# CAPTEK™ MANUAL TABLE OF CONTENTS

## Section 1: Furnace Calibration
- Why Calibration is Necessary 3-3
- High Temperature Calibration (Captek™ Calibration) 4-5
- Low Temperature Calibration (UC Calibration) 6-7
- Nano Material – Firing Programs 8-9
- Traditional (Original) Captek™ Material – Firing Programs 10-11

## Section 2: Refractory Die Preparation
- Master Die Preparation 12-12
- Duplication of Master Die 13-14
- Capvest AV Refractory Die Investment 15-17
- Repairing Refractory Dies 18-18
- Curing Refractory Dies 18-18
- Applying Refractory Die Adhesive 19-19

## Section 3: “P” & “G” Application
- Posterior “P” Application 20-25
- Anterior “P” Application 26-28
- “G” Application for Nano Materials 29-29
- Posterior “G” Application 29-30
- Anterior “G” Application 31-32
- Repairs after “G” Firing 33-34
- Adapting “P” Material using the Pneumatic P-Press 35-37
- Finding the Optimum “P” & “G” Firing Temperature 38-38

## Section 4: Metal Collars, Metal Linguals and Occlusal Stops
- Metal Collar Techniques 39-39
- Metal Collar Using Strips of Scrap “P” 39-42
- Metal Collar Using Build-Up Material 43-45
- Metal Linguals, Occlusal Stops or Islands 46-49
- Re-Establishing Gold Color after Porcelain Application 50-50

## Section 5: Finishing CAPTEK™ Copings
- Refractory Die Removal 51-52
- Finishing Margins on CAPTEK™ Copings 53-55
- Swedging of CAPTEK™ Copings 56-58

## Section 6: Nano Porcelain Support Material
- Adding Porcelain Support on a Completed CAPTEK™ Coping 59-61
Section 7: CAPTEK™ Inconnect Bridge Technique
- Specifications, Pre-case Screening Criteria 62-62
- Inconnect Bridge Technique 63-70
- Inconnect Material with Laser or Electric Welding 71-74
- Captek Pontic Cover Material 75-76

Section 8: Repairing of CAPTEK™ Copings after Divesting
- Repairs with Repair Paste or Scrap “P” Material 77-79
- Repairs with UCP Bonder 80-80
- Inflow D Replenishing Gold Color on Copings 81-82

Section 9: CAPTEK™ Bonder Application
- UCP Bonder Application (Universal Coupler Porcelain) 83-83
- UCP Adhesive Technique 84-86
- UCP Bonder Brush Technique 87-88

Section 10: Opaquing CAPTEK™ Copings
- Opaquing Instructions 89-90

Section 11: CAPTEK™ Glossary
- P&G Materials 91-91
- Calibration Kits 91-91
- Duplication Materials 91-91
- Liquids 92-92
- Adhesives 92-92
- Investments 92-92
- Powders and Gold Materials 93-93
- Instruments, Dispenser Bottles and Equipment 94-94
- Finishing Tools 95-95
Section 1:
FURNACE CALIBRATION

Why is Calibration Necessary?

Because the temperature inside your furnace is rarely the same as what is displayed, and changes over time, calibrating at least once a month* is recommended to ensure accurate firing temperatures.

*Calibration frequency may increase in proportion to workload.

- CAPTEK™ materials require specific firing temperatures and programs. To determine these settings, the firings of two different calibration strips are needed.

These two calibrations must be completed prior to the first firing of any CAPTEK™ materials.

1. **High Temperature Strips:** for high temperature processes (1075°C)
   - a. Utilize the Captek Calibration Kit
   - b. Refer to pages 2-3 for instructions

2. **Low Temperature Strips:** for low temperature processes (1040°C)
   - a. Utilize the Captek UC Calibration Kit
   - b. Refer to pages 4-5 for instructions

**Captek™ Calibration** (High Temp) will determine the firing temperature for:

- Final cure of the refractory dies
- Firing CAPTEK™ “P” and “G”
- Repairs & build-ups on refractory dies
- Captek Inconnect & bridge connectors

**Captek UC Calibration** (Low Temp) will determine the firing temperature for:

- UCP Bonder
- Inflow D
- Repairs off refractory die
- Pontic Cover
- Original Capbond
High Temperature Calibration Procedures
(Captek™ Calibration)

Muffle temperatures will change after continuous use. To ensure accuracy, the furnace should be calibrated once a month to once a week.*

* Frequency of calibration should be in proportion to workload.

Step 1: Program the Furnace

Enter Calibration Program

<table>
<thead>
<tr>
<th>ENTRY / DRY TIME: 0-1 minute</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENTRY TEMP: 500-600ºC (930-1100ºF)</td>
</tr>
<tr>
<td>TEMP RATE: 65º C per minute (120ºF)</td>
</tr>
<tr>
<td>HIGH TEMP: 1075º C (1967º F)</td>
</tr>
<tr>
<td>HOLD TIME: 1 minute</td>
</tr>
<tr>
<td>NO VACUUM OR COOL TIME</td>
</tr>
</tbody>
</table>

Most furnaces calibrate between 1075º C (1967º F) - 1115º C (2040º F)

Step 2: Preheat the Furnace

Preheat the furnace by completing at least one CAPTEK™ “P” & “G” firing cycle. It is recommended to preheat each day prior to processing Captek™ materials

1. New furnaces, muffle, and furnaces not previously used for CAPTEK™ may require a break-in period. Firing additional preheat cycles will help stabilize muffle temperatures.
2. Additional cleaning of the muffle chamber can be accomplished by using a purging system. Contact Captek for purging recommendations.

Step 3: Fire Captek™ Calibration Strip (High Temp)

Place a calibration strip in the provided crucible.

Place the calibration strip (1075ºC will be stamped on the strip) in the center well of the crucible (See fig.1).

Place the crucible in the center of a firing tray and fire.

Use a new, lightweight firing tray. Honeycomb trays work well.

Fig.1
Step 4: Access the Fired Strip

**Ideal High Calibration Temperature:** The Calibration strip should be slightly slumped over the top edge of the crucible (see Figure 2).

![Ideal Calibration Strip](image1.png)

Write this temperature in the Captek Calibration & Firing Cycle Guidebook.

If you do not achieve the ideal high calibration temperature, reference below.

To ensure accuracy, do not use a calibration strip for more than three firings.

If the Calibration Strip is **Unchanged**, the temperature is too low (See fig.3).

![Too Low Calibration Strip](image2.png)

If the calibration strip is unchanged (Fig. 3), increase the high temperature in 10°C (18°F) increments and fire again.

If the strip is only slightly bent, increase the high temperature by 5°C (9°F) and fire again.

*Fire until the Ideal High Calibration Temperature, described above, is achieved (Ref. figure 1).*

If the Calibration Strip **Melts into a Ball**, the temp. is too high (See fig.4)

![Too High Calibration Strip](image3.png)

If the Calibration Strip has melted into a ball (Fig. 4), replace with a new calibration strip and lower the high temperature setting in 10°C (18°F) increments and fire again.

*Fire until the Ideal High Calibration Temperature, described above, is achieved (Ref. figure 1).*

Step 5: Program the Furnace for High Temperature Processes

Refer to pages 6-9 for all Captek firing programs.

("P" & “G” and Bridge Connector Firing Cycles)

*After finding the high calibration, use the Calibration & Firing Cycle Guidebook to find the optimum “P” & “G” temperature and firing programs in your furnace.*

(Contact Captek to request a guidebook)

1. Transfer the Calibration temperature to the Guidebook.
2. Follow the Quick Start Steps and Firing Temperature Calculator to find the “P” & “G” firing temperatures in your furnace and all firing programs.
3. Note temperatures in the Calibration Log.

*Every furnace radiates heat differently, requiring you to adjust the temperature for the “P” & “G” cycle slightly up or down based on the look of the CAPTEK™ copings after the “G”-firing.*
Low Temperature Calibration Procedures
(UC Calibration)

UC Calibration strips are different than the High Temperature Calibrations strips. They are colored **red** and fire at a lower temperature. **Keep them separate.**

Muffle temperatures will change after continuous use. **To ensure accuracy, the furnace should be calibrated once a month to once a week.**

* Frequency of calibration should be in proportion to workload.

Step 1: Program the Furnace

Enter UC Calibration Program

<table>
<thead>
<tr>
<th>ENTRY TEMP:</th>
<th>500º C - 600º C (930º F - 1100º F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENTRY / DRY TIME:</td>
<td>0 - 1 Minutes</td>
</tr>
<tr>
<td>TEMP RATE:</td>
<td>80º C (145º F)</td>
</tr>
<tr>
<td>HIGH TEMP:</td>
<td>-40º C (-72º F) below the Captek™ High Temperature Calibration</td>
</tr>
<tr>
<td>HOLD TIME:</td>
<td>1 Minute</td>
</tr>
<tr>
<td>NO VACUUM OR COOL TIME</td>
<td></td>
</tr>
</tbody>
</table>

Step 2: Preheat the Furnace

Preheat the furnace by completing at least one CAPTEK™ “P” & “G” firing cycle. It is recommended to preheat each day prior to processing Captek™ materials

1. New furnaces, muffles, and furnaces not previously used for CAPTEK™ may require a break-in period. Firing additional preheat cycles will help stabilize muffle temperatures.
2. Additional cleaning of the muffle chamber can be accomplished by using a purging system. Contact Captek for purging recommendations.

Step 3: Fire UC Calibration Strip

Place a UC Calibration Strip in the Crucible

Place a UC Calibration Strip (colored **red** in the center well of the calibration crucible. (See fig.1). Place the crucible in the center of a firing tray and fire. **Use a new, lightweight firing tray. Honeycomb trays work well.**

Fig.1
Step 4: Access the Fired Strip

**Ideal UC Calibration Temperature:** When the exposed part of the UC Calibration Strip bends over and begins to melt, leaving the strip inside the crucible un-melted as seen in Figure 2.

![Ideal UC Calibration Strip](image)

Note this temperature in the Captek Calibration & Firing Cycle Guidebook.

**Note:** If you do not achieve the Ideal UC Calibration temperature, reference below.

To ensure accuracy, do not use a calibration strip for more than three firings.

If the UC Calibration Strip is **Unchanged**, the temperature is too low

![Too Low UC Calibration Strip](image)

If the calibration strip is unchanged (Fig. 3), increase the high temperature by 5°C (9°F) increments and fire again.

*Fire until the Ideal UC Calibration Temperature, described above, is achieved (Ref. Fig. 2)*

If the UC Calibration Strip **Melts into a Ball**, the temperature is too high

![Too High UC Calibration Strip](image)

If the UC Calibration strip completely melts (See fig. 4), add a new strip and lower the temperature by 5°C (9°F) increments. Fire until only the exposed part of the strip begins to melt, leaving the strip inside the crucible un-melted. (See Figure 2)

*Fire until the Ideal UC Calibration Temperature, described above, is achieved (Ref. Fig. 2).*

Step 5: Programming the Furnace for low temperature processes:
Refer to pages 6-9 for all Captek firing programs. *(Low temperature process)*

![After finding the UC (low calibration) use the Calibration & Firing Cycle Guidebook to enter all low process temperatures and firing programs in your furnace. (Contact Captek to request a guidebook)](image)

1. Transfer the UC calibration temperature to the Guidebook.
2. Follow the Quick Start Steps and Firing Temperature Calculator to find the firing temperatures and all firing programs in your furnace.
3. Note temperatures in the low temperature calibration log.
High temperature processes: (High Calibration)

“P” & “G”
Entry / Dry Time: 3-4 minutes
Entry Temp: 500º C-600º C (930º F-1100ºF)
Temp. Rate: 65º C per minute (120º F)
High Temp: “High Calibration Temperature” plus +30º to 40ºC (+63-72º F)
Hold Time: 4 minutes
No vacuum or cool time

2nd “P” &”G” or Repair Firing - on refractory die
Entry / Dry Time: 3-4 minutes
Entry Temp: 500º C-600º C (930º F-1100ºF)
Temp. Rate: 65º C per minute (120º F)
High Temp: “P” & “G” temp. minus -10º C (-18º F)
Hold Time: 2-3 minutes
No vacuum or cool time

Inconnect-invested
Entry / Dry Time: 3-4 minutes
Entry Temp: 500º C-600º C (930º F-1100ºF)
Temp. Rate: 80º C per minute (145º F)
High Temp: +15º C (+27º F) above High Calibration
Hold Time: 1 minute
No vacuum or cool time

Inconnect-weld
Entry / Dry Time: 3-4 minutes
Entry Temp: 500º C-600º C (930º F-1100ºF)
Temp. Rate: 80º C per minute (145º F)
High Temp: High calibration temp.
Hold Time: 1 minute
No vacuum or cool time

Nano Porcelain Support Material-and UCP as a build-up material
Entry / Dry Time: 3 minutes
Entry Temp: 500º C-600º C (930º F-1100ºF)
Temp. Rate: 80º C per minute (145º F)
High Temp: High calibration temp.
Hold Time: 1 minute
No vacuum or cool time
Low Temperature Processes: (UC Calibration)

**Pontic Cover**
Entry / Dry Time: 2 minutes  
Entry Temp: 500º C-600º C (930º F-1100ºF)  
Temp. Rate: 80º C per minute (145º F)  
High Temp: UC calibration temperature  
Hold Time: 30 second  
No vacuum or cool time

**Inflow**
Entry / Dry Time: 2 minutes  
Entry Temp: 500º C-600º C (930º F-1100ºF)  
Temp. Rate: 80º C per minute (145º F)  
High Temp: UC calibration temperature plus +5 to 10º C (+9-18º F)  
Hold Time: 30 second  
No vacuum or cool time

**UCP Bonder**
Entry / Dry Time: 2 minutes  
Entry Temp: 500º C-600º C (930º F-1100ºF)  
Temp. Rate: 80º C per minute (145º F)  
High Temp: UC calibration minus -10º C (-18º F)  
Hold Time: 1 minute  
No vacuum or cool time

**Restoring gold color or layer (Inflow material)**
Entry / Dry Time: 3 minutes  
Entry Temp: 500º C-600º C (930º F-1100ºF)  
Temp. Rate: 80º C per minute (145º F)  
High Temp: 750º C (1382º F)  
Hold Time: 1 minute  
No vacuum or cool time
High temperature processes: (High Calibration)

