

The  
Zirconia  
(R)evolution

# ***DDcubeX<sup>2</sup>***

cubic zirconia system



Bending strength  
according to ISO 6872

**> 720 MPa**

Fracture toughness  
according to ISO 6872

**> 4,5 MPa√m**

Translucency at a  
thickness of 0,6 mm

**49 %**

# ***DDcubeX<sup>2</sup>***

## cubic zirconia system



### Translucent like lithium disilicate – stable like zirconium oxide

Dental Direkt GmbH has defined a new zirconium standard with *DD cubeX<sup>2</sup>*. This material facilitated a considerable enhancement in light transmission. Consequently, *DD cubeX<sup>2</sup>* is suitable for affordable, but highly aesthetic monolithic treatments, in anterior and posterior teeth region.

#### Material-Specific Properties

chemical composition	value (%)
ZrO <sub>2</sub> , HfO <sub>2</sub>	> 90
Y <sub>2</sub> O <sub>3</sub>	< 10
Al <sub>2</sub> O <sub>3</sub>	< 0,1
other oxides	< 0,005

physical characteristics	value
Density (after sintering)	> 6,0 g/cm <sup>3</sup>
(25-500°C)	10 10 <sup>-6</sup> K <sup>-1</sup>
fracture toughness	4,8 MPa* m <sup>1/2</sup>
bending strength	> 720 MPa
E-Modul	210 GPa

#### Indications

High translucent, aesthetic zirconium oxide (type II, class 5 according to DIN EN ISO 6872) for the manufacture of fully anatomical crowns, porcelain veneered or reduced crowns and up to three-unit bridges in the front and side tooth area – including molar restorations, inlays as well as onlays and veneers.

height	DD cubeX <sup>2</sup>	art. - no.	quantity	listprice (Euro/net.)
10 mm	DD cubeX <sup>2</sup> 98H10	G 710	1	149,00
12 mm	DD cubeX <sup>2</sup> 98H12	G 711	1	169,00
14 mm	DD cubeX <sup>2</sup> 98H14	G 712	1	179,00
16 mm	DD cubeX <sup>2</sup> 98H16	G 713	1	199,00
18 mm	DD cubeX <sup>2</sup> 98H18	G 714	1	219,00
20 mm	DD cubeX <sup>2</sup> 98H20	G 715	1	229,00
25 mm	DD cubeX <sup>2</sup> 98H25	G 716	1	259,00



## The Translucency (R)evolution



**DD BioZ**

1450°C  
35% translucency



**DD BioZX<sup>2</sup>**

1450°C  
40% translucency



**DD cubeX<sup>2</sup>**

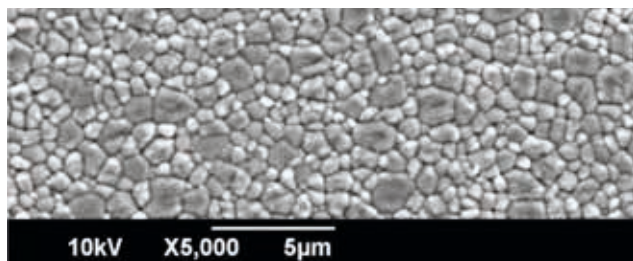
1450°C  
49% translucency

*DD cubeX<sup>2</sup>* develops optical light effects previously unknown with zirconium oxide. The cubic/tetragonal microstructure, to which the material also owes its characterisation as 'cubic zirconia system' is basically responsible for its extremely high translucence.

### „cubic zirconia system“

The zirconium varieties familiar and established in the dental field can be grouped together as 3Y-TZP ceramics. By adding 3 mol% yttria oxide, the tetragonal crystal phase of the zirconium oxide is stabilised up to the use temperature (body temperature 37°C) (3Y-TZP = 3 mol% **Y**ttria stabilized **T**etragonal **Z**irconia **P**oly-crystals).

The “*DD cubeX<sup>2</sup> system*” is based on 5 mol% yttria oxide, which leads to a stabilisation of approx. 53% cubic and 47% tetragonal crystals. Thanks to the larger cubic form in volume terms compared to the tetragonal, radical reductions in the light dispersion on grain boundaries and the scattering effect of residual porosity, as familiar from 3Y-TZP, can be achieved. Transparency is obviously improved after sintering. Accordingly, the technical designation of this material – analogously to the 3 mol% yttria stabilised material 3Y-TZP – is necessarily 5Y-TZP.



