

Clinical Handling Guidelines for Dentists –
For Clinical Experts from Clinical Experts

Lava™

Precision Solutions



Clinically Successful with
Lava™ Zirconia Restorations

3M ESPE



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More than 11 years of clinical history

Since its introduction in 2001, Lava™ Zirconia has become a huge success story. Lava™ Zirconia is very well known for its outstanding reliability, precision and beauty. 11 years of clinical history with millions of produced restorations, and scientific data prove this true. The indication versatility of Lava™ Zirconia and its clinical excellence convinced already many dentists to leave the “metal era” behind and open up for beautiful all-ceramic Lava™ restorations.

Patients, clinicians and lab technicians strive for dental restorations that perfectly imitate natural teeth. With the Lava™ Plus High Translucency Zirconia system – the next generation of Lava Zirconia – translucency, color match, and individualization opportunities are improved to reach a higher esthetic level, especially for monolithic restorations. Lava Plus Zirconia is a comprehensive system consisting of the new Lava Plus High Translucency Zirconia Mill Blanks with a complete range of 3M ESPE Lava™ Plus High Translucency Zirconia Dyeing Liquids for excellent match to VITA classical shade guide. While esthetical aspects were improved, the physical properties like durability, strength and fit of Lava Plus Zirconia and Lava Zirconia remain on their excellent, well proven Lava Zirconia level. This is backed up by a 15-year limited warranty on 3M™ ESPE™ Lava™ Plus frameworks and Lava™ Plus All-Zirconia monolithic restorations.*

The enhancements added with Lava Plus Zirconia further enable dentists to serve their patient's clinical needs with Lava Zirconia. This preparation and handling guide has been designed for dentists – for clinical experts from clinical experts. In this guide you can find detailed information on all clinical steps for your success with Lava Zirconia Restorations.



Fig. 1: Lava™ Zirconia 6-unit bridge, veneered.

























For further information on Lava™ Ultimate Restorative, please check QR-Code:



Note: A further member of the Lava product family is Lava™ Ultimate Restorative which is a “new to the world” material. Compared to Lava™ Zirconia and Lava™ Plus High Translucency Zirconia, it utilizes the 3M's revolutionary resin nano ceramic technology. Due to the fact, that Lava™ Ultimate Restorative is based on a different material class than zirconia, it has a clinically different handling.

*If fabricated by an Authorized Lava™ Milling Center on Lava™ Equipment in strict compliance with approved indications and instructions for use for Lava Crowns and Bridges. Only approved indications for Lava™ Zirconia are covered and the warranty does not cover any breakage resulting from accidents or misuse.

Indications Overview for Lava™ Zirconia

INDICATION	ZIRCONIA FRAMEWORK		ALL-ZIRCONIA RESTORATIONS	
		FOR FULL VENEERING 	AS FULL-CONTOUR OR PARTIALLY VENEERED 	
Crowns (anterior and posterior)		•	•	
Splinted crowns ¹		•	•	
3-4 unit bridges		•	•	
Long-span and curved bridges (up to 48 mm) ²		•	•	
Cantilever bridges ^{3,4}		•	•	
3-unit Inlay and onlay bridges ^{4,5}		•	•	
Anterior adhesive bridges (Maryland bridges) ^{4,5}		•	•	
Primary Crowns		Veneering not necessary	•	
Crowns on implant abutments ⁴		•	•	
3-unit bridges on 2 implants ⁴		•	•	
Zirconia build-up for two-piece abutments		Veneering not necessary	•	

1. Splinted crowns up to 4 units

2. 5+ unit bridges (up to 48 mm) with a maximum of two pontics next to one another in the posterior area and a maximum of four pontics next to one another in the anterior area. Registration pending in Canada

3. With a maximum of 1 pontic at the position of a premolar or incisor

4. Contra-indicated for patients with bruxism

5. Tests have proven: Lava™ Zirconia shows a sufficient strength for this indication. However, this type of indication overall can have a higher failure risk due to adhesion failure and secondary caries regardless of manufacturer. Please refer to national and regional dental associations for more information

Fig. 2: Lava™ Zirconia and Lava™ Plus Zirconia indications.

Preparation for Veneered Lava™ Zirconia Crowns and Bridges

Clinical advantages of Zirconia.

With 3M™ ESPE™ Lava™ and Lava™ Plus High Translucency Zirconia Crowns and Bridges, you can provide high-quality restorations to patients. Due to the high strength of Zirconia, the handling is very similar to PFM and easier than glass ceramic restorations.

The tooth-colored framework allows supra-gingival margins with easier handling: Easier preparation control (Fig. 3), easier impressing and easier cementation are benefactor. Because the restorations are metal-free, darkening at the margin is no issue. Even after long clinical service or periodontal therapy, tooth-colored zirconia margins stay unremarkable. This makes it easy to maintain optimal gingival esthetics (Fig. 4).



Fig. 3: Preparation of six upper anterior teeth.



Fig. 4: Final situation: Teeth restored with six veneered Lava™ Zirconia crowns.

