

**SCIENCE
SERVICES**

TUBES

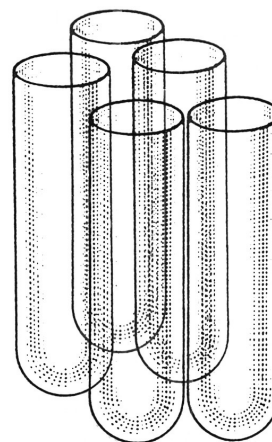


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Polyclear

- Thin Wall and Transparent
- Punctureable and Sliceable
- Equivalent to Beckman Ultra-Clear Tubes
- Molded Stress-Free
- Use with Cesium Chloride Gradients



Polyclear thermoplastic is transparent and non-wettable in an uncoated state.

The UltraCote layer applied to Polyclear tubes provides a wettable surface for convenient gradient formation. Thin wall Polyclear tubes are puncturable but generally with more effort than Polyallomer tubes. UltraThin tubes made of the Polyclear material are about one-half the side wall thickness of open-top Polyclear tubes and are significantly easier to puncture. See UltraThin Tubes page. The useful centrifuge temperature range is 0-20°C. Polyclear tubes can be used at temperatures greater than 20°C, i.e. 25°C, but they may be difficult to extract from the rotor.

You may have to wait for up to 5 minutes to smoothly extract the tubes. The ability to extract depends on the length of run, temperature, fluid and rotor. Generally, the longer, warmer and faster the run, the greater the required effort to extract the tubes. However, at temperatures up to 20°C, the effort will not be significant. Polyclear tubes are stiffer than Polyallomer and rarely collapse. In fact, you need not be as concerned about minimum fill levels as with all other tube materials. The chemical resistance of Polyclear is not as good as Polyallomer, and resistance to solvents at centrifuge stresses is poor.

Mineral and paraffin oil overlays should be avoided as they may cause significant crazing during the run. Polyclear can be used up to a pH of 8.5. Generally the longer and warmer the run, the greater the effect of gradient pH. Sterilization can be achieved by treatment with ethylene oxide gas or by cold methods (1).

See attachment I for chemical resistance.

(1) Aqueous solutions of 70% ethanol, 70% isopropanol or 10% hydrogen peroxide. *Trademark of Beckman Instruments, Inc.

Open-Top Polyclear Tubes

Tubes Size	PN Box of 50	Tubes Capacity ml	For Beckman Rotor	For Sorvall/Kendro Rotor	For Kontron Rotor	Equivalent for Beckman	Equivalent for Sorvall/Kendro
3/16x1-15/16" (5x41mm)	7009	.80 nom .67act	SW60Ti (4) SW65Ti, SW55Ti SW50.1, SW50	TH-660 (4) AH-650	---	344090	---
7/16x1-3/8" (11x34mm)	7011	2.2	TLS55	RP55-S	---	347356	45315 45242
7/16x2-3/8" (11x60mm)	7010	4.4	SW60Ti SW56Ti	TH-660	TST-60.4 TFT-80.4	344062	---
1/2x1-1/4" (13x32mm)	7020	3.0	90Ti, 80Ti, 75Ti, 70.1Ti, 50Ti, 65, 50 & 40 Adapter required	---	---	344092	---
1/2x 1-5/8" (13x41mm)	7021	4.0	90Ti, 80Ti, 75Ti, 70.1Ti, 1Ti 50Ti, 65, 50 & 40 Adapter required	---	---	344093	---
1/2x2" (13x51mm)	7022	5.0	SW65Ti, SW55Ti SW50.1, SW50	AH-650	TST55.5	344057	---
1/2x2-1/2" (13x64mm)	7023	6.5	50.3Ti, 40.3 40.2, 50.4T1 (1)	---	TFT45.6	344088	---
9/16x3-1/2" (14x89mm)	7030	12.0	SW41Ti	TH-641	---	344059	06752
9/16x3-3/4" (14x95mm)	7031	12.9	SW40Ti	---	TST41.14	344060	---
5/8x2" (16x51mm)	7043	8.0	SW30.1	---	---	346600	---
5/8x2-1/2" (16x64mm)	7040	10.2	Ty50	---	---	344089	---
5/8x3" (16x76mm)	7041	12.6	90Ti, 80Ti, 70.1Ti 75Ti, 65, 50Ti 40, 50(2)	T-1270, T-875 T-865, A-1256	TFT80.13, 75.13 65.13, 60.13 50.13, 32.13	344085	---
5/8x4" (16x102mm)	7042	17.0	SW28.1Ti SW27.1Ti SW32.1	AH-629/17 Surespin 630/17	TST28.17	344061	06750
1x2" (25x51mm)	7053	20.0	SW30	AH-629/20	---	346598	---
1x3" (25x76mm)	7050	32.5	SW25.1	---	---	344063	---
1x3-1/2" (25x89mm)	7052	38.5	SW32, SW27, SW28 70Ti, 60Ti, 55.2Ti 50.2Ti, 42.1, 30	AH-629/36, T1250 Surespin 630/36	TFT70.38, 65.38, 50.38, 55.38 TST28.38	344958	75000471
1-1/2x4" (38x102mm)	7060 (3)	94.0	45Ti, 35, 21	---	TFT45.94	345777	---

(1) May be used with adapters in the following rotors: Types 90Ti, 80Ti, 75Ti, 70.1Ti, 65, 60Ti, 55.2Ti, 50.2Ti, 50Ti, 45Ti, 42.1, 40, 35 and 21.

(2) May be used with adapters in the following rotors: Types 70Ti, 60Ti, 55.2Ti, 50.2Ti, 45Ti, 42.1, 35, 30 and 21.

(3) PN 7060 is a box of 25 tubes.

(4) In SW60Ti and TH-660 rotors (11mm dia) use Adapter PN 4109 (Set of 6 adapters);

in SW65Ti, SW55Ti, SW50.1, SW50 rotors (13mm dia) use Seton Adapter PN 4114 (Set of 6).

UltraCote Tubes

PC | ULTRA

Wettable Polyclear

The UltraCote monomolecular layer applied to Polyclear tubes allows gradients to be easily formed as aqueous solutions flow smoothly down tube walls with minimum disturbance of underlying bands. It is no longer necessary to load gradients from the bottom up to avoid mixing. UltraCote tubes offer the only wettable surface since the discontinuation of cellulose nitrate tubes.

