

Clinical & Scientific Documentation



BruxZir[®]

Solid Zirconia Crowns & Bridges

Over 2.8 million restorations placed

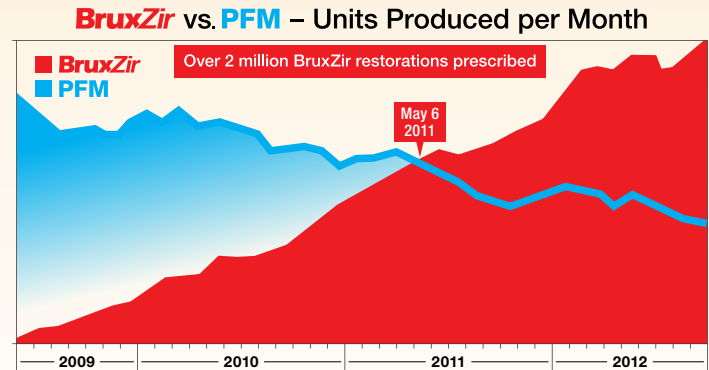


The #1 prescribed brand of solid zirconia is available at dental laboratories nationwide.

See if your laboratory is on the growing list of Authorized BruxZir Laboratories and take advantage of the special offer enclosed.

The BruxZir Phenomenon – A Clinician’s Perspective by Dr. Michael DiTolla

May 6, 2011, is an important day in dental history. That’s the first day that doctors prescribed more BruxZir restorations than PFM restorations. At the time, BruxZir Solid Zirconia was two years old and PFMs were 50 years old. Here at the lab, it confirmed a trend that we had been observing during those two years: the days of the PFM being the dentist’s everyday restoration were coming to a close. The sales of BruxZir never dipped below those of the PFM again; in fact, the gap between the two continues to grow wider as BruxZir grows and PFMs continue to shrink (see graph to right).



The rapid growth of BruxZir Solid Zirconia took us somewhat by surprise, as our original intention for the material was as a cast gold replacement. Almost every dentist I know agrees that cast gold is the finest indirect restorative material we have in dentistry. Unfortunately, almost every patient I know agrees that cast gold is the least esthetic indirect restorative material we have in dentistry. Ten years ago, our R&D department asked me what they should work on, what kind of restorative material would most benefit dentists and patients. My answer was simple: cast gold that is shade A2. They reminded me that they were engineers, not alchemists, but I remained undeterred in my push for a cast gold in shade A2.

Five years later, they presented me with BruxZir Solid Zirconia, an impressive effort at creating a cast gold in shade A2. Fast-forward five more years to today, and it is clear that they were truly onto something big. As the translucency and esthetics of BruxZir Solid Zirconia continue to improve, it has transitioned from a posterior material to an anterior material as well that can be used in almost any clinical situation.

The biggest reasons for the rapid growth of BruxZir are high strength and fit. As a monolithic restoration with no porcelain on it, BruxZir Solid Zirconia has the lowest fracture rate of any restoration (besides cast gold) in our lab. It’s clear that dentists place strength very close to the top, if not at the top, of their list of desirable characteristics for an everyday crown & bridge material.

By far the most common comment we get from dentists about BruxZir restorations is how well they fit compared to most of the crowns they have used in the past. It took us a few months to figure out what these dentists really meant. It wasn’t that they used to cement crowns with open margins; it was that the emergence profile of BruxZir crowns blended with the tooth structure and soft tissue better than any material they had previously used (again, with the exception of cast gold). The microscopic images that follow demonstrate how a high-strength monolithic crown (BruxZir Solid Zirconia) has a much better emergence profile than a bi-layered crown (PFM) on an identical prep.

The combination of fit, strength and improved esthetics has made BruxZir Solid Zirconia the most prescribed restoration in the lab, and it shows no signs of slowing down. The final frontier for BruxZir Solid Zirconia is to be used for veneers, and with the translucency and esthetics improving monthly, that day is not far off.



Dr. Michael C. DiTolla
mditolla@glidewell dental.com

NOW AVAILABLE

BruxZir®
SHADED

BruxZir® Shaded provides improved translucency and esthetics. Complete color penetration all the way through your restorations ensures greater shade consistency and prevents any shade change after occlusal adjustment.



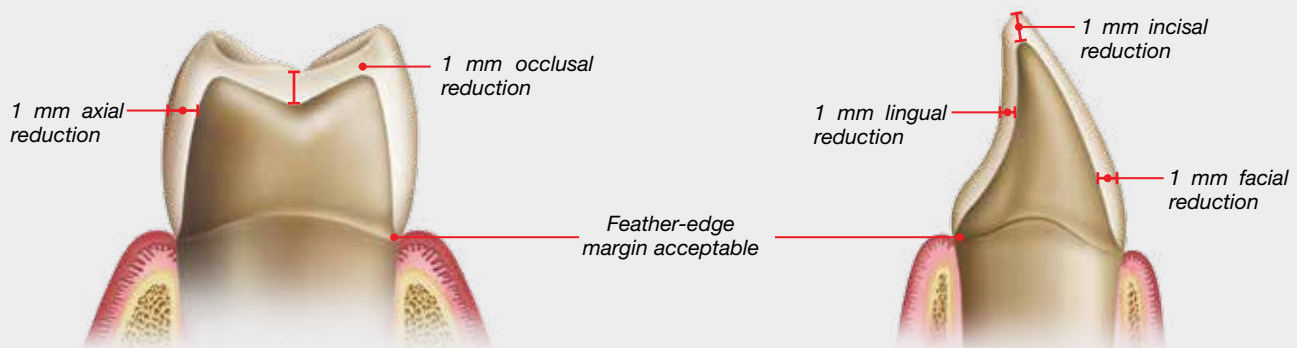


Indications

BruxZir Solid Zirconia is indicated for crowns, bridges, veneers, inlays and onlays. It is an esthetic alternative to PFM metal occlusal/lingual or full-cast restorations and ideal for restorations requiring extra durability such as crowns under partials or screw-retained implant crowns. The chip-proof durability of BruxZir restorations also makes them ideal for bruxers who have broken natural teeth or previous PFM restorations. BruxZir restorations are also ideal for patients lacking the preparation space for a PFM.

Preparation Requirements

- Shoulder preparation not needed, feather edge is OK. It is a conservative preparation similar to full-cast gold, so any preparation with at least 0.5 mm of occlusal space is accepted.
- Minimum occlusal reduction of 0.5 mm; 1 mm is ideal.



These illustrations show an ideal 1 mm reduction for an anterior or posterior BruxZir crown with feather-edge margins. BruxZir Solid Zirconia does fine at 1.5 or 2.0 mm as well, but this amount of reduction is not always possible. Maintaining 1 mm of BruxZir thickness allows you to safely adjust the crown if necessary when checking the occlusion. While BruxZir Solid Zirconia can be milled as thin as 0.5 mm, it cannot be adjusted at this thickness without the risk of breakage. With a BruxZir crown at 0.5 mm thickness with high occlusion, consider adjusting the opposing tooth.

Typical Prep with PFM Crown



This image represents the typical PFM prep we receive with a conservative feather-edge margin. When a PFM is fabricated for this prep, there is a bulky 1 mm margin on the PFM that catches on the explorer. Even if the margin is sealed, the emergence profile is unacceptable.

Typical Prep with BruxZir Crown



This image represents the typical PFM prep we receive with a BruxZir crown in place. Because it is a monolithic crown and can be milled to a feather edge, there is no bulk of material, or "speed bump," at the margin. Dentists tell us their explorer cannot detect where the tooth ends and the BruxZir crown begins.

Cementation Recommendations

- Ceramir® Crown & Bridge (Doxa Dental; Newport Beach, Calif.) or a resin-reinforced glass ionomer cement such as RelyX™ Luting Cement (3M ESPE; St. Paul, Minn.) or GC Fuji Plus™ (GC America; Alsip, Ill.) with Z-Prime Plus or Monobond Plus
- For short or over-tapered preparations, use a resin cement such as RelyX™ Unicem (3M ESPE) or Panavia™ F2.0 (Kuraray; New York, N.Y.) with Z-Prime Plus or Monobond Plus

BruxZir Clinical Study 1

BruxZir and Milled IPS e.maxCAD: Very Promising 1-Year Results

Gordon's Clinical Bottom Line: An unprecedented paradigm shift has occurred in the last few months relative to use of tooth-colored crowns! Some major dental laboratories report the percentage of use of full-ceramic crowns is now higher than porcelain-fused-to-metal (PFM). TRAC Research is conducting the following ongoing controlled clinical study on full-zirconia (BruxZir) and milled lithium disilicate (e.maxCAD) restorations in "real-world" dental practices. You will be impressed with the short-term positive results.