Preparation Guidelines:

Tooth preparations for veneered restorations based on the dimensions indicated below are sufficient (Fig. 5 and 6). We recommend a preparation matrix of the initial clinical situation in order to check the progress of the tooth preparation.

Ideally, the preparation includes a circumferential continuous and clearly visible chamfer. Give the horizontal and vertical preparation an angle of at least 5°, but avoid bevelling. All occlusal and incisal edges should be rounded.

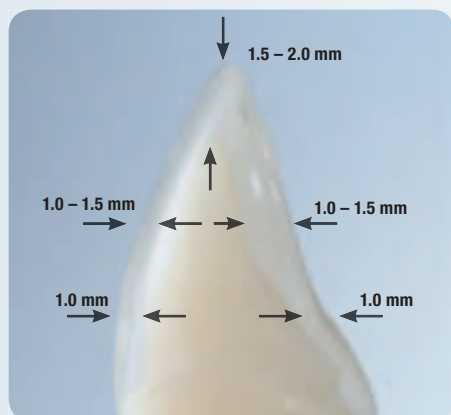


Fig. 5: Recommended preparation for anterior teeth.

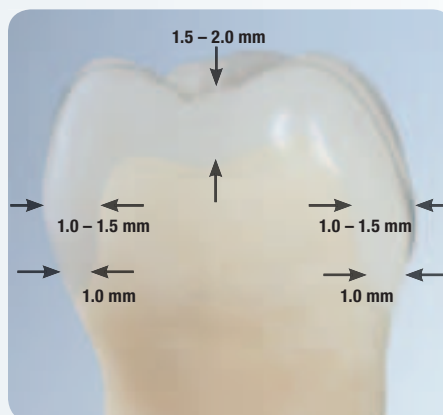


Fig. 6: Recommended preparation for posterior teeth.

Photography created by
Dr. Carlos Eduardo Sabrosa,
Rio de Janeiro, Brazil.

Wall Thickness and Connector Design

The minimum wall thickness requirements of Lava™ Zirconia and Lava™ Plus Highly Translucent Zirconia restorations are 0.5 mm for bridges and posterior crowns and 0.3 mm for stand-alone anterior crowns. Minimum connector cross section of the later restoration should be considered while tooth preparation.

Indication	Anterior Restoration		Posterior Restoration	
	Wall Thickness	Connector Cross Section	Wall Thickness	Connector Cross Section
Single unit	0.3 mm	n/a	0.5 mm	n/a
3-unit bridge	0.5 mm	7 mm ²	0.5 mm	9 mm ²
4-unit bridge	0.5 mm	7 mm ²	0.5 mm	9/12/9 mm ²
6-unit bridge with 4 pontics	0.7 mm	10 mm ²	—	—

Remember: For special indications, please contact your laboratory or milling center or check the Instructions for Use.

Special Preparations

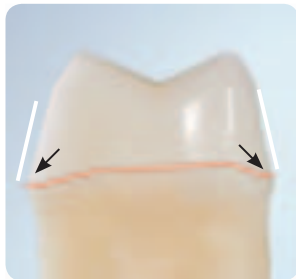
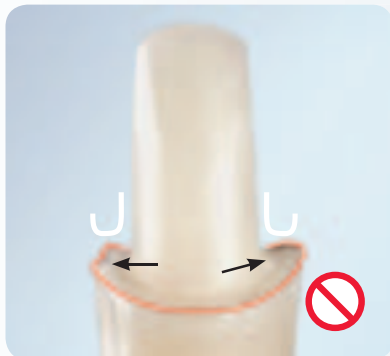


Fig. 7: Feather-edged Margin Preparation: Steep feathered margin preparations may result in very thin tapered margins.

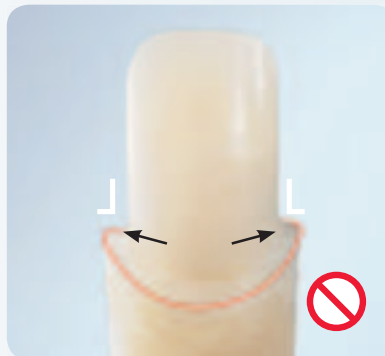
Preparation samples and photography shown on pages 6-9 created by Dr. Carlos Eduardo Sabrosa, Rio de Janeiro, Brazil.

Preparations

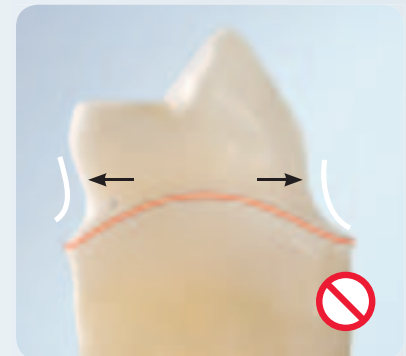
Unacceptable Preparations



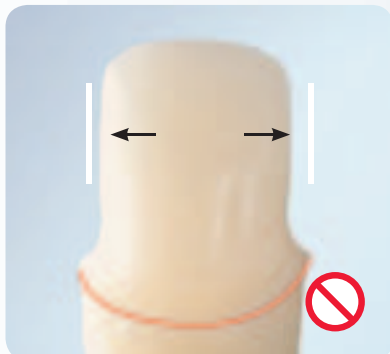
No Gutter Preparation.



