

Menu

| For Dental Labs |
|--------------------------------------|
| Introduction3 |
| Lava™ Plus System |
| Disc specifications 7 |
| Software options |
| Milling |
| Shading |
| Tooth Preparation |
| For Dentists |
| Clinical handling |
| Resources22 |

Website: www.3M.com/LavaPlus

Welcome.

Congratulations on your decision to offer Lava™ Plus High Translucency Zirconia. Dentists and their patients will be pleased with how closely you can match dental crowns and bridges to natural dentition.

The goal of this Reference Guide is to provide quick access to the information you need to get started—and be successful.

And if you need us, we're here to answer any questions you have. Call: 1-800-634-2249



Introduction

We're sharing our expertise so you can create Lava™ Plus High Translucency Zirconia restorations using your own equipment.

Lava is widely acknowledged as the trusted brand that built the market for zirconia restorations, initially through the LavaTM Milling Center network. After years of clinical use and millions of cases worldwide, we understand how to design, mill, sinter and finish our zirconia. Plus, we stay in contact with hardware and software manufacturers to optimize the milling process.

We're sharing our expertise so you can create Lava[™] Plus High Translucency Zirconia restorations using your own equipment. This helpful guide summarizes everything you need to know in one easy reference tool.



Lava™ Plus System: Products/Ordering Information

Lava[™] Plus High Translucency Zirconia Discs

Available in 98mm discs in 14mm, 18mm and 25mm thicknesses, with and without a step.

With Step

| Item# | Thickness | Diameter |
|-------|-----------|----------|
| 69271 | 14mm | 98mm |
| 69272 | 18mm | 98mm |
| 69273 | 25mm | 98mm |



Without Step

| ltem# | Thickness | Diameter |
|-------|-----------|----------|
| 69274 | 14mm | 98mm |
| 69275 | 18mm | 98mm |
| 69276 | 25mm | 98mm |



Lava[™] Plus High Translucency Zirconia Dyeing Liquids

The precise color match of the 18 pre-mixed Lava Plus dyeing liquids ensures predictable and precise results. Lava™ Plus Enamel Liquids enable easier, quicker, and more reproducible application results, while creating incisal esthetics for monolithic restorations.

Dyeing Liquids: 100ml bottles

| Shade | Item# | Shade | Item# | Shade | Item# |
|-------|-------|-------|-------|-------|-------|
| A1 | 69203 | B1 | 69208 | C2 | 69213 |
| A2 | 69204 | B2 | 69209 | C3 | 69214 |
| A3 | 69205 | В3 | 69210 | C4 | 69215 |
| A3.5 | 69206 | B4 | 69211 | D2 | 69216 |
| A4 | 69207 | C1 | 69212 | D3 | 69217 |

| Shade | Item# |
|-------|-------|
| D4 | 69218 |
| W1 | 69219 |
| W3 | 69220 |

Dyeing Liquids: 300ml bottles

| Shade | Item# | Shade | Item# | Shade | Item# |
|-------|-------|-------|-------|-------|-------|
| A1 | 69176 | A3 | 69178 | C1 | 69180 |
| A2 | 69177 | B1 | 69179 | W1 | 69181 |
| | | | | | |

Enamel Liquids: 100ml each

| ltem# | Description | |
|-------|---|--|
| 69229 | Lava [™] Plus Enamel Liquid Intro Kit Kit includes: 1 Lava [™] Plus Enamel Liquid EL (100ml); Lava [™] Plus Enamel Liquid EM (100ml); Lava [™] Plus Enamel Liquid EB (100ml); Applicator (50 pieces); Lava [™] Plus Enamel Shade Guide | |
| 69226 | Lava™ Plus Enamel Liquid EL (100ml) | |
| 69227 | Lava™ Plus Enamel Liquid EM (100ml) | |
| 69228 | Lava™ Plus Enamel Liquid EB (100ml) | |
| 69301 | Applicator (50 pieces) | |

Lava™ Plus High Translucency Zirconia Effect Shades

Offered in 8 shades, including fluorescent, bringing individual artistry into every restoration.

| Item# | Description |
|-------|---|
| 69224 | Lava™ Plus High Translucency Zirconia Effect Shade Kit Kit includes: 1 Lava™ Plus Effect Shade (8ml each) of these nine shades: Orange, Gray, White, Pink, Yellow, Brown, Purple, Fluorescence; 1 Lava™ Plus Effect Shade Liquid |
| | Thinner (100ml) |