SEM picture: thanks to the larger, cubic crystals in the structure, light dispersion on the grain boundaries is reduced and translucency is increased.

### Crystal phases of Zirconia

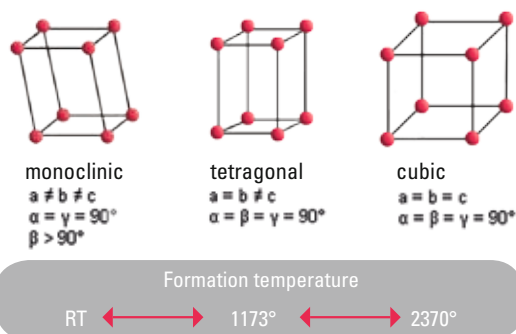
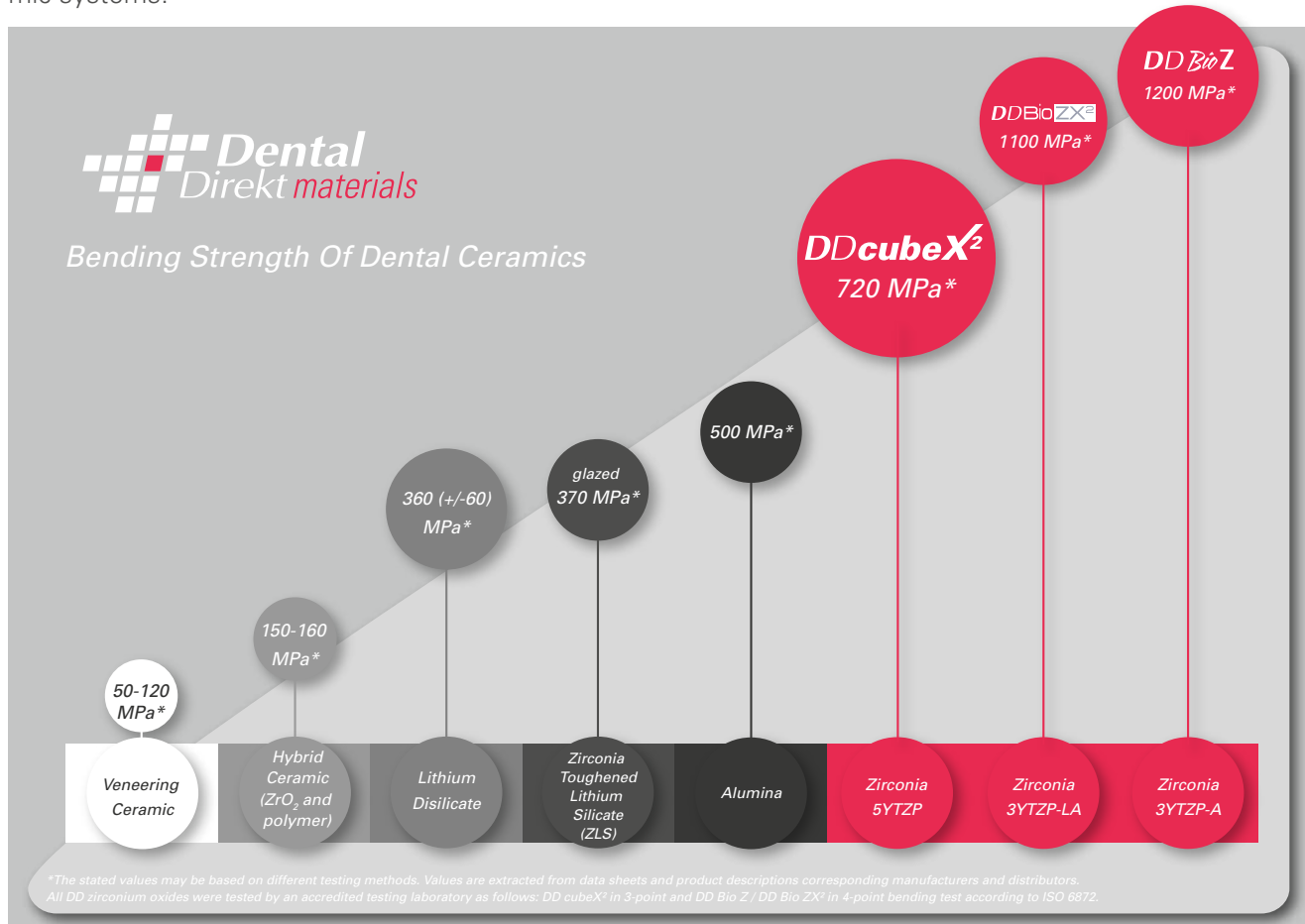


Diagram: The three crystal forms of zirconium oxide. A tetragonal/cubic hybrid structure is stabilised through homogeneous incorporation and augmentation of the stabilisation component Y<sub>2</sub>O<sub>3</sub>.

