

# Posterior Tooth-Colored Indirect Partial Veneer Restorations

## Bonding Procedures

**Evaluation of Restoration on Die & Working Cast (Prior to the patient's appointment)** (For preclinical lab exercise use your tooth die and Viade cast instead of a stone cast.)

1. **Evaluate the restoration for proper shade, contours and surface characteristics.** If the restoration is not correct then modify by staining, re-contouring and/or altering the surface characteristics. This procedure may be done by the dentist or the restoration may need to be returned to the lab for modification or re-make.
2. **Try restoration on the die and evaluate the marginal fit.** If the margins are excessively open then the restoration should be returned to the lab for re-fabrication or marginal correction. If the margins are in excess or bulky then they can be adjusted. Gingival and inaccessible marginal areas should be adjusted on the die. Use the coarse green Brasseler wheel (R17DG) to remove any areas that have excess or are bulky. Margins in accessible areas should be adjusted after bonding to reduce the risk of marginal fracture.
3. **Try in restoration on the working cast to evaluate the proximal contact areas.** Visually evaluate to determine if there is a proper contact area and that the restoration is in contact with the adjacent teeth. Test with thin silver mylar to determine the tightness of the contact. The mylar should pull through with resistance. If the contact is too tight then mark the contact with AccuFilm articulating material and adjust with the coarse green Brasseler wheel (R17DG) until the contact has the proper dimension and tightness.
4. **Evaluate the axial contours on the working cast.** If the restoration is under-contoured then it needs to be returned to the lab for addition of porcelain. If there are area that are over-contoured then mark the areas with a pencil and remove the restoration and adjust the contours with the restoration on the die. Use the coarse green Brasseler wheel (R17DG) to remove the excess. Try the restoration back on the working cast and adjust until the proper contours are achieved. It is difficult, if not impossible, to re-contour the restoration after bonding to the tooth.
5. **Evaluate the occlusion on the working cast.** (This step cannot be done on this lab project, as there is no opposing cast.) Use the AccuFilm articulating material to mark the occlusal, centric and lateral, contacts prior to insertion of the restoration into the working cast. Place the restoration into the working cast and check for centric contacts with silver mylar. The mylar should hold evenly with the adjacent teeth. If the centric contacts are heavy on the restoration then re-mark the occlusal contacts with a different color and adjust with the coarse green Brasseler wheel (R17DG) or the coarse Brasseler point (W16DG). Mark the excursive contacts and adjust as required.
6. **Polish all areas that were adjusted with the coarse porcelain wheels or points.** Use the medium pink Brasseler wheel (R17DM) and/or point

(W16DM) to smooth the adjusted areas. Follow this with the light gray wheel (R17D) and/or point (W16D) to do the final polish.

7. **Evaluate the internal surface of the restoration for proper surface treatment (porcelain etch).** The surface should have a frosty white appearance when properly etched. The etched area should extend uniformly over the entire internal surface and to the internal margins of the restoration. If there are areas that are not properly etched use the yellow hydrofluoric acid gel (Ultradent Porcelain Etching Gel) for 3 minutes. Wash thoroughly, dry and evaluate for frosty appearance. If surface does not etch there may be contamination such as wax on the surface. Carefully air abrade the area and re-etch until the surface is frosty. Care should be taken to protect your eyes, hands and clothing while using this acid, as it is extremely caustic.

The restoration is now ready to try in the patient's mouth.