The extremely thin UltraCote layer is bonded to the tube wall and is not affected by the forces of ultracentrifugation. The coating applied to thin wall tubes will not crack, peel or affect the transparency of Polyclear tubes. Tubes may be run at the same speeds as corresponding non-wetting Polyclear tubes, and chemical resistances remain unchanged.

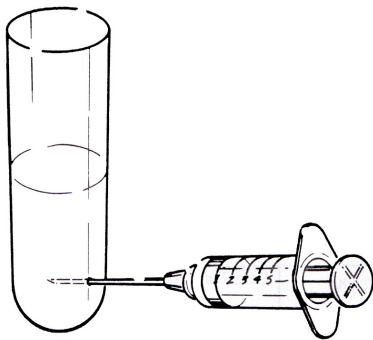
UltraCote tubes are available in Open-Top and UltraThin configurations.

Tube Size	Part No. Box of 50	Tube Size	Part No. Box of 50	Tube Size	Part No. Box of 50	Tube Size	Part No. Box of 50
7/16x1-3/8" (11x34mm)	7011W	5/8x4" (16x102mm)	7042W	Ultra Thin 7/16x1-3/8" (11x34mm)	7070W	Ultra Thin 1x3" (25x76mm)	7078W
7/16x2-3/8" (11x60mm)	7010W	1x2" (25x51mm)	7053W	Ultra Thin 7/16x2-3/8" (11x60mm)	7071W	Ultra Thin 1x3-1/2" (25x89mm)	7079W
1/2x2" (13x51mm)	7022W	1x3" (25x76mm)	7050W	Ultra Thin 1/2x2" (13x51mm)	7072W		
9/16x3-1/2" (14x89mm)	7030W	1x3-1/2" (25x89mm)	7052W	Ultra Thin 9/16x3-1/2" (14x89mm)	7073W		
9/16x3-3/4" (14x95mm)	7031W			Ultra Thin 9/16x3-3/4" (14x95mm)	7074W		
5/8x2" (16x51mm)	7043W			Ultra Thin 5/8x2" (16x51mm)	7075W		
5/8x3" (16x76mm)	7041W			Ultra Thin 5/8x4" (16x102mm)	7076W		

Refer to the „Polyclear Tubes“ page for rotor applications. For example, UltraCote tube 7030W is the wettable version of the 7030 tube which can be used in the Beckman SW41Ti rotor at the maximum speed of 41 krpm.

UltraThin Tubes

PC | ULTRA



Polyclear

- Extremely Thin Side Walls for Puncturing and Slicing
- Durable for 0-20°C Runs at Maximum Rotor Speeds
- Ideal for Gradient Runs in Swinging Bucket Rotors
- Transparent Polyclear
- Available in Wettable UltraCote

UltraThin tubes are made with thin side walls for easy puncturing and slicing after swinging bucket runs (1). These extremely thin, yet durable, Polyclear tubes can be used in the 0-20°C temperature range at maximum rotor speeds and gradient densities. UltraThin tubes are manufactured with precise process controls and provide straight walls with excellent transparency. Because of the thin walls, UltraThin tubes provide increased tube/rotor volume over conventional thin wall tubes. UltraThin tubes are also available with the wettable UltraCote layer applied allowing gradients to be easily formed. The extremely thin walls, wettability and transparency combine features not available since the discontinuation of cellulose nitrate tubes in 1980. The chemical resistance of UltraThin tubes is the same as that of conventional Polyclear tubes. To provide maximum wall support, fill the tubes to within 2-3 mm of the top.

See attachment I for chemical resistance.

CAUTION:

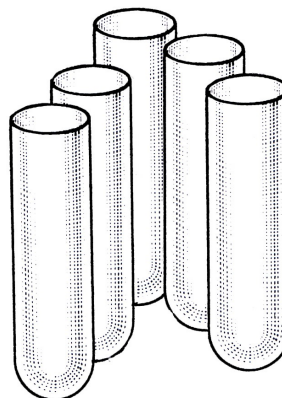
- Do not autoclave UltraThin Tubes
- Do not use UltraThin tubes with oil overlays or solvents
- Fit the tube to within 2-3 mm of the top

(1) UltraThin tubes are about one-half the side wall thickness of conventional thin wall Polyclear and Ultra-Clear tubes. However, the center bottom thickness in a region about one-half the tube diameter is not as thin as the side walls.

Tube Size	Polyclear Part Nr. Box of 50	UltraCote Part Nr. Box of 50	Tube Volume ml	Maximum Speed krpm	Rotor examples			
					Beckman	Sorvall	Kontron	Like Thermo-Sorvall Tube PN
7/16X1-3/8" (11X34mm)	7070	7070W	2,5	55	TLS55	RP55-S	---	75000515
7/16x2-3/8" (11x60mm)	7071	7071W	4,7	60	SW60Ti SW56Ti	TST60.4	TST60.4	
1/2x2" (13x51xmm)	7072	7072W	5,8	65	SW65Ti,SW55Ti SW50.1, SW50 MLS-50	AH-650	TST55.5	
9/16x3-1/2" (14x89mm)	7073	7073W	12,8	41	SW41Ti	TH-641	--	
9/16x3-3/4" (14x95mm)	7074	7074W	15,7	41	SW40Ti	---	TST41.14	
5/8x2" (16x51mm)	7075	7075W	8,5	30	SW30.1	---	---	
5/8x4" (16x102mm)	7076	7076W	18,6	28	SW32.1 SW28.1Ti SW27.1Ti	AH-629/17 Surespin 630/17	TST28.17	
1x2" (25x51mm)	7077	7077W	15,1	30	SW30	AH-629/20	---	
1x3" (25x76mm)	7078	7078W	27,4	25	SW25.1	---	---	
1x3-1/2" (25x89mm)	7079	7079W	40	32	SW27, SW28 SW32	AH-629/36 T-1250 Surespin 630/36	TST28.38	

Polyallomer

- Thin Wall and Translucent
- Puncturable and Sliceable
- Autoclavable
- Molded Stress-Free
- No Brittleness



Polyallomer offers the best overall chemical resistance of plastic ultracentrifuge tubes. It has a useful but limited solvent resistance at centrifugal stresses. It has excellent resistance to alkaline gradients and can be used in a 2-12 pH range. It is translucent but achieves some contact clarity with liquids. It is non-wettable (1).