BruxZir (Glidewell Laboratories) and milled e.maxCAD (Ivoclar Vivadent) attracted attention of TRAC Research scientists because they are **the first of over 100 posterior tooth-colored restoratives tested here clinically over the past 35 years that showed NO cracks, chips, breaks, wear, or staining after their first year of service.** Practice-based controlled clinical tests of tooth-colored restoratives began in this lab in 1976, when the demise of metal in dentistry began to be discussed seriously. The goal was to identify the most promising alternatives. The same test protocol has been used throughout, allowing comparative analyses as restorations age in service. At one year, BruxZir and milled e.maxCAD show superior performance.

Gordon J. Christensen
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OTRAC
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Example clinical and scanning electron microscope (SEM) images of the same restorations at initial placement and one year later show no negative changes in BruxZir and milled e.maxCAD after one year of clinical service.

Three Ways these Restorations are Available to Dentists

1. Conventional impression is mailed to the lab. The lab scans the impression and mills the restoration.
2. Digital impression is mailed to the lab. The lab mills the restoration.
3. The dentist makes the digital impression and mills the restoration in-office. The dentist must have CEREC or CAD equipment.

Study Protocol Summary

- 20 dentists (representing both in-office milling and digital impressions) with practice
- 80 fully-erected dentures
- Clinical and SEM images made on all restorations and supporting dentures at initial placement and one-year recall
- 40 dentures mailed to the lab
- 2 not available, 1 covered (milled e.maxCAD) with 20 made by lab using digital impression and 10 milled by doctor using CEREC with a few milled by doctor
- 1123 restorations developed by P&M CEREC/DR, Control - ceramic substitution with P&M Ceram (same ceramic)
- Contains 8000 Scanning SEM's for BruxZir and milled e.maxCAD with 1000 SEM's for control P&M

Advantages

BruxZir:

- Very strong at +1000 MPa
- Strength allows some of our tooth preparations and better edge margins
- Can enter well in heavy occlusion areas where other materials fail
- Reasonably cost (from some labs about \$700)

Milled e.maxCAD:

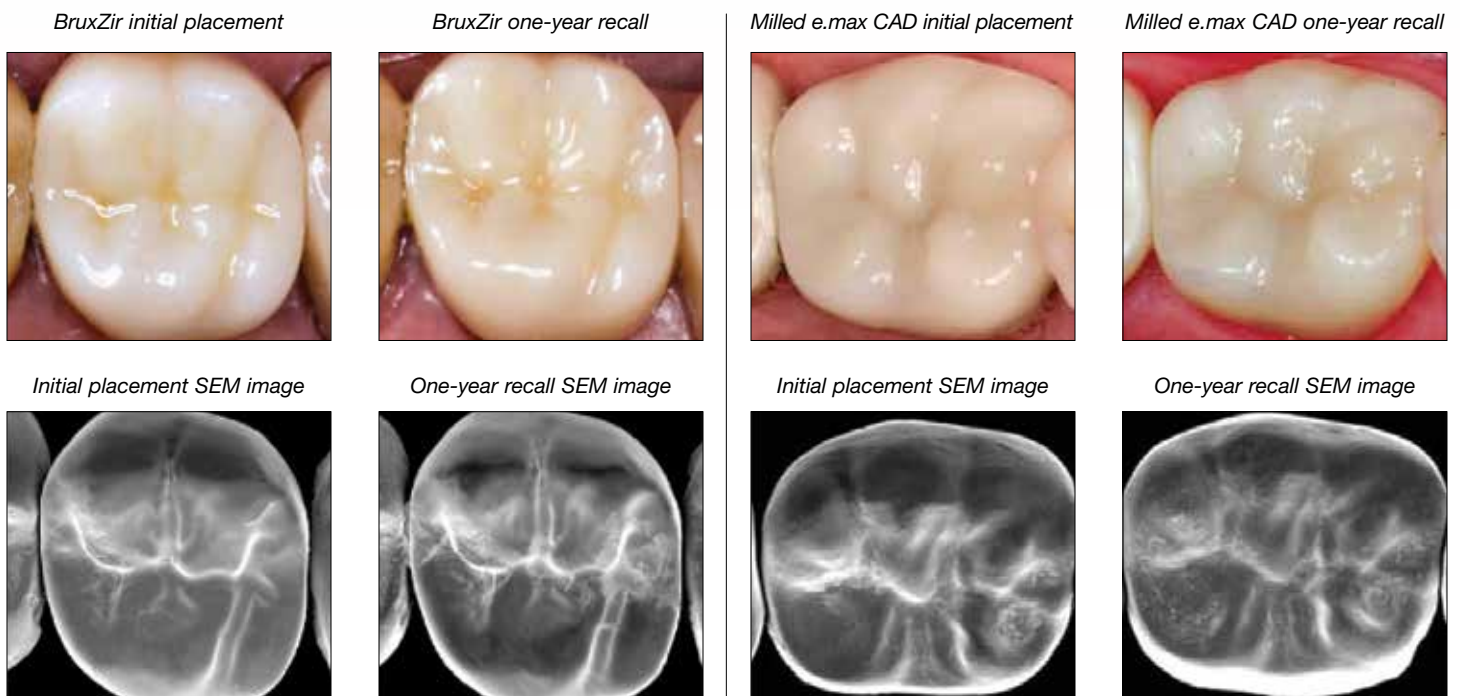
- Can match surrounding dentures very well
- Strength at +7-350 MPa shows no failures at one year in molar full-coverage restorations
- Reasonably cost (from some labs about \$100)

Disadvantages

- More long term clinical data are needed to establish indications, contra-indications, longevity and failure modes. This is the first controlled clinical study comparing performance of e.maxCAD and BruxZir.
- Currently, BruxZir is far superior and e.maxCAD has less strength, but both look acceptable in nature and are covering well retention problems.

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To view the full report, visit www.bruxzir.com.



Example clinical and scanning electron microscope (SEM) images of the same restorations at initial placement and one year later show no negative changes in BruxZir and milled e.maxCAD after one year of clinical service.

ADVANTAGES

BruxZir:

- Very strong at +1000 MPa
- Strength allows more shallow tooth preparation and feather edge margins
- Can serve well in heavy occlusion cases where other materials fail
- Reasonable cost (*from some labs about \$100*)

Milled e.maxCAD:

- Can match surrounding dentition very well
- Strength at +/-350 MPa shows no failures at one year in molar full-crown restorations
- Reasonable cost (*from some labs \$100*)

DISADVANTAGES

- More long-term clinical data are needed to establish indications, contraindications, longevity and failure modes. This is the first controlled clinical study comparing performance of e.maxCAD and BruxZir.
- Currently, BruxZir is less esthetic and e.maxCAD has less strength, but both look acceptable in molars and are serving well without problems.

Three Ways These Restorations Are Available to Dentists

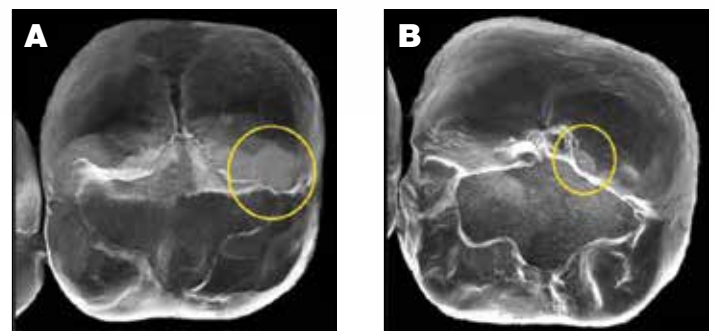
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- 3. The dentist makes the digital impression and mills the restoration in-office.** The dentist must have CEREC or E4D equipment.