“P” & “G”
Entry / Dry Time: 3-4 minutes
Entry Temp: 500º C-600º C (930º F-1100ºF)
Temp. Rate: 65º C per minute (120º F)
High Temp: “High Calibration Temperature” plus +10º to 15ºC (+18-25º F)
Hold Time: 4 minutes
No vacuum or cool time

2nd “P” & “G” or Repair Firing-on refractory die
Entry / Dry Time: 3-4 minutes
Entry Temp: 500º C-600º C (930º F-1100ºF)
Temp. Rate: 65º C per minute (120º F)
High Temp: “P” & “G” Temp. minus -10º C (-18º F)
Hold Time: 2-3 minutes
No vacuum or cool time

Inconnect-invested
Entry / Dry Time: 3-4 minutes
Entry Temp: 500º C-600º C (930º F-1100ºF)
Temp. Rate: 80º C per minute (145º F)
High Temp: +15º C (+27º F) above High Calibration
Hold Time: 1 minute
No vacuum or cool time

Inconnect-weld
Entry / Dry Time: 3-4 minutes
Entry Temp: 500º C-600º C (930º F-1100ºF)
Temp. Rate: 80º C per minute (145º F)
High Temp: High calibration temp.
Hold Time: 1 minute

Nano Porcelain Support Material-and UCP as a build-up material
Entry / Dry Time: 3 minutes
Entry Temp: 500º C-600º C (930º F-1100ºF)
Temp. Rate: 80º C per minute (145º F)
High Temp: High calibration temp.
Hold Time: 1 minute
No vacuum or cool time
Low Temperature Processes: (UC Calibration)

**Pontic Cover**
- **Entry / Dry Time:** 2 minutes
- **Entry Temp:** 500° C-600° C (930° F-1100°F)
- **Temp. Rate:** 80° C per minute (145° F)
- **High Temp:** UC calibration temperature
- **Hold Time:** 30 second
- No vacuum or cool

**Inflow**
- **Entry / Dry Time:** 2 minutes
- **Entry Temp:** 500° C-600° C (930° F-1100°F)
- **Temp. Rate:** 80° C per minute (145° F)
- **High Temp:** UC calibration temperature
- **Hold Time:** 30 second
- No vacuum or cool

**UCP Bonder**
- **Entry / Dry Time:** 2 minutes
- **Entry Temp:** 500° C-600° C (930° F-1100°F)
- **Temp. Rate:** 80° C per minute (145° F)
- **High Temp:** UC calibration minus -10° C (-18° F)
- **Hold Time:** 1 minute
- No vacuum or cool

**Restoring gold color or layer (Inflow material)**
- **Entry / Dry Time:** 3 minutes
- **Entry Temp:** 500° C-600° C (930° F-1100°F)
- **Temp. Rate:** 80° C per minute (145° F)
- **High Temp:** 750° C (1382° F)
- **Hold Time:** 1 minute
- No vacuum or cool time
Section 2: 
REFRACTORY DIE PREPARATION

Step 1: Screen cases for adequate porcelain reduction

a. Check the dies and articulated models for standard metal-ceramic tooth preparation. (1.5mm reduction for optimum esthetics and strength)

b. Use a 1.5mm thickness gauge to check occlusal clearance (1.5 to 2mm required for posterior units)

Step 2: Trim the Master Dies

a. Trim and ditch the margins so they will be easy to find during the Captek “P” application. (See fig.2)

b. Feather-type margins should be ditched – Shoulder / Chamfer margins will stand out with less trimming. 

Over ditching and thinning may cause chipping of the margins during the Captek fabrication…

Step 3: Block-out Undercuts

Aggressively block-out all undercuts and voids above the margins on the master die. Use a hard resin type block-out material; this will allow you to readapt and control the fit of your finished Captek™ copings with the swedger.

Step 4: Apply die hardener and spacer

a. Mark the margins and apply die harder and spacer.

b. Make sure the die hardener and spacer are completely dry before duplicating.

Chemical residue form die hardener and spacer may prevent the silicone form setting around the dies resulting in an inaccurate duplication and refractory die.
Duplication

- Capsil Quick Set A&B
- 3- Duplication flasks
- 2- Plastic measuring/mixing cups
- Mixing spatula

There are three duplication flask sizes: (See fig. 1)

- Small- 1-2 dies
- Medium 3-4 dies
- Large 4 or more dies

<table>
<thead>
<tr>
<th>Flask Size</th>
<th>No. of Dies</th>
<th>Total Amount of Capsil A &amp; B by volume or weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>1-2 Dies</td>
<td>Milliliters- 20 By weight- 20 grams total</td>
</tr>
<tr>
<td>Medium</td>
<td>3-4 Dies</td>
<td>Milliliters- 30 By weight- 30 grams total</td>
</tr>
<tr>
<td>Large</td>
<td>4 or more</td>
<td>Milliliters- 50 By weight- 50 grams total</td>
</tr>
</tbody>
</table>

Step 1: Position dies in the base

Make sure the die harder and spacer is completely dry before duplication. Chemical residue can prevent the silicone from completely setting around dies.

a. Select the correct size duplication flask and place the dies in the wax base:
   - Leave a minimum of 3 to 4 mm. between each die and the sides of the flask.
   - All the dies should be approximately the same height allowing a minimum of 5 to 10 mm. of silicone over the top of dies.
   - Smooth the wax between the dies and place the ring in the base. (See fig. 2-3)

Level the margins parallel to the clay base. If one margin extends lower, tilt the die to level the margins, from buccal to lingual – labial to lingual. (See fig. 4-5)
Step 2: Measure the duplication material

![Image of Capsil A & B bottles](fig.6) ![Image of mixing cup](fig.7)

a. Shake the Capsil A & B bottles.

b. Measure equal amounts of Capsil A & B into a mixing cup (See fig.6), or weigh equal amounts of Capsil A & B on a gram scale. Place a mixing cup on a gram scale and zero out the scale reading before weighing equal amounts. (See fig.7)

Step 3: Mix and pour duplication material

![Image of mixing process](fig.8)

a. Gently mix to avoid incorporating bubbles for 15 to 20 seconds until the color looks homogeneous.

b. To eliminate bubbles raise the mixing cup at least 8 inches above the ring and pour a thin stream of Capsil into the flask until the dies are covered by at least 5 to 10 mm. of silicone (See Figure 8).

> A pressure chamber may be used to force out air Bubbles, 40 to 60 psi (5bars) for 12 minutes...

Step 4: Duplication Setting Time - 12 to 15 minutes

Step 5: Remove Master Dies from the Duplication

![Image of master dies removal](fig.9) ![Image of duplication mold](fig.10)

a. Separate the base from the flask ring and push the Capsil mold from the flask ring.

b. Remove the master dies by flexing the mold and applying pressure to the bottom and lifting out the dies. (See fig.9-10)

c. Check the duplication mold for any discrepancies or un-set duplication material.

d. The duplication is now ready to pour the refractory dies.
Mixing recommendations: (recommendations are included in each box)

1. **Powder & liquid:** 1 Envelope of 30 grams should be mixed with a total of 6 ml of Capvest™ AV liquid / water ratio. For a slightly thinner mix use up to 6.5 ml of total Liquid.

2. **Controlling expansion:** The higher the percentage of Capvest™ AV liquid to distilled water the greater the expansion of the investment and the looser the coping fit to the master die.
   - Please alter ratios to accommodate preferred fit as needed,
   - It is not recommended to use less the 50% Capvest™ AV Liquid
   - Once the preferred fit is achieved, additional mixing bottles are available to pre-mix large quantities of the liquid ratios if desired.
   (Contact Captek Customer Care dept. 1-800-921-2227)

3. **Recommended ratio for most dies:** (posterior & normal anterior dies) 50% Capvest™ AV Liquid / 50% Distilled Water; (3 ml of Capvest AV liquid / 3 ml of distilled water)

4. **Slightly looser fit:** 75% Capvest™ AV Liquid / 25% Distilled Water; (4.5 ml of Capvest™ AV liquid / 1.5 ml of Distilled Water)

5. **Small parallel anterior dies (lower anterior) and parallel implant abutments:** Use straight Capvest™ AV Liquid (maximum expansion)
Step 1: Capsil Relief Spray

a. Spray the silicone mold with Capsil Relief Spray to help break the surface tension.

b. Completely dry the mold with compressed air. (See fig. 1-3)

Step 2: Mix Capvest AV refractory investment

a. Measure the desired ratio of Capvest AV liquid to distilled water and dispense into a small damp vacuum-mixing bowl. (See fig. 4-5)

b. Empty a 30-gram package of Capvest AV refractory investment into a mixing bowl.

c. Hand mix with a spatula for 10 to 15 seconds until all the powder is completely mixed. (See fig.6)

d. Mix under full vacuum for 60 seconds. (See fig.7)

A separate small vacuum-mixing bowl for refractory investment is recommended to avoid contamination.

(Optional) If a pressure chamber was used during silicone duplication, it may also be used during initial setting of the refractory investment to eliminate bubbles (40 – 60 psi) (5 bars) (10-15 minutes for initial set of investment).
**Step 3: Pour refractory dies (duplication mold)**

![Fig. 8](image)

![Fig.9](image)

![Fig.10](image)

a. Carefully vibrate a small amount of investment into each die filling from the incisal or occlusal up to the margins. (See fig. 8)

b. Gently and slowly and squeeze the mold in and out while on the vibrator. The investment will rise and fall coating the sides of the mold, breaking the surface tension. (See fig. 9)

c. Fill the remaining portion of the mold with investment. (See fig. 10)

**Step 4: Capvest AV setting time**

a. Minimum setting time 40 minutes - recommend 60 minutes for maximum hardness.

**Step 5: Remove refractory dies and trim base**

![Fig.11](image)

![Fig.12](image)

![Fig.13](image)

![Fig.14](image)

a. Remove the refractory dies by carefully flexing the mold open and gently pushing the mold from the bottom and removing the refractory dies. (See fig. 11)

b. Use a model trimmer to trim the bases flat and as small as possible but still maintain enough length as a holder (approximately 5 to 10mm). At the same time level the die so that one the margin area is not lower than another (parallel margins. (See fig. 12-14)
Step 6: Repairing Refractory Dies

a. Check the refractory dies for small bubbles or defects. If a repair is required, first wet the die with clean water. (See fig.15)

b. Mix Capvest with straight Capvest liquid to a thick creamy consistency and fill any bubbles of defects. (See fig.16)

c. Contour to match the shape of the die. (See fig.17)

d. Let the repair set for 10 minutes before the burnout and curing of the dies.

Step 7: Burn-out and Curing of Refractory Dies

a. Place the refractory dies in a burnout furnace and fire to 1500°-1600°F (815°-875°C) and hold for 20 minutes. This will remove harmful gases and moisture from the refractory dies.

b. Transfer the refractory dies to a porcelain furnace for final curing using the normal Captek™ “P” & “G” cycle (See Section 1)
Applying Refractory Die Adhesive

Step 1: Mark the margins

a. Make sure the refractory dies have been completely cured. (See page 4)

b. Mark the margins with a soft red pencil. (See fig.1)

Fig.1

Step 2: Apply the Adhesive

a. Shake the adhesive bottle to thoroughly mix the liquid.

b. Apply a liberal even amount of adhesive to the die but do not let it puddle. Completely cover the die extending to the margins but avoid painting below the margins. (See fig. 2-4)

c. Air dry for a minimum of 15 minutes. It’s OK to let the adhesive sit longer or even stand overnight, if covered to keep dust free.

Maintaining Adhesive viscosity (thickness)

1. The Captek Adhesive will thicken with age and exposure to air. Thin with a few drops of Goof Off (paint remover/thinner from paint store) on a regular basis to control viscosity and even application. (See fig.5) For temporary fix, warm the bottle to thin adhesive and shake well.

2. If the Adhesive becomes thick and stringy leaving clumps of adhesive on the die, discard and replace with a new bottle. These thick areas may cause voids or bubbles in the “P” layer. (See fig.6-7)
Section 3:  
“P” & “G” APPLICATION

![Posterior “P” Application](image)

It is important to keep track of the total amount of “P” material applied. Apply an equal amount of “G” material when adding extra “P” material for:

- Retention grooves, box forms or missed undercuts
- Large overlapping pieces when applying “P” layer
- Metal collars
- Additional pieces for strengthening

**Step 1: Pre-adapting “P” Material into irregular areas**

![Fig. 1](image) ![Fig. 2](image)

a. Adapt scrap “P” material into any retention grooves or box forms. Keep track of any extra “P” material; it will require an equal amount of “G” material. (See Fig. 1-2)

b. If an undercut was missed during the model and die work, adapt some extra “P” material in the undercut area. This will allow some extra thickness for internal adjustment when fitting the coping to the master die.