The useful centrifuge temperature range is 0-30°C, but short duration runs under certain circumstances may allow the use of tubes up to 40°C. Polyallomer tubes may be reused (2).

Polyallomer tubes can be sterilized by autoclaving at 121°C for more than 60 minutes with no detrimental effects on centrifuge tube performance. Sterilization can also be achieved by treatment with ethylene oxide gas or by cold methods (3).

Polyallomer tubes are easily punctured and sliced.
Puncturing through the tube bottom is relatively easy.

See attachment I for chemical resistance.

(1) One literature reference for improving wettability by chromic acid treatment is Oplinger, C.E., Heinrich, P.C., and Olson, R.E., J. Lipid Res., 281, (1974).

(2) Tubes can be reused if significant deformation or stress cracking has not occurred. Capped tubes used in fixed-angle rotors may deform below the cap and in that case should not be reused.

(3) Aqueous solutions of 70% ethanol, 70% isopropanol or 10% hydrogen peroxide.

Open-Top Polyallomer Tubes

Tube Size	Part Nr. Box of 50	Tube Capacity ml	Rotor examples		Equivalent to	
			Beckman	Sorvall/Kendro/ Kontron	Beckman	Sorvall/Kendro Kontron
5/16x1-1/4" (8x32mm)	5006	0.85	TLS55 (4) Adapter required	RP55-S (4) Adapter required	---	---
5/16x2" (8x51mm)	5009	1.5	---	TFT80.2	---	5446054460 9091-00174
7/16x1-3/8" (11x34mm)	5011	2.2	TLS55	RP55-S	347357	45240
7/16x2-3/8" (11x60mm)	5010	4.4	SW60Ti SW56Ti	TST60.4 TFT80.4 TH-660	328874	0395503955 9091-90212
1/2x1-1/4" (13x32mm)	5020	3.0	90Ti,80Ti, 75Ti 70.1Ti, 50Ti, 65, 50 & 40 Adapter required	---	---	---
1/2x1-5/8" (13x41mm)	5021	4.0	90Ti,80Ti, 75Ti 70.1Ti, 50Ti, 65, 50 & 40 Adapter required	---	---	---
1/2x2" (13x51mm)	5022	5.0	SW65Ti,SW55Ti SW50.1,SW50 MLS-50	AH-650 TST55.5	326819	03127 9091-90219
1/2x2-1/2" (13x64mm)	5023	6.5	50.3Ti, 40.3 40.2, 50.4Ti(1)	TFT45.6	326820	9091-90227
9/16x3-1/2" (14x89mm)	5030	12.0	SW41Ti	TH-641	331372	03699 9091-90221
9/16x3-3/4" (14x95mm)	5031	12.9	SW40Ti	---TST41.14	331374	9091-90215
5/8x2" (16x51mm)	5043	8.0	SW30.1	---	346601	---
5/8x2-1/2" (16x64mm)	5040	10.2	Ty50	---	326826	---
5/8x3" (16x76mm)	5041	12.6	90Ti, 80Ti, 70.1Ti, 75Ti, 65, 50Ti 40(2) Adapter required	T-1270, T-865 A-256, TFT80.13 TFT80.13,75. 13,65.13,50.13, 32.13	326814	03128 9091-90202
5/8x4" (16x102mm)	5042	17.0	SW32.1 SW28.1Ti SW27.1Ti	AH-629/17 Surespin 630/17 TST28.17	337986	0312603126 9091-90217
1x2" (25x51mm)	5053	20.0	SW30	AH-629/20	346599	03288
1x3" (25x76mm)	5050	32.5	SW25.1	---	326825	---
1x3-1/4" (25x83mm)	5051	35.8	70Ti	---	344367	9091-90197
1x3-1/2" (25x89mm)	5052	38.5	SW27, SW28 70Ti, 60Ti, 55.2Ti 50.2Ti, 42.1, 30	AH-629/36 T-1250 Surespin 630/36 TFT50.38,65.38 55.38,50.38 TST28.38	326823	03141 (5) 9091-90196
1-1/2x4" (38x102mm)	5060 (3)	94.0	45Ti,35,21	TFT45.94	345775	091-90207

- (1) May be used with adapters in the following rotors: 90Ti, 80Ti, 75Ti, 70.1Ti, 65, 60Ti, 55.2Ti, 50.2Ti, 50Ti, 45Ti, 42.1,40, 35 and 21.
 (2) May be used with adapters in the following rotors: 70Ti, 60Ti, 55.2Ti, 50.2Ti, 45Ti, 42.1, 35, 30 and 21.
 (3) PN 5060 is a box of 25 tubes.
 (4) In RP55-S and TLS55 rotors use Adapter PN 4482 (Set of 6 Adapters); Maximum speed is 20 krpm.
 (5) Equivalent to 03141 for use in SW rotors only.

- Short Path Lengths
- Reduced Run Times and Volumes
- Secondary Seal in Swinging Bucket Rotors
- Reusable Tubes

The Science Services Cone-Top system positions a short column tube at the bottom of your rotor hole resulting in a k-factor reduction and increased pelleting efficiency of your rotor (1). Shorter path lengths can reduce run times. These reduced volume tubes offer added flexibility with your present rotors with no need for speed reductions or oil overlays to fill open-top tubes to the required levels. Because the tubes are filled and sealed, gradient concentrations do not change by evaporation as may occur with partially-filled thick wall tubes.

The patented Cone-Top seal System fixes the crown to the top of the tube and maintains the conical tube shape during centrifugation (2). In swinging bucket rotors the Cone-Top system provides a secondary seal and increased protection when separating hazardous materials. Cone-Top tubes may be resealed and offer the advantage of multiple runs with the same tube. Use of Science Services Easy-Out fractionation devices allow direct connection to the top of the tube. The cone top provides a uniform configuration for efficient sample removal.

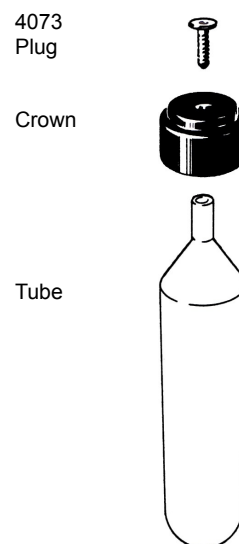
With the Cone-Top System the use of heat and expensive heat sealing stations is eliminated--the seal is made with a simple hex key wrench. Cone-Top polyallomer tubes can be autoclaved, punctured and sliced. Find your rotor in the chart on the next page. You will need one crown and one plug for each hole you intend to use in your rotor. The plug is tightened with wrench PN 4088.

