sintering temperature and sintering duration of ZENOSTAR Zr Translucent Blanks in comparison to conventional translucent blanks was reduced from 1530 °C/4 h to 1450 °C/2 h, the translucent units can now be sintered together with the „white“ blanks.

## Hydrothermal ageing

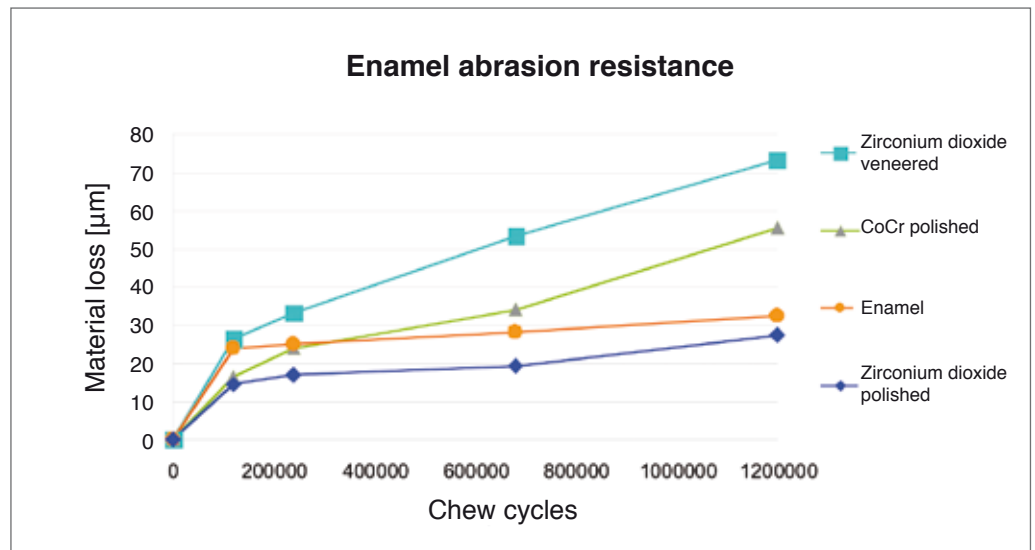
ZENOSTAR Zr Translucent has an excellent hydrothermal resistance to ageing. This is achieved through an improved raw material recipe, optimized manufacturing conditions and a lower sintering temperature.



## The abrasion characteristics of ZENOSTAR

The fact that the hardness of a zirconium dioxide restorative material does not have an effect on antagonist abrasion, but rather the surface roughness thereof does, was proven in a study carried out by the University of Zurich.

The illustration below shows the material loss of a natural antagonist through different restoration materials in the course of a chew machine test involving up to 1,200,000 chew cycles in a hydrous environment and with alternating temperatures, with a duration of use of 5 years being simulated. It can be seen that polished zirconium dioxide exhibits abrasion characteristics similar to natural enamel, whilst polished NEM (CoCr alloy) and a ceramic veneer exhibit higher antagonist abrasion.



*Abrasion characteristics of different materials on the enamel; „Stawarczyk, B.; Özcan, M.; Abrasion Examinations with Different Dental Materials, Dental Materials Unit, University of Zurich, 2010 (in preparation)“*

# The appearance of ZENOSTAR

To arrive at a unit to measure what is commonly referred to as the property of „translucency“, the light transmission is measured with a sample. In doing so, it should be noted that the sample thickness and surface has a large effect on the light transmission, i.e. the translucency, which can be seen in illustration 1. This means that it is only possible to compare samples of the same thickness with an identical surface treatment as part of an identical measurement process.

The light transmission of the zirconium dioxide blanks from 2005 to today is shown in illustration 2. In comparison to the „white“ blanks introduced in 2005, the light transmission of the current ZENOSTAR Zr Translucent Blanks has been increased by over 60 %.

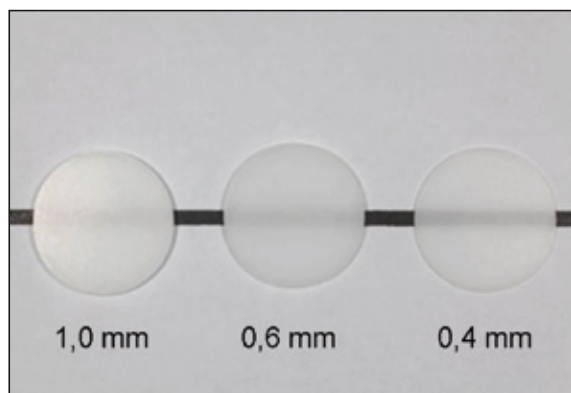


Figure 1: Translucency of ZENOSTAR Zr Translucent pure depending on the sample thickness

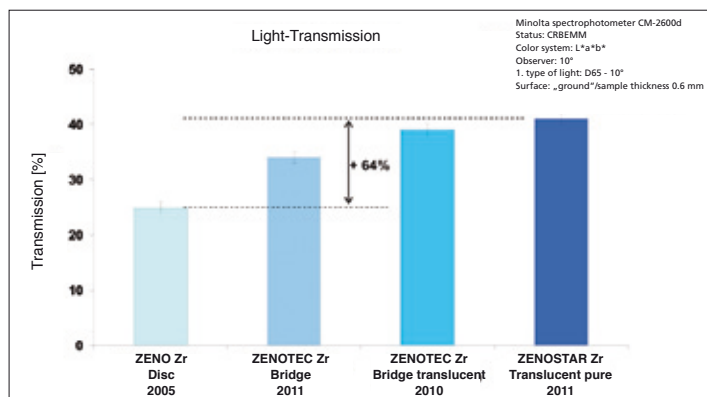


Figure 2: Light transmission of zirconium dioxide blanks from 2005 to today

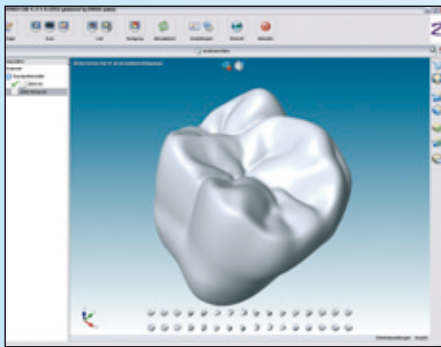
This translucency, very high for zirconium dioxide materials, allows the manufacture of full-anatomic restorations with natural aesthetics. The indication of fully-anatomic or monolithic restoration is assisted significantly by pre-colouring the blanks and the ZENOSTAR shading technique.