Study Protocol Summary

- 20 dentists experienced with in-office milling and digital impressions
- 66 patients
- 81 full crowns on molars
- Clinical and SEM images made on all restorations and opposing dentitions at initial placement and each yearly recall
- 11 characteristics graded clinically and 9 in the lab
- 2 test materials, 1 control material (BruxZir; e.maxCAD with 1/2 made by lab using Ivoclar method and 1/2 milled by dentists using CEREC with a fast mill-fast fire method (12.5 minutes) developed by Paul Child DDS; Control = zirconia substructure with PressCeram veneer ceramic)
- Cements: RelyX Luting RMGI for BruxZir and Control; Multilink resin for e.maxCAD

Results and Observations

- 1. Overall esthetics:** e.maxCAD best with 69% rated excellent for matching color and translucency and 47% excellent for BruxZir.
- 2. Wear of opposing dentition by crowns:** All 3 crown materials wore small facets (see image below) in over half the opposing dentitions. Facets by BruxZir were more numerous and larger. More time is needed to see if the facets progress beyond first year "wearing in."



Images A and B show wear facets on dentition opposing BruxZir and milled e.maxCAD full crowns. All the materials in this study, including the Control, produced similar facets in enamel, gold castings, composite resin and some ceramics.

BruxZir Clinical Study 1

- 3. Wear of crowns by opposing dentition:** Surprisingly, opposing dentition of all types produced wear facets on all the crown materials. Most aggressive was opposing ceramics, followed by enamel. Cast gold alloy and composite resin also produced wear facets.

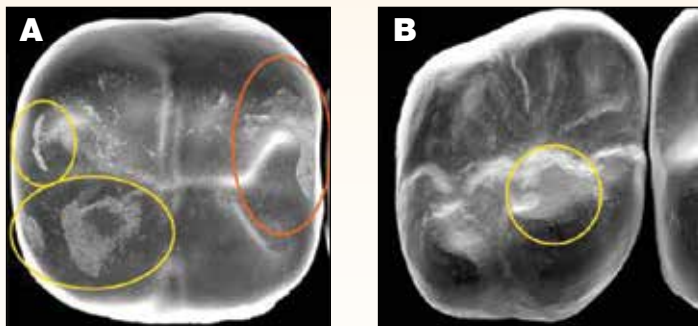
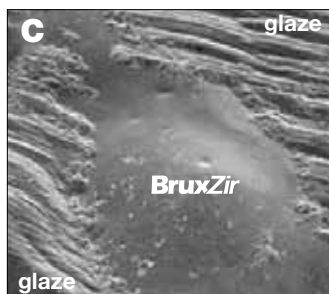
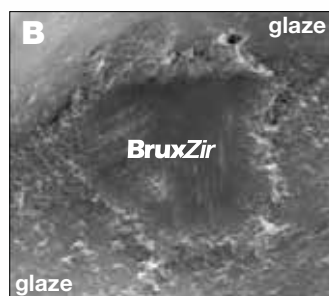
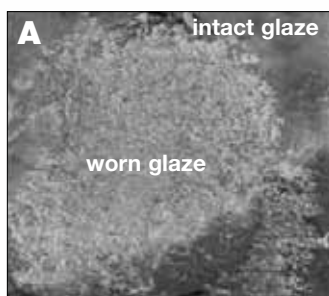


Image A shows a BruxZir crown with wear facets produced by composite resin and enamel (yellow circles) and ceramic (orange circle) opposing dentition. Image B shows a milled e.maxCAD crown with a wear facet made by cast gold opposing dentition. Small wear facets on both the crowns and their opposing dentition is a positive finding indicating near equal wear potential of the materials clinically.

- 4. Surface smoothness:** BruxZir and e.maxCAD ceramics retained smoothness, but surface glazes in some patients roughened and/or wore away at occlusal contacts or were removed by occlusal adjustment. The question arises — is it necessary to glaze these materials?



It is apparent that glazes used on all the crowns in this study will not be long lasting. Image A shows glaze disruption to e.maxCAD by a ceramic onlay; Image B shows glaze worn off a BruxZir cusp tip by opposing cast gold; Image C shows where occlusal adjustment stripped away the glaze and left the zirconia underneath untouched.

- 5. Cracks, chips, breaks, wear, staining:** None of these problems were present on BruxZir and milled e.maxCAD, but the Control (zirconia substructure plus veneer ceramic) had cracks, chips and breaks typical of veneering ceramics designed for use on zirconia.

- 6. Occlusal adjustment:** The homogeneously dense BruxZir and milled e.maxCAD both tolerate occlusal adjustment well, but the rotary instruments roughen and remove the surface glazes. Fine diamonds followed by diamond-impregnated rubber cups are indicated for smoothing of occlusal adjustments. Example products: Axis and Komet have special kits (product numbers LS7579 and LD0707, respectively).

- 7. e.maxCAD recommended protocol vs. faster fabrication protocol:** A fast mill-fast fine protocol to reduce fabrication time to 12.5 minutes was used by dentists chairside in this research. Although Ivoclar states this protocol is “not recommended by the manufacturer,” so far, no differences have been seen in any of the 20 graded characteristics between the slower and faster processing protocols.

- 8. No differences:** So far, there have been no problems with endo, caries, changes in perio health, unusual plaque retention on the crowns, need for re-cementation, margin fit or interproximal contact. Patient ratings for both crown materials have been very high. Overall ratings of crown “feel” and esthetics are 89% excellent and 11% good.

CR Conclusions: Milled e.maxCAD processed two ways and BruxZir full crowns on molars have served well after one year in this practice-based controlled clinical trial, showing no cracks, chips, breaks, wear or staining. Wear of opposing dentition, glaze degradation, effects of occlusal adjustment and long-term durability of e.maxCAD crowns fabricated with the fast mill-fast fire method remain as questions to be answered as more time passes in this ongoing study. Readers can expect a yearly status report on the progress of the pertinent new materials as they age in service.

BruxZir Seating Instructions

Instructions for Seating BruxZir and Other Zirconia-Based Crowns & Bridges

BruxZir restorations are fabricated from solid zirconia oxide material, much like the zirconia oxide coping found in restorations such as PrismaTik Clinical Zirconia™, Lava™ Zirconia (3M ESPE; St. Paul, Minn.) and NobelProcera™ (Nobel Biocare; Yorba Linda, Calif.). Interestingly, zirconia oxide exhibits a strong affinity for phosphate groups. We can take advantage of this fact with phosphate-containing primers, such as Monobond Plus (Ivoclar Vivadent; Amherst, N.Y.) and Z-Prime™ Plus (Bisco; Schaumburg, Ill.), or cements, such as Ceramir® Crown & Bridge (Doxa Dental), to increase our bond strengths to zirconia oxide. Unfortunately, saliva also contains phosphates in the form of phospholipids, so when a BruxZir crown or bridge is tried in the patient's mouth and comes in contact with saliva, the phosphate groups in the saliva bind to the zirconia oxide and cannot be rinsed out with water. Attempting to use phosphoric acid (which is full of phosphate groups) to "clean out" the saliva only makes the problem worse.

The only way we have found to successfully remove these phosphate groups from the interior of a BruxZir restoration is with the use of Ivoclean (Ivoclar Vivadent). This zirconia oxide solution is placed inside the restoration for 20 seconds and then rinsed out. Due to the large concentration of free zirconia oxide in the Ivoclean, it acts as a sponge and binds to the phosphate groups that were previously bonded to the BruxZir restoration. Once the Ivoclean is rinsed out, you will have a fresh bonding surface for the Monobond Plus, Z-Prime Plus or Ceramir to bond to.

The clinical steps would look like this:



1. This patient has a PFM crown on tooth #9 that he would like to replace. Tooth #8 has a failing composite with some fairly significant recurrent decay underneath it that will also require a full-coverage crown. Every month or two I do an anterior BruxZir case like this to give the R&D department some feedback on the translucency of the material, which they continue to improve. Tooth #8 & #9 will be prepped for BruxZir crowns.



2. The BruxZir crowns fit well, and the patient has approved them, so it is time to start the cementation procedure. Since zirconia crowns are susceptible to salivary contamination from phospholipids when they are tried in the mouth, if you simply rinse them out with water, as I am doing here, you remove the visible saliva, but the phosphate groups remain bonded to the zirconia surface. The good news is that once we remove these salivary phosphate groups, we are going to take advantage of this fact when we cement or bond these crowns.



