

ceraPRIME[®] MC Scientific information

Elegant Dent ceraPRIME[®] MC is a leucite supported feldspar ceramic that brings a high level of aesthetics to PFM restorations. The coefficient of thermal expansion (CTE) range is $12.9 \cdot 10^{-6} \text{K}^{-1} \sim 13.8 \cdot 10^{-6} \text{K}^{-1}$ (25–500°C) that has been designed to perfectly match conventional bonding alloys in the market. This includes high gold content, reduced gold content, palladium-based, silver and non-precious alloys.

The composition of ceraPRIME[®] MC 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 ceraPRIME[®] MC 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 2. Shows homogenous distribution and the particle structure of ceraPRIME[®] MC Opaque Powder after firing. Two distinct layers can be observed, the darker layer is the alloy framework and the lighter one is the Opaque material. The homogenous distribution greatly strengthens the adhesion of the porcelain powder on to the sandblasted surface of the alloy. When Elegant Dent Opaque materials are mixed with Elegant Dent Opaque liquid a creamy texture is obtained. Air bubbles are eliminated, cracks avoided, and a perfect bond is achieved.

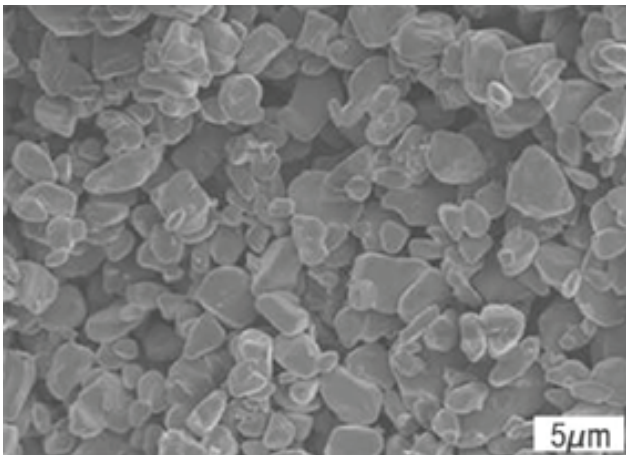


Figure 1. SEM of Elegant Dent ceraPRIME[®] MC surface after acid etching.

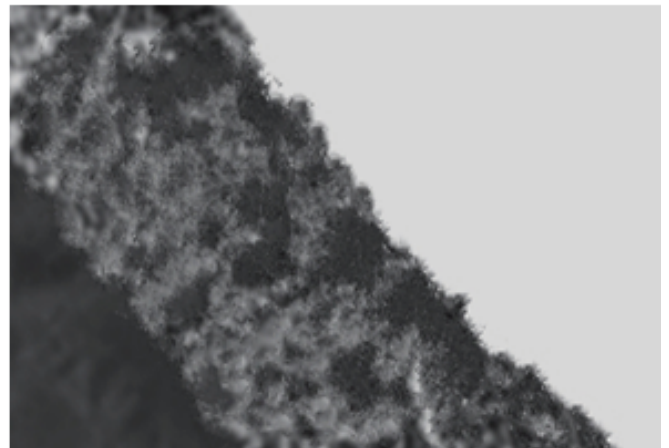


Figure 2. Shows ceraPRIME[®] MC fired Opaque ceramic.

