Litpak 361665
IN-189HD
August 2022

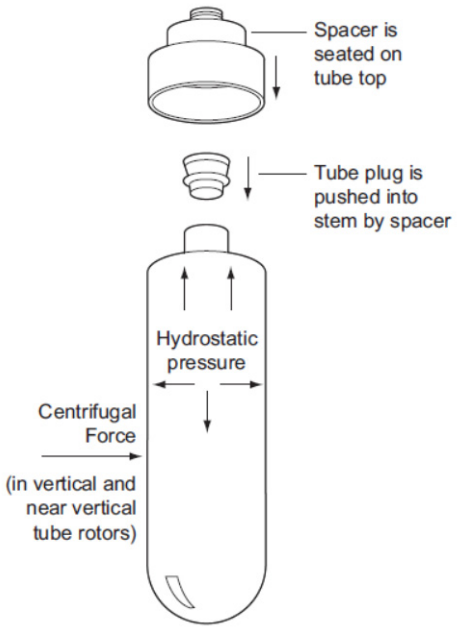
Using OptiSeal Tubes

OptiSeal Tubes

OptiSeal tubes (Figure 1) are designed for use in the rotors listed in Table 1 below. The tubes are made of a propylene ethylene copolymer (polypropylene) and are available in regular and bell-top styles. There is no need for tube caps; the tubes, which come with Noryl* plugs, can be quickly and easily prepared for use without tools or heat. Spacers are required to seal the tubes and to support the tops of the tubes during centrifugation. With the spacer (and rotor plug, in vertical and near vertical tube rotors) in place, the *g* forces during centrifugation ensure a tight, reliable seal that protects your samples.

Polypropylene tubes have been tested for use at temperatures between 2 and 25°C. For centrifugation at other temperatures, it is best to pretest the tubes under the actual experimental conditions, using buffer or gradient of similar density rather than a valuable sample. For information on the chemical resistances of OptiSeal tubes, see *Chemical Resistances* (publication IN-175). **OptiSeal tubes and plugs are single-use components and should be disposed of after use.**

Figure 1 OptiSeal Tube System



Centrifugation exerts high forces on plastic labware. The effect of these forces on OptiSeal labware is compression of the tube, characterized by tube deformation that, even if slight, causes a decrease in internal volume. OptiSeal labware is designed to contain the resulting slight pressure increase during separation, as well as during normal post-separation handling. However, a small volume (≈50 mL) of fluid may occasionally "ooze" from around the plug onto the tube stem area as a plug is removed. Therefore, we recommend using a tissue to contain escaped fluid when extracting plug assemblies from tubes.

* Noryl is a registered trademark of SHPP GLOBAL TECHNOLOGIES B.V.

Filling the Tubes

For filling convenience, use the appropriate eight-tube rack listed in Table 1.

1. Use a pipette or syringe to fill each tube, leaving no fluid in the stem (see Figure 2). Overfilling the tube can cause overflow when the plug is inserted; however, too much air can cause the tube to deform and disrupt gradients and sample bands, as well as increasing the force required to remove the tube from the cavity.

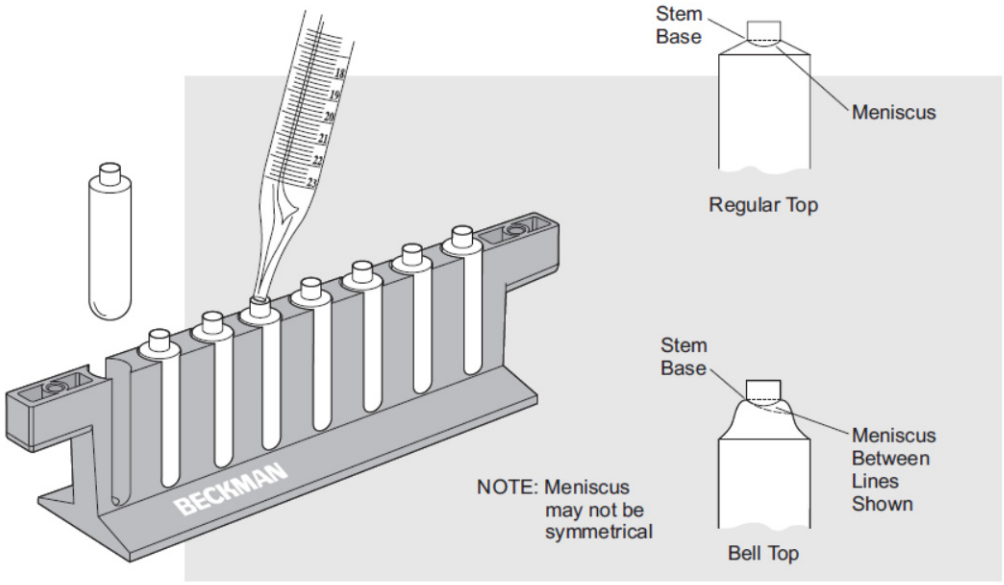
   NOTE If air bubbles occur in the tube shoulder area, tilt and rotate the tube before it is completely filled to wet the tube.