3. Fortunately, Ivoclean was released earlier this year, specifically for the purpose of cleaning out restorations prior to bonding or cementation. I place a couple drops in both of the crowns that will stay in place for 20 seconds. Ivoclean is a concentrated zirconia oxide solution. When placed in crowns, it sets up a concentration gradient so that the salivary phosphate groups bonded to the inside of the crowns are drawn across the gradient to the zirconia particles in the Ivoclean, which can then be rinsed away.



4. I use a microbrush to ensure that the Ivoclean is evenly distributed and has come in contact with all of the internal surfaces of the crowns, although it is not necessary to agitate it against the surface of the zirconia crowns. We just want to ensure that the purple Ivoclean material is coating the entire internal surface of the crown; then, after 20 seconds, it can be rinsed out. Make sure you brush it all the way onto the margins with the microbrush; don't be afraid to get it on the outside surface of the crown.

BruxZir Seating Instructions



5. After 20 seconds, the Ivoclean is rinsed from the crown with an air/water syringe. Ironically, perhaps the worst thing you can do to clean out zirconia-based crowns after try-in is to use phosphoric acid to clean them. As you might imagine, phosphoric acid is full of phosphate groups, so they will occupy every receptor site on the zirconia. It is only by flooding the crowns with Ivoclean that we can decontaminate the internal surfaces in preparation for cementation or bonding. Since Ceramir cement contains phosphates, it will bond directly to the BruxZir crowns without the use of a zirconia primer.



6. Fill the BruxZir crowns with the Ceramir and seat them simultaneously on the preps. Because Ceramir cement is so moisture tolerant, I no longer have to vigorously air-dry the preps prior to cementation, I simply use cotton balls to remove pooling moisture. Not having to blast the preps with air anymore, I find that I have to anesthetize far fewer patients for crown seats than before. We use pinewood sticks to ensure that the crowns stay in place while the cement sets, in case there is any soft tissue rebound. Ceramir is the one cement I use where the excess always peels off in one piece, simplifying cleanup.

Instructions for Adjusting and Polishing BruxZir Crowns & Bridges

Adjust BruxZir Solid Zirconia restorations using a fine-grit diamond with light pressure to avoid potential microfractures. The specially designed BruxZir Adjustment & Polishing Kit may be purchased through Glidewell Direct at www.glidewelldirect.com or by calling 888-303-3975.



A football-shaped bur is most effective for adjusting occlusion on the occlusal surfaces of posterior teeth and lingual surfaces of anterior teeth.



A tapered bur is most effective for adjusting cusps or proximal contacts.



A round bur is used to adjust a cusp or fossa and for creating endodontic access.



Using light pressure and no water, begin pre-polishing with the brown cup to remove abrasions left by the diamonds.



Continue pre-polishing with the green cup until a more glossy look starts to appear on the adjustment areas.



Finally, use the white cup with light to medium pressure to achieve a "wet" high shine.

BruxZir Seating Instructions

CASE 1



As you can see in this non-retracted “before” photo, the patient had two pre-existing, high-value PFMs over what appeared to be base metal copings on tooth #8 & #9. The condition of the gingiva suggested a possible base metal allergy, which contributed to my decision to go with BruxZir all-ceramic (solid zirconia) crowns.



In the retracted view, you can see the full extent of the gingival tissues. As I placed the topical on tooth #9 with a cotton swab, it started to bleed. You can see that the midline on the existing crown is off, as are the axial inclinations of the two crowns. The unhealthy gingival tissue was removed with a diode laser and BioTemps were placed. I’ve found that the smooth glazed surface of BioTemps helps gingiva heal faster in these types of cases.



As you view the BruxZir crowns in the “after” lateral smile view, you will notice the flat facial profiles of these crowns.



Authorized **BruxZir**™ Laboratories

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Burdette Dental Lab Inc.....	Birmingham.....	AL.....	800-624-5301	Carlos Ceramics Dental Lab.....	Miami.....	FL.....	305-661-0260
Capitol Dental Designs.....	Montgomery.....	AL.....	334-269-2700	DigiTech Dental Restorations.....	Doral.....	FL.....	888-336-1301
Mobile Dental Design, Inc.**.....	Mobile.....	AL.....	251-634-2445	DSG – Clearwater.....	Clearwater.....	FL.....	800-237-1723
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Lafayette Dental Lab.....	Phoenix.....	AZ.....	800-996-9482	AOC Dental.....	Hayden.....	ID.....	800-729-1593
Lakeview Dental Ceramics.....	Lake Havasu City.....	AZ.....	928-855-3388	Eastside Crown & Bridge Inc.....	Pocatello.....	ID.....	208-237-2525
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Crowns R Us.....	Brea.....	CA.....	562-694-8670	Lumident, Inc.....	Indianapolis.....	IN.....	866-586-4336
DentalLab.com.....	North Hollywood.....	CA.....	877-437-4647	Heumann & Associates Dental Laboratory.....	Topeka.....	KS.....	800-255-2412
Dental Masters Laboratory.....	Santa Rosa.....	CA.....	800-368-8482	Heumann Kansas City Dental Laboratory.....	Fairway.....	KS.....	800-888-1925
G & H Dental Arts, Inc.**.....	Torrance.....	CA.....	800-548-3384	Myron's Dental Laboratory.....	Kansas City.....	KS.....	800-359-7111
Glidewell Laboratories**.....	Newport Beach.....	CA.....	800-854-7256	Pearce-Turk Dental Laboratory.....	Wichita.....	KS.....	800-835-2776
Great Smile Dental Lab.....	Northridge.....	CA.....	877-773-8815	Keller Dental Laboratory.....	Louisville.....	KY.....	800-292-1894
Hogan Dental Laboratory.....	Huntington Beach.....	CA.....	800-622-9592	CDS Dental Studio**.....	Bossier City.....	LA.....	800-259-7775
Ikon Dental Design.....	San Leandro.....	CA.....	510-430-9659	Crown Dental Studio.....	Shreveport.....	LA.....	800-551-8157
Iverson Dental Laboratories.....	Riverside.....	CA.....	800-334-2057	Pfisterer-Auderer Dental Lab.....	Metairie.....	LA.....	800-288-8910
Mr. Crown Dental Studio.....	Santa Ana.....	CA.....	800-515-6926	Arcari Dental Lab.....	Wakefield.....	MA.....	781-213-3434
Nash Dental Lab, Inc.....	Temecula.....	CA.....	877-528-2522	Dental Studios of Western Massachusetts, Inc.....	West Springfield.....	MA.....	413-787-9920
NEO Milling Center.....	Cerritos.....	CA.....	562-404-4048	Northshore Dental Laboratories, Inc.....	Lynn.....	MA.....	800-338-5850
Nichols Dental Lab.....	Glendale.....	CA.....	800-936-8552	Yankee Dental Arts Agawam Laboratory.....	Agawam.....	MA.....	800-732-2891
Noel Laboratories, Inc.....	San Luis Obispo.....	CA.....	800-575-4442	Aronovitch Dental Laboratory.....	Owings Mills.....	MD.....	800-441-6647
PCS Dental Lab.....	Foster City.....	CA.....	650-349-1085	Eliason Dental Lab.....	Portland.....	ME.....	800-498-7881
Perfect Smile Dental Ceramics, Inc.....	San Diego.....	CA.....	877-729-5282	Apex Dental Milling.....	Ann Arbor.....	MI.....	866-755-4236
Polaris Dental Laboratory**.....	Anaheim.....	CA.....	866-937-1563	Artistic Dental Lab**.....	Allen Park.....	MI.....	800-437-3261
Precision Ceramics Dental Laboratory**.....	Montclair.....	CA.....	800-223-6322	D.H. Baker Dental Laboratory.....	Traverse City.....	MI.....	800-946-8880
Riverside Dental Ceramics**.....	Riverside.....	CA.....	800-321-9943	Davis Dental Laboratory.....	Wyoming.....	MI.....	800-253-9227
Robertson Dental Lab.....	Lompoc.....	CA.....	800-585-3111	Davison Dental Lab.....	Flint.....	MI.....	800-340-6971
San Ramon Dental Lab.....	San Ramon.....	CA.....	800-834-4522	Dental Art Laboratories.....	Lansing.....	MI.....	800-444-3744
So Cal Dental Lab.....	Colton.....	CA.....	909-633-6462	LaDouce Dental Lab.....	Saginaw.....	MI.....	989-799-0472
Solitaire Smile Dental Laboratory LLC.....	San Diego.....	CA.....	619-819-7526	Nelson Dental Laboratory.....	Rochester Hills.....	MI.....	800-570-2131
Williams Dental Laboratory.....	Gilroy.....	CA.....	800-713-5390	Olson Dental Laboratory.....	Clinton Township.....	MI.....	800-482-3166
World Lab U.S.A.....	Irvine.....	CA.....	800-975-3522	Spartan Dental Lab.....	Lansing.....	MI.....	800-678-2227
Dahlin Laboratory.....	Lakewood.....	CO.....	800-536-8241	U.S. Dental Laboratories.....	Southfield.....	MI.....	248-557-8029
Gnathodontics, Ltd.....	Lakewood.....	CO.....	800-234-9515	Xcel Dental Studio.....	Flint.....	MI.....	810-733-0909
Zinser Dental Lab, Inc.....	Westminster.....	CO.....	303-650-1994	Boos Dental Laboratory.....	Golden Valley.....	MN.....	800-333-2667
Yankee Dental Arts Laboratory.....	Wethersfield.....	CT.....	800-447-3941	Dimension Dental Design.....	Hastings.....	MN.....	888-793-3682

