FLEXSTAR-V™
Flexible Appliances
Instruction Manual

NOBILIUIM
Your Partner In Prosthetic Dentistry
Aesthetic Comfort

Invisible Partial Dentures, Comfortable & Metal-Free

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**Survey and Design**

**Master Model**

A successful partial denture begins with an accurate and complete impression. An alginate impression is usually sufficient, as long as all buccal and labial areas are captured completely (Fig. 1). If not able to get this kind of impression, a custom tray may be warranted. FleStar partials primarily rely on soft tissue areas for retention and support, so an accurate impression, providing a precision master model is of utmost importance.

Once the master model has been examined and all surface defects removed, visually survey the model to determine path of insertion and two or three areas of retention to provide maximum stability. It is a technician’s choice to use or not to use a surveyor. FleStar’s flexibility will allow the technician to make full use of tissue undercuts, as well as undercuts on the abutment teeth for retention. A clasp only needs to cover a small portion of the abutment tooth to be retentive, as much of the retention is gained by the tissue. A mistake technicians often make, is taking the clasp up to the height of contour on an abutment tooth, which is not necessary.

Care also has to be taken to only block out non flexing areas. Too much block out may make the partial denture fit too loosely, causing it to rub and cause pain. The flexible partial’s major connector will flex to go into undercuts that are not able to be utilized with a metal framework partial.

Outline the major connector and clasps always with a wax red pencil (Fig.2). The flexible material may pick up deposits left by a lead pencil and carry them into the appliance.

**Clasping**

Following are several types of clasps that can be utilized for retention.

A. Most popular is the wrap around clasp (Fig. 3). This clasp is placed adjacent to the edentulous area on the abutment tooth.

It wraps around the neck of the tooth on the buccal or labial side. This clasp only extends up onto the tooth a millimeter or so, relying on most of the undercut obtained by covering the tissue. This clasp is usually preferred on a free-end saddle appliance.

B. Another great retentive device is the spur type clasp (Fig. 4).

This clasp is also placed adjacent to the edentulous area close to the neckline of the tooth, relying on the undercut of the tooth and not tissue undercuts. A spur clasp is often used when the saddle area is bordered by an abutment tooth both mesial and distal. This clasp may also be used when the abutment tooth is severely tilted. A spur clasp can be placed high on the tooth when severe undercuts prevent a wrap around clasp from functioning. Occasionally, a finger type clasp is used usually on the maxillary in the labial region. These type clasps should extend a two-tooth length from the saddle area (Fig. 5). Often used when the 6 anteriors remain and great retention is needed.
C. Another clasp not used very often is the **split clasp** (Fig. 6). This clasp functions similar to a roach clasp and works well when the abutment tooth is flared.

Maxillary flexible partials are most successful with a horseshoe, designed resting on the cingulums of the anteriors and the linguals of the posteriors. Mandibular partials are most successful designed with a lingual plate. These designs will give a FLEXSTAR-V partial as much stabilization as possible. One of the downfalls to a complete flexible partial is the vertical stabilization. Rests added to a flexible partial in the FLEXSTAR-V material must be thick. A thickness of 1.5-2.0 millimeters is warranted. This occlusal clearance may not be easy to obtain.

If you do have enough clearance for rests - remember this material is flexible - the forces of mastication on the edentulous ridge will cause the appliance to flex. If a positive rest seat is needed for vertical stabilization - a chrome frame/flexible saddle combination will be warranted. Take care not to overextend the labial or buccal flanges of the saddle.

**Block Out Master Model and Duplication**

All maxillary cases should be beaded at the posterior border line. (Fig 7). Any undercuts in the rugae area should be relieved.

When using a finger type clasp on the labial, place slight block out wax relief on the tissue from the connection point for a distance of one tooth (Fig. 8). This is the part of the clasp that will not be as flexible and relief is needed for patient comfort.

Basically, all undercuts in non-flexing areas (or areas that would be more rigid as they flex into undercuts) should be blocked out. A mistake often made by frame technicians is over-relieving. FLEXSTAR-V will flex and twist slightly into undercut areas that metal cannot.