   Homogeneous solutions of gradients and sample may be loaded into the tubes and centrifuged immediately. Step gradients can be loaded with a long needle inserted to the bottom of the tube. Load the light end of the preformed gradient first and float up the lighter gradient with more dense solution. If the sample is to be layered on top, be sure to allow enough room for the sample so that there is no fluid in the tube stem. Refer to *Rotors and Tubes for Beckman Coulter Preparative Ultracentrifuges* (publication LR-IM), for detailed information about layering samples.

2. After filling the tube, make sure that there is no fluid in the stem. (Draw off excess fluid with a syringe or pipette. If necessary, wipe the inside of the stem with a lintless tissue.)

3. Fill the remaining tubes in the same manner.

Figure 2 Filling OptiSeal Tubes. Stems are large enough to accept standard pipettes.

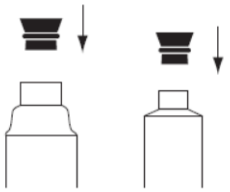


Seating the Tube Plugs

Eight tubes can be prepared for use at once in the specially designed racks listed in Table 1.

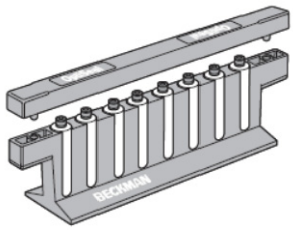
NOTE The Ultem* spacers (361678) snap onto the 3.3-mL tubes (361627). To avoid disturbing the sample or splashing out liquid, put the spacers on these tubes before inserting the plugs.

1. Make sure that no fluid is in the tube stem and that the stem is clean and dry.



2. Insert a Noryl plug assembly (plug and O-ring—shipped assembled) in each tube stem.

3. Set the plug seating bar on the rack, ensuring that the pegs at each end fit into the rack openings.



4. Press firmly straight down all along the top of the bar. When you remove the bar, the plugs should be straight and seated into the stems.

5. Check the tubes to be sure all plugs are seated. If any plugs are not seated, seat them individually.

Loading the Rotor

To ensure sealing and to support the top of the tube during centrifugation, each OptiSeal tube must be used with a spacer (see Figure 1).

NOTE The 3.3-mL tube, when used with Ultem spacer (361678), should already have the spacers on the tubes at this point.

* Ultem is a registered trademark of SABIC GLOBAL TECHNOLOGIES B.V.

Table 1 OptiSeal Tubes and Accessories. Spacers are shown in the correct orientation for placement onto tubes.

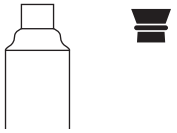
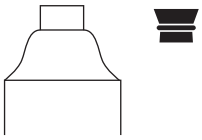
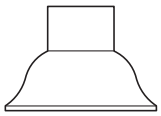
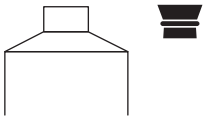
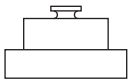
Size (mm)	Volume (mL)	Part Number[a] (pkg/56)	Spacer	Rack Assembly	Rotor
13 × 33	3.3	361627 	361678 (pkg/2) amber Ultem 	361650	MLS-50 SW 55 Ti
			362198 gold aluminum 	361650	TLN 100
13 × 48	4.7	361621 Bell-top 	361676 (pkg/2) amber Ultem 	361638	Type 50.4 Ti, TLA-110
13 × 51	4.9	362185 	362198 gold aluminum 	361638	VTi 90, VTi 65.2, NVT 90, NVT 65.2
			362199 black Noryl 	361638	VTi 65
16 × 60	8.9	361623 Bell-top 	361670 (pkg/2) amber Ultem 	361642	MLA-55 Type 90 Ti, Type 70.1 Ti,
16 × 70	11.2	362181 	362202 gold aluminum 	360538	NVT 65, VTi 65.1

Table 1 OptiSeal Tubes and Accessories. Spacers are shown in the correct orientation for placement onto tubes.