Authorized **BruxZir**™ Laboratory **Rx**

Lab Name _____
 Dr. Name _____
 Phone # _____ E-mail _____
 Address _____
City / State / Zip
 Patient Name _____ Deliver by 5 p.m. on _____
First Last

Rx **BruxZir Solid Zirconia**

COUPON CODE: \$10 off BruxZir – 7/31/2013 *DWB001*



BruxZir®
 SOLID ZIRCONIA CROWNS & BRIDGES

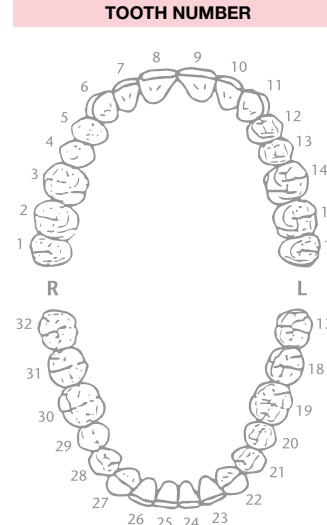
Signature _____ License # _____ Date _____

Special Rx Offer*

- To schedule your case pickup, call an Authorized BruxZir Laboratory (choose from the list of Authorized BruxZir Laboratories).
- Send this Rx with your next case to save \$10 per unit (limit 4 units) off the list price of BruxZir Solid Zirconia.

Offer expires July 31, 2013

Limit one special offer per case. **No copies accepted.** Offer applicable for a maximum of four specially priced Rx's per account for specified product only. Special pricing not valid with any other offer.



FINAL SHADE

Indicate Shade Here _____

OCCLUSAL STAINING

None Light**
 Medium Dark

PONTIC DESIGN

**Standard unless specified otherwise

ENCLOSED WITH CASE

Impression Bite Models
 Articulator Photos
 Other: _____

GL-3124-0413

Authorized **BruxZir**™ Laboratory **Rx**

Lab Name _____
 Dr. Name _____
 Phone # _____ E-mail _____
 Address _____
City / State / Zip
 Patient Name _____ Deliver by 5 p.m. on _____
First Last

Rx **BruxZir Solid Zirconia**

COUPON CODE: \$10 off BruxZir – 7/31/2013 *DWB001*



BruxZir®
 SOLID ZIRCONIA CROWNS & BRIDGES

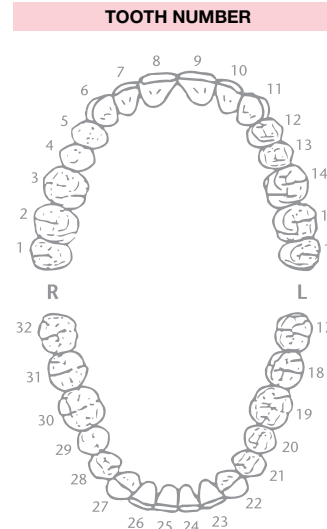
Signature _____ License # _____ Date _____

Special Rx Offer*

- To schedule your case pickup, call an Authorized BruxZir Laboratory (choose from the list of Authorized BruxZir Laboratories).
- Send this Rx with your next case to save \$10 per unit (limit 4 units) off the list price of BruxZir Solid Zirconia.

Offer expires July 31, 2013

Limit one special offer per case. **No copies accepted.** Offer applicable for a maximum of four specially priced Rx's per account for specified product only. Special pricing not valid with any other offer.



FINAL SHADE

Indicate Shade Here _____

OCCLUSAL STAINING

None Light**
 Medium Dark

PONTIC DESIGN

**Standard unless specified otherwise

ENCLOSED WITH CASE

Impression Bite Models
 Articulator Photos
 Other: _____

GL-3124-0413

FOR LAB USE ONLY
TELEPHONE CALL RECORD

DR. _____ ACCT. # _____

PATIENT NAME _____

RE: _____

RESULT _____

DATE DUE IN OFFICE _____

DATE OF CALL _____ INITIALS _____

FOR LAB USE ONLY
TELEPHONE CALL RECORD

DR. _____ ACCT. # _____

PATIENT NAME _____

RE: _____

RESULT _____

DATE DUE IN OFFICE _____

DATE OF CALL _____ INITIALS _____

LABORATORY	CITY	STATE	PHONE
Excel Dental Studios Inc.....	Minneapolis	MN	800-328-2568
Harrison Dental Studio.....	West St. Paul	MN	800-899-3264
Saber Dental Studio.....	Brooklyn Center	MN	800-264-3903
Thoele Dental Laboratory.....	Waite Park	MN	800-899-1115
Trachsel Dental Studio**.....	Rochester	MN	800-831-2362
Webster Dental Laboratory.....	Saint Paul	MN	800-621-3350
Wornson-Polzin Dental Lab.....	North Mankato	MN	800-950-5079
Becker Dental Lab, Inc.....	Herculanem	MO	800-963-6691
Keller Laboratories, Inc.**.....	Fenton	MO	800-325-3056
Mallow-Tru Dental Studio.....	Lee's Summit	MO	800-444-3685
Midwest Dental Laboratory.....	St. Louis	MO	800-325-8011
Stewart Dental Laboratories.....	Columbia	MO	866-724-5509
Oral Tech Dental Laboratory.....	Pearl	MS	800-321-6201
Western Dental Arts.....	Billings	MT	406-652-1652
Carolina Outsource Inc.....	Charlotte	NC	704-814-0644
Drake Precision Dental Laboratory.....	Charlotte	NC	800-476-2771
Sirona InfiniDent.....	Charlotte	NC	800-659-5977
Natural Ceramics Inc.....	Fayetteville	NC	910-425-8296
The Freeman Center.....	Stallings	NC	800-659-7636
Kiess Kraft Dental Laboratory.....	Omaha	NE	800-553-9522
H & O Dental Laboratory.....	Manchester	NH	800-543-4312
Excel Berger Dental Laboratory.....	North Brunswick	NJ	800-438-3384
Ideal Dental Laboratory.....	Albuquerque	NM	800-998-6684
Core 3D Centres, LLP.....	Las Vegas	NV	888-750-9204
Crown Dental Lab, LLC.....	Las Vegas	NV	702-432-4012
Digital Dental Studio.....	Henderson	NV	702-992-4055
Las Vegas Dental Studio.....	Las Vegas	NV	800-455-1598
Las Vegas Digital Dental Solutions**.....	Las Vegas	NV	800-936-1848
DSG Americus New York.....	Jamaica	NY	800-222-8980
Creo Dental.....	New York	NY	212-302-3860
DP/Mt. Vernon Dental Laboratory.....	Mt. Vernon	NY	800-431-1797
Elegant Dental Laboratories.....	Brooklyn	NY	877-335-5221
GP Dental Lab.....	Brooklyn	NY	718-339-4995
Smile Design Dental Laboratory.....	Port Washington	NY	516-472-0890
AccuTech Dental Lab.....	Reynoldsburg	OH	614-751-9888
Dresch/Tolson Dental Laboratory.....	Sylvania	OH	800-843-4110
Form & Function Laboratory.....	North Royalton	OH	800-423-8453
John Hagler, CDT.....	New Albany	OH	614-560-5667
New Era Dental Arts, LLC.....	Sylvania	OH	800-971-8201
Northwest Ceramics Inc.....	Columbus	OH	614-451-9597
ROE Dental Laboratory.....	Garfield Heights	OH	216-663-2233
Salem Dental Laboratory.....	Cleveland	OH	800-747-5577
Simon DeChatlet Dental Lab.....	Miamisburg	OH	800-448-6684
Tooth Fairy Dental Lab.....	Findlay	OH	419-429-8181
Flud Dental Laboratory.....	Tulsa	OK	800-331-4650
Great Southwest Dental Laboratory.....	Oklahoma City	OK	800-777-1522
Imperial Crowns Dental Laboratory.....	Broken Arrow	OK	866-207-0858
Applegate Dental Ceramics.....	Medford	OR	541-772-7729
Ceramicraft Dental Lab.....	Bend	OR	541-318-7808
Abel Dental Laboratory.....	Uniontown	PA	800-524-1106
Albensi Laboratories**.....	Irwin	PA	800-734-3064
DeLux Dental Laboratory.....	Reading	PA	800-541-5642
Dental Services Group of Pittsburgh.....	Pittsburgh	PA	800-322-7080
Dynamic Dental Group: Toothsmiths.....	Lititz	PA	717-626-8806

