

*PrepAir*TM
Air Abrasion System

OWNERS MANUAL

SAFETY

READ BEFORE USE



Read entire manual carefully before use, improper use may create hazards for patients and staff.

- **Eye protection** should always be worn by patients and staff during use. Protect loops and optics and wash off particles, do not rub surfaces.
- **Disconnect from air when not in use** to prevent accidental activation.
- **Do not use tips beyond their useful life.** Excessive use may allow the abrasive stream to erode through the steel tubing, resulting in a hazardous, unexpected erratic spray.
- **Warning: Pressurized air directed at gingiva or pulpal exposures can induce an air embolism.**
- **If unit is dropped** inspect for damage to jar and nozzle before using on a patient. Replace cracked jars or damaged nozzle carbides.

RESPIRATORY PROTECTION

While aluminum oxide is rated as a “nuisance” dust and is not harmful, unnecessary inhalation is undesirable. Persons with respiratory problems, such as asthma, should avoid exposure.

When a rubber dam is not used, the patient should be asked to hold their breath during actual intervals of abrasion. A damp cloth is ideal to protect the patients eyes and nose, (or goggles must be used). Aluminum oxide can be swallowed without harm but should be avoided. Standard surgery masks will protect staff.

 **Do not use on amalgam due to aerosolizing of mercury alloy.**

PRACTICE ON EXTRACTED TEETH

With air abrasion, tactile sense isn't possible, necessitating a 'cut and look' technique. Dwelling too long in one spot can accidentally induce a pulpal intrusion. Practicing on extracted teeth is highly recommended, then proceed to small class I & V. Most report the technique is easy to learn.

ABRASIVES

It is recommended to only use Danville 27 micron abrasives; they are dry, high purity alpha alumina and specially formulated for maximum performance. Use of other alumina powders may give less than optimal results.

Abrasives readily absorb moisture from the air causing clumps, which results in sporadic performance. Keep abrasives tightly capped. Dry abrasive should flow freely. Moist abrasive will resist flowing easily or will clump.

 **AIR SOURCE**

Clean, dry air is required for operation. The PrepAir air line has a plastic connector (5) that twist-connects clockwise into the handpiece. The other end of the line is equipped with a 1/4" dental disconnect fitting. **Optional adaptors are available from Danville:** Female 1/4" disconnect kits and adaptors to connect to: 4-hole, Kavo, Siemans Sirona & EMS.

 **PRESSURE:**

Connection to regulated house air normally provides ideal pressure. If necessary, the compressor can generally be adjusted to a higher range. 100 psi will cut almost twice as fast as 80 psi, but also induces greater sensitivity.

100 psi (6.7 bar) = Suggested maximum

80 psi (5.3 bar) = Ideal, low sensitivity cutting

30 psi (2.6 bar) = Aggressive stain removal

Optional: An in-line regulator (Order# 45550) offers easy adjusting of pressure.

ABRASIVE FILL

Maintaining proper abrasive fill is essential for good performance. Low abrasive levels in chamber (<1/3 full) will result in poor cutting action.

- *Disconnect the PrepAir from the air source and depress the lever to depressurize the unit. Unscrew the reservoir jar.*
- *Fill to the top of the ribs found inside the jar. Do not fill above step in jar (o-ring face seal) (see figure 1, page 9).*
- *Clean the threads if necessary before replacing the jar. The jar should be screwed down until it seats against the handpiece, thus sealing the o-ring. Do not over tighten.*

Note: Inspect threads before use. Excessively worn threads can result in the jar releasing from the handpiece under pressure.

NOZZLE SELECTION:

Two nozzles: .019" x 45° and .019" x 80° are included with the PrepAir. The nozzles are held on by a fast turn thread. Turn the nozzle until it 'clicks' into place (see figure 2, page 9). The metal cannula can be easily rotated to the desired position (see figure 3, page 9). Nozzle sizes are indicated by a dot on top of the plastic nozzle.

.015" for minimal preps.

Slow cutting

One Dot

.019" for general use.

No Dot

PREPAIR USE:

- The PrepAir can be held like a pen with the index finger depressing the lever. A partially depressed lever will 'throttle' the cut but will accelerate pinch tube wear.
- The orientation of the jar should not be more than 30 deg off vertical or powder flow will be drastically affected. Clogging of the nozzle may result.

EVACUATION

Abrasives and debris are effectively collected by in-house high speed suction. The efficiency of collection improves dramatically with experience.

- *Hold suction about 8" away and move to seek debris plume.*
- *The tissues of the mouth trap most debris when a rubber dam is not used.*
- *Place damp gauze in the back of the rubber dam to aid in collection.*

**STERILIZATION & DISINFECTION:**

Warning: The PrepAir and nozzle must be sterilized prior to each use, or wiped down in accordance with standard disinfecting procedures. The hose assembly and other elements that will come in close proximity to patients should be sheathed in a handpiece barrier plastic sleeve to limit contamination.

