

ZrPro® Ceram Scientific information

Elegant Dent ZrPro® Ceram is a superiorly aesthetic feldspar ceramic that is reinforced by leucite crystals. The CTE range is $8.9 \cdot 10^{-6} \text{K}^{-1} \sim 9.6 \cdot 10^{-6} \text{K}^{-1}$ (25–500°C) and has been adapted to match zirconium dioxide (ZrO_2) frameworks. The ceramics feature a homogenous distribution of leucite in the glass phase after firing which significantly reduces stress crack development. High flexural strength values are seen throughout the range and are up to twice as high as the required ISO standard.

The composition of ZrPro® Ceram is silicon dioxide (SiO_2) 61%, aluminium oxide (Al_2O_3) 17%, potassium oxide (K_2O) 11%, sodium oxide (Na_2O) 6%, zirconium dioxide (ZrO_2) 2%, calcium oxide (CaO) 1%, boron oxide (B_2O_3) 1% and more. It is based from potassium feldspar and is crucial for Elegant Dent ceramics as it has great biocompatibility, stability, strength and hardness which are ideal for oral function. Through a special manufacturing process, optical requirements like translucency and transparency can be attained to ensure life like restorations are produced by dental technicians.

Figure 1. Surface of ZrPro® Ceram viewed with a scanning electron microscope (SEM) after acid etching. It can be seen that the leucite crystals are uniformly distributed in the glass phase structure and without cracks.

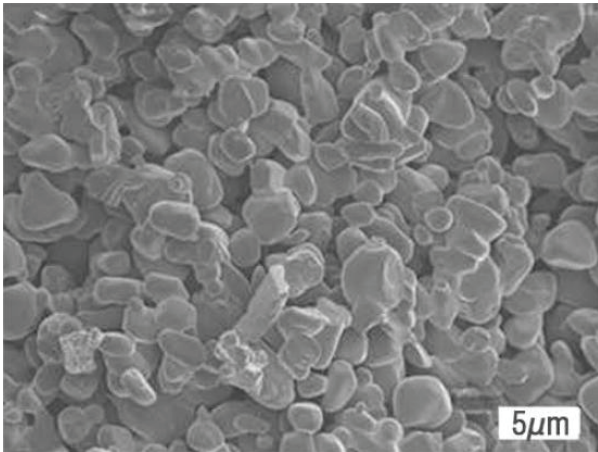


Figure 1. SEM of Elegant Dent ZrPro® Ceram surface after acid etching.