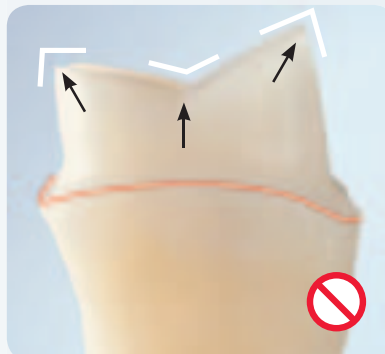
No 90° Shoulder.



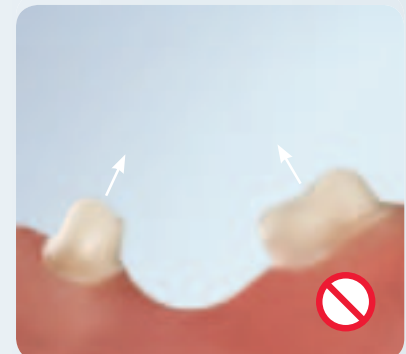
No Undercuts.



No Parallel wall preparations.



No Sharp incisal-occlusal edges.



No convergent or divergent multi-unit preparations.

Fig. 8: Unacceptable preparations.

Preparation for Lava™ All-Zirconia Monolithic Crowns and Bridges

3M™ ESPE™ recommends Lava™ Plus High Translucency Zirconia for monolithic or partially veneered restorations because of its high translucency and natural warm shades.

Consider the following clinical situations:

- Cases with only limited inter-occlusal space (Fig. 9). Due to its high strength, all-Zirconia restorations allow 0.5 mm restoration wall-thickness in the posterior (Fig. 10) and 0.3 mm in the anterior region.



Fig. 9: Prep situation: Little inter-occlusal space at 45 to 47. Monolithic restoration indicated.



Fig. 10: Final result: Monolithic Lava™ Plus Highly Translucent Zirconia bridge at 45 to 47. Minimum wall thickness at contact points 0.5mm, effect-shaded and glazed.

- Patients with **bruxism**. Due to its high strength, All-Zirconia restorations provide a virtually unbreakable solution
- **Cost-sensitive** patients. Due to its warm colors, All-Zirconia restorations provide a tooth-colored alternative to metal-based restorations.

Preparation Guidelines:

Tooth preparations for monolithic restorations based on the dimensions indicated below are sufficient (Fig. 11 and 12). We recommend a matrix of the initial clinical situation to check the progress of the tooth preparation. Ideally, the preparation includes a circumferential continuous and clearly visible chamfer. Give the horizontal and vertical preparation an angle of at least 5°, but avoid bevelling. All occlusal and incisal edges should be rounded.

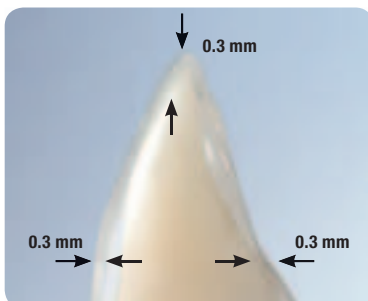


Fig. 11: Anterior crown: Minimum wall thickness of 0.3 mm.

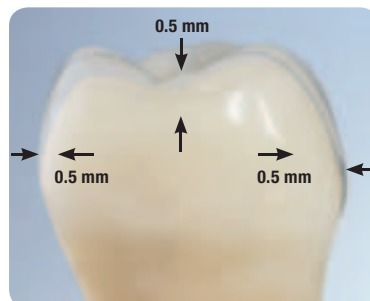


Fig. 12: Posterior crown: Minimum wall thickness of 0.5 mm.

Note: Wear tests have shown that polished Lava™ All-Zirconia surfaces were less abrasive to antagonist materials than veneering materials or glazed zirconia surfaces.

Photography created by Dr. Carlos Eduardo Sabrosa, Rio de Janeiro, Brazil and modified for monolithic indications.

The wall thickness and connector cross-section requirements, as well as special and unacceptable preparation guidelines apply also for monolithic restorations.

Note: Similar to full cast, non-precious metal restorations Zirconia occlusal surfaces are not subject to any noteworthy abrasive wear. This must be considered when planning the therapy. Special attention must be paid to the design of the occlusal surface so that dynamic and static occlusion is correct. This should be checked regularly by a dentist, e.g., during preventive check-ups.

Preparation for Lava™ Zirconia Adhesive Bridges

Anterior Adhesive Bridges.

Adhesive bridges have the advantage of being minimally invasive. In comparison to a 3-unit adhesive bridge, a cantilever 2-unit adhesive bridge design is even more conservative, since only one abutment tooth needs to be prepared. With Lava™ Plus High Translucency Zirconia, a tooth-colored and strong substitute for metal-based adhesive restoration can be provided to fulfill the special esthetical requirement in the anterior region.



Note: Check page 16 for the proper cementation of Lava Zirconia anterior adhesive bridges.