### **Try-in procedures, in patient's mouth, prior to bonding**

1. **Remove the provisional restoration and all temporary cement.** Carefully remove the provisional restoration being careful not to damage the margins of the preparation. Use an explorer to remove any temporary cement that is left on the surface of the tooth.
2. **Try in the restoration with water to evaluate the esthetics.** Evaluate to insure the proper shade, contours and surface characteristics have been achieved. Modify as necessary. It is extremely important to have the patient observe the restoration in normal lighting conditions (not with the dental operatory light) to determine if they are satisfied with the esthetics of the restoration.
3. **Isolate the teeth with a rubber dam.** It is important that the rubber dam is properly placed with proper invagination to insure that the tissues are retracted and that there will not be any leakage at the time of bonding the restoration to the tooth.
4. **Clean the preparation and adjacent teeth.** Use fine pumice on a small applicator tip (Kerr) to scrub the internal of the prep and adjacent teeth to insure that all debris has been removed. To prevent leakage after bonding, special attention should be paid to cleaning the gingival marginal areas.
5. **Evaluate the proximal contact areas and adjust as required.** Visually evaluate to determine if there is a proper contact area and that the restoration is in contact with the adjacent teeth. Gently, hold the restoration in place with an instrument and test the contact area with thin dental floss to determine the firmness of the contact. The floss should go through with resistance but not shred or tear. If the contact is too tight then mark the contact with AccuFilm articulating material and adjust with the coarse green Brasseler wheel (R17DG) until the contact has the proper dimension and tightness.
6. **Evaluate the marginal fit.** Visually and tacitly (use an explorer while holding the restoration in place with an instrument) evaluate the margins to insure it fits properly. If the margins are excessively open then the restoration should be returned to the lab for re-fabrication or marginal correction. If the

margins are in excess or bulky they should be adjusted. Gingival and inaccessible marginal areas should be adjusted on the die. Use the coarse green Brasseler wheel (R17DG) to remove any areas that have excess or are bulky. Margins in accessible areas should be adjusted after bonding to reduce the risk of marginal fracture.

7. **Evaluate the axial contours.** If the restoration is under-contoured then it needs to be returned to the lab for addition of porcelain. If there are area that are over-contoured then mark the areas with a pencil and remove restoration and adjust the contours with the restoration on the die. Use the coarse green Brasseler wheel (R17DG) to remove the excess. Try the restoration back on the tooth and adjust until the proper contours are achieved. It is difficult, if not impossible, to re-contour the restoration after bonding to the tooth.
8. **Do not attempt to evaluate the occlusion until after the restoration has been bonded as the restoration may fracture.**
9. **Polish all areas that have been adjusted.** Use the medium pink Brasseler wheel (R17DM) and/or point (W16DM) to smooth the adjusted areas. Follow this with the light gray wheel (R17D) and/or point (W16D) to do the final polish.

### **Bonding procedures**

1. **Clean the surface of the restoration prior to bonding.** Place the restoration in acetone (preferably in conjunction with ultrasonic vibration) to remove all organic debris from the internal surface of the restoration. Dry the restoration.
2. **Organization for bonding procedure.** When bonding an indirect posterior tooth-colored restoration there may be areas of the preparation that are not accessible to the light necessary for polymerization of a light cured bonding resin. Therefore, you will be using a dual cure material (Ultradent's Permaflo DC), which polymerizes both chemically and with light. Complete chemical polymerization occurs in approximately 9 minutes. Therefore, it is essential that you place and remove excess bonding material efficiently before the luting material begins to harden. It is recommended that you use an assistant during this procedure.
3. **Acid etch the preparation.** Use a mylar matrix band to protect the adjacent teeth during the etching procedure. Apply a 37% phosphoric acid gel for 20 seconds on the enamel surfaces and approximately 1 mm beyond the margins. Wash thoroughly and dry to observe for the frosty white surface that is indicative of proper enamel etching. If there are areas of exposed dentin they should be etched separately for 5 seconds and then the tooth should be blotted dry with cotton pellets to prevent dehydration and a collapse of the collagen fibrils.
4. **Application of bonding agent.** Use a mylar matrix band to protect the adjacent teeth during the placement of the bonding agent. Use a dual curing dentin and enamel bonding agent, as there may be areas where the curing light may not reach. In the lab you will be using Ultradent's dual cure bonding resin. The bonding resin comes as an A & B resin. Using the disposable