Effect Shades: 8ml each

| Shade | Item# | Shade |
|--------------|-------|--------|
| Fluorescence | 69260 | Yellow |
| Gray | 69261 | Purple |
| Brown | 69262 | Pink |
| Orange | 69263 | White |
| Thinner | 69350 | |

Shade Guide

| ltem# | Description |
|-------|--|
| 69225 | Lava™ Plus Shade Guide (Dyeing Liquids & Effect Shades) |
| 69300 | Lava™ Plus Enamel Shade Guide |



Item# 69264 69265

69266 69267

Lava[™] Plus High Translucency Zirconia Color Markers Kit

Lava™ Plus High Translucency Zirconia Color Markers can be added to the Lava Plus dyeing liquid to visualize application on the pre-sintered restoration, allowing full control over custom shading.



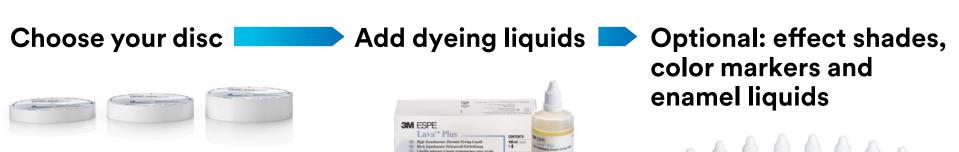
Item No. Description

| 69223 | Lava™ Plus Color Marker Kit |
|-------|---|
| | Kit includes: Lava™ Plus Color Marker BLUE (10ml); Lava™ Plus |
| | Color Marker RED (10ml) |

Customer Care Center: 1-800-634-2249 www.3M.com/LavaPlus



What do you need to get started?





IMPORTANT: Make sure your CAD/CAM equipment is appropriately programmed and you understand the process to achieve the best results from Lava Plus zirconia.

Indications

Lava™ Plus High Translucency Zirconia is approved for crown and bridge indications, including full-contour all-zirconia or frameworks.

Restorations can be monolithic full contour or with a partial or full veneer.

*For more details and contraindications, please see the Lava Plus zirconia Instructions for Use (940KB).

Crowns (anterior and posterior) Splinted crowns



Long-span and curved bridges*



3-unit inlay and onlay bridges*



Crowns on implant abutments*





Full-arch bridges



Anterior adhesive bridges (Maryland bridges)*



Bridges on implants*



3-4 unit bridges



Cantilever bridges*



Primary crowns



Zirconia build-up for 2-piece abutments

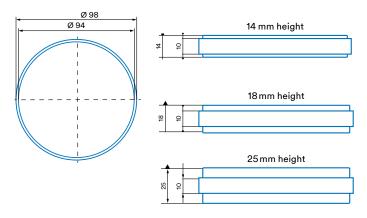


^{*}For more details and contraindications, please see the Lava Plus zirconia Instructions for Use.

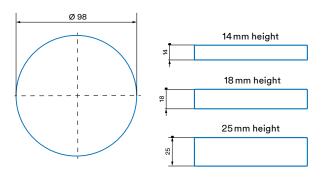
Disc Specifications

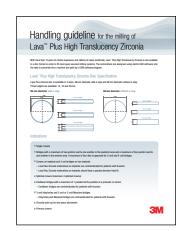
Lava™ Plus High Translucency Zirconia in disc format fits most open-sourced milling systems. Available in two sizes: 98 mm diameter with a 10 mm step and 98 mm diameter without a step. Three heights are available: 14, 18 and 25 mm.

98 mm diameter with a 10 mm step



98 mm diameter without a step





Download the four-page Handling guideline for milling Lava™ Plus High Translucency Zirconia (PDF 657 KB)





Software Options

CAD

To make design easier, the parameters for Lava™ Plus High Translucency Zirconia are included in popular design programs.







CAM

Common CAM software can be used. To make milling easier, hyperDENT Lava™ Edition contains the milling templates for all 3M™ Lava materials. hyperDENT Lava™ Edition can be operated on all existing Lava™ milling machines as well as on a selection of open milling machines.









For specific questions regarding your CAD or CAM software, please contact your software provider.

Milling system compatibility.

Lava™ Plus High Translucency Zirconia Discs can be milled by all milling systems with open architecture that are designed to mill 98mm discs—with or without a step. Please check the manual of your mill to determine if the Lava Plus zirconia format is compatible.



