

# Packing Procedure for 3.2 mm Liquid Samples

Sample Volumes of 22  $\mu\text{L}$  and 36  $\mu\text{L}$

---

## Safety Precautions



Personal injury is possible if a spinning rotor explodes. Avoid eye and body injury from an exploding rotor by not spinning rotors outside magnet. Use a certified safety shield, full face shield, and cover all exposed skin at all times if it is necessary to spin a rotor outside the magnet.



Personal injury and rotor explosion is possible if rotors are spun beyond their maximum spin speed. Decrease the maximum spin rate by 20% if the sample density is above 6.0 g/cc.



Do not exceed the sample spacer VT range or spinning speed. Exceeding the sample spacer VT range or spinning speed can result in spacer failure causing damage to the rotor housing and or the probe. Liquid sample spacers have a specific VT and spinning speed ranges, which may be different than the probe VT and spinning speed ranges. Refer to the documentation supplied with the sample spacer kit or contact Varian Technical Assistance and request the temperature range of the sample spacer. A specification document is provided.

 **CAUTION**

Do not use chemicals that are incompatible with liquid sample O-rings. Sample spacer and sealing capability damage can result in sample leakage and damage to the rotor housing and or the probe. Chemicals that are incompatible with liquid sample O-rings can compromise the integrity of the O-ring. Refer to the documentation supplied with the sampler spacer kit or contact Varian Technical Assistance and request the temperature range of the sample spacer.

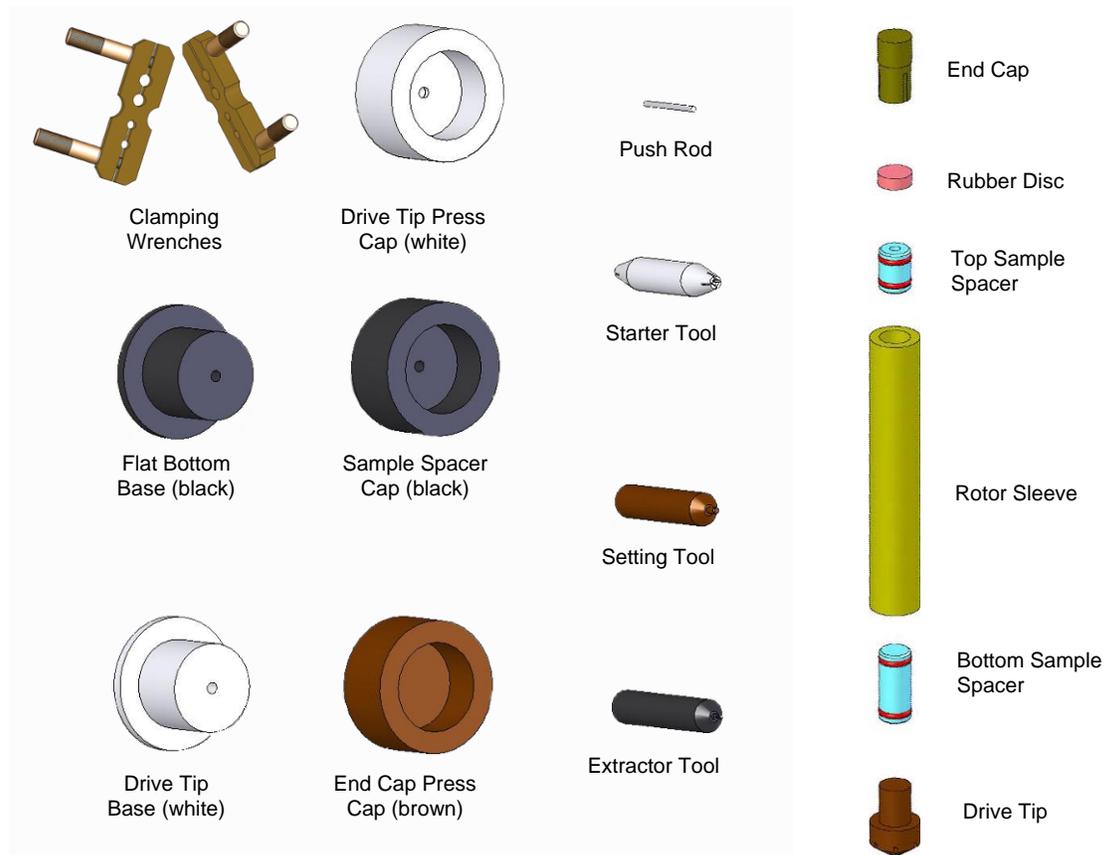
 **CAUTION**

Never use rotors that have been dropped onto a hard surface. Micro-cracks in the rotor material resulting from dropping can cause rotor explosions at low speeds.