**Step 2: Measure and cut the “P” Material**

*Posterior units will be applied in 4 pieces*

![Fig. 3](image) ![Fig. 4](image)

a. Place the die on top of the “P” sheet and cut a strip of material that is slightly wider than the mesial/distal width of the margin. (See Fig. 3)

b. Place the mesial or distal surface of the die on the cut strip of “P” material. Measure from slightly below the buccal margin to slightly past the incisal and cut the strip. (See Fig. 4)
Step 3: Place the buccal piece on the die (First piece)

a. Place the measured piece onto the buccal surface of the die. It should extend slightly past the margin and slightly over the incisal edge. Press it to place on the incisal half of the die only. Avoid adapting at or below the margins, let the “P” material drape over the labial margin. (See Fig. 5-6)

b. Carefully wrap the “P” material around to the interproximal surfaces of the die. Secure by lightly burnishing the occlusal/incisal and interproximal ends to the refractory die. (See Fig. 7-8)

⚠️ **Optional - Adapting individual pieces in the P-Press (See P-Press section-page 14-16)**

c. It may be easier to P-Press individual pieces to the refractory die instead of all the pieces at one time, especially when adapting into deep shoulder or chamfer margins. This will also help maintain the “P” material thickness. (See Fig. 9-10)

Step 4: Measure and place the interproximal and lingual pieces

a. Measure and cut the next piece from slightly below the margin to slightly past the incisal edge. (See Fig. 11)

b. Burnish a slight bevel on each cut end before placing the next piece. This will help avoid internal lines between overlapping pieces. (See Fig. 12)

c. Place the second piece overlapping the bevel on the first piece and wrapping to the lingual surface. Press to place on the incisal/occlusal half only and secure into place by burnishing the overlap and occlusal edge. P-Press if needed (See Fig. 13)

d. Repeat this process until all axial walls are covered. (See Fig. 11-14)
Step 5: Place the occlusal piece

![Images of dental procedures](Fig. 15, Fig. 16, Fig. 17, Fig. 18)

a. Smooth and burnish the occlusal area to avoid having thick areas or internal lines. (See Figure 15-16)

b. Place the remaining piece on the occlusal surface. It is okay to overlap onto the other surfaces. (See Fig. 17)

c. Lightly tack in place; it is now ready for final processing in the P Press. (See Fig. 18)

⚠️ Any small gaps will be filled after processing in the P-Press. (See Fig. 15 & 17)

Step 6: Final processing in the P-Press (See P-Press section-page 14-16)

![Images of pressure chamber and lid](Fig. 19, Fig. 20, Fig. 21, Fig. 22)

a. Place the die in the middle of the pressure chamber base, fit the blue rubber cone with washer over the die and pressure chamber base. (Fig. 19)

b. Replace the lid and pressurize several times to adapt the “P” material to the die. Recommend 70 -90- psi (5-6 bars) - (See Fig. 20-22)

Step 7: Fill in any missing areas or gaps

![Images of filled gaps](Fig. 23, Fig. 24)

a. After pressing fill in any gaps or short margins with scrap “P” material, burnish and smooth the pieces together(See Fig. 23-24)
Step 8: Remove any large overlaps and smooth joints

a. With the knife or burnishing instrument remove any overlaps that will thicken the coping and interfere with porcelain application. (See Fig. 25-26)

b. Leave any overlaps in the interproximal area that will not interfere with room for porcelain application. This will create extra strength in the CAPTEK™ coping.

c. Burnish and slightly smooth any overlapping areas, cracks and defects. It is not necessary to completely smooth these areas. (See Fig. 27)

Step 9: Trim and adapt the margin

WARNING: It is very important to maintain the “P” layer thickness at the margins

a. Use a Captek knife at a 90-degree angle and remove the excess “P” material below the margin. The excess should be easily removed if the margins were properly ditched. (See Fig 28)

b. Lightly burnish and condense the margins. Hold the adapting tool at an angle that will maintain the thickness of the “P” material resulting in a small .3mm collar. (See Fig. 29-30). If there is no “collar”, the “P” material was over worked and thinned. If this is the case, adapt and burnish more “P” material back to the margin.

c. Carefully trim as close to the margins as possible with the knife tip, removing any overextensions. Re-burnish and seal the margins if needed, always be careful to maintain the thickness of the “P” material at the margins. (See Fig. 31)
Step 10: Process in the porcelain furnace

Fig. 32

Fig. 33

a. The posterior “P” material is now ready for processing. Place the refractory dies in the center of the firing tray and fire in a porcelain furnace on the “P” & “G” cycle. (See Fig. 32-33)

- Do not fire more than 5 to 6 copings at one time.
- For large refractory dies, fire only 3 to 4 copings at one time.

- For firing cycles and firing temperatures, see the calibration section and the Calibration & Firing Cycle Guidebook.

- Clean light weight honeycomb firing trays are recommended.

Step 11: After processing - Check the “P” layer for any cracks or voids.

If deep cracks or voids are found, carefully fill with scrap “P” material before applying the “G” layer. (See Figure 34-49)
Step 12: The coping is now ready to apply the “G” layer

*Optional: Technique for strengthening posterior copings*

![Fig. 40](image1) ![Fig. 41](image2) ![Fig. 42](image3)

- **a.** Adapt a piece of scrap “P” material in the interproximal area. Measure and apply slightly short of the buccal and lingual surfaces and from the occlusal edge to approximately 1-2mm short of the margins. (See Fig. 40-41)
- **b.** Adapt into place; do not burnish smooth. Leave the piece visible as a reminder to apply an equal amount of “G” material. (See Fig. 41)
- **c.** Please note that this will require an equal amount of “G” material to be applied during the “G” application to match the extra “P” material. (See Fig. 42)
Anterior - “P” Application

Step 1: Pre-adapting “P” Material into irregular areas
(See posterior “P” section for instructions and example)

Step 2: Measure and cut the “P” Material

Anterior units will be applied in 2 pieces

a. Place the die on top of the “P” sheet and cut a strip of material that is slightly wider than the mesial/distal width of the margin. (See Fig.1)

b. Place the mesial or distal surface of the die on the cut strip of “P” material. Measure from slightly below the labial margin to slightly past the incisal edge and cut the strip. (See Fig. 2)

Step 3: Place the labial piece (First piece)

a. Place the measured piece onto the labial surface of the die. It should extend slightly past the margin and slightly over the incisal edge. Press it to place on the incisal half of the die only. Avoid adapting at or below the margins let the “P” material drape over the labial margin. (See Fig.3)

b. Carefully adapt the “P” material around the interproximal surfaces. Secure by lightly burnishing the lingual and incisal edge to the refractory die. (See Fig. 4)

Optional – Adapting individual pieces in the P-Press (See P-Press sections-page 14-16)

c. It may be easier to P-Press each piece to the refractory die instead of both pieces at one time, especially when adapting into deep shoulder or chamfer margins. This will also help maintain the “P” material thickness (See Fig.5-6)

d. Before applying the lingual piece, remove any overlapping pieces on the lingual surface and burnish the blunt ends to the die. (See Fig. 7-8)
Step 4: Measure, cut and place the lingual piece

a. Measure and cut the lingual piece. (See Fig. 9)

b. Place the lingual piece in a diamond configuration so the top corner is extending over the incisal edge and the bottom corner is slightly over the margin. Press the piece to place in the incisal 1/2 of the die only, avoid adapting at the margin. (See Fig.10)

c. Lightly adapt the two remaining corners around the interproximals, slightly overlapping the labial piece and tack into place. (See Fig. 11-12)

⚠️ Any small gaps will be filled and burnished into place after processing in the P-Press

Step 5: Final processing in the P-Press (See P-Press Instructions - page 14-16)

Step 6: Remove any large overlaps and smooth joints

a. Fill in any gaps or short margins with scrap “P” material and burnish the pieces together.

b. Remove any overlaps with a knife on the labial, lingual or incisal surfaces that will thicken the coping and interfere with porcelain application. (See Fig. 15 & 16)

c. Leave any overlaps in the interproximal area that will not interfere with room for porcelain application. This will create extra strength in the CAPTEK™ coping.

d. Burnish and slightly smooth any overlapping areas, cracks and defects. It is not necessary to completely smooth these areas. (See Fig. 17)
Step 7: Trim and adapt the margins

! **It is very important to maintain the “P” layer thickness at the margins**

![Fig. 18](image1.jpg) ![Fig. 19](image2.jpg) ![Fig. 20](image3.jpg)

a. Use a CAPTEK™ knife at a 90-degree angle and remove the excess “P” material below the margin, the excess should be easily removed if the margins were properly ditched. (See Fig. 18)

b. Lightly burnish and condense the margins. Hold the adapting tool at an angle that will maintain the thickness of the “P” material resulting in a small .3mm collar. (See Fig. 19) If there is no “collar”, the “P” material was over worked and thinned. If this is the case, adapt and burnish more “P” material back to the margin.

c. Carefully trim as close to the margins as possible with the knife tip, removing any over-extensions. Re-burnish and seal the margins if needed, always be careful to maintain the thickness of the “P” material at the margins. (See Fig. 20)

Step 8: Process in the porcelain furnace

![Fig. 21](image4.jpg) ![Fig. 22](image5.jpg)

a. The posterior “P” material is now ready for processing. Place the refractory dies in the center of the firing tray and fire in a porcelain furnace on the “P” & “G” cycle. (See Figure 21-22)

- Do not fire more than 5 to 6 copings at one time.
- If the refractory dies are large, fire only 3 to 4 copings at one time

- For firing cycles and firing temperatures, see the calibration section and Calibration & Firing Cycle Guidebook.
- Clean light weight honeycomb trays are recommended.

Step 9: After processing - Check the “P” layer for any cracks or voids.

If deep cracks or voids are found, carefully fill with scrap “P” material before applying the “G” layer. (See posterior “P” section for instructions and example)

Step 10: The coping is now ready to apply the “G” layer

! **Important information for applying the “G” layer**
Equal amounts of Nano “P” & “G” material are required to achieve the reinforced metal structure and gold color.

Application of the “G” layer should take no more than 1 to 2 minutes.

The Pneumatic P-Press will not be used for the “G” material application. Use finger pressure and Captek instruments to apply the “G” layer.

Measure, cut and apply the “G” layer the same as the “P” layer, this will help to gauge the correct (equal) amount. (Posterior 4 pieces-Anterior 2 pieces)

Do not leave large overlaps; this will result in excess gold. It is okay to have slight gaps or small overlaps.

Do not burnish or smooth the “G” layer seams like the “P” layer. The “G” layer (gold) will completely melt and infiltrate the “P” layer.

**Posterior “G” Application**

**Step 1:** Add extra “G” for any extra pre-adapted “P” Material

If any extra “P” material was applied into box forms, retention grooves or under cuts an equal amount of “G” material needs to be applied during the “G” application.

**Step 2:** Measure, cut and apply the “G” layer (Same as “P” Layer)

- Measure and cut a strip the width of the die. (See Fig. 1)
- Measure from incisal to margin and cut the buccal piece. (See Fig.2).
- Apply with Captek tools and finger pressure. (See Fig. 3).
- Lightly tack into position. (See Fig. 4).
- Cut uneven corners to create a straight edge (See Fig. 5).
- Align the next piece with the cut straight edge and adapt into place. Do not overlap. (See Fig. 6)
- Measure, cut and apply the remaining pieces (See Fig. 7-8).
Step 3: Trim any excess “G” overlaps and margins

a. Trim any overlaps from the joints and occlusal surface. A few small overlaps and gaps will be okay. (See Fig. 9-10).
b. Trim away the excess “G” below the margins slightly exposing the fired “P” material. (See Fig.11-12)

⚠️ The amount of exposed “P” required at the margins will vary due to firing temperature and the amount of extra “P” applied (overlaps).

Step 4: Process in the porcelain furnace

a. Place the refractory dies in the center of the firing tray and fire on the “P” & “G” cycle. (See Fig. 13-15) The coping should have a uniform gold color and a slight texture inside and out.
b. Do not fire more than 5 to 6 copings at one time.
c. For large refractory dies fire only 3 to 4 copings at one time.

⚠️ For firing cycles and firing temperatures, see the calibration section and the Calibration & Firing Cycle Guidebook.
- Clean light weight honeycomb firing trays are recommended.

Step 5: Readapt using the Swedger (See swedger instructions)

It is recommended to re-adapt all copings on the refractory die by light swedging. This will insure the coping is well adapted to the refractory die with no gaps.

⚠️ During the gold infiltration many copings will lift away from the refractory die on posteriors occlusals, linguals of anteriors and shoulder/chamfer margins. Light swedging will evenly re-adapt the entire coping and maintain a passive fit.
Anterior “G” Application

Step 1: Measure-cut and apply the “G” layer the same as the “P” layer

a. Measure and cut a strip the width of the die. (See Fig. 1)
b. Measure from incisal to margin and cut the labial piece (See Fig. 2).
c. Apply with Captek tools and finger pressure (See Fig. 3-4).

d. Lightly tack into position and remove uneven corners to create a straight edge (See Fig.5)
e. Measure from incisal to margin, cut and apply the reaming piece in a diamond shape, wrapping the four corners around the die. (See Fig. 6-8)

Step 2: Trim any excess “G” overlaps and margins

a. Trim any overlaps from joints and the incisal/labial surface. A few small overlaps and gaps will be okay (See Fig. 9).
b. Trim the excess “G” below the margins slightly exposing the fired “P” material (See Fig. 10-12).
c. If there is excess “G” after firing, trim the “G” on future cases .3 to .5mm short of the fired “P” margins.

⚠️ The amount of exposed “P” required at the margins will vary due to firing temperature and the amount of extra “P” applied (overlaps).
Step 3: Process in the porcelain furnace

Fig.12 Fig.13 Fig14

a. Place the refractory dies in the center of the firing tray and fire on the “P” & “G” cycle. (See Fig. 13-14) The coping should have a uniform gold color and a slight texture inside and out.
b. Do not fire more than 5 to 6 copings at one time.
c. If the refractory dies are large, fire only 3 to 4 copings at one time.

- For firing cycles and firing temperatures, see the calibration section and the Calibration & Firing Cycle Guidebook.
- Clean light weight honeycomb firing trays are recommended.

Step 4: Readapt using the Swedger (See swedger instructions)

It is recommended to re-adapt all copings on the refractory die by light swedging. This will insure the coping is well adapted to the refractory die with no gaps.

During the gold infiltration many copings will lift away from the refractory die on posteriors occlusals, linguals of anteriors and shoulder/chamfer margins. Light swedging will evenly re-adapt the entire coping and maintain a passive fit.
Repairs after “G” Firing - (On refractory die)

Insufficient amount of “G” Material
If an insufficient amount of “G” material was used, the coping will have a pale gold appearance. (See Fig. 1)

- Re-adapt the coping before applying repair material (light swedge).
- Add a small piece of “G” material to the incisal or occlusal area. (See Fig. 2)
- Re-fire on the “P” & “G” cycle or Nano repair cycle. (See Fig. 3)

⚠️ **Heat and dry the added “G” material slowly to avoid it melting and dripping off the coping.**

Excess “G” Material
If the firing temperature is too low or too much “G” was used, excess puddling of gold will occur near the margins. (See Fig. 1)

1. **Firing temperature too low:**
   - Check calibration and raise the firing temperature if needed.
   - Re-adapt the coping before firing (light swedge).
   - Re-fire on the “P” & “G” cycle to infiltrate excess “G”.