How to Use:

After the Cone-Top tube is filled a crown is placed on the stem of the tube, a plug is screwed into the stem and hand-tightened with the wrench. As the plug is screwed in, it forms a thread in the stem of the tube providing a reliable compression seal. After centrifugation, the tube assembly can be pulled form the rotor with hemostats and the plug unscrewed. The tube can be reused by again screwing in the plug.

Noryl crowns, stainless steel plugs and polyallomer tubes can be sterilized by autoclaving, ethylene oxide gas or immersion in aqueous solutions of 70% ethanol, 70% isopropanol or 10% hydrogen peroxide.

Fraction Recovery: see the „Fraction Recovery“ page



4216

+ Black Noryl
+ 70KRPM max.
+ For Tubes
9050, 9051
+ For Rotors: 70Ti, 60Ti
50.2Ti, SW32, SW28



4219

+ Black Noryl
+ 41KRPM max.
+ For Tubes
9032, 9055
+ For Rotors: 90Ti, 80Ti
75Ti, 70.1Ti



4246

+ Black Noryl
+ 100 KRPM max.
+ For Tubes
9011, 9012
+ For Rotors: TLS55, S55-S
TH660, TFT80.4



(1) Rickwood, D., editor, Centrifugation (2nd Edition), Oxford: IRL Press, Ltd., 1986.
(2) U.S. Patent 4,690,670 and UK Patent GB 2185245 apply.

Polyallomer Cone-Top Tubes

Tubes Size	Part Nr. Box of 50	Volume ml (1)	Use Crown	Re-Seal Plug (1)	k-factor Rotor	Replaces Beckman	Replaces Sorvall	For Beckman Rotor	For Sorvall Rotor	For Kontron Rotor
7/16x1" (11x25mm)	9011	1.5/1.5	4246	4073 4075	14 (TLA100.2)	344624	75000501	MLA-130 TLA120.2 TLS55	TH-660,TFT80.4 S55S, S140-AT S150-AT S120-AT2	TST60.4 TFT80.4
7/16x1-1/4" (11x32mm)	9012	2.0/1.9	4246	4073 4075	21 (SW60)	344625	75000459	TLS55	S55-S TH-660 TFT80.4	TST60.4 TFT80.4
7/16x2-3/8" (11x60mm)	9059	3.4/3.4	4246	4073 4075	---	---	75000483	SW60	TH660 TFT80.4	
1/2x1" (13x25mm)	9024	2.0/1.9	4247	4073 4075	18 (SW65)	345829	75000458	SW55 100Ti 50.4Ti	AH-650 TFT-45.6	TST55.5 TFT45.6
1/2x1-1/4" (13x32mm)	9025	3.5/3.1	4247	4073 4075	27 (50.3Ti)	349621	75000456	SW55	AH-650 TFT-45.6	TST55.5 TFT45.6
1/2x2" (13x48mm)	9058	4	4247	4073 4075	12 (TLA 100.4)	---	75000482	SW55	TFT45.6 AH-650	
1/2x2" (13x51mm)	9029	5.0/5.1	4249	4073 4075		362248	---	TLA100.4	---	---
9/16x1-7/8" (14x47mm)	9032	5.9/6.1	4219	4073 4075	61 (SW41)	355537	75000454	SW41 SW40	TH-641	TST41.14
9/16x3-1/2" (14x88mm)	9055	10/10.02	4219	4073 4075	---	---	75000411	SW41 SW40	TH-641	
5/8x1-3/4" (16x45mm)	9040	6.3/6.8	4248	4073 4075	98 (SW28.1)	345830	75000450	90Ti,80Ti,75Ti 70.1Ti,65,50Ti 50, 40,SW32.1 SW28.1	AH629/17,T-1270 Surespin 630/17 T-890	TFT:80.13 75.13,65.13 60.13,50.13 32.13,TST28.17
5/8x4" (16x100mm)	9056	15.0	4248	4073 4075	---	356291	75000414	SW32.1 SW28.1	Surespin 630/17 AH-629/17	
1x1-1/2" (25x38mm)	9050	15/14.7	4216	4073 4075	102 (SW28)	343664	---	70Ti,60Ti,55.2Ti 50.2Ti, SW32,SW28	AH629/36 Surespin 630/36	TFT:70.38,65.38 55.38,50.38 TST28.38
1x3-1/4" (25x81mm)	9051	30/29.7	4216	4073 4075	---	344623	7500427	SW32 SW28	AH629/36 Surespin 630/36	TFT:70.38,65.38 55.38,50.38 TST28.38

(1) Nom/Act.

(2) PN 4073 is a single plug; PN 4075 is a package of ten plugs.

(3) Beckman Bell-Top and Seton Cone-Top tubes are interchangeable, they can also be used with Beckman Bell-Top spacers.

4250 Removal Tool

Insert the tip of the tool into the hex hole of the screw plug, tilt slightly and pull the tube assembly from the rotor hole.



4088 Wrench

This hex key with molded plastic handle is used to tighten the 4073/4075 plugs.



Plugs

Single Plug PN	Material	Use with Tube	Pk of 10 PN
4073	ES	PA	4075

How to Order:

Find your rotor in the chart at the top of the page. Note the corresponding crown PN and order one crown for each rotor hole you intend to Use. Order one plug for each crown. For convenience, plugs are supplied individually or in packages of ten. Use the PN 4088 wrench to tighten the plug. An example is:

4247

+ Black Noryl
+ 100 krpm max.
+ For Tubes
9024, 9025, 9058
+ Rotors: SW55, 100Ti
50.4Ti, TFT45.6, AH-650

4248

+ Black Noryl
+ 80 krpm max.
+ For Tubes
9040, 9056
+ for rotors: 90Ti, 80Ti
75Ti, 65, 50Ti, 50, 40
SW32.1, SW28.

