

## Operative Dentistry: Mixing Zinc Phosphate Cement

### Instruments

The instruments needed for mixing ZPC are as follows:

- Gauze
- Cotton rolls and small cotton pellets
- Glass slab
- Stop watch or a watch with a seconds hand
- Calcium hydroxide applicator
- Zinc phosphate cement liquid
- Zinc phosphate cement powder
- Spatula for mixing (we use the long flexible side of the spatula for mixing the cement)
- Condenser (for packing the zinc phosphate cement)
- Spoon excavator (to remove the excess cement)
- Cotton pliers
- Explorer

Zinc phosphate cement consists of a powder and a liquid.

### Step 1: Preparation

Before placement of zinc phosphate cement, we cover the deepest part of the pulpal floor with calcium hydroxide to prevent the irritating effects of phosphoric acid from damaging the pulpal tissue.

### Step 2: Mixing

Find the glass slab in section C of the 2nd drawer. Use the powder bottle cap as a measuring scoop. Pack  $\frac{2}{3}$  of the dome shaped cap with powder and dispense it on the lower right corner if you are a right handed operator. Place another full cap on the upper right corner of the glass slab. The powder (initial  $\frac{2}{3}$  bottle cap) is divided into six equal parts, using the flexible blade, the thin and tall side of the spatula.

Swirl the liquid bottle before dispensing 6 drops of liquid onto the center of the slab beside the powder. Keep the orifice of the dropper perpendicular to the surface of the slab.

One, two, three, four, five, six.

Mixing starts by carrying the first one-sixth portion of the powder into the liquid. The mixing area should cover at least half of the slab. Use the flexible portion of the spatula to mix. At the end of 15 seconds, the second portion of powder is incorporated. Each of the portions is spatulated for 15 seconds.

**Step 3: Primary Consistency**

A primary consistency is usually attained at the end of 90 seconds. It may be that not all of the sixth portion will be required or a slight additional amount of powder from the upper corner of the slab may be required to achieve this primary consistency. When the mass is gathered together and the spatula is laid into it and withdrawn, the cement will string up for 1 to 1 1/2 inches before breaking. The primary consistency mix is used for inlays, onlays, and crown cementation.

**Step 4: Secondary Consistency**

The secondary consistency is the cement base consistency. The unused powder from the upper right corner is now incorporated, perhaps in increments of 1/4, and thoroughly mixed until a slightly tacky, but heavy putty like mass is developed. The secondary consistency mix should be completed within 2 to 2 1/2 minutes from the beginning of the mix. This secondary consistency demonstrates a carving advantage, an ease of placement and a decrease of setting time.

**Step 5: Placement**

Roll the zinc phosphate cement and divide it into pieces. With a condenser pick up a piece as big as the area where it is going to be placed and place the piece into the cavity. Pack the piece down into the cavity preparation using the condenser. Now pick up a smaller portion with the condenser and pack it until you achieve 1mm thickness. Take special care not to contaminate the wall of the cavity. If there is any excess cement, carefully remove it using a spoon excavator. This is the completed procedure of placement of zinc phosphate cement into the prepared cavity.