



Hawley Retainer Fabrication Technique

Safety glasses should be worn for all lab procedures as well as gloves when handling acrylics. Items featured in this technique are found on the last page.



- 1 Apply a small amount of liquid separator foil to the model except along the facial areas where the wires will be waxed in place.



- 2 Use a Bunsen burner and #7 wax spatula to secure the wires with hot baseplate wax on the facial.



- 3 Place a small quantity of pellets in the bottom of the cup to support the model, allowing the occlusal-incisal edges to be at the same height as the rim (lip) of the cup. Add a substantial amount of pellets on the facial surface, bridging the gap flat between the occlusal-incisal margin and top edge of the cup. Level these pellets with a 1-inch brush. Then tap the rim of the cup with the brush handle to ensure that no loose pellets can fall into the palate. Also, make sure no pellets are present along the cup's rim.



- 4 Set a 2 or 2.5 mm thick piece of Biocryl or colored Biocryl of choice on the pressure chamber and secure it with the clamping frame. A small amount of acrylic resin must be applied to the wires to bond them onto the thermoformed material. After the heat has been applied to Biocryl material locked onto the chamber, a maple syrup consistency of acrylic resin is mixed in a small resinmix cup 40-45 seconds prior to the conclusion of the heating time.



- 5 20-30 seconds before the heating cycle ends, the resin mix is applied to the wire letting it flow under the wire from the gingival margin to the end. Maximum bonding between the acrylic resin and Biostar material occurs when cold cure acrylic is in its non-polymerized or liquid state.



- 6 At the end of the heating cycle, close the chamber by first removing the heat source and bringing the chamber over the cup with the model in place.



- 7 Then with the right hand turn the locking handle toward the front of the machine. Pressure should be maintained for a minimum of 120-180 seconds for the liquid acrylic to completely polymerize and bond to Biostar material.



- 8 At the end of the cooling phase, release air pressure by pressing the "evacuate" pad.



- 9 When the pressure is released, turn the locking handle toward the back of the machine. With the left hand, turn the clamping frame handle to the left and lift the chamber back to its rest position. Remove the appliance from the pellet cup.



- 10 Release all loose lead pellets from the appliance with a knife or spatula over the Biostar to minimize pellet loss. Loosen wires with a knife, and then separate the model from the appliance. If any plaster teeth have broken in the blank, chip them away before the appliance is cut from the blank. Plaster will dull the cutting bur.



- 11 The lower retainer acrylizing process is the same as the three previously discussed procedures with the upper model. The lower retainer has a horseshoe acrylic body that is fabricated on the lingual surface of the dentition and tissues. Prior to lower retainer fabrication, identify the soft tissue undercuts. These areas should be relieved (blocked-out) to prevent soft tissue impingement during appliance insertion and removal.



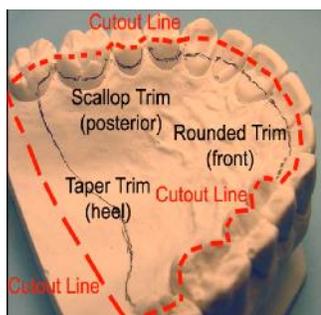
- 12 For lower retainers fabricated on the Biostar machine, a thin layer of "salt and pepper" acrylic resin should be applied to the lingual soft tissue area and cured in a pressure pot before the Biostar process. During material heating, a maple syrup consistency of acrylic resin should be applied to all hardened cold cure acrylic to adhere it to the thermal formed plate. This increases the appliance's strength and rigidity. *The lower retainer is trimmed in the same manner as the upper.*

Trimming Procedure

- 13 Retainer trimming can be divided into two categories of cut-out/rough trim and final trimming. Cut-out/rough trim refers to cutting out the basic shape of the retainer followed by thinning and smoothing excessive bulkiness.

The equipment that is used commonly for these procedures includes:

- A dental lathe w/quick-chuck attachment for fast bur replacement.
- A lathe splash pan with adequate suction unit to remove trimming dust.
- An acrylic grinding stone attached to a quick-chuck mandrel.
- A 1/2-inch tapered or egg carbide lathe bur.
- A trimming station or tower shield with suction.
- An electric or air driven laboratory handpiece.
- A series of handpiece burs (carbide cone or taper, 3/4-inch lightning discs, standard mandrels, sandpaper, sandpaper mandrel, and cutting burs).