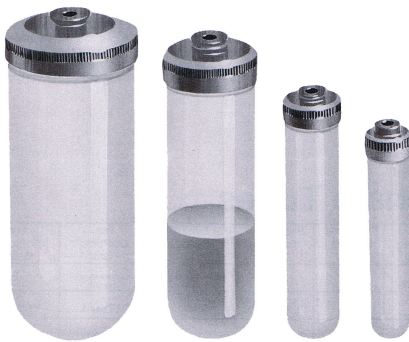


4249

+ White Noryl
+ 100 krpm max.
+ For Tubes
9029
+ for rotors: TLA-100.4

Threaded Polycarbonate Tubes

PCB | ULTRA



- Smooth, Straight Wall Design
- Fast, Reliable Sealing Caps
- Reusable and Autoclavable
- Transparent

Thick wall polycarbonate tubes are available in five popular sizes for use in a wide range of fixed-angle rotors. With smooth, straight walls, these polycarbonate tubes allow complete decanting of supernatants.

Because there is no reduced neck, there is easy access to pellets at the bottom of the tube. Tubes can be run partially filled but should always be used with a cap. Tubes should be at least half-full when run. Polycarbonate tubes are autoclavable. They should not be used with oils or solvents as cracking may occur. Tubes, caps and o-rings may be purchased as assemblies or as individual components if replacements are required. A gripping tool is available for unscrewing the caps after centrifugation and provides maximum leverage without scratching the anodized surface of the caps. A threaded removal tool is available for extracting the sealed tube assembly from the rotor.

Tube Size	Volume Nom / Fill ml	Assembly PN (1)	PN Tube	PN Cap Assembly (2)	PN O-Ring	Max. Speed krpm Fill / Part-Fill (3) 4°C	Max. Speed krpm Fill / Part-Fill (3) 25°C	Rotor examples	
								Beckman	Sorvall/ Kontron
7/16x2-3/8" (11x60mm)	4.4/2.7	4388	4387	4389	4390	55/50	50/45	---	TFT80.4
1/2x2-1/2" (13x64mm)	6.5/4.5	4277	4278	4279	4280	45/45	45/40	50.4Ti, 50.3Ti 40.3, 40.2	TFT45.6
5/8x3" (16x76mm)	13.5/9.5	4281	4282	4283	4284	50/40	40/40	90Ti, 80Ti 75Ti, 70.1Ti 65, 50Ti 50 & 40	T-1270, T-865 A-1256 TFT80.13
1x3-1/2" (25x89mm)	38.5/32.5	4285	4286	4287	4288	50/35	50/35	70Ti, 60Ti 55.2Ti, 50.2Ti 42.1(4)	TFT 70.38 65.38 55.38, 50.38
1-1/2x4" (38x102mm)	94/88	4386	4385	4291	4292	40/35	40/35	45Ti, 35	TFT45.94

(1) Assembly consists of one polycarbonate tube, aluminum cap and a Viton o-ring.

(2) Assembly consists of one aluminum cap and a Viton o-ring.

(3) Tubes have been tested for 24 hours. Tubes must be at least half full and must be centrifuged with caps. Reduced speeds are necessary for partially filled tubes. Separate caps from tubes when autoclaving.

(4) Max. speed is 40 krpm in the Beckman 50.2Ti rotor.

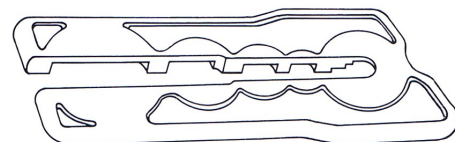
4270 Removal Tool

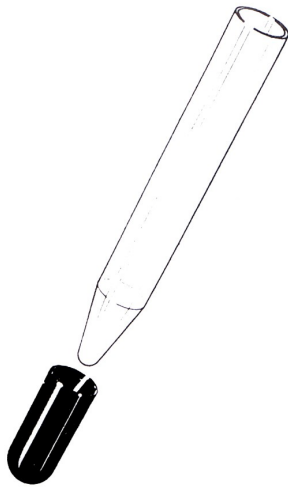
Tube assemblies can be pulled from your rotor after this tool is threaded into the top of the aluminium cap.



4293 Gripping Tool

Aluminium caps can be easily unscrewed from the tube with this cap tool.



UltraCone Tube**PA, PC | ULTRA**

- Use for Concentration Runs such as RNA Isolation
- Conical Ultracentrifuge Tubes
- Polyallomer and Polyclear
- Thin Wall
- Puncturable and Sliceable
- Use in Swinging Bucket and Fixed-Angle Rotors
- Use at Maximum Speed of Swinging Bucket Rotors

The patented* UltraCone tubes with adapters provide a conical bottom in swinging bucket and fixed-angle rotors. The conical bottom of the tube is ideal for concentrations of materials in swinging bucket runs. One common application of the UltraCone system is in the isolation of RNA. One method described in the literature is commonly modified for use with the Beckman SW1Ti rotor and the Science Services UltraCone tube PN 5064 with PN 4228 adapter (1).

Your rotors can be used at maximum speed and fluid density up to 20°C with the UltraCone adapters and choice of Polyallomer or Polyclear conical tubes. The adapters can be sterilized by autoclaving, ethylene oxide gas or by solvent immersion. The adapters have excellent solvent resistance and will not crack after repeated centrifugation and sterilization cycles.

How to Use

The internal taper of the adapter matches exactly the external taper of the UltraCone tubes. Use one adapter for each rotor hole. When using UltraCone tubes and adapters in fixed-angle rotors, the appropriate fixed-angle tube cap must be used (2). Insert the adapter into your rotor hole followed by your filled tube. For swinging bucket rotors observe the filling levels normally used for thin wall tubes: 2-3 millimeters from the top. After your run remove the tube from the bucket. The adapter may remain in the bucket after some runs (long runs at high temperatures) but can be removed with the PN 4209 Removal Tool. This tool can be used with the 7/16 through 5/8" adapters and is convenient for reaching adapters at the bottom of long, narrow swinging buckets. The PN 4195 Tube Cutter can be used to cut the conical tip from the body of the tube for access to your concentrated material.

(1) Chirgiri, John M., Pryzbla, Alan E., MacDonald, Raymond J., and Rutter, William J., 'Isolation of Biologically Active Ribonucleic Acid from Sources Enriched in Ribonuclease,' (1979) Biochemistry 18, 5294-5299.

(2) Use caps designed for Beckman thin wall Ultra-Clear and polyallomer tubes and for Kontron thin wall CAB arid polyallomer tubes.

*U.S. Patent 4,990,129 and UK Patent 2222538 apply.