Preparation Guidelines:

The teeth to be restored with a Lava™ Zirconia adhesive bridge should be prepared according to the following instructions. We recommend a preparation matrix of the initial clinical situation in order to check the progress of the tooth preparation.

In general, rounded edges and continuous and clearly visible margins are required for full ceramic restorations. A minimum preparation depth of 0.5 mm is required to ensure sufficient restoration strength. The preparation margin needs to be in enamel. All prepared radiuses have to be ≥ 0.4 mm, all prepared angles have to be $\geq 2^\circ$.

For the preparation of retentive elements, see Figure 13 to 16.

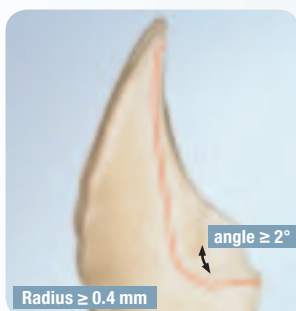


Fig. 13: Mesio-distal view.

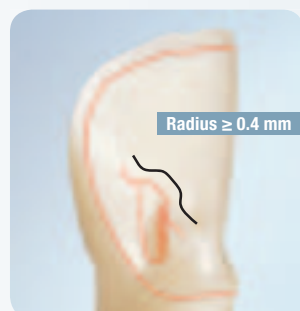


Fig. 14: Oral view: Retentive element: rounded ridge.

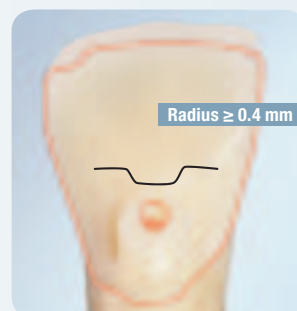


Fig. 15: Oral view: Retentive element: rounded pinhole.



Fig. 16: Oral view: Leave no unprepared enamel. Ensure one margin.

Preparation for Lava™ Zirconia Inlay Bridges

Preparation Guidelines:

Teeth to be restored with a Lava™ Zirconia and Lava™ Plus Highly Translucent Zirconia inlay bridge should be prepared according to the following instructions (Fig. 17, 18, 19a and 19b). We recommend a preparation matrix of the initial clinical situation in order to check the progress of the tooth preparation.

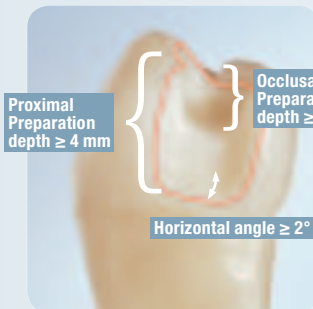


Fig. 17: Proximal view of inlay preparation.

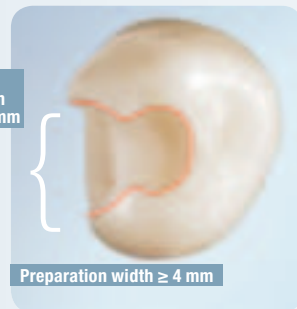


Fig. 18: Occlusal view of inlay preparation.

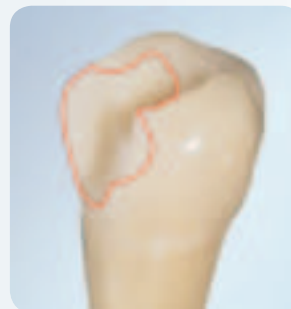


Fig. 19a: Additional lingual or vestibular wings: extension on the level of the tooth equator or above.

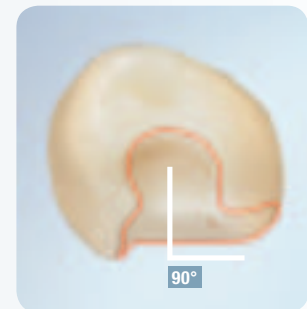


Fig. 19b: In case of additional vestibular and oral wings, prepare them in a 90° angle to the inlay preparation.

In general, rounded edges and continuous and clearly visible margins are required for full ceramic restorations. A minimum preparation depth of 0.5 mm is required to ensure sufficient restoration strength. The inlay cavity must have a proximal depth of 2–4 mm to allow sufficient space for a connector of 9 mm² (Fig. 17 and 18). Check supra-gingival crown length to ensure that appropriate connector dimensions are feasible. The preparation should have a taper of $\geq 2^\circ$ to 3° to avoid any friction. The maximum length of the pontic to replace a missing tooth is 10 mm.



Fig. 20: Initial: Missing tooth 26, healthy tooth 25, insufficient occlusal amalgam filling at tooth 27, single implant therapy neglected.



Fig. 21: Preparation: Minimal invasive preparation for a 3-unit Lava Zirconia Inlay Bridge at teeth 25 and 27 to replace tooth 26.



Fig. 22: Final: 3-unit Lava Zirconia Inlay Bridge, occlusally veneered at teeth 25 and 27, fully veneered at pontic 26.

Courtesy of Prof. Dr. Karl-Heinz Friedl and Dr. Katrin Friedl, Regensburg, Germany

Note: These indications have to be carefully considered for each clinical situation. Recommendations of the national or regional dental associations should be followed.