## Not just beautiful – but also safe

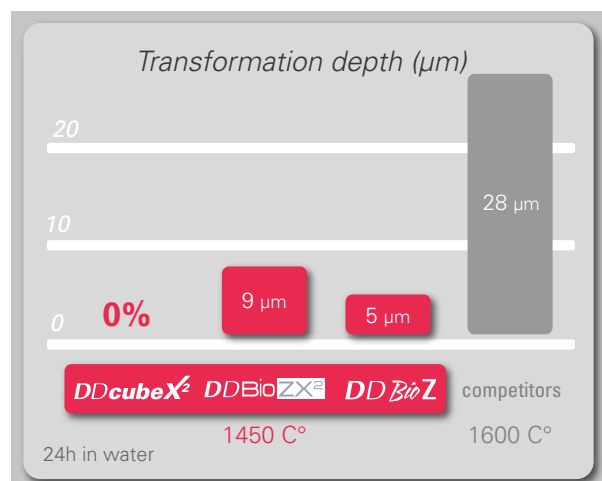
*DD cubeX<sup>2</sup>*'s impressive appearance is combined with very good, typical zirconium material properties. Compared to comparable aesthetic products, the result is a biocompatible high performance ceramic with high flexural strength and fracture toughness. As a result, *DD cubeX<sup>2</sup>* enjoys a unique position among the full ceramic systems.



Properties of various ceramics: despite the advantages in terms of strength and stability that distinguish classic zirconium oxide vis-à-vis e.g. lithium disilicate, the glass ceramic material is to date regarded, also among the CAD/CAM materials, as the aesthetic non plus ultra. *DD cubeX<sup>2</sup>* now combines aesthetics and material safety and in this way opens up completely new possibilities.

## Best resistance to ageing

Full ceramic systems are subject to an ageing process and in the course of time lose strength. In the case of 3Y-TZP zirconium ceramics the phase transition to monoclinic crystal is decisive for the ageing process, which cannot be identified in *DD cubeX<sup>2</sup>*. The decisive factor for this in turn is the larger proportion of cubic phases in the structure. Fewer tetragonal phases are available to the system with regard to 3Y-TZP, which can be attacked by ageing and converted to the monoclinic phase.



Conversion depth in monoclinic after artificial ageing according to ISO 13356 in the autoclave

# *Zirconia has never been so beautiful*

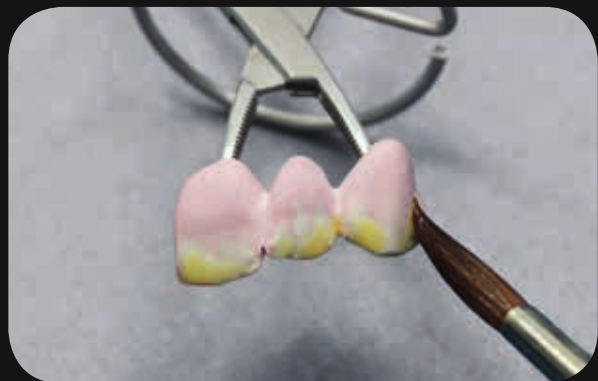
*Monolithic. Aesthetic. Safe.*



## **DDBioZX<sup>2</sup>** monolith zero

During development we paid particular attention to fast, simple reproduction of tooth colours. We offer you the ideal basis for individualising your monolithic as well as veneered work with the DD Bio ZX<sup>2</sup> monolithic zero dyes. Available in 16 Vita®\* dentine colours as well as incisals and effect colours.

- *to be perfectly dyed in the desired tooth colour before sintering*
- *natural colour blending through the use of incisal and effect liquids*





Contact:

Dental Direkt GmbH • Industriezentrum 106–108 • 32139 Spenge

Tel: +49 (0) 5225 - 8 63 19-0 • Fax: +49 (0) 5225 - 8 63 19-99

E-Mail: [info@dentaldirekt.de](mailto:info@dentaldirekt.de) • [www.dentaldirekt.de](http://www.dentaldirekt.de)