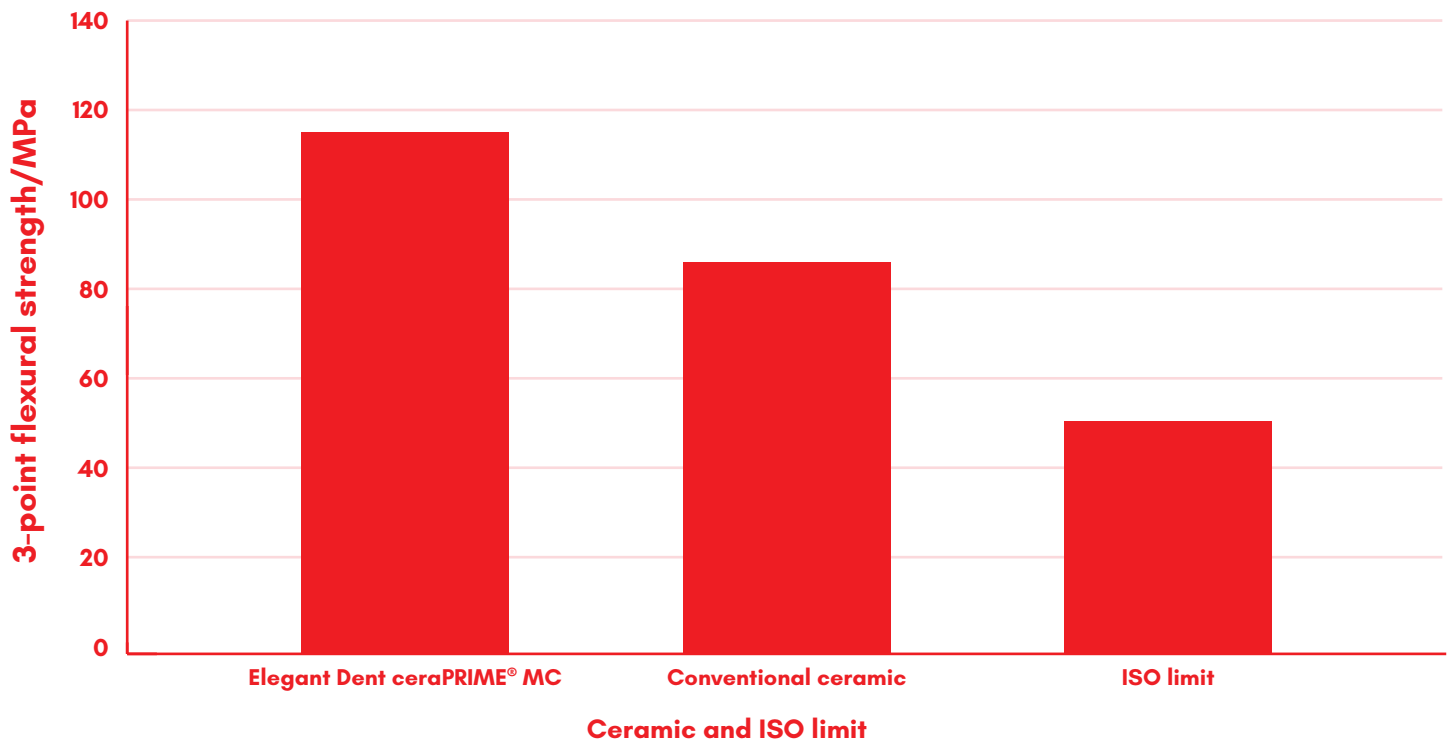
Physical properties

Property	Value	ISO Standard	Unit of measurement
CTE	12.9-13.8	-	10 ⁻⁶ K ⁻¹
Glass transition	575	-	°C
Flexural strength	118	>50	MPa
Bonding strength	39.5	>25	MPa
Chemical solubility	31.8	≤100	µg/cm ²

Flexural strength

Elegant Dent ceraPRIME[®] MC 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 ceraPRIME[®] MC 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



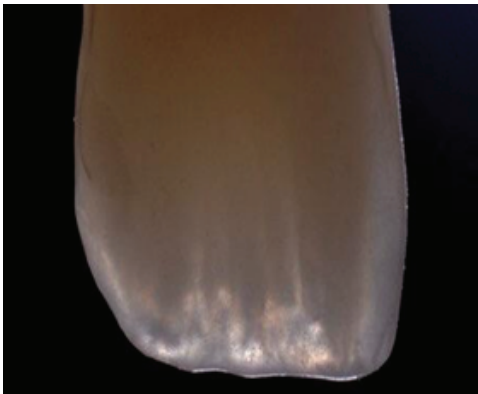
Translucency

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.