Fig. 23: Monolithic Lava™ Plus Highly Translucent All-Zirconia 3-unit inlay bridge.

Lava™ Zirconia Build-up for Two-piece Abutments

With Lava™ Zirconia, you can create a customized, individually shaded Zirconia build-up for two-piece abutments for optimum tissue management and natural appearance. It consists of a Lava Zirconia top cemented to a titanium abutment link by your dental lab (Fig. 24). This system is compatible with most implant systems available. The screw is within the titanium abutment link and does not touch the zirconia build-up.



Fig. 24: Lava™ Plus Highly Translucent Zirconia crown, veneered with Creation ZI-F Willi Geller, Lava™ Plus Highly Translucent Zirconia Build-up for two-piece abutment, effect-shaded with fluorescent shade and Lava™ Plus Dyeing Liquid A2, Zirconia Build-up was cemented to the metal link with RelyX™ Unicem 2.

Compared to traditional stock titanium abutments (Fig. 25), the CAD designed abutments provide optimized emergence profile and tooth-colored implant collars (Fig. 26), even after periodontal therapy.

For optimal pink esthetics, Lava™ Plus High Translucency Zirconia Build-ups for two-piece abutments can be effect-shaded with pink and fluorescence shades by your dental lab. Fluorescence is important to mimic the optical properties of natural dentin by brightening surrounding soft tissue (Fig. 27).



Fig. 25: PFM crown on a stock titanium abutment.



Fig. 26: Lava™ Plus Highly Translucent All-Zirconia crown, Shade A2, custom-shaded and glazed on a Lava™ Plus Highly Translucent Zirconia Build-up for two-piece abutment, Shade A2, effect-shaded with Fluorescence, cemented to metal link with RelyX™ Unicem 2.

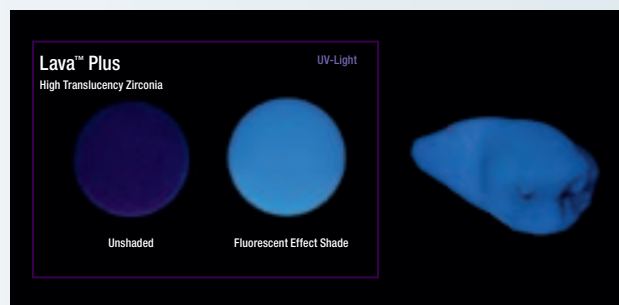


Fig. 27: All images are taken under UVA light exposure. Left: Unshaded Lava™ Plus Zirconia disk; Middle: Lava™ Plus Zirconia disk effect-shaded with fluorescent shade; Right: Fluorescent Effect of natural tooth when irradiated with UVA.

By sending an implant level impression to your lab, you can receive a custom implant abutment which is perfectly shade-matched to your Lava™ restoration (Fig. 26). This abutment is screwed into your implant according to the recommendations of the implant system used. Finally, your restoration is cemented to your implant.

The Conventional or the Digital Way

3M ESPE offers a wide range of impression materials and techniques to ensure this important clinical step is precise, easy and productive. Whether with the invention of Impregum™ Polyether material or the recent digital “3D in Motion” technology – today’s impressing work can’t be imagined without innovations by 3M ESPE.

The innovative retraction paste sets another milestone: it is a simple and effective means of gingival retraction. Because of the paste’s fine tip, the astringent retraction paste can easily be inserted right where it belongs – deep directly into the sulcus.

3M™ ESPE™ Adstringent Retraction Paste



Easy sulcus access and opening

Easy extrusion of highly viscous paste

Soft edge capsule tip

Long, slim nozzle with an orientation ring

Optimized capsule geometry

Hygienic and clean unit-dose capsule

Secure fixation in common capsule dispensers

Clamp mechanism

Impression by 3M ESPE

Conventional Impression Material



3M True Definition Scanner



Fig. 28: 3M™ ESPE™ Impression Materials and the 3M True Definition Scanner

Shading and Finishing Options of Lava™ Zirconia Restorations

By sending a digital or conventional impression to your dental lab, you can choose from a wide range of shading, customization and finishing options for the Lava Zirconia restorations to meet your patients' needs.

What can your dental lab do for you within one restoration?

1. It can provide 16 warm and natural shades to your restoration according to Vita classical shade guide, plus 2 bleach shades.

Shade selection remains the same. You can communicate your selected shade to your dental lab or milling center by using the Vita classical shade guide to choose from 16 shades, plus 2 bleach shades.



For monolithic Lava Zirconia restorations, your dental technician can do a simple dip shading for an uniform color. On the other hand, custom shading allows a color gradient that is closer to natural tooth. In addition, 8 Lava™ Plus Zirconia Effect Shades are available to mimic special tooth characteristics like white spots or stained fissures (Fig. 29):

Shading Options

Lava™ Plus Dyeing Liquids / Dip Shading

2 min
Uniform Shade

Lava™ Plus Dyeing Liquids / Custom Shading

Apply
2x
4x
6x
Gradient

Lava™ Plus Effect Shades

 White Opaque Yellow Orange Brown

Optional Individualization

 Gray Purple Pink Fluorescence

Fig. 29: Shading Options of Lava™ Plus High Translucency Zirconia.