UltraCone Polyallomer and Polyclear Tubes

Tube Size	Polyallomer PN Box of 50	Polyclear PN Box of 50	Tube Volume ml	Volume of Cone ml	Conical Adapter PN	Max. Speed krpm (1)	For Beckman Rotor	For Sorvall Rotors
7/16x1-1/4" (11x32mm)	5061	7061	1.4	0.8	4226	55	TLS55	RP55S
7/16x2-1/4" (11x57mm)	5062	7062	3.4	0.8	4226	60	SW60Ti	THT-660
1/2x1-7/8" (13x48mm)	5063	7063	3.5	1.4	4227	65	SW65Ti, SW55Ti SW50.1, SW50	AH-650
9/16x3-1/4" (14x84mm)	5064	7064	9.1	1.8	4228	41	SW41Ti	TH-641
9/16x3- 1/2" (14x90mm)	5065	7065	10.0	1.8	4228	40	SW40Ti	---
5/8x3-3/4" (16x96mm)	5066	7066	13.0	2.5	4229	28	SW28.Ti	AH-629/17 Surespin 630/17
1x3-1/4" (25x84mm)	5067	7067	28.1	7.5	4230	32 (2)(3)	SW 32, SW28 SW27	AH-629/36 Surespin630/36

(1) To determine r-max used in maximum g-force calculations, subtract the adapter thickness: 7/16" and 1/2" tubes, 3.8mm; 9/16", 5/8" and 1" tubes, 5.1mm.

(2) In rotors where the maximum rotor speed is less than 50 krpm, UltraCone adapters can be used at the maximum motor speed.

(3) Tube cap required for use in fixed-angle rotors.

Removal Tool

4209 Removal Tool

This tool conveniently removes the 7/16", 1/2", 9/16" and 5/8" UltraCone Adapters from all swinging bucket and fixes-angle rotors. Turning the knob expands the conical collet and grips the internal taper of the adapter.



Tube Cutter

4195 Tube Cutter

The conical tips of UltraCone tubes can be removed for retrieval of concentrated materials.

4116 Replacement Blade



Thick Wall Tubes

PA, PCB | ULTRA



Thick wall polyallomer and polycarbonate tubes are designed for use with no caps in fixed-angle and swinging bucket rotors. These tubes can be reused and can be sterilized by autoclaving at 121°C, ethylene oxide gas or cold methods. Cold sterilization is recommended for polycarbonate tubes because the tube life may be reduced by autoclaving. Alcohol should not be used with polycarbonate. These tubes can be run when partially filled but should be at least half-full. Thick wall polyallomer tubes are translucent and polycarbonate transparent; both are non-wettable. When used in fixed-angle rotors, the maximum fill level is a function of the rotor angle, and the maximum allowable speed will depend on the rotor type and temperature of run. In the chart below, the maximum speed and maximum fill level is given for use with no caps. The tube nominal volume corresponds to the meniscus 3 mm below the top of the tube when held in the vertical position. See attachment I for chemical resistance.

Tube Size	PN (1)	Tube Material	Tube Volume ml	Capless Max. Speed krpm (2)	Capless Max. Fill Vol. ml	Equival. Tubes Beckman	Equival. Tubes Sorvall	For Beckman Rotor	Sorvall Rotor
7/16x1-3/8" (11x34mm)	5007	PA	1,0	150	1,0	347287	---	TLS55	RP55-S
	2007	PCB				343778	45237		
7/16x2-3/8" (11x60mm)	5008	PA	3,0	60(3)	3,0	355636	---	SW56Ti SW60Ti	TH-660 TFT-80.4
	2008	PCB				355635			
1/2x2" (13x51mm)	5024	PA	3,5	65(3)	2,7 (4)	349623	---	SW65Ti, SW55Ti SW50.1, SW50 MLS-50	AH-650, RP80AT, S100-AT4, RP100-AT4
	2001	PCB				349622	45238		
1/2x2-1/4" (13x56mm)	5026	PA	3,2	50	3,2	362333	45598	TLA100.4	S100-AT5 S100-AT6
	2010	PCB		90		362305	45239		
1/2x2-1/2" (13x64mm)	5025	PA	4,4	24	2,8	355644	---	50.4Ti 50.3Ti 40.3, 40.2	TFT-45.6 T-8100
	2002	PCB		40		355645			
9/16x3-1/2" (14x89mm)	5032	PA	9,2	41(3)	9,2	---	---	SW41Ti	TH-641
	2013	PCB							
9/16x3-3/4" (14x95mm)	5033	PA	9,8	40(3)	9,8	---	---	SW40Ti	---
	2014	PCB							
5/8x2-5/16" (16x59mm)	5047	PA	5,3	60	5,3	---	45596	---	S80-AT3
	2018	PCB		80		45595			
5/8x2-1/2" (16x64mm)	5044	PA	7,7	30	6,5	355646	---	Ty50	---
	2003	PCB		40		355647			
5/8x3" (16x76mm)	5045	PA	9,5	30	7,0	355640	03238	90Ti, 80Ti, 75Ti 70.1Ti, 65 50Ti, 50 & 40	T-1270, A-1256 T-865.1, T-875 T-880, T-890
	2004	PCB		40		355630	03237		
5/8x4" (16x102mm)	5046	PA	13,2	28(3)	13,2	---	---	SW28.1 SW27.1, SW32.1	AH-629/17 Surespin 630/17
	2005	PCB							
1x2" (25x51mm)	2012	PCB	14,0	29	14,0	355659	---	SW30	AH-629/20
	5056	PA				355658			
1x3" (25x76mm)	5054	PA	26,7	25(3)	26,7	355638	---	SW25.1	---
	2006	PCB				355637			
1x3-1/2" (25x89mm)	5055	PA	32,5	20	20,0	355642	---	SW27, SW28, SW32, 70Ti, 60Ti, 55.2Ti, 50.2T 42.1, 30	AH-629/36 T-1250 Surespin 630/36
	2009	PCB		45		355631			
1-1/2x4" (38x102mm)	5057(6)	PA	78	15	47,0	355643	---	45Ti, 35	---
	5058(6) (5)	PA	81	15		---			
	2011	PCB	78	30		355628			

- (1) PN for PA is a box of 50 tubes, PN for PCB is a single tube.
- (2) Tubes tested at 20 deg. C for 16 hours.
- (3) When used in a swinging bucket rotor.
- (4) Maximum volume in fixed-angle rotor.
- (5) Use without a cap because the tube wall is thicker than 5057.
- (6) Box of 25 tubes.