2. **Too much “G” was applied:**

   - Re-adapt the coping before applying repair materials (light swedge).
   - Adapt a small amount of scrap “P” material to the interproximal area. (See Fig. 2)
   - Re-fire on the repair cycle (-10C -18F lower) or on the “P” & “G” cycle. The excess gold will draw to the added “P” material in the interproximal. (See Fig. 3)

⚠️ For firing cycles and firing temperatures, see the calibration section and the Calibration & Firing Cycle Guidebook.
Deficient areas – Check for holes, tears or short margins
This usually indicates thin areas in the “P” layer.

- Re-adapt the coping before applying repair materials (light swedge).
- Adapt scrap “P” material to the repair area. (See Fig. 1-2)
- Add a equal amount of scrap “G” material above the repair area.(See Fig. 2)
- Add a small amount of “G” material on the lingual to help maintain color.
- Fire on the Nano repair cycle or “P”&”G” firing cycle. (See Fig. 3)
Adapting “P” Material Using the Pneumatic P-Press

The Pneumatic P Press is designed to quickly and evenly adapt the “P” material to the refractory die. It will eliminate the need to hand adapt the “P” material to form a CAPTEK™ coping. (See Figure 1)

Before Using The P Press:

1. Check the P Press for the proper amount of air pressure (maximum of 75 - 90 psi). (See Figure 2)

2. Check the O-rings to make sure they are in the proper position to seal the removable lid to the pressure chamber. (See Figure 3)

3. There are two different size blue rubber cone inserts for pressing different size dies. Take one cone of each size and clean off the white talcum powder with water and completely dry. Leave the talcum powder on the remaining spare blue cone inserts as a preservative. (See Figure 4)

4. Place the metal washer over the blue rubber cone. (See Figure 5)

Important Note: Do not use Vaseline or other petroleum products on the floor or base of the pressure chamber. These products chemically attack and damage the natural rubber components.
Step 1. Place the Die with the applied “P” Material in the Pressure Chamber

- a. Remove the lid to the pressure chamber by turning the cap one quarter turn (counterclockwise) in the direction of the arrow marked “OPEN” and lift straight up. (See Figure 6)
- b. Place the refractory die, with the applied “P” material on its base in the center of the pressure chamber floor.

Step 2. Place a Blue Rubber Cone

- a. Select the correct sized blue rubber cone insert (remove talcum powder). There are two sizes to choose from. (See Figure 7)
- b. Place the metal washer over the blue rubber cone.
- c. Place the selected cone over the refractory die. The cone should fit passively over the die and lay flush with the chamber floor. (See Figures 8 & 9)

If the cone does not fit passively on the pressure chamber floor, the chamber will leak air when the P Press is activated, and will not adapt the “P” material to the refractory die.

If you hear air escaping, either select the larger blue rubber cone or trim the base of the die to make it smaller.
Step 3. Activate the Pressure Chamber

a. Replace the lid by lowering it straight down onto the P Press, lining up the black lines on the lip of the lid and the base of the pressure chamber. Secure the lid by turning clockwise until snug. (See Figure 10)

b. Depress the air pressure button and hold for 2 seconds, release and depress a second time holding for 2 seconds. (See Figure 11)

   a. If air is heard escaping while pressing the button, open the pressure chamber lid and make sure the cone insert and washer are correctly positioned in the chamber. The cone should fit passively over the die and sit flush on the chamber floor.

   b. Secure the lid and repeat the pressing cycle.

Step 4. Remove the Pressed Coping

a. Open the pressure chamber lid and remove the die (counterclockwise). (See Figure 12)

b. The finished pressed “P” material should be completely adapted to the surface of the refractory die and the overlapping “P” areas. If not repeat the Pressing Cycle. (See Figure 13)

Step 5. Finish the “P” Application

For finishing of the CAPTEK™ “P” layering process, refer to the instructions in this manual for Anterior or Posterior “P” application.
Finding the Optimum “P” & “G” Firing Temperature (Original & Nano Captek materials)

The optimum Captek gold appearance and stability can be adjusted by a combination of temperature and the amount of “G” material applied.

Firing the “G” layer 3C to 10C (5-18F) higher than the (Captek™ Manual) suggested “P”& “G” firing temperature and applying equal amounts of “P” & “G” material will help maintain the gold color during bonder and porcelain firings.

Initial test firings will be on molars only

**Step 1:** Apply an equal amount of “G” to match the “P” layer
Extend the “G” material to the margins. (See Figure 1)

**Step 2:** Raise High Temperature -  
**Original Captek:** Fire 5C (9F) higher  
**Nano Materials:** Fire 3C (5F) higher

*Fig 1*  Correct “G” & Optimum Firing Temperature  
(Sample - Fig 1)  
Temperature 5C higher than original P&G firing temp.

*Fig 2*  Excess G  
*Fig 3*  Over fired or to little G  
*Fig 4*  Cut back if needed Anterior only

**Note:** It is critical to make sure you have applied equal amounts of “P” & “G” to achieve the correct gold appearance and fit.

**Step 3:** Check the coping for the correct gold penetration & appearance

a. If the coping has the desired gold color and texture but has too much excess gold at the margins (see fig. 2), raise the firing temperature by 2-3C (5F) and process a new molar coping. Repeat this step until you see very little excess gold, and the coping and margins look properly fired. This is your Optimum “P” & “G” firing temperature.

*![](sprite)  The amount of temperature increase from the High Calibration temperature to the Optimum “P” & “G” firing temperature is called the Optimum Temperature Differential.  
Transfer this figure to your calibration log.*

b. If the coping is pale and loose fitting you may need to lower the temperature 2-3C (5F)  
or you did not apply an equal amount of “G” material. (See figure 3)

c. **Anterior Copings:** After finding the optimum temperature on molars and you still experience excess gold at the margins on anteriors, apply less “G” material by trimming the “G” approximately .5mm short of the margins. (See figure 4)
Section 4:
METAL COLLARS, METAL LINGUALS AND OCCLUSAL STOPS

Captek™ exhibits advantages over traditional porcelain-fused-to-metal crowns where metal is exposed for margins. Capteks™ unique composite metal structure does not oxidize and is clinically proven to reduce harmful bacteria and plaque resulting in healthier gums.

**Metal Collar Application**

There are several proven techniques and Captek™ materials for making metal collars on Captek™ copings. The collar size and tooth preparation may influence which technique will work best. *(See the Captek™ Manual disc for additional techniques for making metal collars)*

This training manual will cover two techniques utilizing two different materials:

1. **Applying additional strips of scrap “P” material during the “P” application.**
   - Best suited for feather, bevel and light chamfer margin design.
   - Any size collar

2. **Applying Captek™ Build-Up material after the coping is completed.**
   - Best suited for large collars and deep chamfer and shoulder margin design.
   - Any size collar
   - Metal linguals and occlusal stops

**(1) Metal collar using strips of scrap “P” Material**
(Feather, bevel and light chamfer preparations)

**Step 1: Apply strips of “P” Material**

a. Cut “P” strips slightly larger in height than the desired collar size (1/3 larger). *(See fig. 1)*

b. Place strips exactly to the margins and tact into place, several pieces will be easier to place rather than 1 or 2 large pieces. *(See fig. 2-3)*
Step 2: Burnish strips to the die

![Fig.4](image1) ![Fig.5](image2)

a. Burnish the blunt edges to the die to avoid internal lines and voids, avoid thinning the overall thickness of the material. (See fig.4-5)

Step 3: Apply “P” layer

![Fig.6](image3) ![Fig.7](image4)

a. Follow manual steps to apply the “P” layer using the P-Press. (See fig.6-7)

Step 4: Adapt “P” material and trim margins

![Fig.8](image5) ![Fig.9](image6)

a. Adapt the overlaying pieces together, this requires slightly more hand pressure. (See fig.8)
b. Trim margins and maintain thickness of “P” material. (See fig.9)
Step 5: **Shape the metal collar**

![Fig. 10](image1.png) ![Fig. 11](image2.png) ![Fig. 12](image3.png)

![Fig. 13](image4.png) ![Fig. 14](image5.png) ![fig.15](image6.png)

a. Shape initial bevel of collar and margin. (See fig.10)
b. Manipulate the double layer down and outward to desired shape and size. (Fig.11-12)
c. Form a sharp porcelain finish line. (See fig.13-15)

⚠️ **Collars should be slightly over contoured; final contouring will be done during porcelain finishing and metal polishing. (See fig.14-15)**

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Step 6: **Process the “P” layer in the furnace**

![Fig. 16](image7.png) ![Fig. 17](image8.png)

a. Place the refractory die on a firing tray and fire in the porcelain furnace on the “P” & “G” cycle. (See fig. 16-17) - (See Section 1 for firing temperatures)
b. After processing, check the fired “P” layer for any cracks or voids and carefully fill with “P” material before applying the “G” layer.
Step 7: Apply the “G” layer

Fig.18  Fig. 19  Fig. 20

a. Follow the manual steps to apply “G” layer. (See fig.18-19)

b. Apply extra “G” material to match the added “P” strips for the collar. (See fig.19)

c. Place the refractory die on a firing tray and fire in the porcelain furnace on the “P” & “G” cycle. (See fig.20) - (See Section 1 for firing temperatures)

Step 8: Finish coping and collar

Fig.21  Fig.22

a. Lightly swedge, divest and fit the coping to the master die.

b. Burnish and finish margins.

c. Contour the collar to desired size and shape creating a sharp finish line for porcelain. Leave the collar slightly over contoured for final contouring during porcelain finishing and metal polishing. (See fig.21-22)

d. The coping is now ready for UCP Bonder
(2) Metal collars on Captek™ finished copings using Build-Up Material

(Large collars and for deep shoulder/chamfer preparations)

- This technique works best for deep shoulder/chamfer preparations and for large metal collars (See fig.1)
- The added Build-Up material to form a collar makes the margin area stronger, therefore harder to re-adapt and seal margins.
- In this technique the coping is finished, re-adapted and margins sealed before the metal collar is added, resulting in well adapted margins.

**Step 1: Follow normal procedures for making a Captek™ coping**

- a. Process and make the Captek™ coping as normal. (See fig. 2)
- b. Fit, re-adapt the coping and seal margins but always maintain the full thickness at the margins (small collar). (See fig. 3)

**Step 2: Apply the Build-Up Material to form a collar**

- a. Mix a small amount of Captek™ Build-Up material with Fast Dry (Capcon Liquid) to a smooth consistency in a Capcon dish or small mixing jar. (See fig 4)
- b. Use a small brush and apply the Build-Up material to form the desired collar size and thickness. *(Any size collar)* - (See fig.4-5)
- c. Shape to the desired dimensions while the build-up is still moist and workable. (See fig.6-7)

**Collars should be slightly over contoured; final contouring will be done during porcelain finishing and metal polishing. (See fig.5-7)**
Step 3: Process the Build-Up Material in the furnace

![Fig. 8](image1) ![Fig. 9](image2)

a. Carefully remove the coping from die. (See fig.8)

b. Place the coping on a firing peg and tray and fire on the Inflow cycle. (See fig 9) (See Section 1 for firing temperatures)

Step 4: “G” application

![Fig. 10](image3)

a. Add scrap “G” material in an equal amount to match the collar build-up. (See fig. 10)

Step 5: Process the “G” layer in the furnace

![Fig.11](image4) ![Fig.12](image5)

a. Mix Captek Solder investment with Slow Dry (UCP) liquid to a thin consistency in a Captek jar and apply a thin layer to the inside of the coping. This will prevent any gold from passing through and affecting the internal fit. (See fig.11)

b. Place on a firing stand or pillow pad and fire on the High Calibration cycle. (See fig. 12) (3 minute entry time with 1 minute hold time)- (See Section 1 for firing temperatures)
Step 6: Finish the metal collar

a. Remove the solder investment with an instrument and Super Stripper acid in the ultrasonic cleaner.

b. Seat the coping on the master die. (See fig. 13)

c. Contour the collar to the desired size and shape creating a sharp finish line for porcelain. Leave the collar slightly over contoured for final contouring during porcelain finishing and metal polishing. (See fig. 14-15)

d. Re-adapt with the swedger if needed

e. Final finishing and sealing of all margins.

Step 7: Apply UCP Bonder

The copings is now ready for Bonder

a. Clean the coping as recommended

b. Apply UCP bonder
**Metal linguals, occlusal stops or islands**

**Step 1: Follow normal procedures for making a Captek™ coping**

a. Fit, re-adapt the coping and seal margins but always maintain the full thickness at the margins.

b. Seat the coping on the articulated model. (See Figure 1)

Fig. 1

**Step 2: Mix the Build-Up Material**

a. Mix a small amount of Build-Up material with Fast Dry (Capcon Liquid) to a thick, creamy consistency in a Capcon dish or small mixing jar. (See fig. 2)

Fig. 2

**Step 3: Apply the Build-Up Material**

a. With a small brush, apply the Build-Up material to the desired area. (See Figure 3-4)

b. Light tapping on the model will help to smooth and condense the Build-Up material.

c. Slightly over build the finish line and edges. These will be shaped later to create a sharp finish line. (See Figures 4 and 5)
Step 4: Check occlusion

Fig. 6

- When the Build-Up material no longer has a wet look, carefully close the articulator to check for occlusion. Only light occlusion is necessary.

- Avoid centric contact on the finish line. Build the material slightly past the contact area. (See Figure 6)

Step 5: Remove the coping from the model

Fig. 7  Fig. 8

- Carefully remove the coping and check for proper contour.

