Universal Crown and Bridge Preparation
The All-Ceramic Crown Preparation Technique for Predictable Success
According to Dr. Ronald E. Goldstein
The Universal* Crown and Bridge Kit
Method of Tooth Preparation

The creation of an esthetically successful restoration requires the careful synthesis of both functional and overall esthetic considerations. The most important element of this process resides in the actual tooth preparation. When an all-ceramic crown is planned, a balanced and uniform reduction of tooth structure is essential for positive esthetic and functional results. Inadequate tooth reduction can result in unsatisfactory decreased thickness of porcelain, potential shade problems or structural weakness in the crown itself. Inadequate reduction of the tooth can also result in an over-contoured crown, possibly creating traumatic pressure on the gingival attachment.

The Universal All-Ceramic Crown and Bridge Kit by Brasseler USA contains virtually all the instruments necessary for making predictable esthetic tooth preparations. (The technique is patterned after clinicians Dr. R. Sheldon Stein and Dr. Ronald Goldstein.) This controlled method of tooth preparation takes the guess work out of tooth preparation. It consists of 3 basic steps: depth cut, enamel reduction, and margin refinement.

The Universal All-Ceramic Crown Method of tooth preparation is a contemporary technical approach for maximizing esthetic considerations without sacrificing functional requirements. In short, an esthetically pleasing crown restoration predicated on a structurally sound and long lasting base.

Advantages

The Universal method utilizes specifically designed and precisely gauged diamond instruments for atraumatic tooth preparation. The Universal technique described on the following pages offers the following important contributions:

• Precise, time-saving method for rapid and atraumatic tooth reduction
• Predictable and consistent tooth preparation
• Predictable esthetic results
• Creation of structurally sound crowns
• Measured uniformity and control in bulk reduction procedures
• Easier margin interpretation by the ceramist
• Long working life and cooler, faster cutting action

*The Universal method is adapted from Esthetics in Dentistry by Ronald E. Goldstein, DDS, published by BC Decker, Inc.

For more information on this and other dental procedures please visit www.dentalxp.com
1. Esthetic Depth Cut

A key to the Universal method is the measured reduction of the horizontal and vertical aspects to a predictable depth. This is accomplished in two steps:

**Horizontal Depth Cut**

Using the AC3 (premeasured 1.5 mm round) or AC4 (premeasured 1.2 mm round) diamond (Fig. 1), a trench is cut to the full depth of the diamond at the gingival level completely around both the labial and lingual surfaces for anterior teeth and the buccal/lingual for posterior teeth. To avoid tissue laceration, take care to not extend into the gingival sulcus. For lower anterior teeth and where significant gingival recession is present, the AC4 (premeasured 1.2 mm round) diamond should be used.

**Vertical Depth Cut**

The depth cut is continued using the AC3 or AC4 for the gingivo-incisal or gingivo-occlusal aspects. Starting at the center of the labial or buccal surface (Fig. 2), continue the depth cut from the cervical middle straight down to the incisal or occlusal edge. The depth of the cut is still controlled by the premeasured round diamond. Next, move to the incisal or occlusal surface. Since the incisal or occlusal clearance should be 1.5 to 1.7 mm, slightly more reduction should take place at these aspects.

Make sure you plan exactly how much reduction your preparation will require. For instance, you will not need full labial reduction if you are building-out the tooth labially. However, you will probably want maximum lingual reduction in this situation.

2. Bulk Enamel Removal

The esthetic depth cuts should now provide visualization of the final tooth preparation form, so enamel can now be stripped away quickly while confidently retaining the correct depth thickness (Fig. 3 and Fig. 4). Remove enamel and dentin, while maintaining a rounded internal angle avoiding sharp line angles. For all-ceramic crowns use the AC5 or the AC7 to complete the preparation by removing the enamel as outlined by the esthetic depth cuts. For mandibular anterior teeth use the smaller AC7 for bulb reduction. In extremely small or narrow teeth use the AC9 diamond.
3. Incisal / Occlusal Clearance

Using the same round-end tapered diamond, reduce the incisal surface approximately 1.5 mm to obtain proper clearance (Fig. 5). When necessary it may be possible to compromise the incisal reduction to 1 mm and alter the teeth in the opposing arch.

4. Lingual Reduction

The AC10 is used to uniformly reduce the contours of the lingual surface (Fig. 6). The AC10 is the ideal diamond to reduce the occlusal aspect of posterior teeth as well. Either a plastic or rubber thickness gauge can be used to make certain that sufficient space is created.

5. Margin Refinement

Preparation and refining of the shoulder margin are important steps of the universal procedure. It is easily accomplished with the beveled-end cutting diamond (AC11 and AC12) shapes (Fig. 7). These diamonds have extremely fine diamond particles on the flat tip only. When finishing subgingival margins to a smooth surface, the beveled corners and smooth sides of the tip help avoid lacerations by pushing soft tissue aside. It is very important to provide a clear, sharp outer margin so the ceramist will have no problem determining the exact margin. A shoulder margin of approximately 1 mm is ideal.

Tissue laceration can also be avoided by displacing the gingival tissue for several minutes with cotton retraction cord just prior to finishing the margin.

6. Finish of Preparation

In the final step the preparation is finished to a smoother surface with the same size round-end tapered diamond used to make the preparation margin, but with medium diamond grit. Use either the AC6 or AC8 diamond. Make sure you eliminate all sharp line angle edges of the prepared teeth, as well as any sharp internal line angles.

Figure 8 is an example of the final preparation.
The Universal Kit includes measured 1.2 mm and 1.5 mm round diamonds for establishing the axial wall reduction, incisal, or occlusal surface reduction (Fig. 2). Included within this kit are specifically-designed round-end tapered diamonds for stripping enamel for all-ceramic crown preparation procedures (AC5 - AC9). A special Universal diamond (AC2) is included for creation of beveled margins when indicated, or stripping enamel in very tight contact areas.

The Universal Kit also features shorter and thinner diamonds for use where the patient’s axial wall thickness and pulp chamber size necessitate more limited bulk reduction considerations. In these instances a smaller 1.2 mm round universal diamond (AC4) is provided for reduced axial, incisal, or occlusal depth cuts. The thinner universal round-end tapered diamonds (AC7, AC8, AC9) also permit reduction of the axial wall with less chance of endangering the pulp chamber as a consequence of excessive enamel removal.

The XL Diamond (AC1) is included in the kit for special situations involving extra long teeth, periodontally involved teeth, and teeth with gingival tissue shrinkage.

The most important step is margin placement accomplished with the tissue-protective beveled-end cutting diamonds (AC11 and AC12). As you extend into the gingival sulcus, the bevel and smooth shank protect the tissue from being lacerated. This step also protects against making an unwanted undercut in the axial wall.

An alternate technique is to use tissue displacement cord for 5 minutes to isolate and protect the gingival tissue before the shoulder margin is prepared. In the event of advanced bone loss and an extremely long crown, you may need to revert to a ceramo-metal crown with a chamfer of feather-edge margin. The AC1 and the AC2 are good choices for this procedure. These are also the extra-coarse diamond instruments of choice to roughen the enamel for direct bonding procedures.

Another consideration for darkly stained teeth, unless the teeth need building out labially, is to plan on reducing both incisal and occlusal surfaces greater than 1.5 mm.

A final consideration, if you are using a Zirconia core, is to plan on a reduction of about 1.7 mm to allow for proper thickness of both core and ceramic.