Micro-Ultracentrifuge Tubes

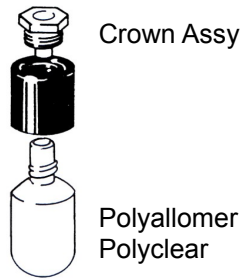
PA, PC, PCB I, ULTRA

Several types of tubes are used in micro ultracentrifuge fixed-angle and swinging bucket rotors.

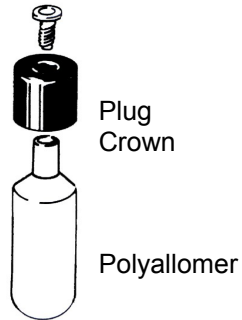
Tube Size	PN Box of 50	Type	Vol. ml (2)	For Rotor				Replaces			Crown		
				Beckman	DuPont	Hitachi	Sorvall	Beckman	DuPont	Hitachi	Beckman	DuPont	Hitachi
7/16x1" (11x25mm)	9011	CT PA	1.5/1.5	TLS55 TLA120.2 MLA-130	RP55S, RP100AT RP120AT	RP55S, RP100AT RP120AT	S55-S, S150-AT S140-AT, S120-AT2	344624	---	S405346	4246 (344636)	---	4246
	9013 (3)	CT PA	1.5/1.5	---	RP100AT RP120AT	RP100AT RP120AT	S150-AT, S140-AT S120-AT2	---	45245	S405649	---	4255 (45306)	4255 (S405432)
7/16x1" (11x29mm)	6011	Easy-Seal PA	1.5/1.5	TLA120.2			RP100AT RP120AT	RP100AT RP120AT	S150-AT, S140-AT S120-AT2	---	06700	---	4264 (06781)
	8011	Easy-Seal PCB	1.5/1.5		---	06702				---	4264 (06781)	4264	
7/16x1-1/4" (11x32mm)	9012	CT PA	1.5/1.5	TLS55	---	RP100VT RP120VT	S55-S	344625	---	S405347	4246 (344674)	---	4246
	9014 (3)	CT PA	1.5/1.5	---	RP100AT RP120AT	RP100AT RP120AT	S150-AT, S140-AT S120-AT2	---	45246	S405650	---	4255 (45306)	4255 (S405432)
7/16x1-1/4" (11x32mm)	5061 (1)	UltraCone PA	1.5/1.5	TLS55	RP55S	RP55S	S55S	---	45313	---	4226 Adapter	4226 (545317)	4226 Adapter
	7061 (1)	UltraCone PC	1.5/1.5					---	45314	---	4226 Adapter	4226 (45317)	4226 Adapter
7/16x1-3/8" (11x34mm)	5011	Open-Top PA	---	TLS55	RP55S	RP55S	S55S	347357	45240	S300536A	---	---	---
	7011	Open-Top PC	---					347356	45315	S300538A	---	---	---
7/16x1-3/8" (11x34mm)	5007	Thick Wall PA	2.2/2.2	TLS55, TLA120.2 MLA-130	RP55S, RP100AT RP120AT	RP55S, RP100AT RP120AT	S55-S, S150-AT S140-AT, S120-AT	---	---	---	---	---	---
	2007	Thick Wall PCB	2.2/2.2	TLS55, TLA120.2 MLA-130	RP55S	RP55S		---	45316	---	---	---	---
	7070	UltraThin	2.2/2.2	TLS55	---	---		S55A	---	---	---	---	---
1/2x1" (13x25mm)	9024	CT PA	2.0/1.9	MLS-50 TLA-100.3	---	RP100AT4	S52-ST, S100-AT4	345829	---	---	4247 (355936)	---	4247
	9026 (3)	Re-Seal	2.0/1.9	---	RP100AT4	---	S100-AT4	---	45319	---	---	4256 (45318)	4256 (S405433)
1/2x1" (13x29mm)	6020	Easy-Seal PA	1.5/1.7	TLA100.3	RP100AT4 RP80AT	RP100AT4 RP80AT	S100-AT4 S100-AT6	---	06704	---	4267	4267 (06782)	4267
	8020	Easy-Seal PC	1.5/1.7	TLA100.3				---	06706	---	4267 (06782)	4267	
1/2x1-1/4" (13x32mm)	9025	CT PA	3.5/3.1	MLS-50	---	RP100AT4	S52-ST	349621	---	S405348	4247 355936	---	4247
	9027 (3)	CT PA	3.5/3.1	---	RP100AT4	---	S100-AT4	---	45247	S405651	---	4256 45318	4256 (S405433)
1/2x1-1/2" (13x44mm)	6021	Easy-Seal PA	3.5/3.4	TLA100.3	RP100AT4 RP80AT	RP100AT4 RP80AT	S100-AT4 S100-AT6	---	06740	---	4267	4267 (06782)	4267
	8021	Easy-Seal PC	3.5/3.4					---	06742	---	4267 (06782)	4267	
1/2x1-1/2" (13x45mm)	9021	Re-Seal PA	3.9	TLN100	---	---	---	358980	---	---	-342883	---	---
1/2x2" (13x51mm)	9028 (3)	Re-Seal PA	5.0/5.1	---	RP80AT	RP80AT	S100-AT6	---	45248	S405349	---	4257 (45321)	4257 (S405434)
1/2x2" (13x51mm)	9029	CT PA	5.0/5.1	TLA100.4	---	---	---	362248	---	---	4249 (362307)	---	---
1/2x2" (13x51mm)	5024	Thick Wall PA	3.0/3.5	TLA100.3 MLS-50	RP80AT	RP80AT	S100-AT\$ S52-ST	349623	---	---	---	---	---
	2001	Thick Wall PCB	3.0/3.5					349622	45238	S301599A	---	---	---
1/2x2" (13x51mm)	5022	Open-Top PA	5	MLS-50	---	---	S52-ST	326819	---	---	---	---	---
	7022	Open-Top PC	5					344057	---	---	---	---	
	7072	Ultra Thin	5,8					---	---	---	---	---	
1/2x2" (13x51mm)	6022	Easy-Seal PA	5.0/4.4	TLA100.4	RP80AT	RP80AT	S100-AT6	---	06744	---	4267	4267 (06782)	4267
	8022	Easy-Seal Polyclear	5.0/4.4					---	6746	---	4267 (06782)	4267	
1/2x2-1/4" (13x56mm)	5026	Thick Wall PA	3.2/3.2	TLA100.4 TLA-110	---	---	---	362333	---	---	---	---	---
	2010	Thick Wall PCB	3.2/3.2					---	---	---	---	---	
5/8x2" (16x53mm)	9042	Re-Seal PA	8	---	---	---	S80-AT3	---	---	---	---	---	---
	5047	Thick Wall PA	8										
	2018	Thick Wall PCB	8										
5/8x2-1/2" (16x64mm)	9040	CT PA	6.3/6.8	MLA-80	---	---	---	345830	---	---	4248	---	---