- syringe with the black mini brush tip (Ultradent) apply one coat of A liberally on the surface of the preparation followed by one coat of B liberally placed on the surface of the preparation. Thin the bonding agent with compressed air. Use the same procedure to coat the internal surface of the restoration.
5. **Mixing the luting material.** Place the white spiral mixing tip on the Ultradent Permaflo DC luting material. Use the black locking collar to attach the mixing tip. Attach the black mini-tip to the disposable syringe (Ultradent's Skini Syringe) and extrude a small amount of the mixed Permaflo material into the back end of the syringe.
  6. **Apply the dual cure luting material to the preparation.** Place the tip of the disposable syringe into the proximal box portion of the preparation and extrude material onto the gingival floor and then cover the remaining areas of the preparation. Do this procedure as quickly as possible with as little external light as possible.
  7. **Insertion of the restoration.** Place the restoration into the preparation and apply gentle finger pressure until the restoration is completely seated. Hold the restoration with an instrument (small ball burnisher) to allow access for removal of excess luting material.
  8. **Removal of excess luting material.** Hold the restoration in place with the small ball burnisher during the complete removal procedure. By **not** keeping constant pressure on the restoration you might inadvertently unseat the restoration. Use the micro applicator tips (Kerr) to remove excess luting material from the facial, lingual and gingival margins as well as the interproximal embrasures. A small brush can also be used to remove the excess material from the gingival embrasures. Use an explorer to remove additional excess from the embrasures as required. Since there is always an air-inhibited layer on the surface of all composite resin material it is advisable to leave a small amount of excess luting material at all marginal areas. Apply some of the Triad lubricant to the marginal areas of the restoration with a Kerr micro applicator tip. The Triad lubricant covering the excess composite will insure the surface polymerizes as it prevents air inhibition. The excess composite luting material will be removed when finishing the margins leaving properly polymerized composite at the margins of the restoration.
  9. **Polymerize the bonding material.** Light cure from the occlusal, facial and lingual for 40 seconds in each area. Keep the light as close to the restoration as possible to maximize its effectiveness.

### **Adjusting the bonded restoration**

1. **Remove excess luting material.** Use the #12 blade to remove the excess material from the gingival embrasures. Use dental floss to remove excess material from the contact area. If the teeth are bonded together use an instrument and gently separate the teeth. You may hear a cracking sound (warn your patient) but this will not break the tooth or restoration. An explorer will help in the removal of material from the embrasure areas.
2. **Adjust the margins.** Where required, use a fine diamond or coarse Brasseler polishing point (W16DG) to finish the margin of the restoration. The

diamond should be run from the restoration to the tooth to prevent excessive removal of the surface of the tooth. It is unacceptable to excessively alter the contours of the tooth. When the margin is flush with the surface of the tooth you are ready to begin the polishing procedure.

3. **Polish the margins of the restoration.** Use the medium and fine porcelain points (W16DM & W16D) to polish the porcelain in areas where the margin was adjusted with coarse instruments. All accessible margins should now be polished with composite polishing points and discs. Use the medium to fine SofLex discs (3M) or the coarse green, medium yellow and white fine discs and points (Ultradent) to smooth and polish the composite margin interface. If the gingival margin is rough it can be smoothed with strips going from coarse to fine. Evaluate to see that the margins are flush with the surface of the tooth and are smooth and polished.
4. **Remove the rubber dam.**
5. **Evaluate and adjust the occlusion.** Check for centric contacts with silver mylar. The mylar should hold evenly with the adjacent teeth. If the centric contacts are heavy on the restoration then use the AccuFilm articulating material to mark the centric contact and adjust with the coarse green Brasseler wheel (R17DG) or the coarse Brasseler point (W16DG) until the contact are marking evenly on the restoration as well as the adjacent teeth. Recheck with the silver mylar to verify the teeth are occluding evenly with the other teeth in the mouth. Ask the patient if the occlusion feels comfortable. Mark the excursive contacts and adjust as required.

#### **Instructions for the Care and Maintenance of the Restoration**

1. Encourage the patient to enjoy their beautiful new teeth.
2. Advise the patient to treat the restored teeth as healthy natural teeth.
3. To help prevent fracture of the porcelain the patient should avoid chewing excessively hard objects such as ice, bones and hard candies.
4. The patient should continue normal oral hygiene procedures such as brushing and flossing.
5. If the patient experiences any abnormalities or discomfort they should report this immediately to their dentist.
6. Patients with destructive oral habits, such as clenching or bruxism, should be treated with an occlusal protective device, such as a night guard, as soon as possible after placement of the restorations.