 **CAUTION**

Spinning rotors heat up due to friction with air and can cause the sample to boil out of the rotor. Always purge the spinning system with VT flow to minimize the spin heating effect.

# Sample Holder Parts and Tools



---

## Packing the Sample

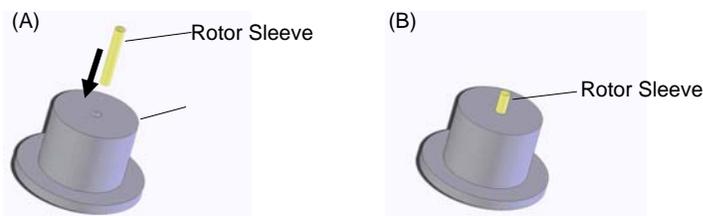


**CAUTION**

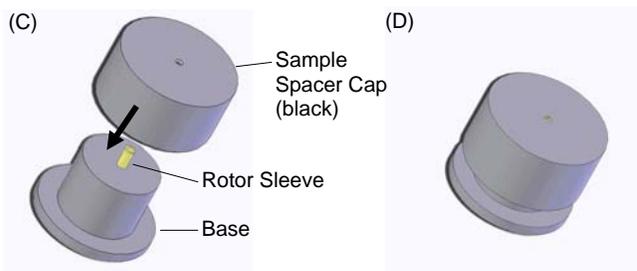
Do not use chemicals that are incompatible with liquid sample O-rings. Refer to the documentation supplied with the sample spacer kit or contact Varian Technical Assistance and request the temperature range of the sample spacer.

### Inserting the Bottom Sample Spacer

1. Insert the empty rotor sleeve (A) into the black flat bottom base (B).



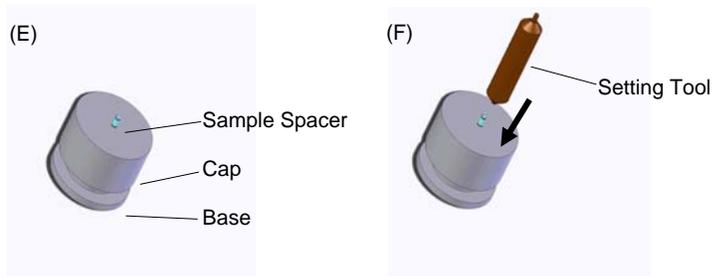
2. Place the black sample spacer top cap (C) on the rotor (D) and base.



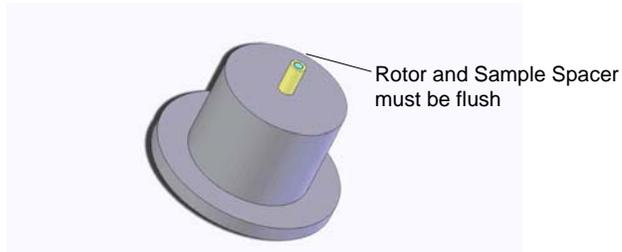
3. Insert the bottom sample spacer (longer) into the sample spacer cap (E).

**NOTE:** The spacer cap is designed to compress the O-ring into the spacer groove so the edge of the rotor sleeve does not cut/tear the O-ring as it enters the sleeve. Slowly load the spacers into the rotor sleeve using the packing tools. The success of loading the spacer hinges on slowly working the spacer into the rotor sleeve rather than quickly pushing it in. This allows the O-ring to compress into the groove. Use a rocking or precession motion on the spacer when pushing it through the spacer cap into the sleeve. Wetting the O-ring adds a little lubrication to the process and also helps.

4. Use the short end of the setting tool (brown) to insert the sample spacer into the rotor flush to the end of the rotor sleeve (F).

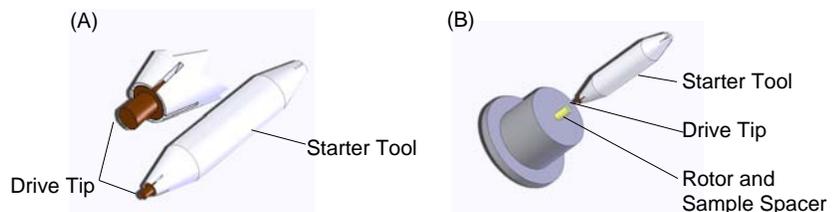


- Remove the sample spacer cap and check that the ends of the rotor and sample spacer are flush (**G**).

