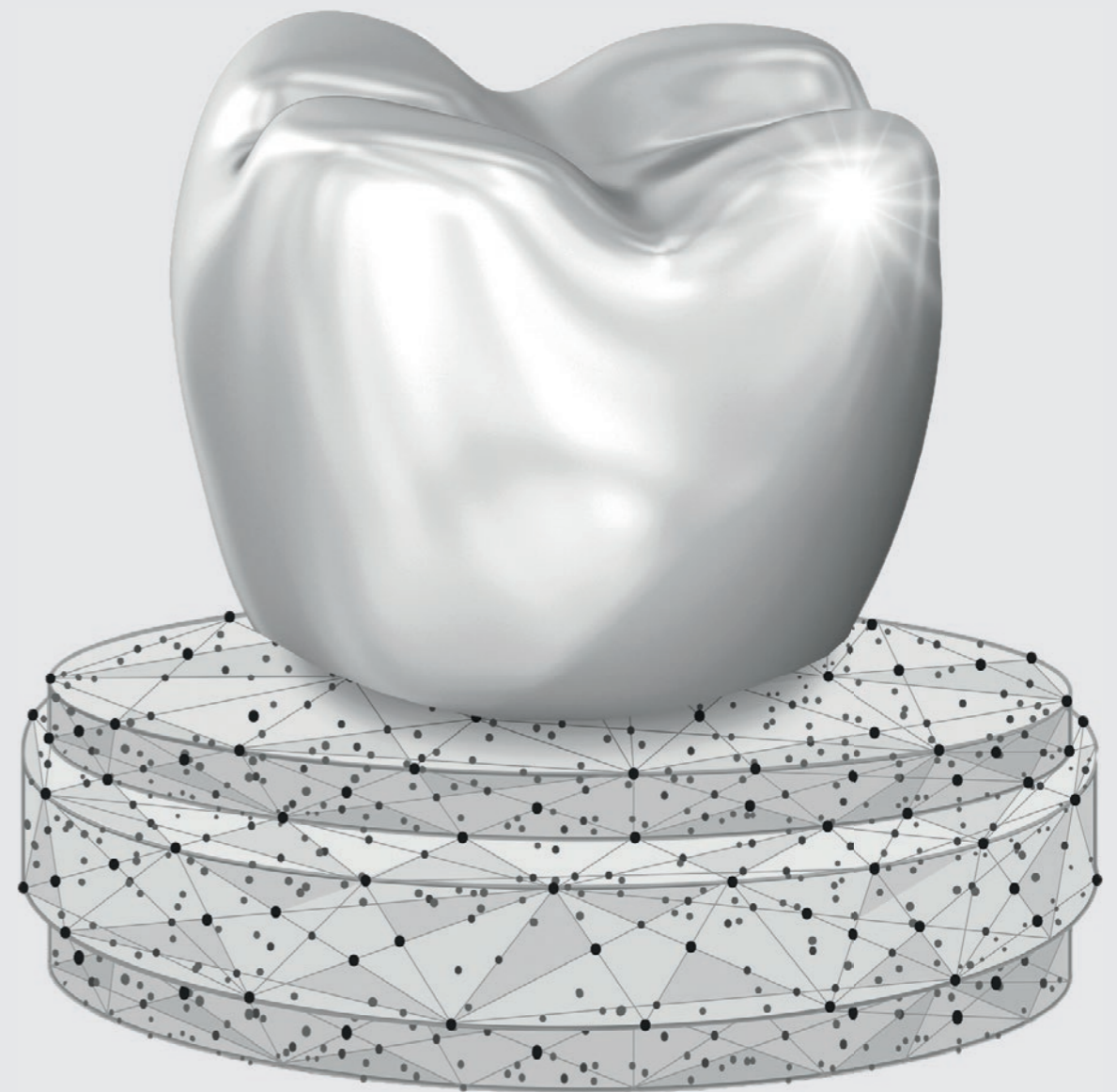




Brilliant denture made of  
high-performance ceramic - made in Germany



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# Show your teeth?