Perfect Shading & Veneering

2. It can provide veneered, partially veneered or monolithic Lava Zirconia restorations (Fig. 30).

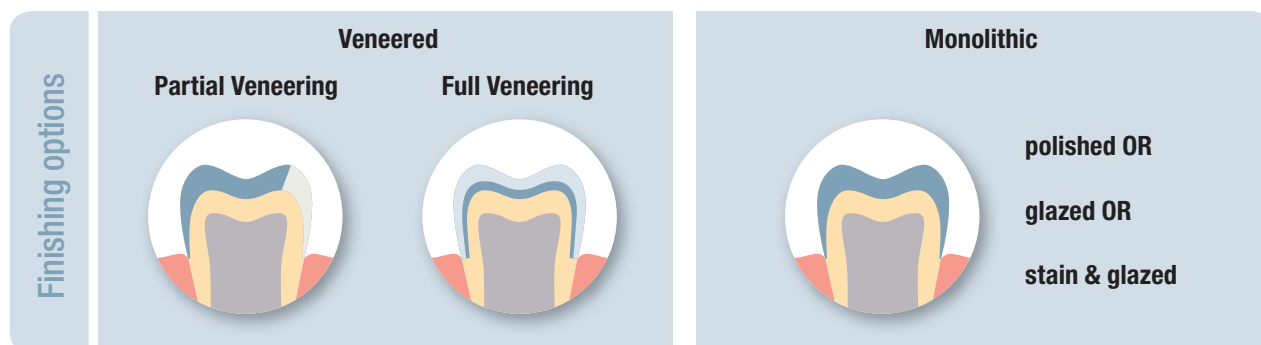


Fig. 30: Finishing Options of Lava™ Plus High Translucency Zirconia.

Veneered

For ultimate esthetical requirements, 3M ESPE recommends a porcelain overlay (Fig. 31). Lava™ Zirconia is compatible with a long list of porcelain veneering systems. Years ago, chipping of veneering was an intensely discussed hot topic. Nowadays, several reasons for porcelain chip-offs were identified: e.g. unsupported veneering layers by non-anatomic framework design, wrong porcelain firing protocol, or un-polished intra-oral adjustments. Clinician can prevent chipping by e.g. re-polishing adjusted surfaces.



Fig. 31: Fully veneered single unit Lava™ Zirconia crowns at both central incisors.

Clinical Pictures Courtesy Dr. Seto, Japan

Monolithic

If the clinical situation requires outstanding strength (e.g. bruxism) or when there is only limited inter-occlusal space (Fig. 32), 3M ESPE recommends the Lava™ Plus High Translucency Zirconia system because of its translucency and shading.



Fig. 32: Prep situation: Little inter-occlusal space at 45 to 47° Monolithic restoration indicated.



Fig. 33: Final result: Monolithic Lava™ Plus Highly Translucent Zirconia bridge at 45 to 47°. Minimum wall thickness at contact points 0.5mm, effect-shaded and glazed.

Intra-oral Handling of Lava™ All-Zirconia Monolithic Restorations

Intra-oral adjustments and polishing:

If intraoral adjustments are necessary, a fine diamond bur and copious amount of water should be used to remove strong contact points. Use a rubber polishing set to smooth the ceramic surface afterwards for the final high-shine. SEM analysis reveals the initial surfaces and the superficial surface modification of Lava Plus Zirconia after red ring diamond bur, and subsequent polishing (Fig. 34, 35 and 36).



Fig. 34: Lava™ Plus Zirconia surface as fired (500 fold magnification)



Fig. 35: Lava™ Plus Zirconia ground with a red ring diamond bur (500 fold magnification).

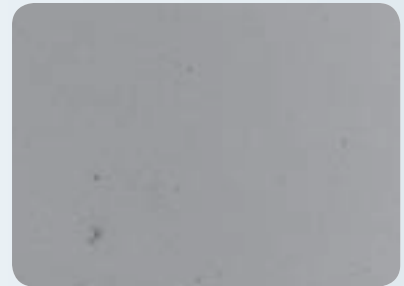


Fig. 36: Lava™ Plus Zirconia surface polished with the EVE 2-step rubber polisher system (500 fold magnification).

The adjusted surface can be re-polished as described below. There are several polishing sets (Fig. 37) for dentists available that allow a quick and efficient polishing of adjusted surfaces, e.g.:

KOMET Set 4622



EVE Diacera Diamond polishers for zirconia



Fig. 37: Examples of zirconia polishing sets

Please check the video "How to seat a Lava™ All-Zirconia Monolithic Restoration" for detailed cementation and polishing information at



Step by Step – Adjustment and Polishing of a Lava™ All-Zirconia Crown:



Fig. 38: Supracontact on Lava™ All-Zirconia crown.



Fig. 39: Intra-oral occlusal adjustment with finishing diamond and copious water.