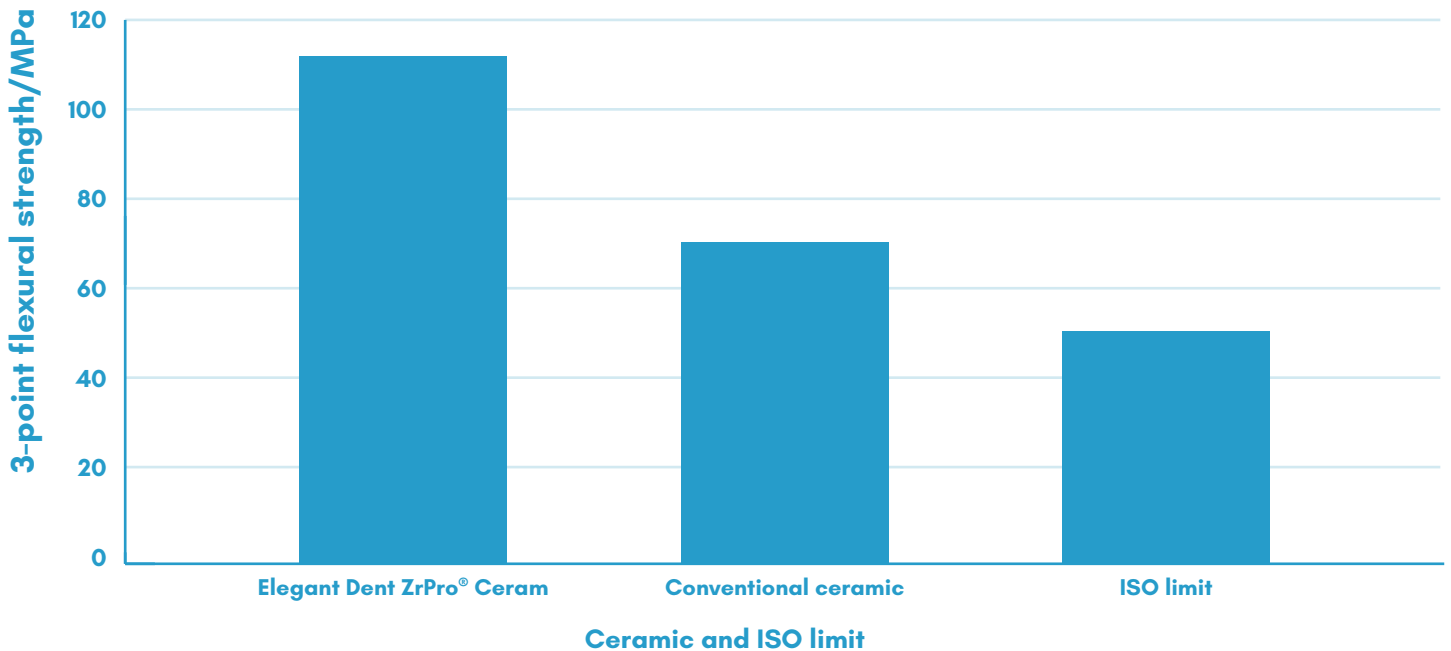
Physical properties

Property	Value	ISO Standard	Unit of measurement
CTE	8.9-9.6	-	10 ⁻⁶ K ⁻¹
Glass transition	590	-	°C
Flexural strength	106	>50	MPa
Bonding strength	34	>25	MPa
Chemical solubility	20	≤100	µg/cm ²

Flexural strength

Elegant Dent ZrPro[®] Ceram features extremely high flexural strength values which are over twice as high than the required ISO standard (EN ISO 6872). The graph below shows the ZrPro[®] Ceram flexural strength value in comparison to a conventional ceramic and the ISO limit.

3-point flexural strength comparison



Biocompatibility

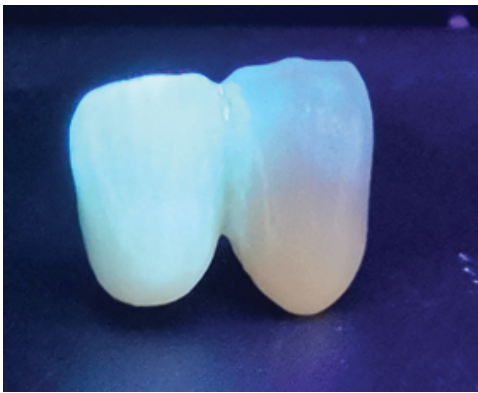
Elegant Dent has performed the necessary tests to confirm that the products meet the requirements of the international standard EN ISO 7405 Evaluation of biocompatibility of medical devices used in dentistry and EN ISO 10993 Biological evaluation of medical devices. The testing carried out showed that the ceramics have perfect biocompatibility, suitable for long term oral use.

Optical properties



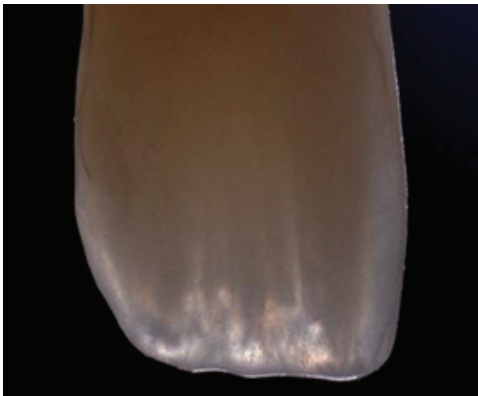
Translucency

Perfectly imitates the enamel layer in real dentition.



Fluorescence

The restorations will replicate the optical characteristics of real teeth, no matter the lighting conditions. The prosthetics will display fluorescence under ultra-violet lighting.



Opalescence

This optical property is distinct in youthful teeth. The reflected light from the crown gives a blue appearance in the incisal third, but in transmitted light the crown has an orange appearance in the incisal third.