With metal-free zirconia blanks made of StarCeram® Z grades




As one of the leading solution providers in the field of high-performance ceramics, KYOCERA Fineceramics Precision GmbH has unique expertise in the production of zirconium oxide blanks. Our innovative spirit and precision standards are reflected in the quality of each of the more than 1 million components manufactured so far and therefore offer the best conditions for the subsequent processing of the blanks. The cost-effective production of dentures using modern CAD/CAM technologies with our high-quality StarCeram® Z ceramics enables the German dental workflow to be integrated into the company's own value-added chain. From a veneer to a long-span bridge, the results from

StarCeram® Z are very impressive: A beaming smile with exceptional naturalness and guaranteed biocompatibility ensure outstanding satisfaction among dentists and patients. Our high-precision production creates blanks of unique quality, which ensures the time-efficient and safe manufacture of industrial dentures. For example, each batch of raw materials is tested for radioactivity and quality checks are continuously performed throughout the entire production process. Plus, the shrinkage factor is specified precisely for the subsequent workflow. This allows us to achieve optimum fit accuracy and solid precision in the end result with our blanks.

## Your success through...

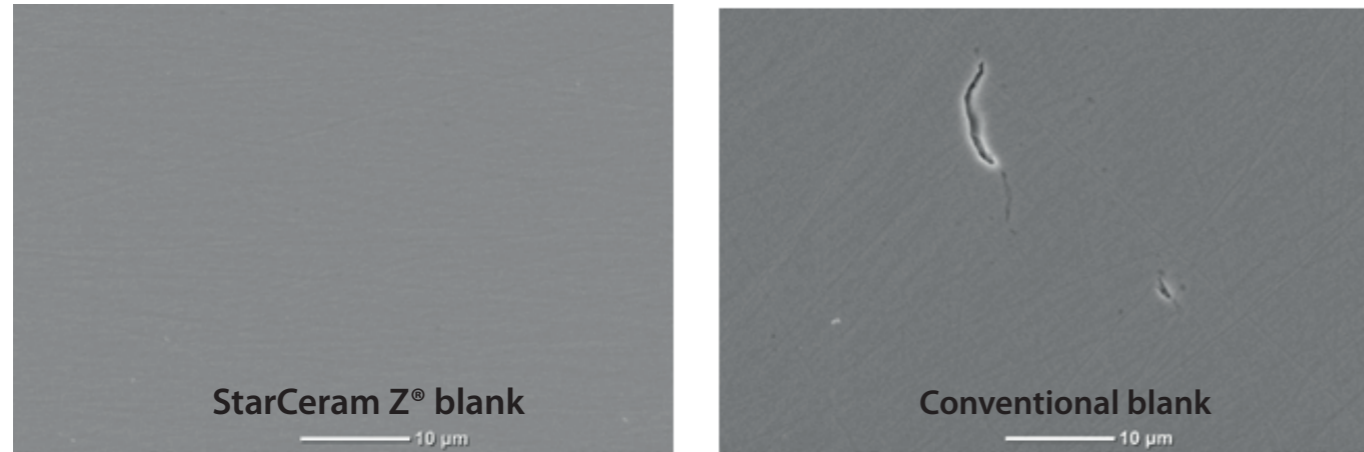
- 1 the Dental German Workflow! Optimally tailored to products and accessories.
- 2 Blanks made in Germany! With maximum precision without compromise.
- 3 isostatically pressed blanks according to the Single CIP® process!
- 4 an optimized workflow and a very precise determination of the shrinkage factor. 100% fit accuracy
- 5 Blanks exclusively and 100% from the high-quality raw material of the market leader!
- 6 Best processing results and excellent edge strength!
- 7 Exceptional naturalness, aesthetics and abrasion!
- 8 Custom-made products and customized printing of the blanks!

## Our StarCeram® product range

	translucent	extra translucent	highly translucent
<b>Multilayer</b> (with a natural shade gradient)		 Z-Nature Ultra MultiShade	 Z-Smile MultiShade
<b>Preshade</b> (precolored)	 Z-AL-Med-HD, color	 Z-Nature Ultra, color	 Z-Smile, color
<b>White</b> (white)	 Z-AL-Med-HD pure	 Z-AL-Med-HD Ultra pure	 Z-Smile Pure