LABORATORY	CITY	STATE	PHONE
Innovative Dental Arts.....	North Huntingdon	PA	866-305-5434
Maverick Dental Laboratories.....	Export	PA	866-294-7444
Muth & Mumma Dental Lab.....	Harrisburg	PA	800-932-0584
Newtech Dental Laboratories.....	Lansdale	PA	866-635-5227
Thayer Dental Laboratory.....	Mechanicsburg	PA	800-382-1240
Windl Dental Laboratory.....	New Castle	PA	800-645-4576
Sherer Dental Laboratory.....	Rock Hill	SC	800-845-1116
Bauer Dental Studio.....	Mitchell	SD	800-952-3334
Dental Prosthetics Lab.....	Clarksville	TN	931-647-2917
Hermitage Dental Lab.....	Hermitage	TN	615-889-4949
Peterman Dental Laboratory.....	Nashville	TN	800-476-1670
R-Dent Dental Laboratory.....	Bartlett	TN	877-733-6848
Rogers' Dental Laboratories.....	Athens	TN	800-278-6046
Wade Dental Ceramics.....	Maryville	TN	865-982-4324
Affordable Cosmetic Laboratories.....	Arlington	TX	860-258-0678
C & J Dental Lab.....	El Paso	TX	915-564-3800
Crystal Dental Ceramics.....	Richardson	TX	972-680-1660
Dental Dynamics Laboratory Inc.....	Arlington	TX	800-640-8112
MDA Studio, Inc.....	Corpus Christi	TX	888-544-3307
Natural Arts Dental Laboratory.....	San Antonio	TX	800-322-6235
Oral Designs Dental Laboratory, Inc.**.....	San Antonio	TX	800-292-5516
PCB Dental Lab.....	Richardson	TX	972-671-3894
Rose Dental Laboratory.....	Stafford	TX	281-565-3600
Stern Empire Dental Laboratory.....	Houston	TX	800-229-0214
Stern Reed Associates Dental Laboratory.....	Addison	TX	800-888-8341
Stern Tyler Dental Laboratory.....	Tyler	TX	800-926-1318
Accudent Dental Lab.....	West Jordan	UT	801-231-6161
Arrowhead Dental Laboratory.....	Sandy	UT	800-800-7200
Crown Laboratories Inc.....	Sandy	UT	800-574-1911
Crystarr Dental Design.....	Salt Lake City	UT	800-343-2488
Epic Dental Studios**.....	American Fork	UT	801-756-1117
Evolution Dental Studio.....	Draper	UT	801-432-7446
Precision Milling Center.....	West Valley City	UT	877-810-6210
Treasure Dental Studio.....	Salt Lake City	UT	800-358-6444
Via Digital Solutions.....	Sandy	UT	888-484-6842
Art Dental Lab.....	Chantilly	VA	888-645-7541
NexTek Dental Studios.....	Manassas	VA	800-678-7354
The Point Dental Studio, LLC.....	West Point	VA	804-337-5477
Harrison & Cardillo Dental Laboratory.....	Renton	WA	800-525-5913
McElvain Dental Laboratory.....	Colville	WA	509-684-8620
Ziemek Aesthetic Dental Lab.....	Olympia	WA	866-943-6357
Gessler's Dental Laboratory.....	Tomahawk	WI	715-453-4383
Haag Dental Laboratory.....	Kenosha	WI	262-694-4732
Lord's Dental Studio.....	DePere	WI	800-821-0859
Saber Dental Studio.....	Waukesha	WI	800-365-3210
Midtown Dental Laboratory.....	Charleston	WV	800-992-3368
Standard Dental Laboratory.....	Clarksburg	WV	800-842-6265
Tincher/Butler Dental Lab.....	South Charleston	WV	800-225-4699

INTERNATIONAL SERVICING THE U.S.

Smith-Sterling Dental Laboratories**.....	Cartago	Costa Rica	800-479-5203
EPS Dental Studio.....	Cuernavaca	MO, Mexico	347-246-5203
Pacific Edge Dental Laboratories**.....	Baja California	Mexico	800-889-9323

****An Authorized BruxZir Milling Center**

BruxZir Before & After Cases

CASE 1 (continued)



Flat facial profiles are much more difficult to achieve with bi-layered restorations such as porcelain-fused-to-metal or porcelain-fused-to-zirconia. Since a BruxZir zirconia restoration is monolithic (one layer), it is much easier to achieve desirable contours.

CASE 2



This patient had a number of existing PFM restorations in the anterior, but tooth #8 & #9 had a previous root canal and a lingual fracture next to the access openings. It was decided that the best option was full-coverage, anterior BruxZir crowns.

CASE 3



The patient presented with a fractured Maryland bridge. He ruled out implants because it would require a large bone graft. Instead, a digital impression was taken to fabricate a conventional BruxZir bridge.

CASE 4



As you can see in the “after” photo, the BruxZir bridge has acceptable esthetics, although it won’t be mistaken for IPS Empress® anytime soon. Because BruxZir restorations are virtually unbreakable and the patient had already broken two PFM bridges in the past, this was the most appealing solution.

IPS Empress is a registered trademark of Ivoclar Vivadent.

CASE 5



This female patient presented with a predominately cast metal bridge, which her dentist prescribed after she fractured the porcelain on each of the abutment teeth on the previous restoration. The patient always disliked how it looked and desired a more esthetic, long-term option. Because her PFM restorations had fractured previously, a high-strength BruxZir bridge was prescribed, providing the patient with the best combination of strength and esthetics.

CASE 6



When this patient required an onlay to replace a broken cusp, cast gold was suggested, but the patient declined. A BruxZir onlay was used instead due to its impressive strength.

BruxZir Before & After Cases

CASE 7



This patient fractured a porcelain all-ceramic crown on the second molar and chipped the first molar. Both crowns were replaced with BruxZir crowns.

CASE 8



The patient had always disliked the metal occlusal on this PFM. When it became necessary to replace it, a tooth-colored BruxZir crown was chosen.

CASE 9



This endodontically treated molar had a large amalgam and several fractures, necessitating a full-coverage BruxZir crown.

CASE 10



This PFM crown had undergone chipping on multiple cusps and the mesial marginal ridge, resulting in an open contact. To prevent this from happening again, high-strength BruxZir Solid Zirconia was prescribed as a replacement restoration.

CASE 11



When a patient generates enough occlusal force to break a PFM, a BruxZir crown is a great choice as a replacement.

CASE 12



Delivery of the BruxZir screw-retained implant crown involved removing the custom healing abutment and then seating the one-piece crown. The abutment screw was tightened to 35 Ncm, and a periapical radiograph taken to verify final seating.

BruxZir Before & After Cases

CASE 12 (continued)



Once the interproximal and occlusal contacts had been checked, the occlusal screw access opening was sealed with a piece of Teflon tape and composite, bringing the BruxZir implant case to a successful conclusion.

