

All Ceramic Finish and Polishing

Purpose: (1) To measure the gloss achieved with three different polishing systems on lithium disilicate.
(2) To measure the gloss achieved with two different polishing systems on dental zirconia.

Effectiveness of Several Polishing Systems on IPS e.max CAD:

Experimental Design:

Substrate: *IPS e.max CAD* (Ivoclar Vivadent, Inc.)

Baseline Finishing: 30 um diamond grit paper (Buehler)

Two-step polishing systems: *Luster Lithium Disilicate Adjusting and Polishing Kit* [LUS80] (Meisinger USA), *Axis CeraGlaze Kit* [LS-503] (Axis Dental) and *LD/ZR Cut, Finish & Polish* (Komet USA)

Test Conditions: 30 um diamond grit paper finished surface and 1st and 2nd step polished surface

Variable Measured: 30 um diamond grit paper (Buehler)

Materials: Gloss (Gloss Units)

Replications: 5

Methods:

Heat-treated (crystallized) *IPS e.max CAD* (10 x 10 x 2-mm thick) specimens were mounted in acrylic discs to facilitate performing the grinding and polishing steps. Five specimens were fabricated and were freshly ground with the 30 um diamond paper for each polishing system. Specimens were then finished with the first step point or cup and then measured for gloss. They were then polished with the 2nd step polishing point or cup at 20 seconds per step. Gloss was evaluated for each condition with the *Rhopoint Novo-Curve*™ small curve glossmeter with readings taken until the maximum gloss is determined. A higher “gloss” value, suggests a more reflective and better polished surface. Mean values and standard deviations of gloss were determined.

Results:

IPS e.max CAD Average Gloss Units (SD)

Polisher System	~30 um diamond grind	1 st step	2 nd step
Meisinger Luster LUS 80 Lithium Disilicate Adjusting and Polishing Kit	39.2 (4.0)	56.9 (2.0)	90.8 (1.9)
Axis LS-503 CERAGLAZE INTRA-ORAL POLISHING SET	33.8 (3.5)	60.5 (1.0)	88.3 (4.7)
KOMET LD/ZR Cut, Finish & Polish	30.9 (1.8)	39.5 (4.1)	89.0 (5.2)

Effectiveness of Two Polishing Systems on Zirconia:

Experimental Design:

Substrate: *BruXZir Zirconia* (Glidewell Dental Laboratories)

Finishing: 30 um diamond grit paper (Buehler)

Two-step polishing systems: *Luster Zirconia Polishers* (Meisinger USA), and *LD0707 Finishing and Polishing Kit* (Komet USA).

Test Conditions: 30 um diamond grit paper finished surface and 1st and 2nd step polished surface

Variable Measured: Gloss (Gloss Units)

Materials: Gloss (Gloss Units)

Replications: 5

Methods:

Sintered *BruXZir Zirconia* (10 x 10 x 2-mm thick) was mounted in an acrylic disc to hold it while performing the grinding and polishing steps. Five specimens were fabricated and were freshly ground with the 30 um diamond paper for the baseline condition for each polishing system. The baseline maximum gloss was then measured for each specimen. Specimens were then finished with the first step point or cup and the maximum gloss measured. They were then polished with the 2nd step polishing point or cup at 20 seconds per step and the maximum gloss measured. Gloss was evaluated for each condition with the *Rhopoint Novo-Curve*™ small curve glossmeter with readings taken on each specimen until the maximum gloss was determined and these values averaged for the five specimens. A higher “gloss” value, suggests a more reflective and better polished surface. Mean values and standard deviations of gloss units were determined.

Results:

BruXZir Zirconia Gloss Units (SD)

Polisher System	~30 um diamond grind	1 st step	2 nd step
Meisinger Luster Zirconia Adjusting and Polishing Kit	64.2 (2.8)	115.0 (9.2)	159.4 (3.4)
KOMET LD/ZR Cut, Finish & Polish	64.7 (4.1)	74.5 (4.0)	135.4 (3.7)