# ZENOSTAR

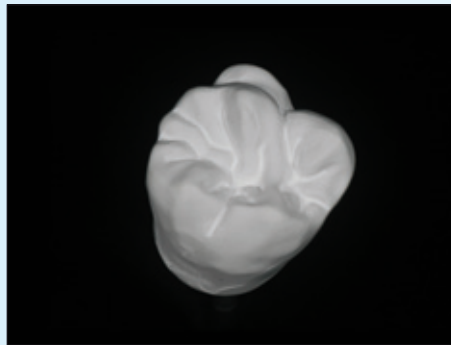
## ZENOSTAR Shading Technique

The dental process for the manufacture of a fully-anatomic ZENOSTAR restoration starts with the construction of the fully-anatomic work in the CAD program. After the monolithic supplied from the ZENOSTAR Zr Translucent Blank is milled, it is sintered to a high density in a high-temperature sintering oven and obtains its ultimate solidity as a result of this.

### The ZENOSTAR Shading Technique Process



*Construction*



*Milling*



*Sintering*

In a next step, the zirconium dioxide surface of the restoration is polished, which is important for antagonist-friendly abrasion characteristics. After this, the fully-anatomic treatment is individualized with Magic Glaze spray, which is particularly well suited to application on polished zirconium dioxide surfaces, as well as the shading from the ZENOSTAR Art Module.



*Polishing*



*Individualisation*



*Done!*

## Summary

Thanks to optimization of powdered raw material and manufacturing parameters, it has been possible to develop ZENOSTAR Zr Translucent, a zirconium dioxide material that combines very good mechanical properties with excellent aesthetic properties.

ZENOSTAR Zr Translucent blanks are suitable for both the manufacture of fully-anatomic prostheses with antagonist-friendly abrasion characteristics as well as for substructures for ceramic veneering.

With the Zenoflex Dimension veneering ceramic system and the ZENOSTAR Art Module with the Magic Glaze spray, the necessary tools are available to make aesthetic and functional prostheses from zirconium dioxide.

### An overview of ZENOSTAR Zr Translucent colouring:

This is how you reproduce the desired tooth colour

	ZENOSTAR Zr Translucent	ZENOSTAR Bodystain (BP = brush point)	Stains
A1 + A2	Light	A	Occlusal blue and white
A3	Medium	A	Occlusal white
A3,5 + A4	Intense	A + 2 BP orange + 1 BP yellow	Occlusal white and grey
B1 + B2	Light	B	Occlusal white and blue
B3	Medium	B + 1 BP orange	Occlusal white
B4	Intense	B + 1 BP orange + 1 BP yellow	Occlusal white and blue
C1	Light	C	Occlusal grey and white
C2 + C3	Medium	C + 1 BP grey	Occlusal grey and white
C4	Intense	C + 1 BP grey + 1 BP violet	Occlusal grey and white
D2 + D3	Medium	D + 1 BP grey	Occlusal grey and white
D4	Intense	D + 1 BP grey + 1 BP violet	Occlusal grey and white

## Testimonials from practices and laboratories



*“As one of the first Cerec users, I am well aware of the advantages of full-contour ceramic milled restorations. Zirconia materials feature good physical properties and a pleasing appearance. Because they are comparatively “more simple” – and therefore more cost-effective – to process, they would seem to be future-oriented materials for restorative dental surgery. Soon they may also – depending on the indications – largely replace metals”* **Dr. Frank Jeschke** – dentist/oral surgeon, Augsburg

*“For me, ZENOSTAR is an ideal and highly cost-effective addition to the range of services I offer in the price-conscious segment between esthetics and basic restorations. Using only three basic shades, I can reproduce all 16 classical shades. The process is simple and reliable. My customers are attracted by the excellent translucence of the material which gives amazing esthetic results. This means that I can achieve results of a consistently high quality regardless of personnel. The dentist can prepare the tooth in a minimally invasive manner; we can combine monolithic dental restorations with veneered ones. Bridges are possible. ZENOSTAR can do a lot more than other monolithic single crowns.”* **Jörg Boger** – Dental technician and business graduate, proprietor of Boger Zahntechnik, Reutlingen



*„A few products come along in our lives as Technications that not only please the patient, the oral cavity and us all at the same time and are profitable in the making, like the ZENOSTAR crown (the all-zirconia restoration). I started producing this restoration years ago with regular zirconia, but there is very little comparison to the restoration we now produce with translucent zirconia. It has increased our business by 30% in this economy. The Dentist often comments “are you sure these are not layered?”* **Charles Warren cdt** – Dental Consultant, Tempus Dental Laboratory, Springville (Utah)

**ZENOSTAR – Simple. Beautiful. Strong.**

**ZENOSTAR** 

**Adopt a clear line –**  
with just one ceramic material.

**Demand biocompatibility –**  
the ZENOSTAR high performance  
ceramic is 100 % biocompatible.

Further information from:  
**[www.zenostar.de](http://www.zenostar.de)**

Dental lab:

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