- Disconnect the air line to the PrepAir, do not autoclave air line.
- Depressurize the unit by depressing the lever.
- Remove the abrasive jar and discard any remaining abrasive.
- *Place the PrepAir & nozzle, free of debris, in a sterilization pouch. Autoclave in saturated steam at 132° C, 27.4 psi for 15 min.*
- *Cool for 30 min. prior to handling.*

TECHNIQUES OF USE:

NOTE: ADJUSTMENT OF PRESSURE MAY BE REQUIRED FOR DIFFERENT TECHNIQUES.

TOOTH REDUCTION:

- Hold the nozzle at about a 60° angle up from the surface (a slight angle from perpendicular). Angling the stream reduces sensitivity in dentin.
- *Hold the tip 1-2mm from the surface. Move in slow, even passes.*
- *Inspect cut result after every few seconds.*

SURFACE ETCHING & AGGRESSIVE STAIN REMOVAL:

- *Hold tip 5-10mm away from surface.*
- *Dwelling will result in excessive surface reduction of the tooth.*
- *Use slow sweeps until the surface is clean and evenly etched.*

INDICATIONS FOR USE

- Cavity preparations for smaller composite restorations. Class I to VI.
- Removal of composites, acrylic and other resin restoratives.
- Pit and Fissure prep.
- Conservative preparation of incipient lesions.
- Endodontic access through porcelain crowns.
- Etching metals, composites, acrylics and amalgam for maximum bond.
- Etching porcelain where hydrofluoric acid use is not advisable.
- Aggressive stain removal.
- Enhancing bond to tooth structure. Acid etch after air abrasion has been shown to be superior to an acid etch alone.
- Removal of discolored tooth structure due to amalgam and amalgam by products.



INSPECT TIPS MONTHLY OR AFTER 100 USES:

Worn nozzles cut with greatly reduced efficiency. In extreme cases of wear, the stream can cut through the side of the carbide tip or through the stainless tube, creating a safety concern. *The bore can also be gauged by placing tapered endodontic files into the nozzle bore and observing how deep it will easily pass:*

.015" Nozzles - use a # 15 file

.019" – use a # 20 file:

New = half the taper. Worn out = all the taper passes in the bore.

**INSPECT MONTHLY:**

- **Pinch tube performance:** The pinch tube is the conduit for the output stream of air / abrasive and wears with use. A worn tube will not shut off completely and will allow a small amount of air to continue to escape.
Test: Place the nozzle tip in a glass of water. A large leak will cause a constant stream of bubbles and signals the need to renew the pinch tube.
- Replace worn or leaky abrasive jar o-rings.

Trouble diagnosis

- **Clearing clogged nozzles:** Remove the nozzle and *blow air backwards into the nozzle.*
- **Slow cutting performance:** Slow cutting is caused by: weak abrasive flow, or low pressure and/or a nozzle that is small in size, or worn out.
A microscope slide can be used for the following test.

Cut Test: *With a .019 tip held perpendicular at 1mm, and 100psi. pressure, the slide should be pierced in 3 to 5 sec.*

1. Check the abrasive fill and for moist abrasive.
 2. Check for low pressure
 3. Check nozzle size & nozzle condition: (.015" nozzles will cut slow).
 4. Check for weak powder flow. *See weak powder flow.*
- **Abrasive flow does not shut off immediately:** Pinch tube assembly may need replacement or may be jammed with powder. *See pinch tube replacement.*
 - **Excessive powder flow:** Check for abrasive fill above the $\frac{3}{4}$ full level. If PrepAir is used with the abrasive jar in horizontal or inverted position, excessive flow will result.
 - **No air flow:** Check for clogs in the pinch tube. Clogs can usually be cleared by removing the pinch lever (see figure 4, page 9) while the unit is connected to the air source. *Note: Direct the nozzle into a trash can and away from face.*

- **Internal air leak:** Check for improperly installed or worn pinch tube.
- **Weak powder flow:** Weak abrasive flow will greatly reduce the cutting efficiency. The PrepAir is tuned to use about 5gm/min. at 80psi (5.3 bars). The abrasive stream is most easily viewed when sprayed across a dark background with good lighting. The spray should appear light but clearly defined. Weak abrasive flow can be caused by: Low powder in the abrasive jar, moist abrasive or clogged metering holes. Clogged pick-up stem metering holes result from moisture contamination and prevent the abrasive from being picked up (see: Recommended Abrasives). *Remove moist abrasive and inspect pickup holes. Clean clogged holes with the bristles of a toothbrush.*



Pinch tube replacement:

The pinch tube is subject to erosion in use, with a normal life of 50 preps. Pinch tubes can be easily renewed in the office (see figure 4, page 9).