CASE 13



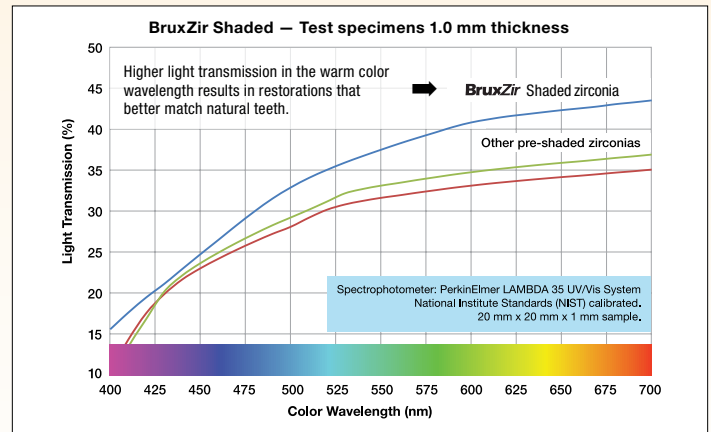
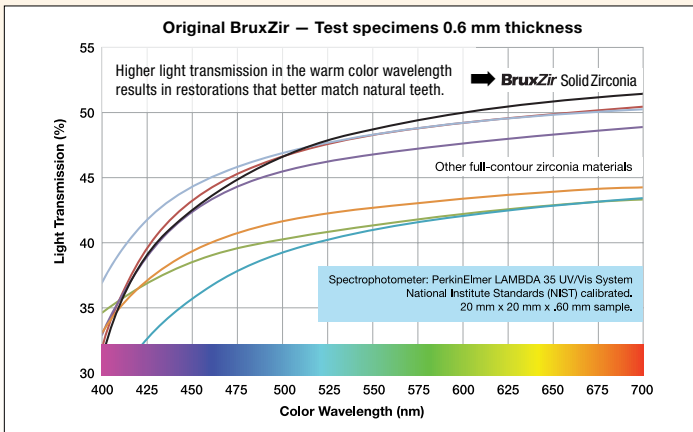
Mandibular occlusal view demonstrating healthy dentition, with edentulous sites #29 & #30 planned for implant restoration. BruxZir screw-retained crowns, consisting of a titanium base and monolithic zirconia body, were prescribed.



BruxZir screw-retained implant crowns, with access openings to the titanium retention screws, were tightened into place. Buccal view with the occlusal screw access openings sealed with Teflon tape and composite demonstrates the excellent tissue adaptation.

BruxZir Scientific Validation

The translucency of BruxZir Solid Zirconia is unsurpassed in the warm color spectrum for more natural esthetics.



BruxZir Solid Zirconia exhibits higher translucency in the warm color spectral wavelength (>550 nanometers), allowing for more natural-looking restorations.

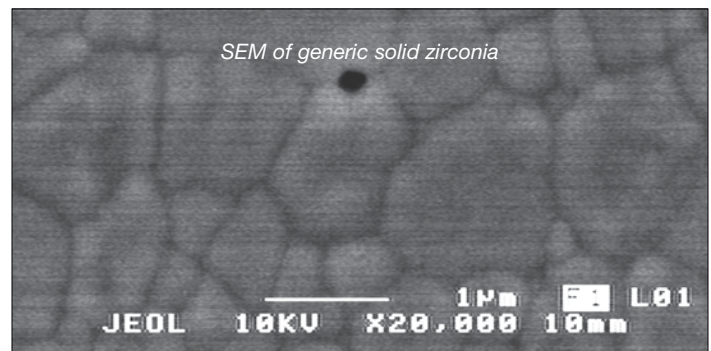
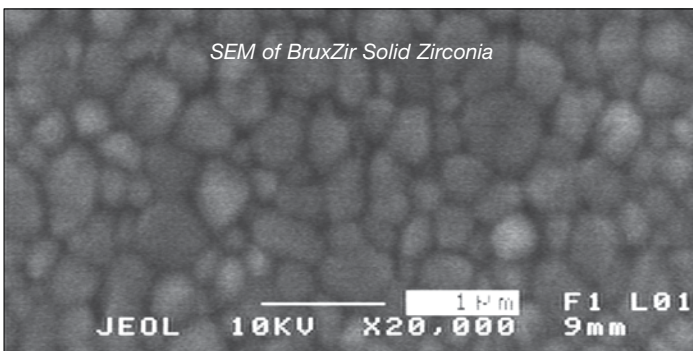
BruxZir Shaded zirconia, which allows for improved shade consistency, also exhibits a higher translucency when compared to other pre-shaded zirconias.

BruxZir Restorations Deliver More Lifelike Results



Note the differences in these photomicrographs of solid zirconia brands. The high-resolution photomicrographs capture cross-sectioned samples of BruxZir Solid Zirconia and two generic competitors. The visible white spots in the competitor samples reveal agglomerates that remain after the sintering process, which decrease translucency and flexural strength. BruxZir Solid Zirconia has a smaller grain size and is nearly free of agglomerates. Unique, patented colloidal zirconia processing gives BruxZir Solid Zirconia higher flexural strength and provides more natural-looking restorations.

Scanning Electron Microscope Images



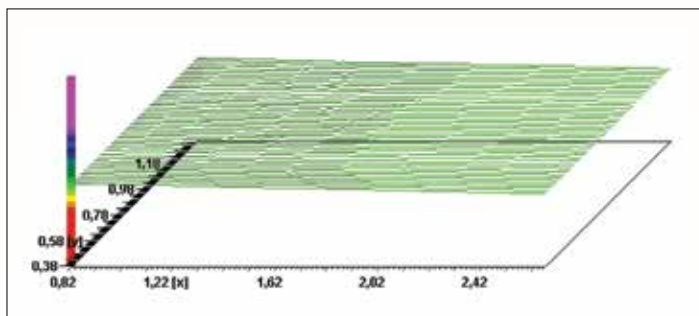
SEM of sintered, colloiddally processed BruxZir Solid Zirconia vs. sintered, isostatically pressed zirconia

BruxZir Scientific Validation

BruxZir vs. Ceramco[®]3 – Comparative Wear Study

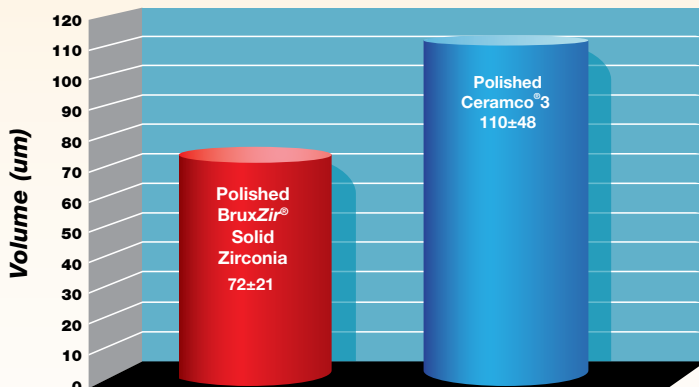


BruxZir[®] Solid Zirconia and Ceramco[®]3 were tested in a comparative wear study led by Dr. Jürgen Geis-Gerstorfer, a professor at the University Hospital Tübingen in Germany.

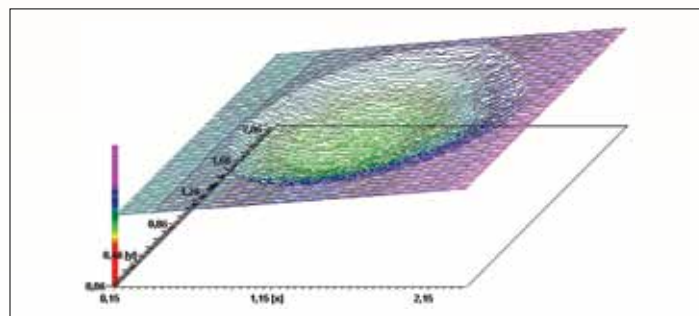


Each material was tested using an eight-chamber Willytech Chewing Simulator, which simulated the clinical performance of the material over a period of five years. Example of the topography of BruxZir Solid Zirconia after wear test is shown above.

