



## Fabricating a Hawley Retainer with Screw

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.

### Retainer with Expansion Screw

- Used to broaden the dental arch in a transverse, mesial, and/or distal direction.
- Smaller screws may be used to align individual teeth.
- In most screws one activation is equivalent to .225mm of opening.
- Recommend one activation every 5-7 days.



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- 1 A retainer with an expansion screw is used to broaden the dental arch in a transverse, mesial, and/or distal direction. Smaller screws may be used to align individual teeth. In most expansion screws, a single activation is equivalent to .225mm of opening. A single activation is usually recommended every 5-7 days.

- 2 Before the transverse expansion screw is placed, the midline of the arch is identified. Draw a reference line through the center of the arch with a No. 2 pencil. Also identify the anterior/posterior position of the expansion screw by placing a transverse reference line at the second bicuspid region. The midpoint of the expansion screw will be referenced at the intersection of the two reference lines for the upper arch.



- 3 A slotting bur and a lab handpiece is used to create a groove in the center of the model along the center reference line. This groove will hold the plastic tab of the expansion screw in its proper position.



- 4 Remove model dust and place the tab of the expansion screw into the model slot. The screw tab should fit loosely within the slot. The arrow of the expansion screw should point to the heel of the model. Cut the tab as needed to allow screw to fit closer to the tissue. A 1 – 1 ½ mm gap should be present between the model and the screw body. Apply hygienic base plate wax into the slot on the model. The slot should be about half-filled with wax. Place the tab of the expansion screw into the soft wax in the model slot. The screw body should be referenced level to the occlusal plane and center opening or tab aligned with the midline reference.



- 5 Remove the expansion screw and apply liquid separator with a brush. Place the screw back into the model slot and secure with wax. Make sure the original reference position is established.



- 6 Secure the wire work in place with wax along the facial surface of the model.



- 7 Apply monomer liquid and polymer powder using the salt and pepper technique to flow under the expansion screw. Once the resin is cured, it will stabilize the screw's position during the pressure molding process of the retainer plate.

Place the model and acrylic into a humid pressure pot for 15 minutes. Pressure should be adjusted to approximately 20psi. At the end of the curing cycle, evacuate the pressure and remove model.



- 8 Remove the expansion screw tab with wire cutters. Cut the tab close to the top of the screw.



- 9 For the Biostar® or MiniSTAR® machine, adjust the pellets within the pellet cup to elevate the model. For a Hawley retainer, the top tooth surfaces should be at the height of the cup's rim. Fill the gap between the model and the cup's rim with pellets. Sweep excess pellets with a 1" brush. Pellet level should be against the occlusal tooth surfaces, heel of model, and should extend to the rim of the cup. Make sure the pellets are removed from the cup's rim.



- 10 Select a 2mm biocryl disc. A variety of colors and pattern designs are available. Clamp the biocryl disc onto the chamber. Identify the material's heating time or Biostar code and enter it into the machine. Swing the lamp over the material to initiate the heating cycle. With 45 seconds remaining in the heating cycle, mix monomer liquid and polymer powder to a syrup-like consistency with a #7 spatula. With approximately 20-30 seconds remaining in the heating cycle, apply the mixed resin to flow along wires as well as the expansion screw and cure support acrylic. The heating cycle and resin application should conclude at the same time.



- 11 At the end of the heating cycle, remove the lamp and swing the chamber over the model in the pellet cup and lock the chamber in place to initiate the forming process. Allow to cool under pressure for 2-3 minutes. During this process, the applied resin will cure. At the end of the cooling and curing cycle, evacuate the pressure from the chamber. Unlock the chamber and clamped material. Swing open the chamber and remove the formed material and model. With a lab knife, remove any pellets that may be stuck to the material.



- 12 Loosen the wires that were held in place with wax along the facial surface of the model and remove plastic.



- 13 Using a carbide cutting bur and 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. Cut long the lingual cusps of the posterior teeth and near the incisal edges of the anterior teeth. Caution must be used around the wires that are embedded in the plastic. Once the cut has been made in the plastic, remove the retainer from the disc.



- 14 The posterior segment is scalloped 1 ½ mm above the gingival margins to rest against the cervical crown surface and rounded to the interdental papilla height along the anterior dentition. This is accomplished by using a carbide cone or taper bur and a lab handpiece. The back or heel of the retainer is often 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 ¼ of an inch. Finally, the scalloped posterior and rounded anterior segments are blended into the retainer body.



- 15 The expansion screw cut is made through the center of the plastic plate. Place a reference line on the plastic along the midline. Using a 3/4" or 7/8" diameter lightning disc and lab handpiece, incorporate a center cut in the plastic along the reference line. Expose the key-hole of the expansion screw using a cutting bur and lab handpiece. Insert a wire key into the hole of the screw and rotate in the direction of the arrow on the screw body. Activate screw approximately 10 turns. Remove the plastic tab in the center of the screw with a lab plier.



- 16 Smooth the plastic along the center cut with a cone bur. Use a sandpaper mandrel with a 3" piece of 150-grit sandpaper with a lab handpiece on medium speed to smooth trimmed surfaces.



- 17 Keep the screw in an open position through all remaining steps. Close screw after pumice and polish process.



- 18 This retainer is pumiced and polished using the same procedure as outlined for the upper Hawley retainer.

**Items featured in technique:**

235-010 Astro Spec Safety Glasses (reg./blue)  
235-062 N-Dex Non-latex Gloves (Med)  
Vector Standard Expansion Screws  
Leone Standard Expansion Screws  
190-063 Electric Waxer  
260-018 Pink Wax  
260-013 Sticky Wax  
Biocryl Disc Material (Summer Shades, Glitter, Pattern)  
040-016 Biocryl Resin Kit  
175-102 Monomer Bottle  
225-040 Pressure Pot  
080-002 Wax Cup  
075-004 Model Brush  
175-027 Resinmix Cup  
165-004 Spatula  
175-034 Separator  
075-007 Separator Brushes  
030-014 1mm Copyplast  
080-006 Micro Torch  
080-009 Gas Refill  
170-005 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  
230-003 Medium Pumice  
086-003 Plastic Rag Wheel  
180-002 Lathe with Quick Chuck  
110-014 Splash Pan w/Light (right side)  
105-060 Handler Portavac  
086-002 Muslin Buffs  
180-016 Lathe Threaded Mandrel  
230-007 Tripoli  
230-008 Fabulustre  
230-010 Metal Polish



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