

*****Handout*****
Faqs About Today's Ceramics
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Zirconia

Adjusting Zirconia

When adjusting zirconia, keep grinding to a minimum lest you induce phase transformation (tetragonal phase to weaker monoclinic phase). If significant recontouring is needed or large surface areas are adjusted, send the restoration back to the lab for re-glazing.

Polishing systems for zirconia exist that are more durable than those for composite.
Eg.:



Zirconia Fracture Rates

Layered Zirconia: Mean fracture rate of **3.25%**

Abdulmajeed A, Donovan TE, Cooper LF, Walter R, Sulaiman TA. Fracture of layered zirconia restorations at 5 years: a dental laboratory survey. *J Prosthet Dent* 2017.

Monolithic Zirconia: Mean fracture rate of **1.09%**

Sulaiman, TA, Abdulmajeed A, Donovan TE, Cooper LF, Walter R, Fracture rate of monolithic zirconia restorations at 5 years: a dental laboratory survey. *J Prosthet Dent* 2016;116:436-439.

Bonding to Zirconia

Zirconia is very sensitive to saliva contamination (phosphates in saliva bond to zirconia). Clean crown thoroughly with Ivoclean (Ivoclar) or similar. Contains 2.5% sodium hydroxide) prior to bonding. Avoid sand blasting, since long term effects on phase transformation are unknown.

Lithium Disilicate (Eq. eMax)

Zirconia Fracture Rates

Layered Zirconia: Mean fracture rate of .91% for monolithic and 1.83% for layered.

Abdulmajeed A, Donovan TE, Cooper LF, Walter R, Sulaiman TA. Fracture of layered zirconia restorations at 5 years: a dental laboratory survey. *J Prosthet Dent* 2017.

Cementation for Zirconia and Lithium Disilicate

If Adequate Crown Retention Exists

(Adequate Ferrule Height and Minimal Degree of Taper)

Either Adhesive Resin Cements or Luting Cements can be used.

Superb Study: Effect of cement type on the clinical performance & complications of zirconia and lithium disilicate tooth-supported crowns: A systematic review. Maroulakos, et al. *J Prosthet Dent* 2019; 121(5):754-765.

Study Parameters:

17 clinical studies assessed; 1,280 subjects; 2,436 crowns.

Mean study duration ranged from 2-10 years.

Conclusions

Surprisingly, the results of an extensive systematic review demonstrate if adequate retention form exists, Zirconia and Lithium Disilicate crowns exhibited comparable survival rates for either adhesive or conventional cementation!



If Inadequate Crown Retention Exists, Resin Cements are Recommended

If **resin cements** are used with **Zirconia** restorations, the intaglio surface should first be treated with a devoted Zirconia primer, or a Universal Adhesive containing MDP monomer to optimize the resin/Zirconia bond.

If **resin cements** are used with **Lithium Disilicate** (eMax), the intaglio surface of the restoration should first etched with 9.6% HF- for 20 secs followed by Silane application or by using Monobond Etch & Prime which does both.