(Replacement tubes are available from Danville Order # 201734)

1. *Disconnect PrepAir from air source and depressurize by depressing the lever, remove the nozzle.*
2. *While lifting up the forward end of the pinch lever slightly, push forward on the rear most section of the pinch lever assembly. The lever will slide forward and allow it to be lifted out.*
3. *Remove the white pinch tube by grasping the forward end of the tube with forceps and pulling it up and forward. This will cause the rear of the tube to slide out of the plastic ribs that hold it in place.*
4. *Reinstall the new tube by pushing the rear end down into the ribs. Snap the front end of the tube into place. Note: Both ends of the pinch tube are the same.*
5. *Reassemble the pinch lever by placing the lever assembly in the opening and sliding it rearward, into place. Reinstall nozzle.*
6. *Reconnect to air and test for proper function.*

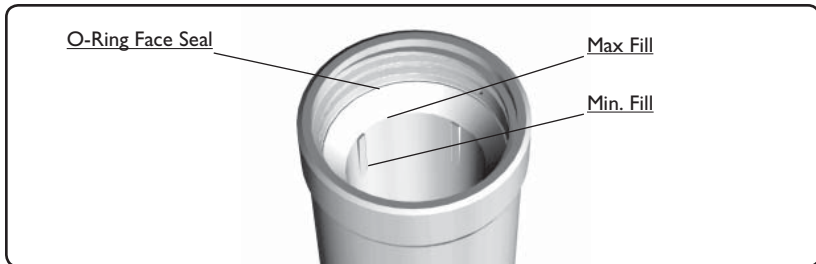


FIGURE 1

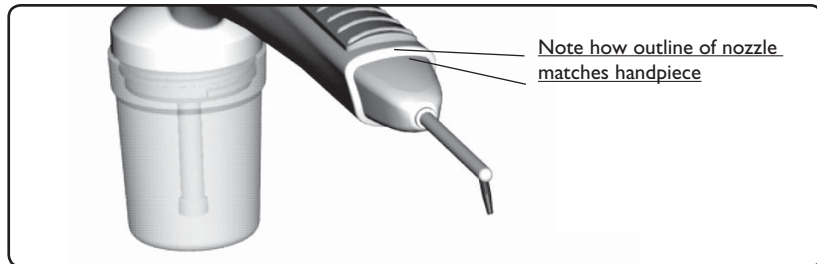


FIGURE 2



FIGURE 3

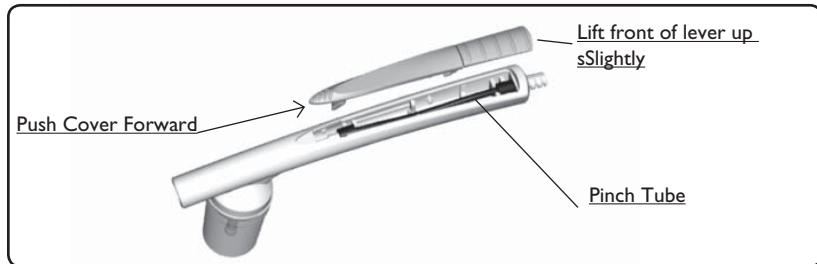


FIGURE 4

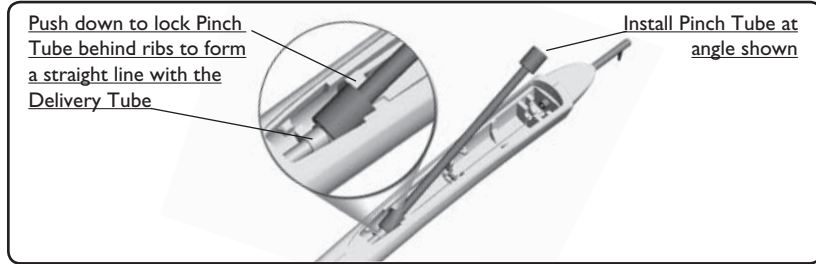


FIGURE 5

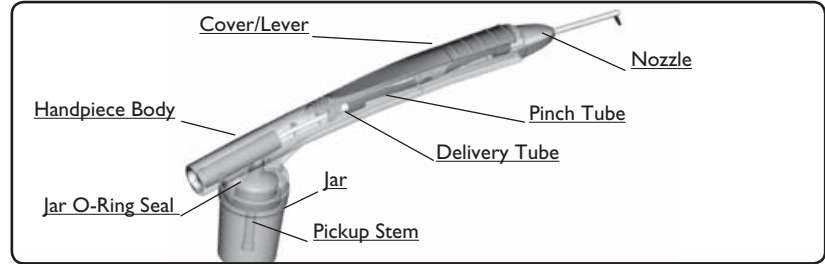


FIGURE 6



DANVILLE MATERIALS
INNOVATIVE DENTAL PRODUCTS

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