# Zirconia

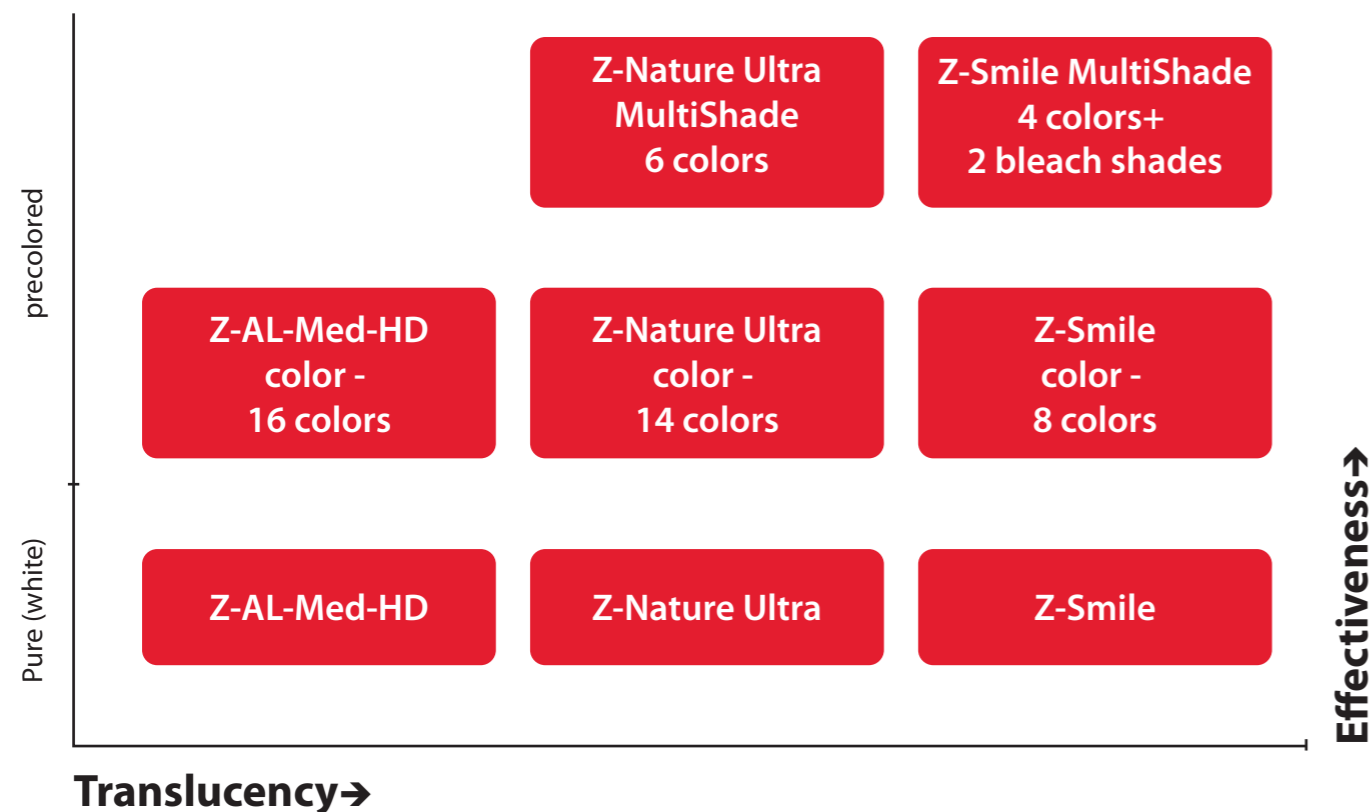
The material for high dental standards for CAD/CAM applications



An original StarCeram® Z blank compared to a conventional blank.

(REM 2000x magnification, pre-sintered)

The aesthetic properties in combination with the translucency and the milling properties are important for a blank. With our experience, we have optimized all parameters, achieving the best possible abrasion and excluding microdefects. StarCeram® Z made of 100% Tosoh material is a powerful ceramic that withstands the toughest daily wear and tear and achieves natural aesthetics. Kyocera based in Selb in Bavaria is committed to providing dentures for a wide range of indications with perfect functionality and aesthetics.



## Effectiveness and efficiency

The effectiveness and efficient differences in blanks are often difficult to see with the naked eye. Mechanical, chemical and visual properties often appear to be the same. StarCeram®Z blanks are particularly economical due to their high edge stability: The possibility of producing multiple milled restorations from a single blank means that less waste is automatically generated. An intelligent product range and color management does not require that you store a full range of blanks in any height and shade. With StarCeram® Z Nature Ultra in various shades and MultiShade variants, the user has a zirconium oxide blank available for many indications. StarCeram®Z blanks are precisely manufactured. It is therefore not necessary for them to be pre-milled to obtain a flat surface. By specifying the precise shrinkage factor, the need for regrinding is minimized. The mechanical properties, such as the high stability, allow quick and safe removal of a restoration and smoothing of the bridges.