- Add to any deficient areas if needed. (See Figure 7)

- Carefully shape the finish lines. (See Figure 8)

Step 6: Process in the furnace

Fig. 9

- Place on a firing peg and tray and fire on the Inflow D cycle to fuse the Build-Up material. (See Figure 9)

(See Section 1 for firing temperatures)
Step 7: Apply the “G” Material

![Fig. 10](image1.png) ![Fig. 11](image2.png)

a. With a thickness gauge, measure the fired build-up area or lingual in 4 to 5 areas to establish an average thickness. A measurement of .5 mm to .6 mm equals one sheet of posterior “G” material. Compensate for more or less “G” material as needed according to the measurement. (See Figure 10)

b. Apply the correct amount of “G” material. (See Figure 11)

Step 8: Apply the CAPTEK™ Solder Investment

![Fig. 12](image3.png)

a. Mix a small amount of CAPTEK™ Solder Investment with UCP Liquid.

b. Paint a thin layer of the solder investment on the inside of the CAPTEK™ coping. This will prevent the gold from flowing through to the inside. (See Figure 12)

Step 9: Process in the furnace

![Fig. 13](image4.png) ![Fig. 14](image5.png)

a. Place the coping on a firing peg and tray and fire on the High Calibration cycle. Add a 3 minute dry time to the cycle to slowly burn off the “G” wax. (See fig.13) (See Section 1 for firing temperatures)

b. Check for the correct amount of gold on the built area. (See Figures 13 and 14)

c. More gold may be added and re-fired if needed
Step 10: Remove the solder investment
   a. Remove investment with a sharp instrument.
   b. Place the coping in acid (Super Stripper) and clean in the ultrasonic.

Step 11: Seat the coping on the model
   a. Seat the coping on the articulated model and adjust occlusion (See Figure 15-16)
   b. Contour and sharpen finish lines with a carbide bur (See Figure 17)
   c. Finish with rubber wheels to a smooth surface. (See Figure 17)
   d. Repair any pits or voids with Pontic Cover material or Inflow D.

Step 12: Finish the margins and apply the UCP Bonder

Step 13: Apply porcelain
Re-establishing gold color on exposed Captek™ metal after porcelain application. (Metal linguals, collars and stops)

Step 1: Completely finish the porcelain application (glaze).

Step 2: Finish the exposed Captek™ metal to a smooth satin finish.

Step 3: Mix Inflow D to a thick creamy consistency with Inflow (IPC) Liquid.

Step 4: Apply Inflow D.

a. Apply a thick coat of Inflow D on the exposed metal.

b. Lightly vibrate to smooth the Inflow D material. (see fig.1)

c. Fire in the furnace to (750ºC - 1385ºF)

⚠️ At this temperature, the Inflow D will fuse to the coping, but will not melt. (See Figure 1)

Step 5: Hand burnish the fired Inflow D to a luster.

a. Use the CAPTEK™ adapting tool and aggressively burnish to a high luster. (See Figure 2)

Step 6: Carefully polish with rubber wheels and polishing paste.

Contact Captek for polishing kit

⚠️ If there is insufficient gold this process may be repeated.
Section 5:
FINISHING

Refractory Die Removal

Instructions:

Step 1. Readapt the Copings on the Refractory Die

_During the firing of CAPTEK™ copings you may experience some lifting from the refractory die at the margins, shoulder-chamfer areas, lingual of anteriors and deep fossa areas of occlusal. Readapt these areas by hand with a CAPTEK™ instrument or light swedging (See Pages 6-8)._  

*Option:* After readapting on the refractory die, you may pre-finish with a rubber wheel approximately 50% of the margins thickness. Stay within 1-2 mm. of the margins.

_Important Note: CAPTEK™ copings cannot be sandblasted with aluminum oxide for divestning. The gold layer is only 20 to 30 microns thick and can easily be removed by sandblasting, exposing the gray “P” layer._

Step 2. Divest the Coping

_If the CAPTEK™ coping does not release from the refractory die, cut and break the base away from the coping._

a. Use a bur and carefully grind out the major portion of the refractory die from inside the coping. Be careful not to hit the sides of the coping. (See Figure 1)

b. You can use a small knife to chip away the remaining pieces of investment from inside the coping. (See Figures 2 and 3)
Step 3. **Remove the Remaining Investment in Acid**

a. Place the divested coping in acid and remove any remaining investment by cleaning with the aide of an ultrasonic cleaner for 10 to 20 minutes. The more investment left in the coping the longer it will take to remove it in the ultrasonic cleaner. (See Figure 4)

**Note:** Recommended Acid: “Super Stripper” or “Super Strip-It.” (See Figure 4)

**Use safety precautions; avoid any contact with the acid.**

*Note: The more investment left in the coping the longer it will take to remove the investment.*

b. Use tweezers to remove the CAPTEK™ coping from the acid and rinse thoroughly in water

Step 4. **Seat and Finish the Coping**

The coping is now ready to be seated on the master die and finished.
Finishing Margins on CAPTEK™ Copings

- The processed CAPTEK™ copings will be a uniform thickness throughout (.2 mm. to .3 mm.) requiring less finishing than traditional porcelain-fused-to-metal copings.

- You will only grind on and finish the last 1 to 2 mm. of the margins of a CAPTEK™ coping.

- Do not grind on or finish the surface of a CAPTEK™ coping.

**Note:** During the firing of CAPTEK™ copings you may experience some lifting from the refractory die at the margins, shoulder-chamfer areas, lingual of anteriors and deep fossa areas of occlusal.

**Option before Divesting:**

- Readapt these areas by hand with a CAPTEK™ instrument or light swedging. (See Pages 6-8)

- After readapting on the refractory die, you may pre-finish with a rubber wheel approximately 50% of the margins thickness. Stay within 1-2 mm. of the margins.

*(Option)* It is recommended to use a spare die for the initial seating and finishing of CAPTEK™ copings to avoid damaging the master die. It can be a spare master die or a die from the Capsil duplication mold. There are also resin and epoxy materials available. When spare dies are used always check them for accuracy and compare the fit to the master die. If they are different, discard the spare die.

**Finishing Directions:**

**Step 1. Seat Copings**

- Use a rubber wheel, a small carbide or diamond bur to remove all the overextensions at the margins until the coping is completely seated on the die. Position the coping and the hand-piece so the rotation of the grinding tool will remove the extensions from the margins outwards and away from the inside of the coping. (See Figure 1)

- If the margins have lifted carefully adapt the margins including the shoulder-chamfer area to the die with the round end of the CAPTEK™ instrument. (See Figure 2)
Step 2. Finish Margins

Use a rubber wheel or carbide bur to remove the thickness at the margins. (See Figures 3 & 4)

Fig. 3

Important Note: Do not use grinding stones or diamonds for fast bulk cutting of these areas. They may roll the material and trap air and grinding materials, which if not treated properly, can cause gassing during the porcelain firing.

Fig. 4

Step 3. Evaluate Fit

At this point, check the fit of the coping on the master die. The coping should have a passive fit.

Note: If the coping fits too loose or too tight it can be adjusted by swedging. (See Pages 6-8 for swedging instructions)

Step 4. Readapt Open or Lifted Margins

Use the round end of the CAPTEK™ instrument and carefully hand burnish the margins to the die. Be careful not to chip the margins of the die.

Note: Hand burnishing can be done at any stage during finishing of the margins. (See Figure 5)

Fig. 5

Step 5. Remove the Remaining Unwanted Thickness at the Margins

Any additional thickness at the margins can be removed with a coarse or medium diamond grinding tool, rubber wheel or carbide bur. Remember to stay within 1 to 2 mm. of the margins. (See Figure 6)

Fig. 6
Step 6. Recheck Margins

*Always recheck the margins and remove any over extensions after finishing and burnishing. CAPTEK™ margins will stretch and elongate during finishing. (See Figure 7 & 8)*

![Fig. 7](image)

![Fig. 8](image)

Step 7. Final Finishing and Sealing of Margins

*Use a brown course Meister Stick Point (by Noritake) or a small tapered fine or medium grit diamond for the final finishing and sealing of the margins. Re-burnish if needed. (See Figures 9-11)*

![Fig. 9](image)

![Fig. 10](image)

*Note: To break any smooth surface tension, light texturing of the margins with a fine diamond after hand burnishing is recommended. (See Figures 9 & 10)*

![Fig. 11](image)

Step 8. CAPTEK™ Copings are now Ready to Clean and Apply the Bonder (See Section 9 for bonder instructions).

*Option: When finishing CAPTEK™ margins, you will grind into the “P” layer leaving a slightly less gold color at the margin. Inflow D can be used to replenish the gold layer on finished CAPTEK™ copings and margins (See Section 8 for Inflow D instructions).*
The swedger is a tool used to adjust the fit of CAPTEK™ copings. **Most copings do not need swedging.** During the firing of CAPTEK™ copings, the margins will sometimes lift away from the refractory die affecting the over all fit. This is a natural reaction from the “G” layer being drawn into the “P” layer through capillary attraction. The expansion and sintering of the refractory dies will also affect the fit. The swedger can be used to readapt the entire coping evenly to maintain a passive fit. You will find the need to swedge posteriors (molars) more than anteriors. Hand burnishing and adapting takes longer and only affects the margins.

**Swedger Parts**

The base and piston have depressions to be filled with clay. The clay must be filled slightly above the metal rims as shown below to ensure proper compression when Swedging (remove excess clay from sleeve guide when needed). (See Figures 1 & 2)

---

**Important Note**

**Before Swedging:**

1. *CAPTEK™* copings must be free of overextension or flash at margins.

2. Under-cuts on dies should have been blocked out during die preparation with a hard resin type material.

3. Once *CAPTEK™* copings are fitted to the master die or spare die, the margins should be slightly thinned for best results.
Swedging Directions

Step 1. Seat the Coping

a. Seat the coping on the master die or spare die.

b. Wrap the coping and die with thin plastic sheeting (or Saran Wrap). (See Figure 3)

Step 2. Place the Wrapped Coping in the Swedger

a. Place the wrapped coping in the base with the occlusal or incisal facing down into the clay and the dowell pin straight up, not tilted. (See Figure 4)

Note: Be sure the coping does not separate from the die.

b. Place the outer sleeve into place and slide the piston down inside the sleeve until fully seated using firm hand pressure. (See Figures 5 & 6)

Step 3. Swedge Coping

a. Place the swedger on the floor or solid surface.

b. Tap once with the dead blow hammer to compress the clay.

c. Then strike 2 or 3 times with the hammer.

Note: The harder the blow, the tighter the fit. (See Figure 7)
Step 4. Remove the Coping

Remove the coping from the swedger and check the fit. You are now ready for the final finishing and burnishing of margins.

Note: You may repeat swedging as needed to adjust the fit of your coping.

Step 5. Reverse Swedge to Create a Passive Fit

You can also loosen the fit of your coping by swedging, creating a passive fit.

a. Wrap the master die with thin plastic sheeting (Saran Wrap) and place the coping on the die over the sheeting. (See Figures 8-10)

Note: The plastic sheeting works as a die spacer, actually expanding the coping.

b. Wrap the coping and die with more plastic sheeting as before and swedge lightly. (See Figure 11)

Note: Readapting by swedging can be done at any point from the refractory stage through the opaque stage.
Section 6:
NANO PORCELAIN SUPPORT MATERIAL

This training manual will show a simple and accurate technique for adding porcelain support. (See the Captek Manual disc or visit Captek.com for further information on adding porcelain support)

The stress-relieving properties inherent in Captek copings and UCP Bonder can accommodate more than 2mm of porcelain thickness if supported by metal. Many cases do not require additional porcelain support.

Posterior Guidelines
- Opposing cusp occluding on unsupported marginal ridge.
- More than 2mm of unsupported horizontal space.
- To support functional cusps or group function.

Anterior Guidelines
- High risk occlusion and/or absence of posterior stops.

Instructions to add porcelain support on a completed Captek coping

Step 1: Follow normal procedures for making a Captek™ coping

a. Process and make the Captek™ coping as normal.

b. Fit, re-adapt the coping and seal margins but always maintain the full thickness at the margins (small collar). (See fig. 1)

c. Use a thickness gauge to determine if additional support is needed. Check for high risk occlusion, such as occluding cusp on a marginal ridge, or areas with more than 2mm of unsupported porcelain. (See fig.1-4)

Consider:
- Mesial / distal space
- Narrow occlusion
- Supporting functional cusp
- Severely broken down teeth
- High risk occlusion
Step 2: Mix Nano Porcelain Support Material (Fast Dry Capcon Liquid)

a. Add a small amount of Nano Porcelain Support Material into one side of the Capcon mixing dish. Add Fast Dry (Capcon liquid) and mix to a thick consistency that can easily be applied with a brush. (See fig. 5)

b. Add Fast Dry (Capcon Liquid) in the remaining well to re-wet the powder as you build. (See fig.5)

Step 3: Apply Nano Porcelain Support Material

a. Apply the support material with a brush in small increments to build and extend marginal ridges or cusp additions where needed, over build slightly for shrinkage.

b. Build functional marginal ridges to within .5 to 1mm of the adjacent tooth for maximum porcelain support. (See fig.6-11)

⚠️ **It is not necessary to make marginal ridge extensions more than 1 to 2mm thick.**

c. Close the articulator to check the occlusal clearance, *ideal space is 1.5 to 2mm* (See fig. 9)

d. Carefully remove the coping from the model and add more support material if needed and shape the extension thickness, 1 to 2mm thick. (See fig.10-11)
Step 4:  Process in the furnace.

a. Place the coping on a firing stand and tray and fire on the Nano Porcelain Support Material firing cycle. (See fig.12) (See Section 1 for calibration and all firing temperatures)

<table>
<thead>
<tr>
<th></th>
<th>Entry / Dry Time: 3-4 minutes</th>
<th>Entry Temp: 500° C-600° C (930° F-1100°F)</th>
<th>Temp. Rate: 80° C per minute (145° F)</th>
<th>High Temp: Hi calibration temperature</th>
<th>Hold Time: 1 minute</th>
<th>No vacuum</th>
</tr>
</thead>
</table>

Step 5:  Finish coping

a. The build-up should appear slightly more textured than the coping. It is not necessary to smooth the build-up surface, smooth only sharp edges and corners.

b. Seat the coping and check the occlusal clearance and marginal ridge extensions for maximum porcelain support. (See fig. 13-15)

- **Ideal occlusal clearance is 1.5 to 2mm. (minimum 1mm)**
- **Ideal space between marginal ridge and adjacent tooth is no more than .5 to 1mm**

c. Adjust occlusion and extensions with a carbide bur if needed. (See fig.16-17)

d. Finish the margins; the coping is now ready for UCP Bonder. (See Fig. 18)
Section 7:
CAPTEK™ INCONNECT BRIDGE TECHNIQUE

This training manual will show a simple and accurate technique for making strong Captek™ bridges. (See the Captek Manual disc or visit Captek.com for further information on Captek bridge and splint options)

The Inconnect™ bridge technique in combination with Bridge & Implant Material will insure requirements for strength, accurate fits, and optimum stability during porcelain firings, long term fracture protections along with exceeding esthetics and long term tissue health. With very few exceptions, any bridge appropriate for cast alloy can be done with Captek™.