**Duplication**

Duplicate the master model using hydrocolloid or silicone and dental stone.

**Set-Up, Finish Wax, Invest and Boil Out**

**Set-Up**

Articulate the duplicate model. When setting denture teeth, make sure there is a minimum of 1 mm space between the teeth and the ridge (Fig. 9) to allow material to flow from the labial to the buccal.
When setting a denture tooth next to an abutment tooth, make sure there is enough space for the clasp to fit between the abutment and the denture tooth. This space should be about 1 mm. Place mechanical retention into each denture tooth. This can be done at the set-up stage or at the boil-out stage. Using a round bur, create a diatonic hole in the center of each denture tooth. Then using a twist bur, drill a diatonic from the mesial and one from the distal, connecting with the center diatonic hole. This is sufficient mechanical retention, any more than this will only weaken the tooth (Fig. 10).

Finish Wax
Transfer the design to the duplicate model with a red pencil. Wax the FLEXSTAR-V partial more like a frame work than a conventional acrylic partial, keeping it closely to the thickness of the finished Flex Star partial denture. A much thinner wax up is warranted with Flex Star than traditional acrylic. Waxing in the anatomical features will make the finishing that much easier (Fig. 11).

Recommended thickness of the wax
Palatal Thickness........1.2-1.5 mm
Buccal/Labial Flange....1.2-2.0 mm
Clasp Thickness.........1.0-1.5 mm
Lingual Flange..........1.2-2.0 mm
Lingual Connector.......1.7-2.0 mm

After waxing and carving, clean the denture teeth to make sure no wax residue remains. Any wax residue remaining on the denture teeth when investing can cause teeth to float during injection and open the occlusion.

Investing
Coat both halves of the flask with a thin layer of petroleum jelly. Before investing, grind or cut back any stone teeth on the waxed model. This process will make it easy to invest and eliminate some undercuts. Use 100% dental stone for investing for better surface detail and a smoother finish surface of the appliance. Use gypsum or stone products with a Mpa of 70 or greater (10,153 psi). Plaster or a mixture of stone and plaster does not provide the type of strength needed for injection compression. Place waxed model into the stone with the posterior facing toward the rear of the flask toward the sprue opening. Bring stone up onto the model to cover all undercuts, but keeping all wax and denture teeth exposed. Continually smooth the stone until hard (Fig. 12).

It is recommended that a baseplate is not used when setting the teeth. A baseplate will only take up excessive space. One millimeter is the minimum acceptable space between the denture tooth and the tissue.
**Investing - Continued**

After the stone is completely set, place sprues. Use two 7 gauge (1/4 inch) sprues (PN 3035). (Color red, white, or clear should be used as darker color may seep into the stone). Rounded utility wax may also be used. More sprues may be necessary if doing a cast framework/FLEXSTAR-V combination appliance, in which case a separate sprue lead would go to each saddle area. Place the sprues onto the stone base from the sprue opening, curved into the lingual posterior area of the appliance. The sprues should have gentle curves so that the injected material flows easily. Make sure there are no sharp turns. Seal the sprues to the partial wax-up and seal to the stone with a hot spatula, so that when pouring the top half no stone can seep under the sprues (Fig. 13).

Carefully vibrate stone into the top half of the flask taking care not to trap air causing bubbles around the denture teeth. The more care taken with your investing, the easier your FLEXSTAR-V appliance will be to finish. Let stone set for 20-30 minutes until completely hard.

**Boil Out**

Remove the bolts from the flask. Place the flask carefully into boiling water for 8 minutes. Remove the flask from the boiling water and carefully open to separate the two halves. Wash out the wax, making sure all wax residue is eliminated (Fig. 14). Let the flask cool. If not done at the set-up stage, now is the time to create the diatorics in the denture teeth. Just add a dap of Elmer’s glue to tack the teeth back into position in the upper half of the flask.

Check the sprue channels to be sure they are smooth and clean. Grind away any jagged edges.

Paint entire stone surfaces with separator and allow to dry. Be careful not to paint separator on the teeth. Do Not heat the flask, as Flex Star must be injected into a room temperature flask. After surfaces are dry, close the flask and tighten all four bolts securely (Fig. 16).