## Quality

The quality of the raw material for each individual StarCeram®Z blank is carefully tested for its mechanical and chemical properties, for example, radioactivity and bending strength - and this is done for each batch. The pressing is always done in two stages: uniaxial pre-pressing and then isostatic pressing using Kyocera's Single CIP® process. The result is a very homogeneous structure. With our decades of experience in the production of high-precision components, debinding always occurs. In a final step, the blanks are measured, weighed and also visually inspected. Only then is it a StarCeram®Z blank of the highest quality, 100% made in Germany.



# From practical experience for practical use

Individual dentures are not just a question of design. Our two color systems in different definitions offer maximum flexibility in color determination and a natural-looking result. The color for all StarCeram® Z blanks is selected in close cooperation with dentists, dental laboratories and milling centers.

## Practical tip:

### How can you compare different blanks?

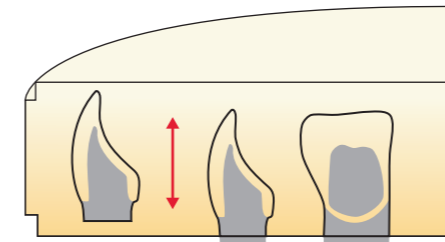
- ▶ What is the bending strength, translucency and indication spectrum?
- ▶ How many restorations can be milled from a single blank?
- ▶ Does the blank have good edge stability?
- ▶ Open solution, freedom in the subsequent processing
- ▶ To what level of precision are the blanks produced? Maximum height deviation of StarCeram® Z blanks: 200 µm
- ▶ Which raw material is used and is this pure or mixed?

*"In order to meet my own demands and those of my patients for a harmonious appearance and "undetectable" functionality, I prefer zirconium oxide blanks made of StarCeram®, whose fantastic translucency coupled with an obviously high resistance to shear forces impress me, as well as the high quality of the material."*

**André H., dentist from Berlin**

The new StarCeram® Z MultiShade in Z-Smile and Z-Nature Ultra redefines the color and fit accuracy of CAD/CAM restoration materials. The available number tried and tested StarCeram® Z MultiShade blanks has been expanded to include ultra-translucent and highly translucent variants. They not only offer increased, ultrahigh translucency, but also natural light dynamics and color reproduction, which are comparable to Vita® colors. MultiShade blanks are produced by means of the targeted supply of colors. The fine-flowing color gradations, from the cervical to incisal region, give the fully anatomical or anatomically reduced dentures a natural color character. With a bending strength of more than 600 MPa, Z-Smile not only produces highly aesthetic and long-lasting monolithic single tooth restorations, but also three-part bridges according to DIN ISO 6872.

The new StarCeram® Z-Nature Ultra MultiShade blanks with a high translucency of 45% and a bending strength of > 800 MPa are the extraordinary, economical answer to many questions: direct milling and sintering. Due to the unique manufacturing process combined with our expertise in precise ceramic production, almost all restorations can be produced, from veneers to large bridges.