Scaling the restoration

Scaling/Shrinkage Factors

All restorations must be enlarged by a certain factor before milling in order to compensate for the shrinkage of the material during sintering. The scaling factor is shown on the Lava™ Plus High Translucency Zirconia Disc and must be entered in the CAM software. The indicated scaling factor applies to undyed Lava Plus zirconia.

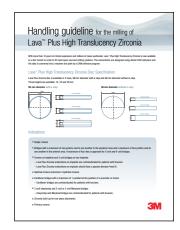
The scaling factor must be adjusted for restorations, which will be dyed with the Lava™ Plus High Translucency Zirconia Dyeing Liquids, because the dyeing chemistry slightly reduces the shrinkage during sintering. The corrective value of the specific dyeing liquid must be subtracted from the scaling factor shown on the Lava Plus zirconia disc. The table below shows recommended corrective values for some of the dyeing liquids:

| Dyeing liquid* | Corrective value of the scaling factor |
|--------------------------------|--|
| A1, A2, B1, B2, B3, C2, D3, D4 | - 0.0017 |
| A3, A3.5, A4, B4, C3, C4 | - 0.0030 |

Example for dyeing liquid A4: The scaling factor shown on the Disc is 1.2432. Subtract the corrective value 0.0030. The resulting scaling factor to enter in the CAM software for this restoration is 1.2402.

The hyperDent Lava[™] Edition includes the adjustment for shade shrinkage, as well as optimized milling templates and strategies.

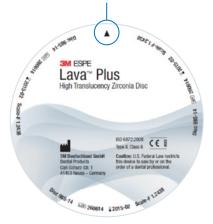
*W1, W3, C1 and D2 do not require a corrective value.



Download the four-page Handling guideline for milling Lava™ Plus High Translucency Zirconia (PDF 657 KB)

Repositioning indicator

If the disc is used several times, this small arrow will help to re-position the disc correctly into the milling machine.



Processing in the milling unit

Clean and dry the milling chamber of the milling unit before processing Lava™ Plus High Translucency Zirconia restorations. We recommend dry milling using uncoated milling tools with two flutes and the following processing parameters for Lava Plus zirconia:

| Job | Feed [mm/min] | Step Down [mm] | Step Over [mm] | Spindle Speed [rpm] | Tool Diameter [mm] | Tool Type |
|--|---------------|----------------|----------------|---------------------|--------------------|-----------|
| Roughing | 600 | 0.4 | 0.6 | 10,000 | 2 | carbide |
| Rest material roughing | 600 | 0.3 | 0.3 | 30,000 | 1 | carbide |
| Finishing inside 3D/ Finishing occlusal | 1,350 | NA/ 0.15 | 0.15 | 25,000 | 2 | carbide |
| Finishing margin line 3D | 500 | NA | 0.1 | 25,000 | 2 | carbide |
| Finishing outside cavity | 800 | 0.15 | 0.15 | 25,000 | 2 | carbide |
| Fine finishing inside 3D | 1,000 | NA | 0.12 | 20,000 | 1 | carbide |
| Fissure machining | 800 | 1 | 0.2 | 30,000 | 1 | carbide |
| Fine fissure machining | 500 | 0.5 | 0.15 | 30,000 | 0.5 | carbide |

Removal of the Milled Restorations from the Disc

We recommend using a turbine handpiece to remove milled restorations. If no turbine is available, fine cross-cut tungsten carbide cutters can also be used—rotary speed ≤ 20,000 rpm.

Sintering cycle

Standard Sintering temperature is 1450°C Option for Speed Sintering: 1500°C



Sintering cycle

Standard Sintering Cycle

| Cycle Stage | Temperature | Temperature | Heating Rate | Time |
|-------------|------------------|------------------|--------------|----------|
| | Start | End | | |
| Drying | room temperature | room temperature | | 2 h. |
| Heating | room temperature | 800°C | 20°C/min. | 39 min. |
| Heating | 800°C | 1450°C | 10°C/min. | 65 min. |
| Dwell time | 1450°C | 1450°C | _ | 120 min. |
| Cooling | 1450°C | 800°C | 15°C/min. | 43 min. |
| Cooling | 800°C | 250°C | 20°C/min. | 28 min. |

Speed Sintering Cycle

| Cycle Stage | Temperature | Temperature | Heating Rate | Time |
|-------------|------------------|------------------|---------------------|---------|
| | Start | End | | |
| Drying | room temperature | room temperature | | 2 h. |
| Heating | room temperature | 900°C | 40°C/min. | 22 min. |
| Heating | 900°C | 1200°C | 20°C/min. | 15 min. |
| Heating | 1200°C | 1500°C | 15°C/min. | 20 min. |
| Dwell time | 1500°C | 1500°C | _ | 30 min. |
| Cooling | 1500°C | 1000°C | 15°C/min. | 33 min. |
| Cooling | 1000°C | 400°C | 60°C/min. | 10 min. |

The sintering cycles in the tables at left have been developed for predictable color and translucency.