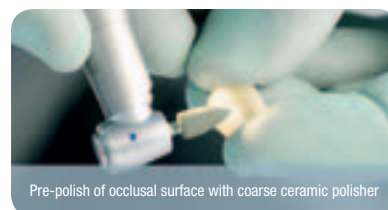


Fig. 40: Pre-polish of occlusal surface with coarse ceramic polisher.



Fig. 41: Polish of occlusal surface with medium-fine ceramic polisher.



Fig. 42: Polish of occlusal surface with super-fine ceramic polisher.

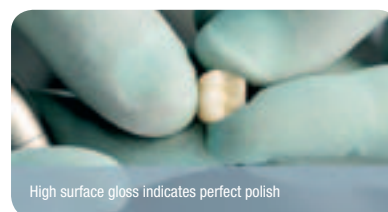


Fig. 43: Final high shine.

Endodontic Access and Zirconia Restoration Removal.

If an endodontic access through a Lava restoration is necessary use a new coarse diamond bur to open the crown. During the opening process, intense water cooling is crucial to avoid heating. Ensure adequate amounts of water always coat the rotating instrument.

Zirconia-indicated crown cutter



Komet 4ZR.314.018

Fig. 44: Example of zirconia-indicated crown cutter.

For Lava restoration removal, use a new crown cutter (Fig. 44) and adequate water cooling to introduce a cutting slot in the axial direction. Use moderate pressure to extend the slot over the occlusal surface to the oral side. Sparks may be observed while cutting through zirconia. Lift the restoration with a common dental office chisel to pull off restoration. Sometimes additional slots and changing diamond burs are necessary for complete removal.

Discolored teeth.

The esthetical result of a restoration, especially in the anterior region will be compromised, if darker underlying structures shine through. To prevent a grayish appearance of the restoration from the inside, various measures can be applied.

- Bleaching of endodontically treated discolored teeth
- Core build-up with tooth-colored restorative materials
- Masking cements
- Lava Zirconia with thicker walls or/and veneered with veneering porcelain
- Tooth-colored Lava Zirconia build-up for two-piece abutments
- Opaque layer on titanium abutments.

Note: 3M ESPE recommends Lava Frame if the clinical situation requires a better masking effect. Due to its high translucency, Lava Plus Zirconia, especially when used as monolithic restoration material with thin walls, may not have enough concealing properties.

Cementation of Lava™ Zirconia Restorations

Sandblasting.

Regardless of the cement, extra-oral sandblasting of the cementation area of the Lava™ Zirconia restoration is mandatory. We recommend aluminium oxide with grain sizes $\leq 50\mu\text{m}$ and 2 bar pressure. This allows efficient roughening for increased cementation surface and micro-mechanical interlocking without compromising material strength (see SEM pictures at Fig. 45, 46 and 47).



Fig. 45: SEM picture of polished surface of Lava™ Zirconia (Magnification 500 fold).



Fig. 46: Sandblasting of inner restoration surface.



Fig. 47: SEM picture of sandblasted surface of Lava™ Zirconia (Magnification 500 fold).

Cement Selection.

Due to the outstanding strength of Lava™ Zirconia, adhesive cementation is not mandatory for regular crown and bridge indications – they can be cemented conventionally. For esthetic reasons or for preparations offering only low retention (e.g. short prep, high taper, small surface) self-adhesive or adhesive cementation are indicated for crowns and bridges.

- For the best combination of ease of use and bond strength 3M ESPE recommends **RelyX™ Unicem 2 Self-Adhesive Cement** for Lava Zirconia crown and bridge cementation.
- For anterior adhesive bridges and inlay/onlay bridges adhesive cementation is recommended. 3M ESPE recommends **Scotchbond™ Universal Adhesive/RelyX™ Ultimate Adhesive Resin Cement** for adhesive bridges.

Adhesive bonding to Zirconia is highly efficient via phosphate monomers like MDP. Scotchbond Universal Adhesive contains MDP and is a highly efficient Zirconia primer. RelyX Unicem self-adhesive cement contains phosphate functionalized monomers and can bond efficiently to Zirconia.

Note: Do not use a phosphoric acid cleaning step when using RelyX Unicem 2, as this will have a negative impact on the effectiveness of the phosphate monomers to bond to the Zirconia Surface.



Fig. 48: RelyX™ Unicem and RelyX™ Unicem 2 with various delivery options

Cementation with success

Cementation of Crowns and Bridges with RelyX™ Unicem Self-Adhesive Resin Cement.



Try-in of Lava™ Zirconia or Lava™ Plus Zirconia Restoration

- Try-in Lava restoration to check fit and color match.
- Carefully mark contacts.
- Remove undesired contacts with red ring diamond if necessary. (30 µm grain, water cooling and turbine)



Cleaning Step Intraorally

- Clean the prepared abutment/cavity thoroughly with pumice slurry, rinse with a water spray and lightly air dry or use cotton pellets to dry it off. Do not over dry.
- Don't use H₂O₂ (hydrogen peroxide) or substances such as desensitizers, disinfectants, astringents, dentin sealants, rinsing solutions containing EDTA, etc., after the final cleaning with pumice slurry and water.
- Take care for adequate blood and saliva control. Do not use ferrous liquids for blood control.