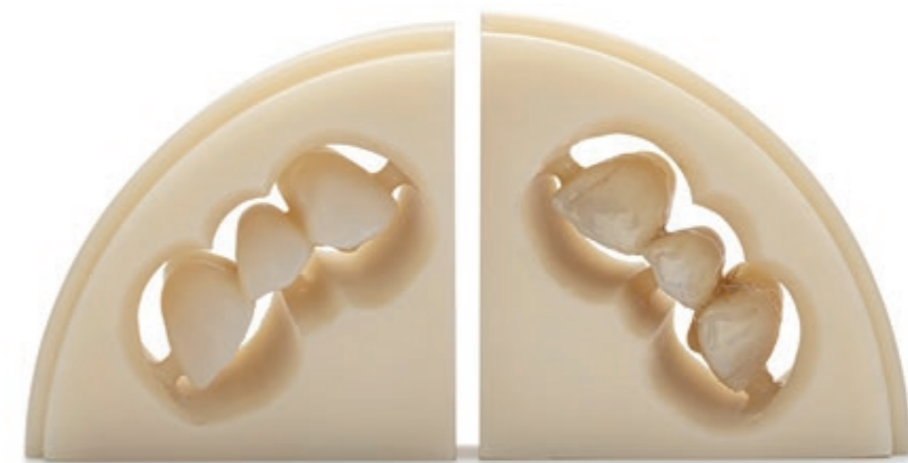


The natural color gradient in StarCeram® MultiShade blanks makes it possible to achieve natural dental aesthetics with no veneers or stains. With clever nesting in the CAM software, the entire color spectrum of a MultiShade blank can be used to obtain a high chroma restoration. Depending on the ratio of the tooth size to the blank height, the color gradation from the dentine to the incisal edge can be used individually. Benefits include no need for complicated coloring and drying in addition to reproducible results.



## Practical tip:

Use special milling strategies for the optimal use of a blank.



# What is Sintering?

Sintering is a manufacturing process. Kyocera has a great deal of experience in this process step. After pressing, we repress the blanks isostatically (Single CIP® – cold isostatic pressing). The StarCeram® blank is then produced based on a special workflow, accounting for the relevant oven temperature. Fine-grained ceramic materials are heated, whereby the temperatures of zirconium oxide remain below the melting temperature of the main components, so that the form (shape) of the workpiece is retained. This results in a controlled shrinkage, given that the particles of the raw material compress and pore spaces are filled. A comparison of the surface can be made under a scanning electron microscope after the pre-sintering and final stage sintering. Excellent blank quality is homogeneous and free of inclusions.

## We achieve the following through this special workflow:

High precision in the blank not only in terms dimensions, but also an exact determination of the shrinkage factor and extraordinary edge stability. The pre-sintering produces a tool-effective blank with excellent milling properties and accurate milling paths.

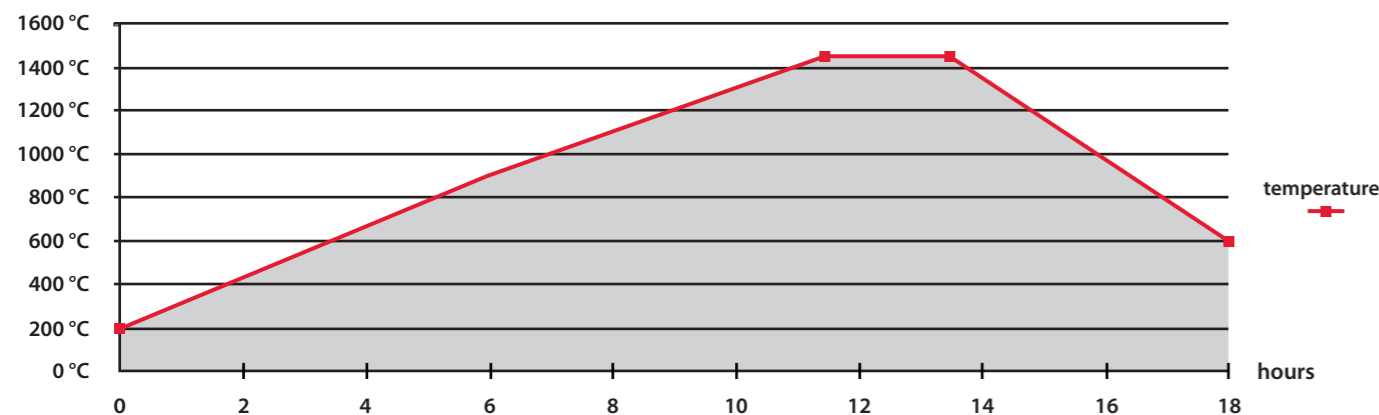
### Practical tip:

Ensure the colors and translucency before and after the sintering:

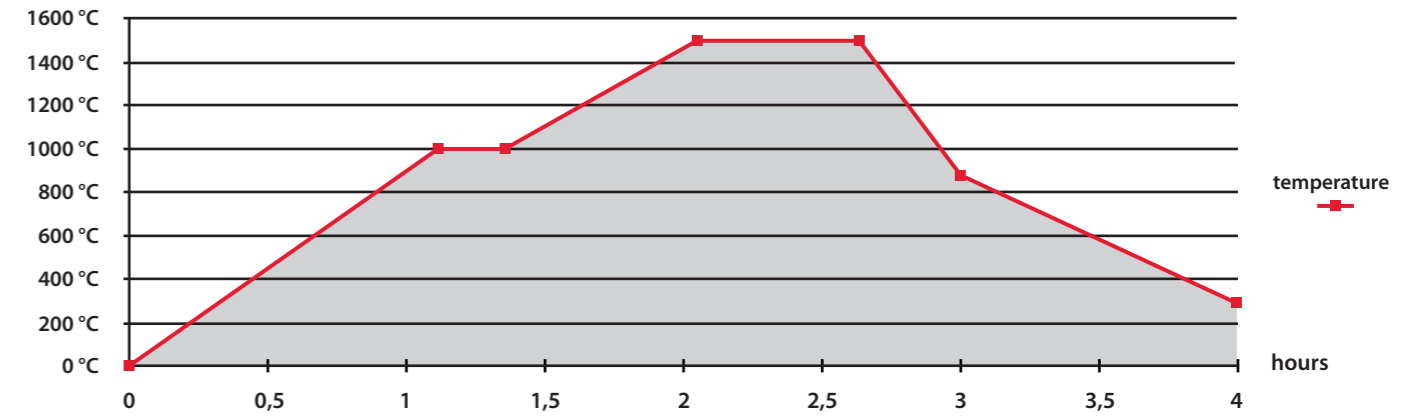
- ▶ Avoid contamination in the oven caused by foreign materials, for example, residues of staining fluids
- ▶ If necessary, run a cleaning firing cycle with cleaning powder
- ▶ Sinter with sintering pearls/sintering granulate
- ▶ Regularly calibrate the oven for optimal, homogeneous sintering conditions, for example, with a reference strip.

# Sintering curves

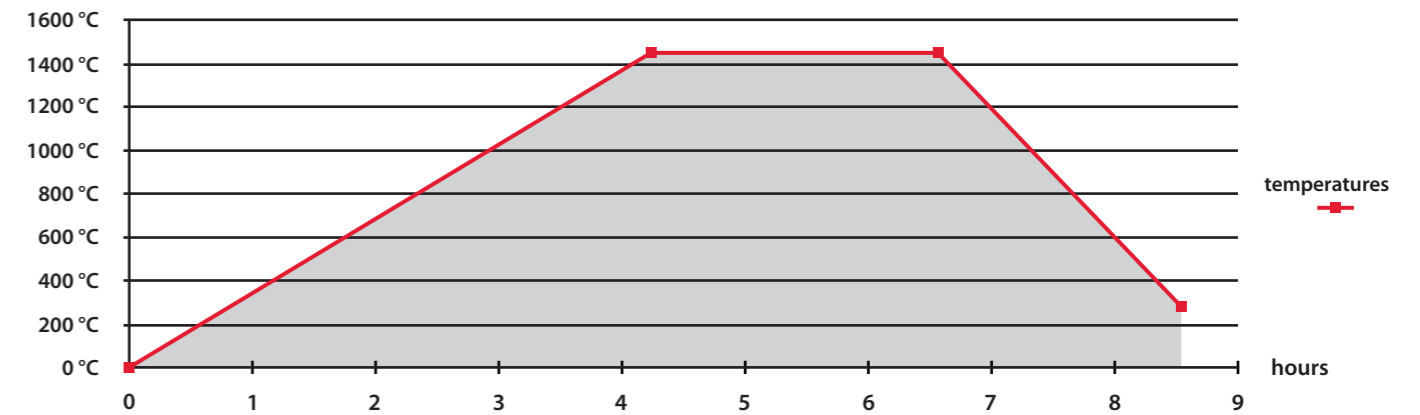
Large-span restorations



Single crowns and individual restorations



Crowns



StarCeram® Z blanks are ideal for:

Application	Z-AL-Med HD	Z- Nature Ultra	MultiShade Z- Nature Ultra	Z-Smile	MultiShade Z-Smile
Bending strength Mpa*typical values (4-point method)	1200 +/- 200	1000 +/- 200	1000 +/- 200	600 +/- 100	600 +/- 100
Class	5	5	5	4	4
Veneer		✓	✓	✓	✓
Crown	✓	✓	✓	✓	✓
Telescopic	✓				
Bridge with up to 3 units	✓	✓	✓	✓	✓
Bridge with 3 to 6 units	✓	✓	✓		
Inlay/onlay	✓	✓	✓	✓	✓
Crown	✓	✓	✓	✓	✓
Telescopic	✓				
Bridge with up to 3 units	✓	✓	✓	✓	✓
Bridge with 3 to 6 units	✓	✓	✓		
Bridge with 6 or more units	✓	✓	✓		