Dyed restorations need to be dried a minimum of two hours at room temperature prior to sintering. Shorter drying times or different sintering cycles can result in a different shade.

Shading

Predictable shading: An A2 is an A2

Shading occurs before the restoration is sintered. 3M's patented color ion technology offers:

 Excellent and consistent match to the VITA Classical shade guide and conversion to VITA System 3D-Master® shades

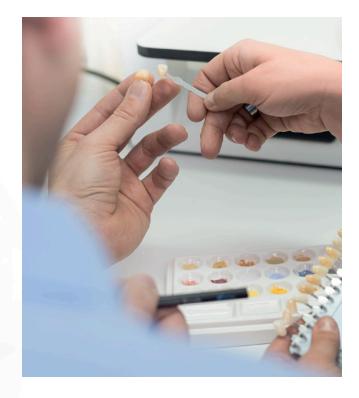
• Warm, natural color to create highly esthetic monolithic or layered restorations

 Liquids that are completely absorbed into the microstructure of Lava[™] Plus High Translucency Zirconia for a perfect match and

no white spots







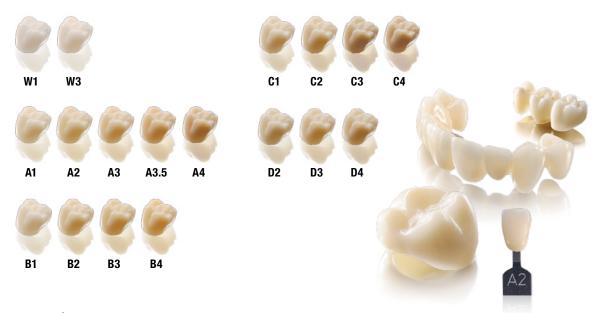
Shading options

Monochrome Dip Shading

- The simple way to achieve a highly esthetic monochrome tooth color—used for monolithic, all-zirconia restorations and frameworks
- Fast and easy 2-minute process in which the shading liquid is evenly and completely absorbed throughout the zirconia (Follow the process outlined in the video.)

Customized Shading

• For achieving esthetics mimicking a natural tooth—used by artisans to produce natural gradient shading (Follow the process outlined in the video.)



Glazing

• The color effect of the dyeing liquids has been optimized for use with glaze firing.

Cleaning

To ensure a consistent coloring, the restoration must be clean, free of oils and dust and completely dry prior to dyeing.

Watch the videos



Live Demo (long)— how to dip and custom shade monolithic Lava™ Plus Zirconia restorations (12:56)



Watch the video: Finishing a Monolithic Restoration— Lava™ Plus High Translucency Zirconia (2:09)

Shading tables

Lava[™] Plus High Translucency Zirconia can be shaded as detailed in the table.

Dyeing liquids EB (Enamel, bleach), EL (Enamel, light) and EM (Enamel, medium) are only used for customized accentuation in the incisal area.

| VITA [®] Classic | VITA System 3D-Master® | Lava™ Plus Dyeing Liquid Enamel |
|------------------------------|---------------------------|------------------------------------|
| W1* | OM1 | EB |
| W3* | 0M3 | EB |
| A1 | 1M2 | EL |
| A2 | 2M2 | EL |
| A3 | 2R2.5 | EL |
| A3.5 | 3R2.5 | EM |
| A4 | 4M2 | EM |
| B1 | 1M1 | EL |
| B2 | 2L1.5 | EL |
| В3 | 2M3 | EL |
| B4 | 3M3 | EM |
| C1 | 2L1.5 | EL |
| C2 | 3L1.5 | EL |
| C3 | 4L1.5 | EL |
| C4 | 5M2 | EM |
| D2 | 2L1.5 | EL |
| D3 | 3L1.5 | EL |
| D4 | 3L2.5 | EM |

^{*3}M shades are not part of the VITA Classical shade guide.