If diatorics have been placed previously, make sure no wax remains in the diatorics of the teeth (Fig. 15).
Injection and Finishing

Turn furnace on and bring up to temperature (290˚C or 550˚F). Once up to temperature, preheat cartridge sleeve in the furnace for 15 minutes (Fig. 17). For subsequent injections preheat cartridge sleeve for 10 minutes.

For a large cartridge, use the small bronze disc. For a medium cartridge, use the large bronze disc (Fig. 18).

Spray cartridge sleeve, material cartridge and bronze disc with silicone release spray (Fig. 19).

Place cartridge sleeve back into the furnace. Place FLEXSTAR-V cartridge into the cartridge sleeve. When using the rigid cartridge, place the crimped end into the cartridge first (Fig. 20).

Then place bronze disc into the sleeve. When using the soft cartridge, place the nozzle end into the cartridge first. Then the small bronze disk (Fig. 21).

The end of the cartridge can be scored with a blade or knife to help inject easier (Fig. 27).

Set timer for 12 minutes. When time is up, carefully move cartridge sleeve horizontally over to the injection press. Place the cartridge sleeve over the top of the flask lined up with the sprue hole and the injection piston (Fig. 22).

Rapidly and steadily turn handles of the press using a clockwise motion turning the piston downward. Turn until the springs on the press are fully compressed. Keep the injected flask under pressure for 3 minutes.

Retract injector piston by turning handles counter clockwise. With a slight twisting motion, remove the cartridge sleeve from the flask.

While the cartridge sleeve is still warm, place the second bronze disc into the cartridge sleeve to give more leverage to expel the spent cartridge (Fig. 23).

Place cartridge sleeve into knock out tube (Fig. 24) and place under injector. Rapidly turn injector to bring piston head down into cartridge sleeve to expel used material cartridge.

Clean all material and aluminum off the bronze disc with a plaster knife or nippers, so that they are clean for the next injection.
Injecting and Finishing - Continued

Allow the flask to cool for 20-30 minutes before opening.

When flask is completely cool, loosen the bolts and remove case from the flask. A hammer may be used at the exposed investment area for this step.

Use plaster nippers or an air hammer to remove the stone from the appliance. Do not use a hammer to divest near the appliance.

Finish and Polish

Trimming

Cut off the sprues with a cut-off disc taking care not to overheat the appliance. Use FLEXSTAR-V knock-down wheel (P/N 5080) for grinding down the sprue leads and gross trimming of the FLEXSTAR-V Appliance (Fig. 25).

Apply even pressure to finish FlexStar. Avoid excessive pressure that may cause over heating. Selecting the right finishing tools is often the preference of the technician (Fig. 26).

(Fig. 25)

(Fig. 26)

Polishing

To polish FLEXSTAR-V we recommend using a coarse pumice, cold water and a rag wheel on a polishing lathe on slow speed. At this stage smooth the surface and eliminate all scratches to get the appliance ready for high shine. Use cold water and be careful not to overheat the appliance.

Then apply Tripoli with a rag wheel to give an initial shine. For the final shine, use Shining Star polishing compound (P/N 301) and a buffing wheel. FLEXSTAR-V is much easier to finish and polish than other brands of flexible materials because of its slightly higher melting temperature, which makes it less likely to melt under pressure of an abrasive instrument. This also results in FLEXSTAR-V being more color stable and not as prone to absorb odors like other materials.

As material is added, immediately press the melted surface with your thumb (covered with tin foil) or a clean spatula. Repeat this until desired surface level is achieved.

Tooth Repair

To repair a tooth that has come out of a flexible partial, some mechanical retention must be added to the socket. To do this, either use the pins from a broken porcelain tooth, or a curved wire. Heat the pins or the wire by holding it over a flame until it becomes red hot. Insert it quickly into the socket where the tooth will be placed. Let the pin penetrate half way into the socket, taking care it does not go all the way through. Grind the same tooth, or a new tooth if necessary to fit over the wire or pins used. Secure the tooth with cold-cure acrylic. The acrylic will bond chemically with the tooth and mechanically with the wire or pin.