- 14 The retainer shape must be cut out before the final trim can be completed. The cutout line should be approximately 3-4mm above the final trim reference. The plastic is cut at the distal of the molars and along the lingual cusp tips at the posterior segment. The anterior section is cut near the incisal edges.



15 **Cutout/Rough Trim**

Cutout is the first trimming procedure necessary to fabricate a Hawley-type retainer. Using a carbide cutting bur in a lab handpiece, cut out the retainer from the disc. Start by cutting along the back of the appliance at the first or second molar reference. Then cut along the lingual cusps of the posterior teeth and near the incisal edges of the anteriors. Caution must be used around the wires that are embedded in the plastic. Either pull the bur out of the plastic at the wires and continue on the other side or cut out around wires. Once the cut has been made, remove the retainer from the disc.



16 **Final Trim**

In most retainer designs the anterior acrylic is rounded down to the interdental papilla, maintaining palatal tooth contact and not interfering with the opposing lower incisors. A carbide cone or taper bur is used in a laboratory handpiece. Viewing the tissue side of the retainer, identify the interdental papilla and place the bur between the labial bow and anterior acrylic. Trim the acrylic, cuspid to cuspid using the bur. Create a rounded, symmetrical anterior contour along teeth.



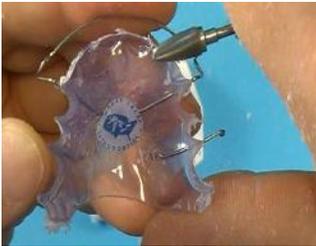
- 17 With a carbide cone or taper bur in the laboratory handpiece, scallop the posterior section approximately 1.5mm above the gingival tissues. To trim this properly, the handpiece and bur must be precisely positioned parallel to the occlusal surface of the retainer. The goal during posterior scalloping is to reduce acrylic tooth contact in an occlusal to gingival direction, not away from the teeth. Thus, the handpiece should be positioned near the occlusal of the opposite side of the retainer.



- 18 Turn the appliance to view the gingival contours. Reduce the acrylic to 1.5mm from the gingival margin.



- 19 The heel of the maxillary retainer is tapered forward near the mid-palatal area. Maintain plastic contact against the last tooth on each side of the arch and taper acrylic forward about $\frac{1}{4}$ -inch.



- 20 Remove any acrylic ledges around the periphery with the bur. The acrylic should contact the dentition and slope smoothly toward the base of the palate. The scalloped posterior and anterior segments are blended into the retainer body.



- 21 Acrylic that extends along the wire to the occlusal area is removed with a brush-like bur in a lab handpiece. The brush-like bur will not harm wirework but will trim away acrylic.



- 22 Finally, the acrylic retainer is sanded smooth along all previously trimmed areas. A 3 to 4-inch strip of 150-grit sandpaper is inserted into the slot of the sandpaper bur. It is wrapped around the bur allowing the coarse side of the sandpaper to face outward. As the bur rotates quickly in the handpiece, the sandpaper slaps against the trimmed acrylic providing a smooth surface. Thus, minimal pumicing is required to achieve a glass-like finish.

Items featured in technique:

235-010 Astro Spec Safety Glasses (reg./blue)
235-062 N-Dex Non-latex Gloves (Med)
190-063 GLO Electric Waxer
260-018 Pink Wax
Biocryl Disk Materials
Summer Shades
Glitter Biocryl Disks
Pattern Biocryl
1 lb. Biocryl Resin Kits (Clear/Lt Blue/Pink)
175-102 Monomer Bottle
215-020 Snap Stone
075-004 Model Brush
175-027 Resimix Cup
165-004 Spatula
175-034 Separator
075-007 Separator Brushes
080-006 Micro torch
080-009 Gas refill
080-002 Wax Cup
175-005 Lab Knife
150-025 Lab Handpiece
145-008 Air Handpiece
085-027 Cutting Bur
085-009 Carbide Taper Bur
085-003 Carbide Cone Bur
086-038 Saw Bur
075-008 Bristle Brushes
085-022 Sandpaper Mandrel
060-007 Sandpaper Roll



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