Specifications:

Anterior:                           Posterior:
- Up to four pontics                - 2 to 3 pontics
- Splints                          - Splints
- Cantilever                       - Cantilever - Requires added frame design
- Implants                         - Implants

Recommended cast metal for pontics: All Captek testing and research has been done with a 2% gold high palladium alloy (Leach & Dillon 250 SL from Argen). It is important to select the right alloy matched to the CTE of your porcelain and is in line with the following criteria:
- Low gold high palladium alloys are recommended
- Alloys over 60% Gold are not recommended (Less than 10% palladium)
- No base metals

Contact your Captek representative or Captek.com for alloy considerations.

Frame requirements:
- Captek design requirements for bridge frames are the same as for standard cast alloys.

Pre-case screening criteria:
- Occlusal clearance: (Metal frame and porcelain)
  - Posterior: Minimum 1.5 to 2.0mm reduction.
  - Anterior: Minimum 1.0 reduction (much less biting force or load)
- Connector design:
  - Enough vertical height to accommodate a 2.5 to 3.0mm. metal frame connector and porcelain. (Vertical height from margins to opposing)
- Prep design:
  - Short or over tapered preparation may not be advised, low retentive preparations may not support a bridge.

- Metal collars are recommended to improve load strength on all bridges.
- Light air abrading with aluminous oxide is recommended for low retentive preparations and posterior bridges.

Cantilever Bridges: (Contact Captek or visit Captek.com for information on Cantilever bridge criteria)
Cantilever bridges are indicated but require pre-case planning and design.
- Anterior: Most anterior cantilever bridges will work
- Posterior: Posterior cantilevers require special preparation and case design.
Inconnect Bridge Technique

Step 1: Process the Abutment Copings

- Follow the standard procedures to fit and readapt the copings to the master dies.
- Leave the margins slightly thick to protect the margins during the Inconnect bridge firing.
- Seat the copings on the model for the bridge connection and lightly tack with sticky wax. (See fig.1)

Copings cannot be readapted by swedging after the bridge is connected.

Step 2: Wax the connector area

Light cured wax is recommended for the connector area; it does not lift or pull away from the metal coping when waxing pontics. (See fig.2-6) Contact Captek light cured wax recommendations.

- The connector area and occlusal rest can be larger if more strength is needed.
- Anterior bridge connectors will be smaller and may not need an incisal rest.

a. Posterior:
   - Wax the connector area from buccal to lingual extending to the occlusal marginal ridge and within 1 to 2 mm. of the margins, approximately 4-6 mm. in diameter.
   - Wax an occlusal rest for added strength and to provide a vertical stop to hold pontics in place. This can be thinned or removed for occlusion after soldering. (See fig.5)

b. Anterior:
   - Wax the connector area as large as possible without affecting esthetics and occlusion. Wax labial to lingual extending to the incisal marginal ridge and within 1 to 2 mm. of the margins.
   - Wax an incisal rest to provide a vertical stop, this can be thinned or removed if needed after soldering. Extend the rest across the incisal for added strength if there is room. (See fig.6)

The wax should be approximately .3 mm. in thickness and will be re-contoured and thinned after casting and soldering.
Step 3: Fit / wax and attach the pontics

a. Choose a pre-made wax pontic or hand wax the pontic to fit the space according to traditional cast metal design for porcelain support and strength. **The connector arms should have an approximate 3 mm. vertical height and 2 mm. width.** (Fig. 7-8)

![Fig. 7](image1)

![Fig. 8](image2)

**Anterior connectors may be slightly smaller due to tooth size.**

b. Adjust 3mm. X 2mm. pontic arms to fit between abutments and waxed connector areas.

c. Align pontics approximately center of the waxed connectors areas and incisal contours of abutments. (Use soft wax under pontics to help hold in position) (See fig.9-11)

d. Check occlusal clearance, ideal space is approximately 1.5 to 2mm (See fig.11)

![Fig. 9](image3)

![Fig. 10](image4)

![Fig. 11](image5)

![Fig. 12](image6)

![Fig. 13](image7)

![Fig. 14](image8)

e. Carefully attach pontics to connector with low shrinkage crown & bridge wax. **Always be careful to maintain approximate 2x3 connector arm.** (See fig.12)

f. Remove sticky wax from abutments and carefully remove bridge from model. Fill any voids and contour with wax in the interproximal area. (See fig.13-14)
Step 4: Additional contour for porcelain support

a. Check contour, add wax to match width and contour of abutment copings or adjacent teeth. (See fig.12-17)

Step 5: Check connector arms for maximum strength

a. Measure connector arms for approximate 3mm. vertical and 2mm. width

b. Add wax to arms to achieve correct size for maximum strength (See fig. 18-19)

⚠️ Anterior connectors may be slightly smaller due to tooth size.

Step 6: Invest pontics

a. Carefully remove the connectors from the copings with an instrument. (See fig.20)

b. Check fit and make sure connectors and rest are well adapted to the coping. Conventional wax will often lift away from the copings during the pontic waxing. (See fig.21)

c. Sprue pontics and prepare for investing (See fig.22-26)
It is recommended to weigh the wax pattern + Sprue bar and subtract weight of button to insure the correct amount of metal is used without using excess metal. (Weight of wax (grams) X density of metal = amount of metal needed (See fig. 25-26)

e. Adjust the casting investment special liquid/water ratio for less expansion to create a passive fit (mostly water- reverse the normal special liquid to water ratio).

f. Follow the manufacturer’s recommendations for investment procedures for mixing and setting time.

**Step 7: Casting**

a. Cast with recommended alloys. (See page 1 for alloy recommendations)

b. Divest as usual and remove oxides. (Sandblast)

c. The casting should fit well but passively with very little adjusting. Adjust as needed but do not create excess space between the connector and the coping.

- The pontics and connectors must passively seat without moving the abutment to insure an accurate fitting bridge…
- If the pontics do not easily seat, adjust investment liquid to water ratios for less expansion for future cases (less liquid more water). (See fig.27-28)
**Step 8: Connect the bridge sections together**

![Connect bridge sections](image1) ![Block out interproximal](image2)

a. Position the copings and pontic on the model and tack the copings to the dies with sticky wax.

b. Connect the bridge sections by luting a metal bar across the units with sticky wax or thick low shrinkage glue or resin material. (See fig.29)

c. Remove the sticky wax from the dies and carefully remove the bridge from the model. If the connector is close to the margin, block out the interproximal areas with wax to keep investment from the connector area. (See fig.30)

**Step 9: Invest the bridge**

![Paper towel](image3) ![Stiffen base](image4) ![Fill copings](image5)

a. Measure enough Captek™ soldering investment into a mixing bowl to fill the copings and form a base approximately 8 to 10mm. (3/8 inch) thick and the length of the bridge. Mix the investment with water to a thick creamy consistency.

b. Remove enough investment for the base and blot with a paper towel to stiffen, and form the base. Leave enough investment in the bowl to fill the copings. (See fig.31-32)

c. Carefully fill the copings with the remaining investment using a vibrator, slightly over fill extending above the margins.(See fig.33)
d. Place the bridge on the stiff base and slightly sink into the base until the investment covers the margins by approximately 1.0 mm. (See fig. 32) Trim the base to avoid absorbing too much heat during the firing cycle (See fig.34-35)

![Be careful to avoid locking the pontic into the investment, for easy removal.]

e. Let the investment set for a minimum of 20 minutes.

f. Remove the wax and bar with boiling water or steam cleaner and remove any wax residue by slightly heating with the hand butane torch. If resin or glue was used, burn off with the butane hand torch or burn-out furnace. (Fig.35-36)

![Be careful to not over heat and form oxides on the pontic.]

g. Remove the pontic from the investment and check the invested bridge for access to the connectors. Remove any investment that may interfere with the connector. (See Fig.36)

### Step 10: Apply the Inconnect Material (Slow Dry / UCP Liquid)

![Fig.37](image)  ![Fig.38](image)  ![Fig.39](image)

a. Mix Inconnect with Slow Dry (UCP liquid) as thick as possible but still able to apply with a brush. (See fig.37-38)

b. Apply a thick layer of Inconnect to the inside of the connectors and seat the pontics into place. (See fig.38-39)

![Some excess Inconnect should squeeze out of the connector to insure enough was applied. (See fig. 39)]

### Step 11: Apply Pontic Cover Material to connector seam

![Fig.40](image)  ![Fig.41](image)  ![Fig.42](image)

a. Mix pontic Cover Material with Slow dry (UCP Liquid) and apply a small bead directly on the connector seam to fill any gaps and to allow for shrinkage. Pontic Cover Material will help reduce oxides during soldering (See fig.40-43)
Step 12: Process in the furnace

Fig. 42

<table>
<thead>
<tr>
<th>Entry/Dry Time</th>
<th>4 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entry Temp</td>
<td>500º - 600º C</td>
</tr>
<tr>
<td>Temperature High calibration</td>
<td>High + 15º F</td>
</tr>
<tr>
<td>Hold Time</td>
<td>1 minute</td>
</tr>
</tbody>
</table>

(See calibration and firing program section)

a. Place the bridge on a firing tray and process on the Inconnect cycle. The Inconnect should have a gold sheen and slightly more texture than the Captek copings. (See fig.42)

⚠️ **Do not disturb the pontic after the Inconnect dries, this may break the seal between the Inconnect layer, copings and metal connectors affecting the solder connection!**

Step 13: Divest and finish the Captek bridge

Fig. 43 Fig. 44 Fig. 45

a. Divest the bridge and remove the remaining investment residue and Pontic Cover flux in an ultrasonic cleaner with “Supper-Strip It” acid for 10 to 20 minutes.

b. Check the fit on the master model. (See fig.43)

c. Contour and smooth the connector seams to the copings as needed for esthetics. Do not over thin or remove the flared connector areas on the copings. **Maintain an approximate 3mm. vertical height by 2mm. width for the connector arms.** (See fig.44-45)

d. Check occlusal space; adjust pontics and occlusal rest if needed 1.5 to 2mm. is ideal, **1mm minimum** (See fig.46-47)
e. Remove any heavy oxides from the cast metal. Cast metal conditioning will automatically take place during the UCP Bonder firing.

f. Finish the margins

⚠️ **If there are any remaining voids or spaces in the connector seam, fill with Pontic Cover Material and process on the Pontic Cover cycle.**

**Step 14: Option - Apply Pontic Cover Material**

- See Pontic Cover instructions

**Step 15: Apply UCP Bonder**

- See UCP Bonder instructions
Inconnect Material with Laser or Electric Welding

Step 1: Process the abutment copings

a. To prevent welding through the CAPTEK™ copings it is recommended to apply a double layer of “P” & “G” material in the connector area during the “P” & “G” application. (See Figures 1 and 2)

b. Fit the copings on the master dies but leave the margins slightly thick to protect the margins during welding and firing of the Inconnect material.

c. Seat the CAPTEK™ copings on the model to be used for the bridge connection.

Step 2: Wax the custom pontic into place

a. Wax the pontic according to traditional cast metal design for appropriate porcelain support and strength with a minimum 3 by 2mm. connector arm. The connector arms should flare onto the abutment copings approximately 4-5mm in diameter and approximately .5mm thick. It will be easier to slightly over wax the connector flare and cut it back after casting. The flare will become larger after welding. The connector area (flare) can be larger if needed to create more strength. Anterior bridges will have a smaller connector. (See Figures 3 and 4)

b. Wax a small occlusal (or incisal) rest onto the coping to provide a vertical stop to help hold the pontic in place. This can be removed if needed after the connectors are completed.

c. Additional support structures can be waxed over and around on the abutment copings depending on case requirements.
Step 3:  Sprue the pontic
Sprue the pontic and carefully connect to the crucible former. (See Figure 4)

Step 4:  Invest the pontic
a. Adjust the special liquid/water ratio for less expansion to create a passive fit (mostly water).
b. Follow the manufacturer’s recommendations for mixing and setting time.

Step 5:  Burnout and cast
a. Follow the manufacturer’s instructions for burnout time and temperatures.
b. The standard pontic metal for CAPTEK™ bridgework is a 2% gold, palladium alloy. The alloy choice for pontics must have a high yield strength, resistant to sag and creep, and a coefficient that is matched to your porcelain. It is recommended that the gold content not exceed 65% to 70%. High gold alloys are not recommended for high CAPTEK™ temperatures and strength considerations.

Step 6:  Divest and seat pontics
a. Divest as usual and remove all oxides.
b. Carefully adjust the pontic connectors to passively fit onto the CAPTEK™ abutments. Do not create excess space between the connector and the coping.
c. Adjust the interproximal connector flare to the correct size. Do not make the connector smaller than 3-4 mm. in diameter on the posterior bridge; they may be larger if needed. The thickness should be approximately .5mm. with blunt edges for welding. (See Figures 5-7)
Step 7:  Apply the Inconnect Material (Slow Dry - UCP Liquid)

a. Seat the copings on the model for the bridge connection.

b. Mix Inconnect to a thick creamy consistency with UCP Liquid.

d. Apply Inconnect to the inside of the connectors and seat the pontic into place. (See Figures 8 and 9)

c. To help hold the pontic in place during welding you may attach the pontic to the ridge with thick super glue. Sticky wax can be applied to the saddle of the model to allow the glue to be removed without damaging the model.