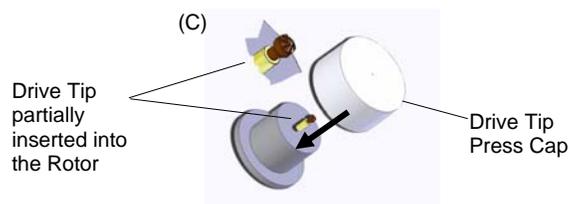


## Insert the Drive Tip

- Insert the drive tip into the large end of the white starter tool (**A**).
- Push (**B**) the drive tip into the rotor sleeve and push the bottom sample spacer deeper into the rotor sleeve.



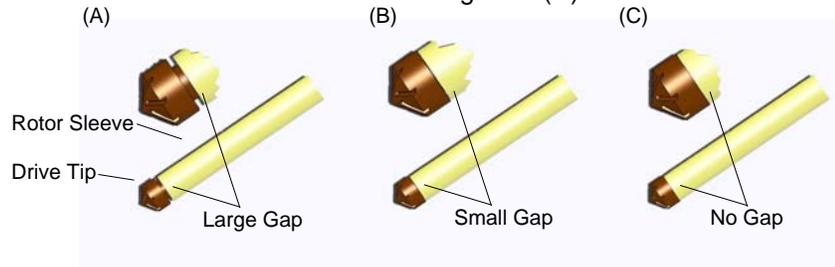
- Remove the starter tool.
- Insert the rotor into the rotor sleeve base (black).
- Press tip into the rotor sleeve using the white drive tip press cap (**C**).



Drive tips will be damaged if the drive tip cap is not used to insert the drive tip. The drive tip press cap provided has angled

surfaces to fit the drive tip. Other caps do not match and tip will damage the drive tip and compromise rotor spinning.

6. Remove the rotor and check that there are no gaps **(A)** and **(B)** between the drive tip and rotor sleeve. The drive tip and rotor sleeve must be flush together **(C)**.

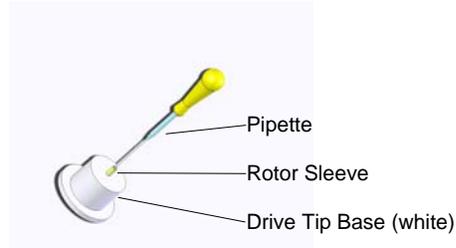


### CAUTION

A gap between the rotor sleeve and drive tip may cause spinning failures and instabilities.

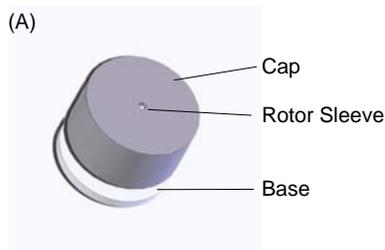
## Loading the Sample

1. Insert the rotor sleeve into the white drive tip base.
2. Use syringe or pipette to load the sample into the rotor.

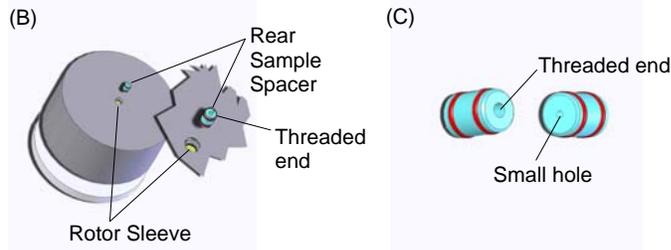


## Inserting the Top Sample Spacer

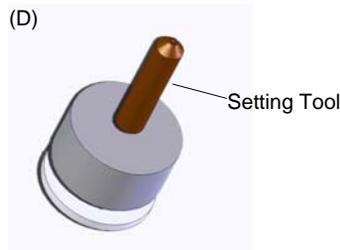
1. Place the black sample spacer cap onto the white drive tip base **(A)** and rotor sleeve.