For detailed information, refer to the shading video and the step-by-step shading guide



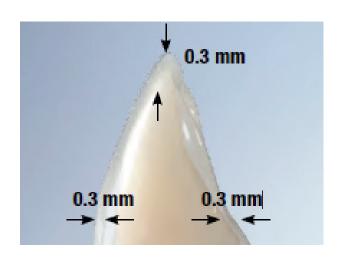
Live Demo (long)—how to dip and custom shade monolithic Lava™ Plus Zirconia restorations (12:56)

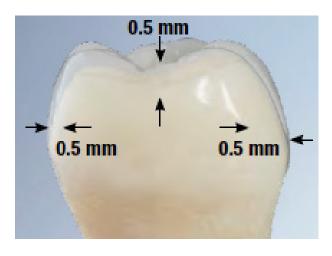


Download the 20-page Step-By-Step Shading Guide for Lava™ Plus High Translucency Ziconia (PDF 1.9 MB)

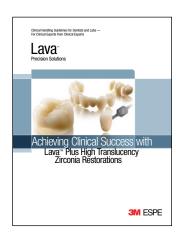


Preparation for monolithic restorations





- Tooth preparations for monolithic restorations based on the dimensions indicated are sufficient
- 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



For complete preparation guidelines, download the 28-page brochure: Clinical Handling Guidelines for Dentists and Labs (PDF 3.2 MB)



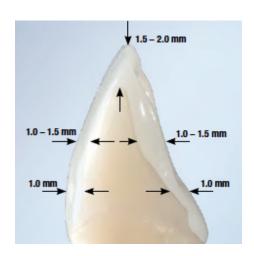
Special preparations

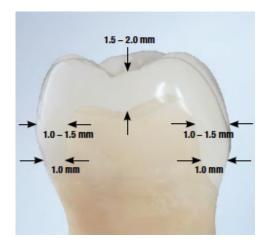
Feathered Margin Preparation: Steep feathered margin preparations may result in extremely thin tapered margins. In principle, this type of preparation is possible, but caution is advised.

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



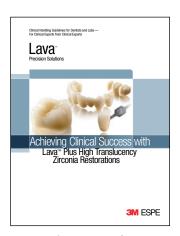
Preparations for veneered restorations





Ideal preparation: shoulder or chamfer?

- A reduction of the tooth structure based on the dimensions indicated is sufficient
- 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 shoulder or chamfer with a horizontal angle of at least 5°
- The vertical preparation angle should be at least 4°
- The inside angle of the shoulder preparation must be given a rounded contour. All occlusal and incisal edges should also be rounded
- The marginal edge of the preparation needs to be continuous and clearly visible. A bevel should be avoided



For complete preparation guidelines, such as adhesive bridges, inlay bridges and further detail on acceptable preparation designs, download the 28-page brochure: Clinical Handling Guidelines for Dentists and Labs (PDF 3.2 MB)

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

Clinical Handling

Adjustment and polishing of Lava™ Plus High Translucency Zirconia monolithic, all-zirconia crown













If endodontic access is necessary:

- A coarse new diamond bur should be used to create access to the pulp. During the opening process of the zirconia restoration, intense water cooling is crucial to avoid heating
- Please ensure adequate amounts of water always coat the rotating instrument

If the removal of a Lava™ Plus High Translucency Zirconia restoration is necessary:

 Use a new conventional rotating diamond tool and adequate water cooling to introduce a slit and lift the restoration with a common dental office chisel as an aid to pull off the restoration

Watch this video



Adjustment and polishing steps shown in the Seating a Monollithic Restoration—Lava™ Plus High Translucency Zirconia (2:45)

Cementation

Here's a simple way to assure dentists experience ultimate success seating crowns and bridges.

Lava™ Plus High Translucency Zirconia

RelyX[™] Unicem 2 Automix Self-Adhesive Resin Cement



When seating crowns and bridges, confidence is everything.

Due to the high flexural strength of Lava™ Plus High Translucency Zirconia, no adhesive is needed, so you can choose RelyX™ Unicem 2 Automix Self-Adhesive Resin Cement. It's recognized as a top product for self-adhesive cement by Dental Advisor.