Size (mm)	Volume (mL)	Part Number[a] (pkg/56)	Spacer	Rack Assembly	Rotor
25 × 77	29.9	361625 Bell-top 	361669 (pkg/2) amber Ultem 	361646	MLA-50 Type 70 Ti, Type 50.2 Ti,
			392833 (pkg/2) amber Ultem 	361646	SW 32 Ti SW 28
25 × 89	36.2	362183 	362204 gold aluminum 	360542	VTi 50, VTi 50.1

a. Disposable plastic plugs included.

1. With the tubes still in the tube rack, place the correct spacer (refer to the Table) on each plugged tube. Spacers are shown in the Table in the correct orientation for placement into the rotor cavity; *be sure that you install spacers in the orientation shown.*

2. Remove each tube and spacer (together) from the rack and insert the assembly into the rotor cavities. Be sure to load the rotor symmetrically (refer to the applicable rotor manual).

   NOTE Make sure that the spacer is firmly seated on the tube top.

3. *Swinging bucket rotors* — Screw caps onto buckets, if applicable, and complete rotor preparation procedures as described in the applicable rotor manual.

   Fixed angle rotors — Complete rotor preparation procedures as described in the applicable rotor manual.

   Near vertical tube or vertical tube rotors — It is especially important that the entire tube cavity be filled; therefore, insert rotor plugs (with the white gaskets pointing down) over the spacers. Then screw in and torque the rotor plugs as indicated in the applicable rotor manual, to seal the tube cavities. Refer to the applicable rotor manual for detailed rotor loading instructions.

⚠ CAUTION

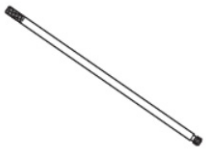
To avoid rotor damage, do not insert rotor plugs or spacers into empty cavities. Leave unused cavities completely empty.

Recovering the Sample

⚠ CAUTION

If disassembly reveals evidence of leakage, you should assume that some fluid escaped the rotor. Apply appropriate decontamination procedures to the centrifuge and accessories.

1. After centrifugation, use the spacer removal tool (338765) or a hemostat to carefully remove the spacers, taking care not to scratch the rotor cavities. (A tube will sometimes come out of the rotor cavity along with the spacer. Separate the tube from the spacer with a lifting and twisting motion.)


Spacer Removal Tool

NOTE *SW 32 Ti and SW 28 rotors only* — Use the spacer removal tool (338765) to remove the spacer and tube together from the rotor bucket. Place the tubes in the rack. Grasp the tube and use the spacer removal tool in a lifting and twisting motion to remove the spacer.

NOTE Centrifugation causes a slight vacuum to build up in the tube cavity, occasionally resulting in a suction effect when removing the tubes from the rotor. This effect is especially pronounced in a rotor that has been centrifuged at a low temperature. A brief delay (approximately 5 minutes) after the rotor comes to rest before removing the tubes will make tube removal easier. If you experience difficulties in removing the tubes from the rotor, use a gentle twisting or rocking motion, and remove the tube slowly to avoid sample mixing.

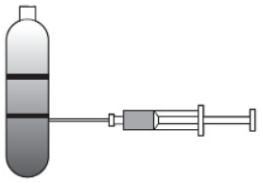
2. Remove the tube with the extraction tool (361668), grasping the base of the stem only — do NOT try to remove the tubes by pulling on the plugs. Some tube deformation occurs during centrifugation, which causes a slight internal pressure to develop inside the tube.


Extraction Tool
(361668)

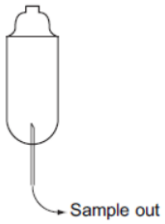
3. Place the tubes back into the tube rack. Openings in the rack allow the tubes to be pierced either from the bottom or sides, permitting fractions to be easily collected regardless of the type of separation.

NOTE If you plan to collect particles from the tube side or bottom, first create an air passage by removing the tube plug (see instructions below) or inserting a hollow hypodermic needle in the top of the tube.

4. Use one of the following methods to retrieve the sample:
   - Puncture the side of the tube just below the sample band with a needle and syringe and draw the sample off. Take care when piercing the tube to avoid pushing the needle out the opposite side.

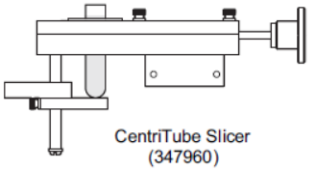


   - Puncture the bottom of the tube and collect the drops.



   - Aspirate the sample from the tube top by removing the tube plug (see instructions below), then aspirating the sample with a Pasteur pipette or needle and syringe.

