Precise whitening trays

Figure 1. The completed whitening tray - note the minimal intrusion on the oral mucosa.

By Peter Herring, Adv Dip Dent Tech, ACCDP

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Whitening trays for patient home use are possibly the single most widely constructed thermoformed appliance. Being relatively quick and easy to make, the benefits of making take-home whitening trays in house is readily apparent.

Tray designs

The highly effective Hydrogen Peroxide and Carbamide Peroxide solutions and gels used today require whitening tray designs that are much more exacting than in the past.

Prior to the huge increases in the popularity of home bleaching of the last decade and the subsequent improvements in whitening solutions, whitening trays were often much less precise than those required today. They were simply thermoformed with low vacuum machines and trimmed with scissors to a shape much like an abbreviated mouthguard. With the less efficacious and less viscose whitening solutions then in use, this allowed the teeth to be immersed in the solution as much as possible. This tray design also permits the whitening solution to have prolonged contact with the gingival margins and surrounding mucosa however, often leading to irritations and/or unwanted bleaching of these tissues.

Manufacturers of whitening gels now overwhelming recommend a scalloped tray design trimmed just short of the gingival margins (0.25mm -0.33mm). This gives a tray which is, for practical purposes, completely tooth borne with virtually no contact with the oral mucosa. Most solutions are now of a greater viscosity and contain additives which are designed to maintain contact with the tooth enamel. So with the scalloped tray design we have a very "clean" whitening process with only the teeth having contact with the solution; excess solution can be either wiped away by the patient or is washed clear of the mucosa by saliva.

Figure 2. Paint on latex spacer (Erkoskin, Part no. 62 50 50) is applied. It is easily removable from the model after use.

Figure 3. Embed the model into the granules to the area of the finished tray leaving an extra 2mm visible and form the EVA foil. (Erkoflex Bleach, Part no. 58 13 10).

The creation of "reservoirs" on the labial surface of the teeth to be whitened is also widely recom-

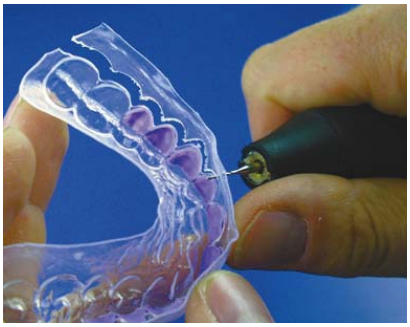

Figure 4. Using the twist drill HSS at high RPM (>20 000 rpm) trim around the gingival margins to achieve the final shape.

Figure 5. Remove the ERKOSKIN spacer.

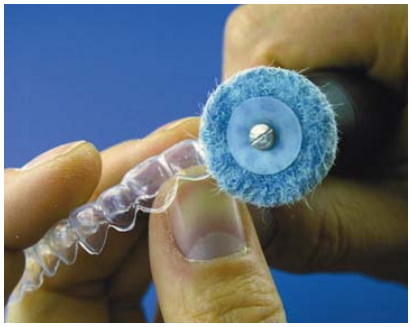

Figure 6. Finally smooth the edges of the tray with a silicon impregnated disc at low speed (<10 000 rpm). (Lisko-S part no. 22 32 10).

mended. This is a simple process with the new paint on spacers.

Materials

The most popular whitening tray materials are similar to the EVA's used for mouthguards but with a higher Shore-hardness (92) and at a 1mm pre-formed thickness. This gives a thin tray which is easy for patients to wear yet maintains its shape and contact with the teeth. EVA materials used for mouthguard construction are generally too flexible for this application.

The "foam backed" materials that are available are not required nowadays. These were developed in an attempt to contain the less viscous solutions of the day and there may also be a question of hygiene with the absorbent compressed foam internal layer.

About the author

Peter Herring is a dental technician and prosthetist based in Perth, Western Australia. He is a regular contributor to eLABORATE on thermoforming and is the Australian agent for Erkodent thermoforming machines. He also runs a busy laboratory dedicated to thermoformed appliances. For more infor, please call 1800-242-634 or pjh@erkodent.com.au