Antagonist Wear Study



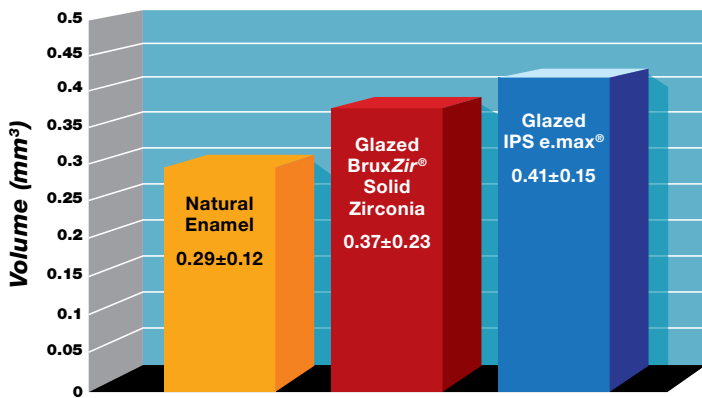
The antagonistic (Steatite balls) wear shows BruxZir Solid Zirconia only with 72±21 micron, which is significantly lower than Ceramco3, with 110±48 micron.



After 1.2 million wear cycles under a load of 5 kg, BruxZir Solid Zirconia compared favorably to Ceramco3, with barely detectable wear. Example of the topography of Ceramco3 after wear test is shown above. **To view the full report, visit www.bruxzir.com.**

Ceramco is a registered trademark of DENTSPLY Ceramco.

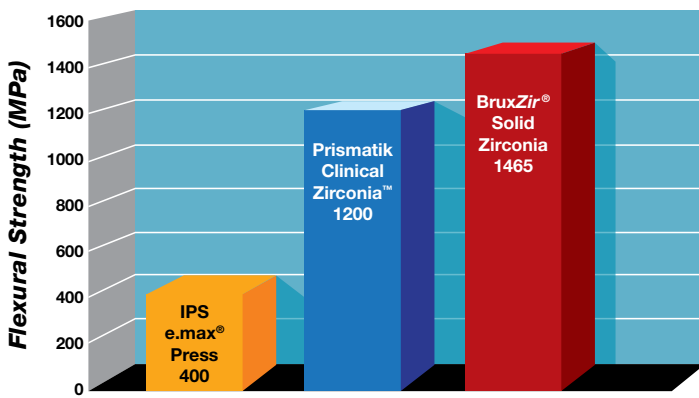
BruxZir vs. IPS e.max[®] Enamel Wear Test



In a recent study to measure the volumetric loss of enamel, glazed BruxZir Solid Zirconia was found to wear compatible with enamel and virtually identical to glazed IPS e.max. **To view the full study, visit www.bruxzir.com.**

IPS e.max is a registered trademark of Ivoclar Vivadent.

High Flexural Strength



Lithium disilicate ceramics have 400 MPa and typical zirconia materials have a flexural strength of more than 1200 MPa. BruxZir Solid Zirconia restorations are able to exceed that strength threshold, with flexural strengths up to 1465 MPa.

BruxZir Clinical Study 2

The Dental Advisor: BruxZir Solid Zirconia and Bridges 18-month Clinical Performance Report

Purpose

The purpose of this clinical study was to determine the clinical performance of **BruxZir Solid Zirconia Crowns and Bridges** (Glidewell Dental Laboratories) over an 18-month period.

Clinical Evaluation Protocol

At recall time, over 390 full-contour, monolithic **BruxZir** restorations (crowns and bridges) were placed. All restorations were fabricated at *Glidewell Dental Laboratories*. Most of the restorations were cemented with self-adhesive resin cement or adhesive resin cement.

Placement

The following parameters were evaluated at placement: esthetics, marginal accuracy, fit, interproximal contacts, and occlusion. Restorations were evaluated on a 1–5 rating scale: 1 = poor, 2 = fair, 3 = good, 4 = very good, 5 = excellent.

Esthetics, marginal accuracy, fit, and interproximal contacts of more than 96% of the restorations were rated excellent at placement. Very few restorations (less than 2%) had to be remade because of improper fit. A few restorations had light interproximal contacts and had to be remade. For the category of occlusion, 84% of the restorations received an excellent rating. In many cases, the occlusion was light and in some cases the restoration was out of occlusion. Based on customer feedback, *Glidewell Dental Laboratories* designs most of their crowns light in occlusion.

Results at 18 Months

In December 2012, 367 **BruxZir** restorations were recalled and evaluated.

Of the 367 **BruxZir** restorations observed at recall (Figure 1), there were:

- 287 posterior single crowns
- 36 units - 12 three-unit bridges
- 24 units - six four-unit bridges
- 10 units - two five-unit bridges
- One 3-unit inlay bridge
- 7 implant crowns

Of the 367 restorations, 121 (33%) had been in function for 18 months while 246 (67%) had been in function for one year (Figure 2).

The recalled BruxZir restorations were evaluated in the following categories:

- Resistance to fracture or chipping
- Esthetics

- Resistance to marginal discoloration
- Wear on zirconia and opposing dentition
- Retention

Restorations were evaluated on a 1–5 rating scale: 1 = poor, 2 = fair, 3 = good, 4 = very good, 5 = excellent.

FIGURE 1
Types of restorations placed.

Restoration Type	Percentage
Single Crowns	78%
Implant Crowns	2%
Bridges	20%

FIGURE 2
Age of restorations at recall.

Age at Recall	Percentage
18 Months	33%
1 Year	67%

To view the full report, visit www.bruxzir.com.

BruxZir®

Solid Zirconia Crowns & Bridges

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US POSTAGE
PAID
LEBANON JUNCTION KY
PERMIT NO 468



See inside for special offer and the expanding list of Authorized BruxZir Labs

BruxZir Clinical Study 2

The Dental Advisor Results (continued)

Esthetics

BruxZir restorations were rated excellent for esthetics when compared to other monolithic zirconia crowns (Figure 3).

Resistance to Fracture/Chipping

Nearly all **BruxZir** restorations exhibited no fracture or chipping (Figure 3). One five-unit bridge with very little clearance fractured one week after cementation. The bridge was redone, and is in function without any issues.

Resistance to Marginal Discoloration

No restorations exhibited marginal staining (Figure 3).

Wear Resistance

Minimal wear was observed on **BruxZir** restorations or on opposing tooth structure (Figure 3).

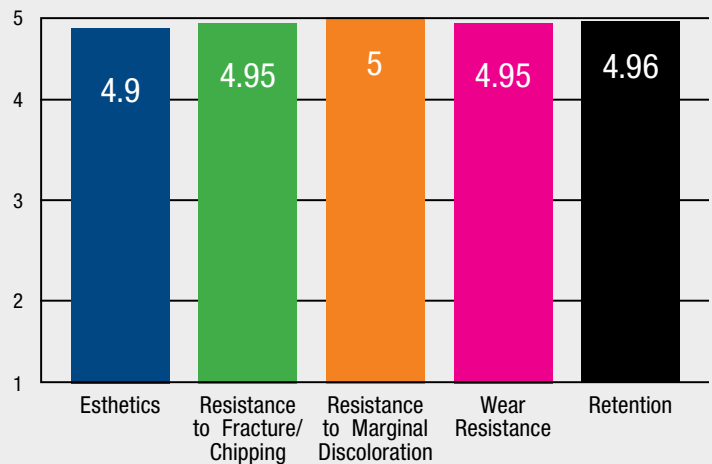
Retention

Three posterior crowns debonded (Figure 3). One was cemented with self-adhesive resin cement and two were cemented with an adhesive resin cement. Two of the teeth had short clinical crowns.

Conclusion

Ninety-eight percent of **BruxZir Solid Zirconia Crowns and Bridges** restorations manufactured by *Glidewell Dental Laboratories* received a 5 or excellent rating at 18-month recall. All of the single crowns and all of the three- and four-unit bridges had no evidence of fracture or chipping. One of two five-unit bridges failed shortly after cementation and was replaced. Over the 18-month period, **BruxZir** has proven to be an excellent restoration with respect to esthetics, resistance to fracture/chipping, resistance to marginal discoloration, wear resistance, and retention. **BruxZir** received a clinical rating of 98%.

FIGURE 3 Ratings of **BruxZir** restorations at recall.



Four-unit bridge for teeth 18-21 at 15 months.

BruxZir is a registered trademark of Glidewell Laboratories.