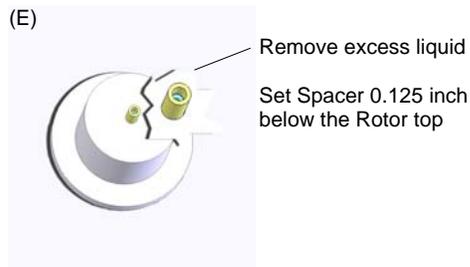
2. Insert the top sample spacer (shorter) **(B)** into the black top cap with the threaded end facing outward **(C)**. The top sample spacer has an internal thread in one end **(C)** and must face outward toward the end of the rotor sleeve during insertion. The extractor tool attaches to the thread to pull out the sample spacer.



3. Insert the sample spacer into the rotor using the longer nose of the brown setting tool (D). A hole through the center of the sample spacer allows removal of air and excess sample from the rotor.

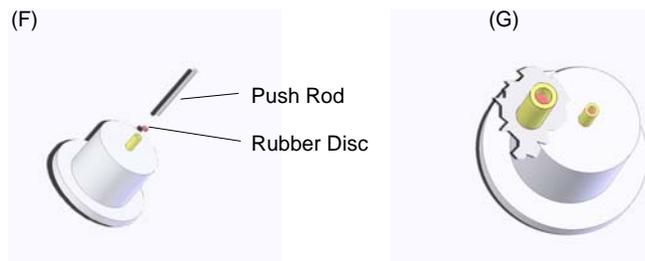


4. Remove the black top cap, remove any extrusion of the sample through the top sample spacer (E), and check that the top sample spacer is approximately 0.125" inside the rotor.



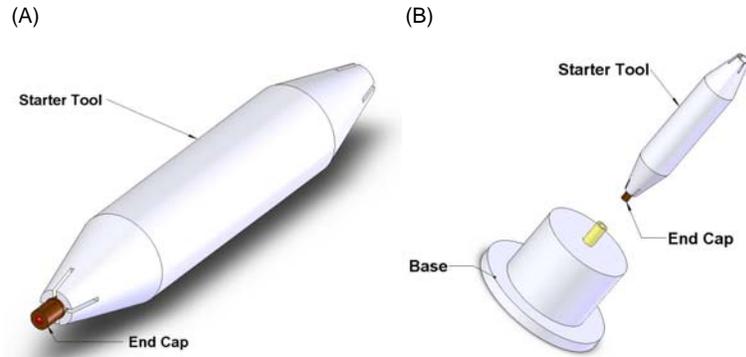
5. Push the rubber disk using the push rod (F) into the rotor sleeve flat against the top sample spacer.

The rubber disk must be flat against the top sample spacer (G) and the sample spacer not pushed further into the rotor sleeve.

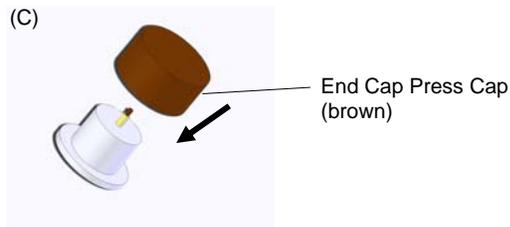


## Inserting the End Cap

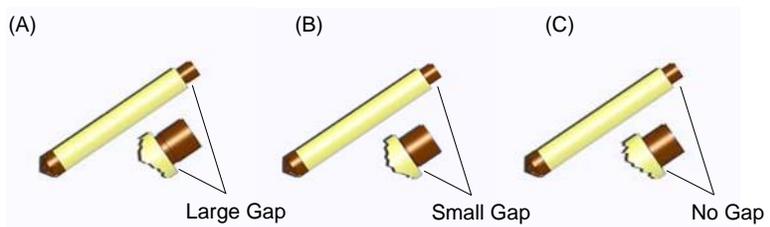
1. Place the end cap into the small end of the white starter tool (A) and insert it into the rotor sleeve (B).



2. Remove the starter tool.
3. Press the end cap into the rotor sleeve using the brown end cap press cap (C).

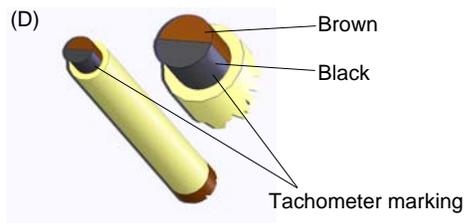


4. Remove the black top cap and check that there are no gaps (A) and (B) between the rotor and end cap. The rotor and end cap must be flush together (C).



