Many Procedures Remain the Same
With 3M™ ESPE™ Lava™ crowns and bridges, you provide high-quality restorations to your customers. In addition to natural esthetics and durability, Lava crowns and bridges also stand out for their excellent fit. To achieve this, practice and laboratory have to meet just a few basic requirements.

Zirconium Oxide – the Framework Material of the Future
Unlike traditional all-ceramic restorations, Lava™ restorations are made of zirconium oxide. This strong material does not require a distinct shoulder to support the framework or to enhance the esthetics. In addition, the margins can be thinly tapered. This means the preparation for Lava restorations protects the tooth structure.

Minimal Reduction
The zirconia used for Lava™ framework is strong enough to allow for thin walls. Space for an opaque layer is not required. Therefore, a reduction of the tooth structure based on the dimensions indicated below is sufficient.

Shoulder or Chamfer to set Precise Limits
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 posterior and anterior teeth, a supragingival margin poses no problems. Due to the tooth-colored framework, very aesthetic results can be achieved.
Preparation for Lava™ Crowns and Bridges.

Special Preparations

Tangential preparation: Steep tangential preparations may result in extremely thin tapered margins. In principle, this type of preparation is possible, but caution is advised.

Parallel walls: In principle, parallel wall preparations are feasible. However, a cement gap cannot be milled in this case. This may significantly affect the fit.

Unacceptable Preparations

Gutter Preparation: Margin cannot be detected unambiguously.

90° Shoulder: Margin cannot be detected unambiguously.

Undercuts must be avoided.

Parallel walls: In principle, parallel wall preparations are feasible. However, a cement gap cannot be milled in this case. This may significantly affect the fit.

Sharp incisal-occlusal edges must be avoided. The rounding radius should be > 0.4 mm.

Divergent stumps in the bridge cannot be milled. Due to the restricted path of insertion inclination of the two stumps can not be realized.
Preparation for Lava™ Adhesive and Inlay Bridges.

Preparation:

Tooth preparation has an influence on the survival of the restoration. Especially in the case of Maryland bridges (anterior adhesive bridges) retentive elements should be prepared (e.g. seating groove and pinhole (M. Behr and A. Leibrock, 1998, El Mowafy 2003, Kern (2005), see dental textbooks).

The teeth to be restored by a 3M™ ESPE™ Lava™ zirconia adhesive bridge should be prepared according to the following instructions. In general, rounded edges and clear margins are required for full ceramic restorations.

Preparation Maryland bridges (anterior adhesive bridges):

- **Preparation depth:** up to 0.7 mm; The preparation needs to be in enamel instead of dentin. The enamel depth of a tooth can vary from 0.4 to 1.0 mm (W. Kullmann 1990). Wall thickness of zirconia framework: 0.5 mm minimum to ensure sufficient strength.

- **Veneering:** 0.1 mm (Glazing is necessary to prevent abrasion of antagonist); If the preparation depth can not be realized with the minimum wall thickness of 0.6 mm (zirconia + glazing) due to insufficient enamel thickness, the dentist should re-evaluate this indication. If the zirconia is not glazed, the restoration should not have any occlusal contact. We recommend the use of a preparation matrix before tooth preparation to be able to check the preparation depth.

For the preparations of retentive elements see figure 1 to 3 (e.g. pinholes, seating groove). In general a radius of ≥ 0.4 mm is required for the milling in the Lava system.

**Figure 1:** Rounded angles (Radius ≥ 0.4 mm, no sharp edges), clear margin and horizontal angle ≥ 2°.

**Figure 2:** Retentive element: rounded ridge (Radius ≥ 0.4 mm).

**Figure 3:** Retentive element: rounded pinhole (no sharp edges, radius ≥ 0.4 mm).

**Figure 4:** Not possible: circular preparation of the wings, no preparation in the middle, only one preparation margin can be detected by the system.

**Remember:** Adhesive and inlay bridges are more complex to manufacture. With these restorations, it is even more important than ever to follow the preparation guidelines to avoid inferior marginal adaptation and lengthy manual fitting efforts after milling.
In comparison to a 3-unit Maryland bridge, fixed-pontic-fixed, a cantilever 2-unit Maryland bridge, fixed-pontic, design is even more conservative, since only one abutment tooth needs to be prepared. The risk of unnoticed debonding and consecutive secondary caries is low. However, debonding of a single retainer adhesive bridge could directly lead to loss or swallowing/aspiration of the restoration. In general clinical studies show a better survival rate of 2-unit cantilever bridges. When considering adhesive bridges, the recommendations of the national or regional dental association need to be followed where applicable.

Preparation of Inlay Bridge (see Figure 5 and 6):

**Preparation depth:** 2 – 4 mm
- It is important to have sufficient space for a connector of 9 mm².
- The preparation should have a taper of ≥ 2° to 3° and have no friction.
- The margins must be clearly indicated.
- Full ceramic preparation in general requires rounded angles (no sharp edges, minimum radius ≥ 0.4 mm)
- Wall thickness of zirconia inlay: ≥ 0.5 mm

**Veneering:** Veneering or glazing is necessary to prevent abrasion of antagonist.
- Maximal length of pontic: 10 mm

In the case of vestibular and lingual/palatinal wings in addition to the inlay cavity, the wings can be prepared by the Lava system maximally until a 90° angle to the inlay preparation (see figure 7a + b).

*References: please turn back for further informations*