Step 8:  Weld the pontic into place

a. Four spot welds will be necessary to secure the pontic. Weld the buccal and lingual flare areas in an “X” pattern: First weld one side of a connector to its abutment coping and then weld the opposite side of the other connector to its abutment coping. Repeat this for the remaining two welds.

b. Direct the weld at the blunt edge of the connection flare. Direct the weld at a slight angle toward the coping in order to extend or push the cast metal onto the CAPTEK™ copings. This will help create more flare, added thickness and additional strength to the coping and connector. (See Figures 10 and 11)

c. The weld must be strong enough to secure the bridge during the Inconnect firing.
Step 9:  Process in the furnace

a. Add Pontic Cover material around the connector to help prevent oxides from forming, and to fill any open seams (the Inconnect may shrink slightly). (See Figure 12)

b. Place the bridge on a firm pillow tray or metal firing pins and process. (See Figure 13)
(See calibration and firing program section)

c. The Inconnect and Pontic Cover material should have a gold sheen but have slightly more texture than the CAPTEK™ copings. Raise or lower the high temperature as needed. (See Figure 14)

Step 10:  Finish the Captek bridge

a. Smooth and contour the connector areas as desired. Do not over thin or remove the flared connector areas on the CAPTEK™ copings. (Figures 15 and 16)

b. Finish the margins.

Step 11:  Option:  Apply Pontic Cover Material

Step 12:  Apply Bonder
Instructions:

After attaching (soldering) the pontic to the abutments:

Step 1: Contour pontics

   a. Adjust the pontic to the correct size and shape. Make the pontic slightly smaller, leaving room for the cover material.

   b. Make sure the pontic is free of oxides.

Step 2: Mix Pontic Cover Material

   Mix the cover material with Slow Dry (UCP Liquid) to a thick consistency, but still be able to apply it with a brush. (See Figure 1)

   Adding a drop of Fast Dry (Capcon Liquid) to your mixture will facilitate a faster drying time for better control and coverage.

Step 3: Apply Pontic Cover Material

   a. With a brush, apply a layer thick enough to completely cover the gray metal, similar to applying opaque.

   b. It may take a second thin coat to completely cover the pontic. (See Figures 2 & 3)

Step 5: (Option) Apply Inflow to CAPTEK™ coping

   Pontic Cover material is for covering the oxidized gray metals of cast pontics, splints or support areas to create a Captek gold appearance.

   Pontic cover can also be used for small repairs on copings. (See repairs section 8)
a. During the application of Pontic Cover material, it is an option to apply a thin layer of Inflow D inside or outside where needed to replenish the gold color. (See Figures 4 & 5)

b. If gold color is lost on the CAPTEK™ copings during the firing of Pontic Cover material, you may apply a thin layer of Inflow D and fire to replenish the gold color.

Be careful not to apply too much Inflow D as it can adversely affect the UCP Bonder by absorbing or melting the UCP particles.

Step 6: Process in the furnace

| Entry/Dry Time: | 2 minutes |
| Entry Temp:     | 500º- 600º C (930º - 1100º F) |
| Temp Rate:      | 80º C (145º F) |
| High Temp:      | Low Calibration to -5º C (-9º F) |
| Hold Time:      | 30 seconds |

(See calibration and firing program section)

a. The Pontic Cover material should have a slight gold sheen but more textured than the Captek copings.

It is important that the Pontic Cover layer not be over fired to smooth and shiny; this brings too much gold to the surface and can adversely affect the UCP bonder. Lower the temperature by -5 to -10º C (-9-18º F) and fire another thin layer to absorb gold.

Step 7: Remove flux

Clean in “Strip-It” for 10 to 20 minutes in the ultrasonic cleaner to remove the flux.

Note: Flux has been added to the Pontic Cover material to reduce oxides on cast metals. It must be removed before applying bonder or porcelain.

Step 8: Apply Bonder

The covered pontic will be bonded the same as the CAPTEK™ copings.
Section 8: 
REPAIRING OF CAPTEK™ COPINGS AFTER DIVESTING

CAPTEK™ copings have the unique ability to be easily repaired during each stage until the porcelain is applied, even after the coping is divested.

The safest and easiest technique for repairing a CAPTEK™ coping is to fire the repaired coping in a porcelain furnace on the Inflow D cycle. The butane hand torch technique is faster, but takes a little practice and experience.

To repair holes, short or damaged margins on the CAPTEK™ coping:

Oven Repair Technique: Repair Paste or Scrap “P” Material

Step 1: Paint the die with a release agent (die lube).

Step 2: Apply Repair Material

Use repair paste or “P” material and adapt it into the repair area slightly overlapping the material onto the CAPTEK™ coping. (See Figures 1 and 2)

Step 3: Remove the Coping
Remove the coping from the die and check to see if the repair is complete. (See Figure 3)
Step 4: **Apply Inflow D**

*Paint a thin amount of Inflow D to the repair on the inside of the coping. With a brush apply a thick drop of Inflow D gold to the repair area. Make sure to apply enough Inflow D to completely fill and penetrate the repair area with gold. (See Figure 4)*

*Note: A thin layer of Inflow may be applied inside or outside of the coping to replenish or maintain the gold color during the repair cycle.*

Step 5: **Process in the Furnace**

*Fire in the furnace on the Inflow D cycle (See Calibration Section).*

Step 6: **Check the Repair**

*Seat the repaired coping on the die, smooth and finish the repair area. (See Figure 5)*

---

**Butane Hand Torch Technique**

The Butane hand torch technique is faster but takes a little practice and experience.

**Step 1:** Paint the die with a release agent (die lube).

**Step 2:** Apply Repair Material

*Use repair paste or “P” material and adapt it into the repair area slightly overlapping the material onto the CAPTEK™ coping.*

**Step 3:** Remove the Coping

Remove the coping from the die and check to see if the repair is complete.
Step 4: Fire with a Butane Hand Torch

a. With a butane hand torch heat the CAPTEK™ coping slowly to avoid swelling of the wax in the repair material. Heat the coping to red-hot, fusing the repair “P” material.

Note: Avoid applying the flame directly on the margins. Heat the coping by aiming the flame from incisal or occlusal downward towards the margins.

b. While the coping is still hot, melt an equal amount of “G” material on the repair area.

c. With the butane torch heat the coping until the gold melts and completely penetrates through the repair, leaving a gold color on the inside of the repair.

(Option) You may substitute Inflow D for “G” material, which flows at a lower temperature.

Step 5: Seat the repaired coping on the die, smooth and finish the repair area.
**Oven Repair Technique: UCP Bonder**

**Step 1: Paint the die with a release agent (die lube)**
Make sure the die is well sealed.

**Step 2: Mix UCP Bonder with Capcon Liquid**
Mix UCP with Capcon Liquid to a thick creamy consistency

**Step 3: Apply UCP material to the repair area**

With a brush apply UCP material to the repair area. Slightly overlap the material onto the CAPTEK™ coping. Let the repair dry for 5-10 seconds or until the liquid sheen is gone. (See Figures 1-3)

**Step 3: Remove the Coping**
After letting the repair dry, remove the coping from the die and check to see if the repair is complete.

**Step 5: Process in the Furnace**
Fire in the furnace on the Inflow-D cycle (See Calibration Section)

**Step 6: Check the Repair**

Seat the repaired coping on the die, smooth and finish the repair area. (See Figure 4)
Replenish Gold Color Using CAPTEK™ Inflow D

Inflow D is used to replenish the gold layer on CAPTEK™ copings after they are divested. For best results fire the Inflow D in a porcelain furnace.

**Inflow D is used for:**
- Gray dull areas inside and outside the copings.
- On areas where the gold has been finished away.
- Copings that are low in gold color.
- Small repairs in conjunction with CAPTEK™ repair paste or “P” material. (See repairs)

**Step 1. Mix Inflow D**

a. Mix Inflow D Powder with Inflow Liquid (IPC) to a creamy paste (similar to paste opaque). (See Figure 1)

**Note:** Do not apply Inflow D too heavy or thick. Applying too much Inflow may adversely affect the UCP Bonder. The UCP Bonder will be drawn into the excess Inflow and be melted or rounded over.

**Step 2. Apply Inflow D**

*Note: For best results and penetration process in the furnace.*

a. For finished margins or gray dull areas, paint a thin layer of Inflow D on the areas you need to replenish the gold layer (inside or outside). (See Figure 2)

**Note:** Be careful not to apply too much inside the coping, it will puddle and affect the fit (coping will not fully seat).

b. For copings that are low in gold color, a thin layer can be applied over the completed coping to replenish and brighten up the gold layer. (See Figures 3 - 5) Repeat this step if the Inflow penetrates and disappears leaving the coping dull.

*Note: Excess Inflow D or “G” material on the coping can adversely affect the UCP Bonder by melting or rounding over the UCP particles. Remove excess gold by finishing or re-firing on the Inflow D cycle.*
Step 3. Process the Inflow D in the Furnace

Option: Firing Inflow with a Butane Hand Torch

Note: Inflow D does not penetrate as well using the torch technique and may adversely affect the UCP Bonder. Processing in the furnace is the easiest, safest and the most effective technique.

a. Adjust the butane hand torch to the desired flame.

b. Hold the CAPTEK™ coping with CAPTEK™ tweezers and heat the coping until the Inflow D flashes and penetrates the coping.

c. Rotate the coping in the flame to fire all sides of the coping evenly. Remove from the flame immediately.

Note: Avoid applying the flame directly on the margins. Heat the coping by aiming the flame from incisal or occlusal downward towards the margins.
Section 9: 
CAPTEK™ BONDER APPLICATION

UCP Bonder Application
(Universal Coupler for Porcelain)

UCP Bonder application is the last step in fabricating a Captek™ coping or bridge. UCP is a mixture of small “P” & “G” particles that is fired to the surface of the Captek coping to create a mechanical bond between the coping and porcelain.

There are two acceptable techniques to apply the UCP Bonder

1. UCP Adhesive (Sprinkle) Technique –
   Refer to pages 2-4 for instruction
   
   This is the preferred technique because it applies a predictable even layer every time.

2. UCP Brush Technique
   (Refer to pages 5-6 for instruction)

Important Information - read before you begin:

- Use the Captek™ or spring-loaded internal tweezers whenever holding a Captek™ coping off the die. Hemostats or other instruments may damage the coping.

- UCP firing temperatures are critical; calibrate at least once a month following the Captek Technical Manual and Calibration & Firing Cycle Guidebook.

Excess Inflow D or “G” material on the coping can adversely affect the UCP Bonder by melting, absorbing or rounding over the UCP particles.

- Remove excess “G” during the margin finishing.
- Remove excess Inflow D by firing a second time on the Inflow cycle (Ref. section 1-Calibration, Captek Technical Manual)
UCP Firing Temperatures are Critical: Calibrate at least once a month following the Captek Technical Manual and Calibration & Firing Cycle Guidebook.

Step 1: Fill the Dispenser Bottle with UCP Material (1-2 jars, 3-6g)

- a. Remove the cap and tip from one of the plastic dispensing bottle and position into the slot at the bottom of collection jar. (See fig. 2)

- b. Replace the funnel lid and empty 1-2 jars of UCP material into the collection jar to fill the dispensing bottle. (See fig. 2-3)

- c. Do not refill until most of the UCP is used. This will help maintain the correct balance of “P” to “G” particles. Always replace the recovery jar lid to keep contaminates out of the UCP powder.

Make sure the UCP is in a moisture free environment,

1. Check the UCP Material daily for any clumps due to moisture.
2. Remove clumps by drying the UCP glass jar on top of a warm furnace or in an oven.
3. Stir and shake the material to remove clumps.

Step 2: Clean the Coping (Do not handle after cleaning.)

Handling and finishing will leave oils and grinding residue on the surface.

Steam cleaning is sufficient to clean the Captek surface for the Adhesive application.

Options:
1. Acid - (Strip-It) or alcohol and ultrasonic clean for 5 minutes.
2. Porcelain furnace - (Restoring Gold color cycle) Fire to 750C - 1 minute hold
3. Hand Torch - Evenly heat the coping by waving the flame around the occlusal or incisal of the coping to a slight red-orange glow (not red hot).
Step 3: Apply UCP Adhesive

1. Internal spring loaded tweezers work best for the Adhesive technique.
2. The adhesive brush should be short for better control of liquid, trim bristles by half if needed. (See fig.4)

a. Completely cover the coping with a thin layer of adhesive where UCP Bonder is to be applied. Do not let the adhesive puddle or get on the inside of the coping.

b. If external tweezers are used, re-position and apply adhesive to uncoated area.

c. Let dry until the adhesive becomes completely clear, approximately 15 to 30 seconds. (See Fig.6)

Maintain the Adhesive liquid
1. Routinely add a few drops of distilled water to maintain consistency.
2. If the adhesive becomes too thick, add 25% distilled water to thin.
3. Do not over thin, this will adversely affect the ability to adhere the bonder.
4. Adhesive can be removed from brush or surfaces with Ethyl alcohol.

Step 4: Apply UCP Bonder

1. Hold the coping directly over the collection jar and tap the dispensing bottle to sprinkle on the UCP Bonder until the coping is completely covered. Shake the bottle between each coping application to re-mix and disperse the “P” & “G” particles. (See Fig. 7-8)

b. Lightly tap the tweezers on the side of the collection jar to remove the excess UCP Bonder. Make sure there is no UCP on the inside of the coping. (See Fig. 9)

c. The coping should have an even coat of UCP but you should still see the coping lightly reflecting through the bonder. (See Fig. 10)
Step 5: Missing or blank areas during application
Look for any large areas that have not been coated with UCP Bonder.

![Fig. 11](image1.png) ![Fig.12](image2.png) ![Fig.13](image3.png) ![Fig.14](image4.png)

a. Re-apply a small amount of adhesive to the missing area and dry until clear, approximately 15 to 30 seconds. (See fig.11-12)

b. Sprinkle UCP directly on the missing area and lightly tap tweezers on the side of the collection jar to remove excess UCP. (See fig.13-14)

Step 6: Fire on the UCP firing cycle
See section 1 and Firing Cycle Guidebook for calibration and firing temperature.