And talk about easy ... no tooth pre-treatment is required, and it's so versatile that you can use it for a wide range of indications—from crowns to longspan, multi-unit bridges.* Now you don't need to sacrifice confidence for simplicity. When you use RelyX Unicem 2 cement, you get both.

*For complete indication details and contraindications, refer to Instructions For Use.

Cementation

Cementation of zirconia crowns ... made easy with RelyX™ Unicem 2 **Automix Self-Adhesive Resin Cement**

Tip: Make sure any

residue (temporary cement, desensitizers,

etc.) is completely removed. Do not use H₀O₀, EDTA or Na₀CO₀.

Prepare restoration



Sandblast the restoration with aluminum oxide after try-in (Max 2 bar or 30 PSI, particle size ≤ 40µm).



Clean with alcohol and air dry with oil-free air.

Pretreat tooth



Remove provisional restoration. Mechanically clean prepared tooth (e.g. with pumice paste).

Apply cement and seat



Discard a small amount of cement onto the mix-pad to ensure a perfect mix.



Dispense cement directly into the crown.

Tip: If sandblasting is done in laboratory before try-in, clean saliva contamination with NaOCI (ca. 5%) and rinse with water. Do not use phosphoric acid for cleaning.

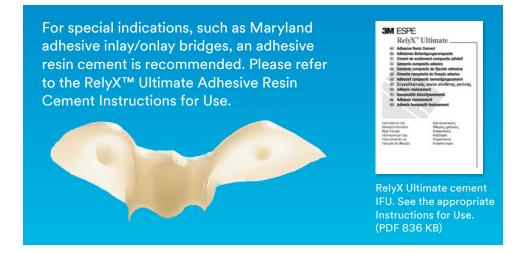
Final cure



Light cure for 20 seconds per surface or wait 6 minutes from start of mix for dark cure. Finish and polish as needed.

Finished crown





Resources

Brochures



Lava™ Plus High Translucency Zirconia Brochure for Labs (PDF, 1.4MB)

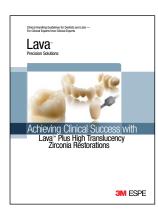


Lava™ Plus High Translucency Zirconia Brochure for Dentists (PDF, 785.6KB)

Application Guides

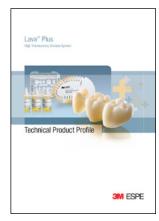


Lava™ Plus High Translucency Zirconia Step-by-Step Shading Guide (PDF, 1.0MB)



Lava[™] Plus Clinical Handling Guidelines for Dentists and Labs (PDF, 3.0MB)

Technical **Product Profile**



Lava™ Plus Technical Product Profile (PDF, 3.1MB)

Scientific Fact Sheet



Lava[™] Plus High Translucency Zirconia shading – True colors explained (PDF, 616KB)

Safety Data Sheets

3M™ ESPE™ Lava™ Plus High Translucency Zirconia Effect Shade Pink/Purple (US)

3M™ ESPE™ Lava™ Plus High Translucency Zirconia Dyeing Liquid A2, A3, A3.5, A4, B3, B4, C3, C4, D3 (US)

3M™ ESPE™ Lava™ Plus High Translucency Zirconia Effect Shade Fluorescence/Grey (US)

3M™ ESPE™ Lava™ Plus High Translucency Zirconia Dyeing Liquid A1, B1, B2, C1, C2, D2, D4 (US)

3M™ ESPE™ Lava™ Plus High Translucency Zirconia Dyeing Liquid W1, W3 (US)

3M™ ESPE™ Lava™ Plus High Translucency Zirconia Mill Blank 20, 40, Multi L, Multi XL (US)

3M[™] ESPE[™] Lava[™] Plus High Translucency Zirconia Effect Shade Brown, Orange (US)

3M™ ESPE™ Lava™ Plus High Translucency Zirconia Effect Shade Kit (US)

3M™ ESPE™ Lava™ Plus High Translucency Zirconia Color Marker (US)

3M™ ESPE™ Lava™ Plus High Translucency Zirconia Effect Shade White (US)

3M™ ESPE™ Lava™ Plus High Translucency Zirconia Effect Shade Yellow (US)

Resources

Videos



Finishing a Monolithic Restoration—Lava™ Plus High Translucency Zirconia (2:09)



Adjustment and polishing steps shown in the Seating a Monollithic Restoration—Lava™ Plus High Translucency Zirconia (2:45)



How to dip and custom shade monolithic Lava™ Plus Zirconia restorations (12:56)



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