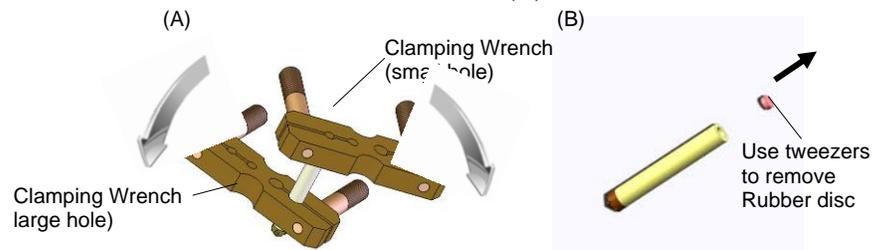
5. Mark the end cap with a black permanent marker for the tachometer spin speed measurement (D).

The tachometer system will not measure the rotor spin speed without a tachometer mark on the end cap.

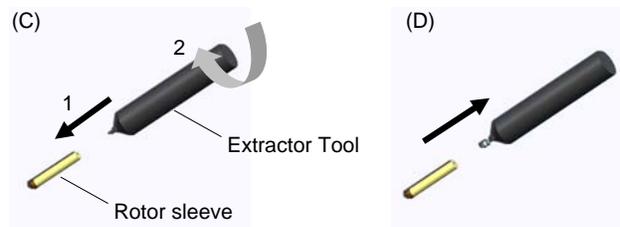


## Removing the Liquid Sample

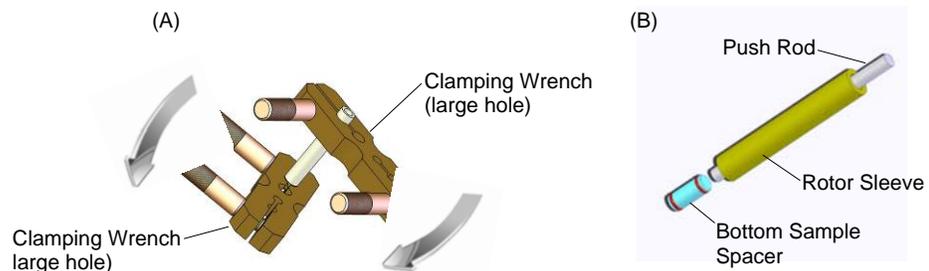
1. Slide the large hole end of one clamp over the rotor and securely tighten the knob. Slide the small hole end of the other wrench over the end cap and securely tighten the knob **(A)**.
2. Twist and pull the end cap to remove it from the rotor sleeve.
3. Remove the rubber disc **(B)** from the rotor sleeve.



4. Insert the extractor tool into the rotor sleeve **(C1)** and thread into the top sample spacer **(C2)**.
5. Pull the sample spacer out of the rotor sleeve **(D)**.



6. Remove the sample using pipette or absorbent towel.
7. Slide the large hole end of one clamp over the rotor and securely tighten the knob. Slide the large hole end of the other clamp over the drive tip and securely tighten the knob **(A)**.
8. Twist and pull the drive tip to remove it from the rotor sleeve.
9. Push the bottom sample spacer out of the rotor sleeve using the push rod **(B)**.



## **Packing Procedure for 3.2 mm Liquid Samples**

Pub. No. 01-999331-00, Rev. E 0309

Revision history:

Initial Release - A0706

B 1006 – Change in definitions

C 0107 – Add additional cautions, ECO 06P0073

D 1007 – Added additional caution regarding spacer spinning speeds, ECO 07P0070

E 0309 – Incorporate use of clamping wrenches, ECO 1010330

Copyright © 2009

Varian, Inc.

2700 Mitchell Drive

Walnut Creek, CA 94598

[www.varianinc.com](http://www.varianinc.com)

All rights reserved. Printed in the United States

The information in this document has been carefully checked and is believed to be entirely reliable. However, no responsibility is assumed for inaccuracies. Statements in this document are not intended to create any warranty, expressed or implied. Specifications and performance characteristics of software and hardware described in this manual may be changed at any time without notice. Varian reserves the right to make changes in any products herein to improve reliability, function, or design. Varian does not assume any liability arising out of the application or use of any product or circuit described herein; neither does it convey any license under its patent rights nor the rights of others. Inclusion in this document does not imply that any particular feature is standard on the instrument.

All product names are trademarks of their respective holders.