![Fig.15](image5.png) ![Fig.16](image6.png)

a. Place the coping on a firing peg and stand, and fire on the UCP cycle (-10°C below UC calibration). It is OK to use fingers to transfer coping to firing peg. (See fig.15)

b. An indication of properly applied and fired UCP Bonder is to see an even coverage with a distinct texture similar to sandpaper with the gold coping slightly reflecting through the bonder. (See fig.16) Another indicator are faint Platinum/Palladium points visible through the first thin opaque layer. (See fig. 17)

c. The Captek coping is now ready for opaque application

![Fig.17](image7.png)

Do Not Handle Captek after Bonder application to avoid contamination.  
**If contaminated - (Clean coping)**  
1. Fire the copings to 750°C and hold for 1 minute or-  
2. (Strip-It) acid and ultrasonic clean for 5 minutes.
Step 1: Clean the Captek™ coping (Do not handle after cleaning)
Handling and finishing will leave oils and grinding residue on the surface.

Options:
1. Porcelain furnace - Fire the copings to 750C and hold for 1 minute.
2. Hand torch - Evenly heat the coping by waving the flame around the coping to a slight orange/red glow (not red hot). (See fig. 1-2)
3. Acid - Place the coping in (Strip-It) acid and then ultrasonic clean for 5 minutes.

Step 2: Mix the UCP Bonder

a. Mix a small amount of UCP Powder with Slow Dry (UCP Liquid). The mixture should be thin enough to be easily applied with a brush. (See fig. 2-3)

- Mix only enough UCP Bonder for that day.
- Mix in new Bonder each day to prevent settling and clumping of the bonder.
- Important to thoroughly mix to prevent the P&G particles from separating, negating the effectiveness of the UCP Bonder.
- Always keep the container covered to prevent contamination from dust.
**Step 3: Apply the UCP Bonder**

![Fig. 5](image1) ![Fig. 6](image2)

a. Use Captek or internal spring loaded tweezers to hold copings.

b. Apply a thin even layer using long brush strokes over the entire surface where porcelain will be applied. (See fig.5-6)

- *Do not let it puddle.*
- *Do not apply too thick, some of the coping should lightly reflect through the bonder.*
- *Thick areas can trap air causing gassing in the porcelain.*

**Step 4: Process in the furnace**

![Fig.7](image3) ![Fig. 8](image4) ![Fig.9](image5)

a. Place the coping on a firing peg and stand and fire on the UCP cycle. (See fig.7)

b. An indication of properly applied and fired UCP Bonder is to see an even coverage with a distinct texture similar to sandpaper with the gold coping slightly reflecting through the bonder. (See fig.8-9) Another indicator are faint Platinum/Palladium points visible through the first thin opaque layer. (See fig. 10)

c. The Captek coping is now ready for opaque application.

> **Do Not Handle Captek after Bonder application to avoid contamination.**

**If contaminated - (Clean coping)**

1. Fire the copings to 750C and hold for 1 minute or-2. (Strip-It) acid and ultrasonic clean for 5 minutes.
Section 10:
OPAQUING CAPTEK™ COPINGS

Opaquing CAPTEK™ Copings

Opaque on CAPTEK™ is no longer a block-out material but a color coat. With traditional gray oxidizing metals it takes from .2 mm. to .3 mm. of opaque to completely block out the metal. CAPTEK™ has no oxides and a warm gold color that only requires 1/3 (.05) the opaque compared to gray oxidizing metals. This will allow light to penetrate through the thin layer of opaque and reflect out from the CAPTEK™ coping and the bonder, creating an optical effect.

*Note: CAPTEK™ copings should not be handled after firing of the bonder.*

The opaque will be applied in 2 layers:

- The first layer is a thin wash coat that is worked into the bonder and fired.
- A second thin layer will be applied just thick enough to achieve the proper color to match the shade guide.
- It’s very important to keep the opaque from getting on the inside of the CAPTEK™ coping. Small amounts of opaque are very hard to see on gold and you cannot sand blast the opaque off without removing the gold layer of the CAPTEK™ coping. Do not use firing pegs with opaque attached; it will transfer to the inside of the CAPTEK™ coping.

Opaquing Instructions:

Step 1. **Apply a Wash Opaque layer**

a. Place the coping on the die or hold with the CAPTEK™ tweezers.

b. Thin the opaque mixture and apply a thin wash coat, working it into the bonder. (See Figure 1)

c. Check and remove any opaque on the inside of the coping and then fire on the opaque firing cycle. (See Figure 2)
Step 2. Process in the Furnace

![Fig. 3](image)

Follow the porcelain manufacturer’s opaque firing cycles. (See Figure 3)

Step 3. Second Opaque Layer

a. Apply the second slightly thicker layer covering the bonder. Check and remove any opaque on the inside of the coping and then fire on the opaque firing cycle. (See Figure 4)

b. Seat the CAPTEK™ coping back on the die and check the fit. The coping can still be re-adapted or swedged at this stage.

c. If the opaque is found on the inside of the coping, remove it carefully with a grinding tool or place porcelain etching gel in the coping and dissolve the porcelain and rinse clean.
Section 11: CAPTEK™ GLOSSARY OF TERMS

<table>
<thead>
<tr>
<th>&quot;P&quot; &amp; &quot;G&quot; Materials (Sheets)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nano P&amp;G:</strong></td>
<td>Strongest Nano “P” &amp; “G” material, designed for bridges, implants and posterior units. (Thickness 0.28mm)</td>
</tr>
<tr>
<td>1. Bridge &amp; Implant: (B&amp;I)</td>
<td>Nano “P” &amp; “G” material designed for all areas and short span bridges. (Thickness 0.23mm)</td>
</tr>
<tr>
<td>2. Universal:</td>
<td>Nano material designed for single anteriors only (Thickness 0.20mm)</td>
</tr>
<tr>
<td>3. Esthetic Zone: (EZ)</td>
<td></td>
</tr>
<tr>
<td><strong>Traditional P&amp;G:</strong></td>
<td></td>
</tr>
<tr>
<td>1. Anterior:</td>
<td>“P” &amp; “G” material designed for anteriors and bicuspid. (Thickness 0.25mm)</td>
</tr>
<tr>
<td>2. Posterior:</td>
<td>“P” &amp; “G” material designed for all areas and short span bridges. (Thickness .275mm)</td>
</tr>
<tr>
<td>3. Margin “P”:</td>
<td>A thick P&amp;G sheet for large metal collars and build-ups during the “P” layer process</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Calibration Kits: (Calibrating porcelain furnace)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Captek Calibration</td>
</tr>
<tr>
<td>2. UC Calibration:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duplication Material:</th>
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</thead>
<tbody>
<tr>
<td>1. Capsil Quick Set</td>
</tr>
</tbody>
</table>
### Liquids

1. **Capcon Liquid:**
   - **“Fast Dry”**
   - (Condensing Liquid)
   - Fast drying liquid for all powders that are used for Build-ups, metal linguals/occl.stops, repairs & Capcon bridge connectors

2. **UCP Liquid:**
   - **“Slow Dry”**
   - (Universal Liquid)
   - Slow drying liquid for applying UCP Bonder, Inconnect, restoring gold color, Capbond and Pontic Cover material

3. **Inflow Liquid (IPC):**
   - Liquid for applying Inflow D

4. **Capvest Liquid**
   - Refractory investment liquid to control expansion

5. **Relief Spray:**
   - Used to relieve surface tension in the duplicating molds when pouring refractory dies

6. **Pro-Shine Liquid Flux:**
   - To reduce oxides on cast alloys during the bridge joint connection and splinting.

7. **Goof Off (Thinner)**
   - Paint thinner/remover for thinning Captek refractory die adhesive. (Sold at any paint store)

8. **DVA Luster Buff**
   - High shine polish of metal collars and metal linguals.

### Adhesives

1. **Captek Adhesive**
   - (Orange)
   - Applied to the refractory dies to adhere the Captek™ “P” material to the die (thin with Goof Off)

2. **UCP Adhesive (Bonder)**
   - Adhesive applied to finish Captek copings using the UCP Bonder Adhesive Technique (thin with water)

### Investments:

1. **Capvest:**
   - Refractory die investment (Box contains 40-30 gram packages).

2. **Soldering Investment**
   - (Captek)
   - Investment for soldering Captek™ bridges and splints (1 kg container) Mix with water
<table>
<thead>
<tr>
<th>Powders &amp; Gold Materials</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. UCP Bonder:</strong></td>
<td>Mechanical interface to bond porcelain or composite resin to Captek™ copings (Adhesive technique or brush technique – (Slow Dry (UCP) liquid)</td>
</tr>
<tr>
<td><strong>2. Nano porcelain Support Material:</strong></td>
<td>Powder for building up completed copings to support porcelain.</td>
</tr>
<tr>
<td><strong>3. Inconnect:</strong></td>
<td>Powder used for soldering cast bridge connectors and porcelain support build-ups. (Mix with Slow Dry (UCP) liquid)</td>
</tr>
<tr>
<td><strong>4. Pontic Cover (LT₂):</strong></td>
<td>For gold coating cast metal pontics, connectors and cast build-ups. (Mix with Slow Dry (UCP) liquid)</td>
</tr>
<tr>
<td><strong>5. Inflow D:</strong></td>
<td>For replenishing or restoring the gold layer on finished Captek copings, margins or dull gray areas, and to make repairs in conjunction with “P” material or Repair Paste. (Mix with Inflow (IPC) or Slow Dry (UCP) liquid)</td>
</tr>
<tr>
<td><strong>6. Captek Build-Up Material:</strong></td>
<td>Powder for building metal linguals, occlusal stops, metal collars, and porcelain support (Mix with Fast Dry (Capcon) Liquid).</td>
</tr>
<tr>
<td><strong>7. Capcon Powder:</strong></td>
<td>For connecting bridges and splinting Captek™ copings (Mix with Fast Dry (Capcon) Liquid).</td>
</tr>
<tr>
<td><strong>8. Capfil:</strong></td>
<td>Gold filler (solder) for Capcon bridges &amp; splint connectors.</td>
</tr>
<tr>
<td><strong>9. Repair Paste:</strong></td>
<td>Combination of wax and metal paste for repairing copings before and after divesting</td>
</tr>
</tbody>
</table>
### Instruments, Dispenser Bottles & Equipment:

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Adapting Instrument:</td>
<td>For adapting and shaping the wax “P” &amp; “G” material and readapting Captek™ margins and copings</td>
</tr>
<tr>
<td>2. Scalpel &amp; Blade:</td>
<td>(Knife) For cutting and carving “P” &amp; “G” material</td>
</tr>
<tr>
<td>3. Captek Tweezers:</td>
<td>For holding Captek™ coping during repairs, Inflow, bonding and opaquing</td>
</tr>
<tr>
<td>4. Captek brush</td>
<td>Small brush for applying Captek liquids and materials</td>
</tr>
<tr>
<td>5. Internal Tweezers:</td>
<td>Spring loaded jacket grip tweezers to hold Captek coping from the inside.</td>
</tr>
<tr>
<td>6. Duplicating Flask/Ring:</td>
<td>Flasks for duplicating the master dies (3 different sizes)</td>
</tr>
<tr>
<td>7. Captek (Capcon) Dish:</td>
<td>Double well dish for mixing and applying Captek powders</td>
</tr>
<tr>
<td>8. Collar Mold:</td>
<td>Plastic mold to compress and shape scrap P&amp;G into collars, Build-ups and repair material</td>
</tr>
<tr>
<td>9. UCP Dispensing Bottle:</td>
<td>Bottle used to dispense UCP Bonder during the UCP Adhesive Technique</td>
</tr>
<tr>
<td>10. UCP Collection Jar:</td>
<td>Recovery container used to collect UCP Bonder during the UCP Adhesive Technique</td>
</tr>
<tr>
<td>11. Pneumatic Adapter:</td>
<td>Compressed air adapter for initial adapting of the wax “P” layer to the refractory die</td>
</tr>
<tr>
<td>12. Swedger &amp; Dead Blow Hammer:</td>
<td>Compression tool for re-adapting Captek™ copings on refractory and master dies after the processing of the “P” &amp; “G” material</td>
</tr>
<tr>
<td>13. Big Shot Torch:</td>
<td>Butane torch for heating fired Captek copings for cleaning and small repairs</td>
</tr>
<tr>
<td>14. Badger Mini Blaster</td>
<td>Mini blaster for glass beading Captek to restore gold color</td>
</tr>
<tr>
<td>15. Badger Regulator</td>
<td>Compress air regulator for Badger Mini Blaster</td>
</tr>
</tbody>
</table>
Finishing Tools

Carbide burs - (Finishing margins and bridges)
1. Brasseler- H73 EUF
2. Brasseler- 129 FSQ
3. Brasseler- 138 EF
4. Brasseler- 139 EUF
5. Servodent- 202

Diamonds & Finishers
1. Noritake Meister coarse aluminous oxide finishing point: Final finishing of margins
2. Brasseler- 7856C-Sintered Diamond: Finishing margins
3. Brasseler- 7856M-Sintered Diamond: Final finishing of margins
4. Komet- HP 033-Coated Diamond: Finishing margins
5. Komet 8860 HP (012) coated fine diamond: Removing porcelain inside of copings

Rubber Wheels & Polishers
1. Komet- 9546C HP 190 Ceramic Polisher-rubber wheel: Initial finishing of margins
   Ceramic Polisher-rubber wheel:
2. Dedeco- No. 4982 Brown Knife Edge 5/8 Rubber Wheel: Initial finishing of margins
3. Komet 9615M Brown Cylinder metal polisher: Pre-polishing exposed Captek metal
4. Komet 9625F Green Cylinder metal polisher: High shine exposed Captek metal
5. Komet 9638 120 HP soft polishing brush: High shine polishing brush
6. Abbot Robinson #11 soft polishing brush: High shine polishing brush

Finishing Kits
1. Polishing kit:
   - 1-Komet 9615M brown cylinder metal polisher
   - 1-Komet 9625F green cylinder metal polisher
   - 2-Komet329 HP mandrel
   - 1- Komet 9638 190 HP soft bristle polishing brush
   - DVA luster Buff
   - Bur Block-plastic box
2. Finishing and polishing kit:
   - 1- Noritake Meister coarse finishing point
   - 1- Komet 8860 HP(012) coated fine diamond
   - 1-Komet 9615M brown cylinder metal polisher
   - 1-Komet 9625F green cylinder metal polisher
   - 2- Komet 329 HP mandrel
   - 1- Komet 9638 190 HP soft bristle polishing brush
   - DVA luster Buff
   - Bur Block - plastic box