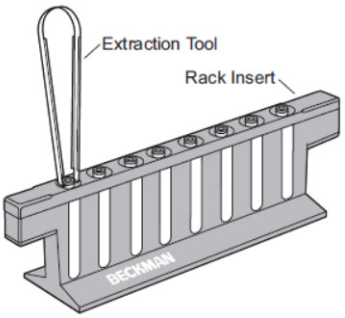
   - Slice the tube, using the Beckman CentriTube Slicer (303811). Refer to publication L-TB-010 for instructions for using the CentriTube Slicer. Use CentriTube Slicer (347960) and CentriTube Slicer Adapter (354526) for 13-mm tubes. (Tubes are pressurized after centrifugation, so pierce the tube top with a needle to relieve pressure before slicing.)



Removing Plugs from Tubes

1. Place the tube rack insert over the tubes in the rack.
2. Press down on the rack insert on each side of the tube being unplugged to hold the tube in place during plug removal.

   NOTE Do not hold onto or squeeze the tubes. Tube contents will splash out when the plug is removed if pressure is applied to the tube.



3. While pressing down on the rack insert, use the extraction tool to firmly grasp the plug.
4. Use a slight twisting motion to slowly release any residual internal pressure when pulling the plug assembly from the tube.
5. Repeat for each tube.

Care and Maintenance

Proper care of tubes and accessories involves observing temperature and run speed limitations as well as careful cleaning and sterilization procedures.

Cleaning

Tubes and plugs. OptiSeal tubes and plugs are single-use components and should be disposed of after use.

Spacers. Wash spacers by hand, using a mild detergent such as Beckman Solution 555 (39555) diluted 10 to 1 with water (do not, however, soak them in detergent). Rinse thoroughly with distilled water, then dry completely before putting them away.

Tube racks. Tube racks are made of Noryl and may be cleaned with Solution 555.

Decontamination

Tubes and accessories contaminated with radioactive or pathogenic solutions should be decontaminated or disposed of following appropriate safety guidelines and/or regulations. Refer to *Chemical Resistances* to select solvent that will not damage the tube or accessory material.

Sterilization and Disinfection

Tubes and spacers can be autoclaved at 121°C for about 30 minutes. (Do not autoclave components made of Noryl.) Note, however, that the tubes may be permanently deformed if they are autoclaved or if they are handled or compressed before they cool. Be sure that tubes are positioned vertically while autoclaved to avoid deformation. A cold sterilization method such as ethanol (70%)* can be used on tubes, plugs, spacers, and tube racks.

While Beckman Coulter has tested these methods and found that they do not damage the tubes or accessories, no guarantee of sterility or disinfection is expressed or implied. When sterilization or disinfection is a concern, consult your laboratory safety officer regarding proper methods to use.

Inspection

If tubes, spacers, or plug assemblies have been stored for long periods, inspect them before use. Discard any item showing signs of damage.

* Flammability hazard. Do not use in or near operating ultracentrifuges.

Storage

Make sure all tubes and accessories are completely dry before storing them. Store tubes in their containers in a cool, dry place away from ozone and chemical fumes. Tubes have an indefinite shelf life is properly stored.

Removing Jammed or Collapsed Tubes

⚠ CAUTION

Do not use a hemostat or any metal tool to pry a jammed or collapsed tube out of the rotor. The rotor can be scratched and damaged.

If a tube becomes jammed or collapsed in the rotor, DO NOT force the tube. Remove the tube contents and place the rotor upside-down in an autoclave. *Do not autoclave sealed tubes.* Autoclave at 121°C for about 60 minutes. At the end of the autoclave cycle the tube material should be softened enough for easy removal. Contact Beckman Coulter Field Service (in the United States, call 1-800-742-2345) if this method is unsuccessful.

Supply List

Publications referenced in this manual can be obtained by calling Beckman Coulter at 1-800-742-2345 in the United States, or by contacting your local Beckman Coulter office.

NOTE For SDS information, go to the Beckman Coulter website at *www.beckman.com/techdocs*.

Table 2 Supply List

Item	Part Number
Tubes (includes plugs), spacers, and racks	See Table 1
Spacer removal tool	338765
Tube extraction tool	361668
Curved hemostat (6-in.)	927208
Beckman CentriTube Slicer	347960
CentriTube Slicer replacement blades (pkg of 10)	348299
CentriTube Slicer adapter (for 13-mm tubes)	354526
Beckman Solution 555 (1 qt)	339555

Revision History

Revision HC
Technical updates were made to the following:

- Table 1

Revision HD
Technical updates were made to the following:

- Table 1

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