Sandblasting and Cleaning Step Extraorally

- Sandblast inner zirconia restoration with aluminum oxide AL₂O₃ ≤50 µm, 2bar.
- Clean inner zirconia restoration surface with alcohol and dry with water-free and oil-free air.



Application of RelyX™ Unicem or RelyX™ Unicem 2 Self-Adhesive Resin Cement

- Apply according to *Instructions for Use*.



Excess Removal

- Remove excess cement after brief light exposure ("tack cure", <2 sec with a conventional polymerization device) or during self-hardening (starting 2 min [2:30 min for RelyX™ Unicem 2 Automix Self-Adhesive Resin Cement] after beginning of mixing in the "gel phase").
- During excess removal use a suitable instrument to hold restoration in place.



Curing Step

- Light- or self-curing according to the *Instructions for Use*.



Polishing Step

- Finish and polish the marginal area with diamond polishing devices, aluminum oxide coated discs (e.g. 3M™ ESPE™ Sof-Lex™ Discs), and polishing paste.
- If occlusion was adjusted, polish these areas with ceramic rubbers, polishers, ceramic polishing paste and adequate brush to a smooth and shiny surface.

Fig. 49: Step-by-step cementation guide

Clinical pictures by Dr. Carlos Eduardo Sabrosa, Rio de Janeiro, Brazil.

Adhesive Cementation, e.g. of Adhesive Anterior (“Maryland”) and Inlay/Onlay Bridges

Indications such as Adhesive (“Maryland”) and Inlay/Onlay bridges demand especially high adhesive bond strength. Regardless of the manufacturer of the cement and restoration, these indications may be exposed to a higher risk of adhesion failure. To achieve an optimal result, abutment teeth must have an adequate enamel surface for bonding. They should be healthy or only slightly restored and the periodontal conditions should be good. It is the sole responsibility of the dentist to ensure proper selection of indication and technique. The guidelines of the relevant national professional associations must be observed for such indications.

For the cementation of Lava™ Zirconia Adhesive Bridges, 3M ESPE recommends the resin cement RelyX™ Ultimate (Fig. 50). Detailed information and Step-by-Step instruction are available on the:

www.3MESPE.com/RelyXUltimate







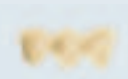






Fig. 50: RelyX™ Ultimate Step-by-Step brochure.

Here you find the PDF of the Step-by-Step brochure:



Remember: Before working with Lava™ Zirconia, Lava™ Plus Zirconia, RelyX™ Unicem Self-Adhesive Resin Cement/RelyX™ Unicem 2 Automix Self-Adhesive Resin Cement, RelyX™ Ultimate, Scotchbond™ Universal, Cojet™ System, Ketac™ Cem Plus Automix Resin-modified Glass Ionomer Luting Cement, Ketac™ Cem Glass Ionomer Luting Cement and Sof-Lex™ Finishing and Polishing Discs, please refer to the respective Instructions for Use.

Lava™ Zirconia and Lava™ Plus Zirconia Cementation Options: Recommendations by Cement and Indication

INDICATION		++ Highly recommended + Recommended - Not indicated	RelyX™ Ultimate	RelyX™ Unicem / RelyX™ Unicem 2/ RelyX™ U200	Ketac™ Cem Plus / RelyX™ Luting Plus / RelyX™ Luting 2	Ketac™ Cem
			Adhesive Resin Cement	Self-Adhesive Resin Cement	Resin Modified Glass Ionomer Cement	Glass Ionomer Cement
Crowns (anterior and posterior)			+	++	+	+
Splinted crowns ¹			+	++	+	+
3-4 unit bridges			+	++	+	+
Long-span and curved bridges (up to 48 mm) ²			+	++	+	+
Cantilever bridges ^{3,5}			+	++	+	+
3-unit Inlay and onlay bridges ^{4,5}			++	+	-	-
Anterior adhesive bridges (Maryland bridges) ^{4,5}			++	+	-	-
Primary Crowns			+	++	+	+
Crowns on implant abutments ⁵			+	++	++	+
3-unit bridges on 2 implants ⁵			+	++	++	+
Zirconia build-up for two-piece abutments			-	++	-	-

1. Splinted crowns up to 4 units

2. 5+ unit bridges (up to 48 mm) with a maximum of two pontics next to one another in the posterior area and a maximum of four pontics next to one another in the anterior area.
Registration pending in Canada.

3. With a maximum of 1 pontic at the position of a premolar or incisor

4. Tests have proven: Lava™ Zirconia shows a sufficient strength for this indication. However, this type of indication overall can have a higher failure risk due to adhesion failure and secondary caries regardless of manufacturer. Please refer to national and regional dental associations for more information

5. Contra-indicated for patients with bruxism

Fig. 51: Cementation Options for Lava™ Plus Zirconia and Lava™ Zirconia.

For detailed information, please check the Instructions for Use of the respective cements.

www.3MESPE.com/Lava



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