Anterior region

Posterior region

## MonoShade - white and precolored blanks

### StarCeram® Z-AL-Med-HD

Available: diam. 99 - 1 mm,  
Heights: 10, 12, 14, 16, 18, 20, 25 mm

White (opaque)

Shades:

- ▶ C500 comparable to A1, A2
- ▶ C800 comparable to A3, B3
- ▶ C1000 comparable to C2, C3
- ▶ C1333 comparable to A3, 5, B4
- ▶ C2000 comparable to A4

- ▶ **Low translucency**  
Used to cover discolored stumps and pin assemblies
- ▶ **Homogeneous density for smooth milling results**
- ▶ **Biocompatibility**
- ▶ **High edge stability**
- ▶ **Easy veneering**
- ▶ **Multifunctional shades**

### StarCeram® Z-Nature Ultra

Available: diam. 99 - 1 mm,  
Heights: 10, 12, 14, 16,  
18, 20, 22, 25 mm

White (opaque)

Shades:

- ▶ A1, A2, A3, A3,5
- ▶ B1, B2, B3, B4
- ▶ C1, C2, C3, C4
- ▶ D2, D4

- ▶ **Extra translucent**
- ▶ **Esthetic results**
- ▶ **Homogeneous density for smooth milling results**
- ▶ **Biocompatibility**
- ▶ **Natural adaptation to the remaining teeth**
- ▶ **Metal-free**

### StarCeram® Z-Smile

Available: diam. 99 - 1 mm,  
Heights: 10, 12, 14, 16,  
18, 20, 22, 25 mm

White (opaque)

Shades:

- ▶ A1, A2, A3, A3,5
- ▶ B2, B3
- ▶ C2
- ▶ D2

- ▶ **Highly translucent**
- ▶ **Esthetic results**
- ▶ **Homogeneous density for smooth milling results**
- ▶ **Biocompatibility**
- ▶ **Natural adaptation to the remaining teeth**
- ▶ **Translucency comparable to glass ceramic**
- ▶ **Suitable for monolithic restorations in the anterior region**
- ▶ **Economical alternative to lithium disilicate**
- ▶ **Metal-free**

## MultiShade - polychromatic blanks

StarCeram® Z-Nature Ultra and Z-Smile are zirconium oxide blanks with continuously integrated translucency and color gradients.

### StarCeram® Z-Smile

Available: diam. 99 - 1 mm,  
Heights: 14, 18, 22 mm

Shades:

- ▶ Bleach light (comparable to BL1/OM2)
- ▶ Bleach dark (comparable to BL4)
- ▶ A1, A2, A3
- ▶ B1

- ▶ **Highly translucent**
- ▶ **Esthetic results**
- ▶ **Homogeneous density for smooth milling results**
- ▶ **Biocompatibility**
- ▶ **Natural adaptation to the remaining teeth**
- ▶ **Translucency comparable to glass ceramic**
- ▶ **Suitable for monolithic restorations in the anterior region**
- ▶ **Economical alternative to lithium disilicate**
- ▶ **Metal-free**

### StarCeram® Z-Nature Ultra

Available: diam. 99 - 1 mm,  
Heights: 14, 18, 22 mm

Shades:

- ▶ A2, A3
- ▶ B1, B2, B3, B4

- ▶ **Extra translucent**
- ▶ **Esthetic results**
- ▶ **Homogeneous density for smooth milling results**
- ▶ **Biocompatibility**
- ▶ **Natural adaptation to the remaining teeth**
- ▶ **Metal-free**

## Advantages of the StarCeram® MultiShade blanks:

The different color layers reproduce the soft color gradient of a natural tooth: starting from the dark neck, through the middle dentine to the high translucency in the incisal edge. Detailed, colorfast representation of the fissures in the posterior region. High bending strength compared to glass ceramic ensures high stability. Very simple handling in the workflow, easy removal of the restoration from the StarCeram® blank and time-efficient smoothing of the connectors compatible with all open CAD/CAM systems and of course also manufactured in the Single CIP® process