

# Accurate Polyvinyl Siloxane Impressions

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**W**ith digital systems such as Invisalign,\* Insignia,\*\* OrthoCAD,\*\*\* and Lingualcare† becoming more prevalent in orthodontics, the impression is often the only physical link between the patient and the computer-generated appliance. Because treatment quality is directly related to the accuracy of the impression, clinicians have been forced to switch from alginate to high-quality polyvinyl siloxane (PVS) materials that are more accurate and dimensionally stable.

PVS impressions, however, are significantly more expensive, time-consuming, and technique-sensitive than conventional alginate impressions. The material alone costs about \$20 per patient. Since rebonding a single bracket costs

\$75-100 in chairtime, the overall expenditure for a set of PVS impressions can easily exceed \$100. Multiple retakes are expensive and stressful for both staff and patients, and clinicians consequently may settle for less-than-ideal impressions.

Based on our experience in taking thousands of impressions for digital orthodontic applications, using a myriad of materials and techniques, we have developed a quick method for producing accurate PVS impressions with minimal retakes. Although it is a two-step procedure, it is done in a single visit, without the need for lab work or intermediate models.

## Materials

The ideal impression trays are disposable, clear, and rigid, with adequate undercuts. We prefer Coltène President trays,‡ which require a minimal inventory of sizes. The PVS body mate-



Fig. 1 A. PVS putty rolled into cylinder. B. Putty cylinder placed in impression tray.



Fig. 2 Foam spacer molded into putty.

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\*\*Trademark of Ormco/"A" Company, 1717 W. Collins Ave., Orange, CA 92867.

\*\*\*Trademark of Cadent, 640 Gotham Parkway, Carlstadt, NJ 07072.

†Lingualcare, 5304 Beltline Road, Dallas, TX 75254.

‡Trademark of Coltène/Whaledent, Inc., 235 Ascot Parkway, Cuyahoga Falls, OH 44223.

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rial should be easy to dispense, non-staining, and available in unidose packaging; we use putty instead of a cartridge-dispensed material, which is much more difficult for staff to handle. The wash material should have a light viscosity so it can be dispensed from a cartridge, a light color that contrasts with the body material for visual inspection, and the ability to capture minute details. Splash! Halftime†† materials meet all these requirements and are also ultra-fast-setting (less than three minutes).

The key to our technique, however, is the use of a pliable foam spacer with a thickness specifically matched to the viscosity of the wash material. The spacer can be cut from 1/32" closed-cell polyethylene foam or ordered pre-cut from www.planetsmiles.com, along with the other materials needed for this method and a free, downloadable, illustrated step-by-step card for chairside use.

## Procedure

Most practitioners are unaware that many latex glove brands and the smallest traces of lipstick or lip balm are incompatible with PVS polymerization. Any glove brand used for im-

††Trademark of Discus Dental, Inc., 8550 Higuera St., Culver City, CA 90232.



Fig. 3 Tray seated deeply along long axes of teeth.

pression procedures in the office should be pre-tested by dispensing a small amount of PVS material onto the glove and examining the glove-PVS interface for smearing, which indicates inadequate polymerization. In addition, before an impression is taken, the patient should be asked to completely remove any lipstick, gloss, or balm.

The technique is as follows:

1. After selecting the appropriate size impression trays, start a timer to monitor the working time. Knead one dollop of each color of the PVS putty together until the blended color is uniform. Then roll the putty into a cylinder, and place it in the tray (Fig. 1).
2. Mold a foam spacer into the putty, being sure to use enough pressure to create an archform-shaped trough and drive the putty into the tray interlocks (Fig. 2).
3. Before the working time of the putty has elapsed, place the tray and seat it deeply along the long axes of the teeth. Ask the patient to help seat the tray by biting down firmly (Fig. 3).
4. Once the putty has set sufficiently, remove the tray from the mouth, then remove the liner to inspect for large voids or lack of second-molar damming (Fig. 4). These problems rarely occur,



Fig. 4 Liner removed to inspect for voids or lack of second-molar damming.



**Fig. 5** PVS wash injected into tray.



**Fig. 6** Final impression.

but if they do, the process can be repeated by adding putty to any deficient areas, replacing the spacer, and reseating the tray.

5. After an acceptable putty impression has been confirmed, instruct the patient to brush and to rinse with mouthwash. Restart the timer, and express a small blob of the PVS wash material onto a paper towel to purge the mixing tip and to serve as a test for polymerization.

6. Inject the wash into the tray, keeping the tip embedded in the material to avoid bubbles (Fig. 5). Typically, about one-third of the cartridge is

used for each impression.

7. Before the working time has elapsed, slowly and gently seat the tray along the long axes of the teeth.

8. When the setting timer goes off, check the test blob to ensure complete polymerization. Remove the tray, and carefully examine the impression for voids, paying particular attention to the gingival margins and the distal aspect of the second molars (Fig. 6). We recommend using a magnifier for this inspection. □