Repair Holes, Blemishes, or Add Small Additions to the Material

This will require the use of a hot-air welder and will take some practice. Keep the appliance on a duplicate model so that it does not warp. Heat the area where you will want to add FLEXSTAR-V material. Use an old sprue as your “weld rod” and melt the sprue into the cavity on the appliance where the material needed.

As material is added, immediately press the melted surface with your thumb (covered with tin foil) or a clean spatula. Repeat this until desired surface level is achieved.
Adding Teeth to an Existing FLEXSTAR-V Partial

Duplicate the master model. Roughen the surface where the new area is going to be added. Place existing appliance onto the duplicate model and set the new teeth to be added. Wax up the addition. Place the cartridge sleeve into the oven to be preheated for at least 15 minutes. Invest the bottom half of the flask covering all of the old partial with stone except the new waxed up section.

Attach one sprue to this area. Put separator or Vaseline onto the surface of the stone and invest the top half. Allow the stone to harden. Remove the screws in the flask.

Place the flask into boiling water for 8 minutes, to boil-out the wax. Flush out any remaining wax with hot water and/or wax remover. Add FLEXSTAR-V material cartridge to the cartridge sleeve to be melted for 12 minutes. Place mechanical retention into the tooth or teeth to be added and glue them back into the flask.

Using a small brush, paint a small amount of plastic fusing solution to the exposed FLEXSTAR-V of the old partial.

This must be done when the flask is hot. Let this set for about one minute to soften the surface. Close the flask and the FLEXSTAR-V resin will be ready to inject after it has been heated for 12 minutes.

Relining

We recommend that FLEXSTAR-V partials are duplicated into a complete new base and are not relined.

Method: Take an impression under the partial. The patient should close as the material sets. Once set, take an alginate “pick up” impression with the partial in place. Remove the impression from the mouth and pour up immediately. Do not remove the partial from the model. Send to laboratory with instructions to duplicate partial into a new base.
**Trouble Shooting**

1. **How did I get POROSITY?**
   This is usually caused by excessive HEAT. Check the following:

   Oven temperature should be at 550°F (290°C). The furnace may be the hotter than the temperature indicates. So reduce heat by 30°F (17°C) and see if porosity dissappears.

   Do not heat flask. It must be at room temperature.

   Two sprues (6-7 mm in diameter) are sufficient. Too many sprues can cause porosity.

   Injected case should be left under pressure for 3 minutes.

2. **Why didn’t the material inject from the tube?**

   Cartridge sleeve must preheat for 15 minutes before adding material tube. Subsequent injections; cartridge sleeve must preheat for 10 minutes.

   When placing a rigid cartridge into the cartridge sleeve, make sure crimped end is toward the back of furnace. The material injects out through the thinner aluminum in the center of the capped end.

3. **Material did not flow through to the buccal or labial.**

   Make sure there is at least 1mm of space under all of the denture teeth to allow for the material to flow through to the buccal or labial.

4. **Inconsistent Color?**

   This is caused by excessive heat. Either the temperature is set too high, or the time in the oven is too long. This will cause the color to change or lighten. The pigments are food-grade and will tend to "burn-out" if heated too long.

5. **Why do I have a seam in my FlexStar?**

   Seams or folds may be caused by the separating material not being completely dry when closing the flask.

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(Fig. 27)
5 Cartridge Sizes
compatible with:
Success/FRS • Flexite • Valplast

Easier to
Grind & Polish
vs. Leading
Brands!

Standard Pink
Light Pink
Red Pink
Meharry

White shade not shown,
5 Shades comparable to Valplast

Proven biocompatibility
combined with ease of finishing
make FLEXSTAR-V a clear choice in flexible partial dentures.

Bulk Size
to save you money!

Universal Sizes - Buy in Bulk
FLEXSTAR-V offers multiple cartridge sizes to fit just about any injection equipment. We even offer an economical bulk package of separate material and cartridges. Each package of material includes heat seal bags, dentist/patient instructions and laboratory directions for use.

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