- (1) Requires UltraCone adapter PN 4226. To determine rMAX used in k-factor calculations, subtract the adapter thickness, 3.88 mm.
- (2) Nominal and actual volume for tubes.
- (3) Tubes have a shorter stem.

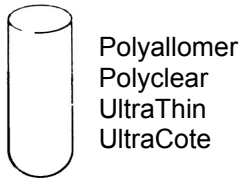
Easy-Seal



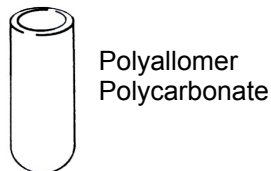
Cone-Top Re-Seal



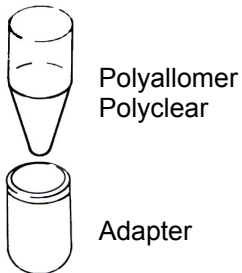
Thin Wall



Thick Wall



UltraCone



Beckman Micro-Ultra Rotors		
PN	Description	Replaces Beckman PN

TLS-55, 7/16" (11mm) Ø

5011	OpenTop PA	347357
5061	Ultra-Cone PA	---
7011	OpenTop PC	347356
7011W	Ultra-Cote	---
	wettable	
7061	Ultra-Cone PC	---
7070	Ultra-Thin PC	---
7070W	Ultra-Thin	---
	wettable	
9011	Cone-Top PA	344624
9012	Cone-Top PC	344625

TLA100.2 & TLA120.2, 7/16" (11mm) Ø

6011	Easy-Seal PA	---
8011	Easy-Seal PC	---
9011	Cone-Top PA	344624
9012	Cone-Top PC	344625

TLV-100, 7/16", (11mm) Ø

9012	Cone-Top PA	344625
------	-------------	--------

TLN-100, 1/2", (13mm) Ø

9021	Cone-Top PA	3558980
------	-------------	---------

TLA-100.3, 1/2", (13mm) Ø

5024	THK PA	349623
6020	Easy-Seal PA	---
6021	Easy-Seal PA	---
8020	Easy-Seal PC	---
8021	Easy-Seal PC	---
9024	Cone-Top PA	345829
9025	Cone-Top PA	349621

TLA-100.4, 1/2", (13mm) Ø

5026	THK PA	362333
6020	Easy-Seal PA	---
6021	Easy-Seal PA	---

Easy-Seal Tubes and Crowns

PA, PC | ULTRA

- No Heating or Crimping
- Resealable
- Volumes from 1.5 to 82 ml
- Large Stem for Access
- Save Time



The Easy-Seal* Tube System was developed to combine the advantages of various ultracentrifuge containers. Easy-Seal tubes can be used in Beckman and selected Sorvall and Kontron rotors at the maximum speed with choice of the appropriate crown assembly. Easy-Seal tubes are essentially thin wall, flexible bottles sealed with simple band tools. The tube stem is compressed between a plug and crown. A large diameter stem allows access to tube contents. Polyclear and autoclavable polyallomer tubes provide choices in chemical properties and clarity and can be punctured and sliced. Easy-Seal tubes can be resealed and reused which is particularly useful for consecutive centrifugations of single samples such as flotation of buoyant molecules or washing of pellets.

Find your rotor in the chart below, make your choice of tube material and review the choices of crown on page 19 where the maximum speed of each assembly is listed. You will need one crown assembly and one tube for each hole you intend to use in your rotor. Tools for holding and tightening the plugs are shown on page 19.

Tube Size	PN Box of 50	Tube Capacity ml	Material	Crown Assembly	For Rotor		
					Beckman	Sorvall	Kontron
7/16x1" (11x29mm)	6011	1.5	Polyallomer	4264	TLA120.2	S150-AT S140-AT S120-AT2	---
	8011		Polyclear				
1/2x1" (13x29mm)	6020	1.5	Polyallomer	4267	TLA100.3	S100-AT4 S100-AT6	---
	8020		Polyclear				
1/2x1-1/2" (13x44mm)	6021	3.5	Polyallomer	4267	TLA100.3	S100-AT4 S100-AT6	---
	8021		Polyclear				
1/2x2" (13x51mm)	6022	4.4	Polyallomer	4267	TLA100.4	S100-AT6	---
	8022		Polyclear				
1x2-1/2" (13x64mm)	6023	5.6	Polyallomer	4171	50.4Ti, 50.3Ti 40.2, 40.3	TFT45.6	TFT45.6
	8023		Polyclear				
5/8x2-7/8" (16x73mm)	6041	10	Polyallomer	4017, 4018, 4019, 4020, 4063, 4064	90Ti, 80Ti, 75Ti, 70.1Ti, 65, 50Ti, Ty50, Ty40	T1270, A1256, TT-865 TFT80.13	TFT80.13, 75.13, 65.13, 60.13, 50.13, 32.13
	8041		Polyclear				
1x3-1/8" (25x79mm)	6051	28.5	Polyallomer Polyclear	4111	SW28 SW32	AH-629/36 Surespin 630/36	TST28.38
	6052		Polyallomer				
1x3-1/2" (25x89mm)	8052	33	Polyclear	4015,4014	70Ti, 60Ti, 55.2Ti, 50.2Ti 42.1,	---	TFT70.38 TFT65.38 TFT55.38 TFT50.38
	6060 (1) 8060 (1)		Polyallomer Polyclear				
1-1/2x4" (38x102mm)	6060 (1) 8060 (1)	82	Polyallomer Polyclear	4202	45Ti	---	TFT45.94

(1) PN 6060 and 8060 are boxes of 25 tubes.

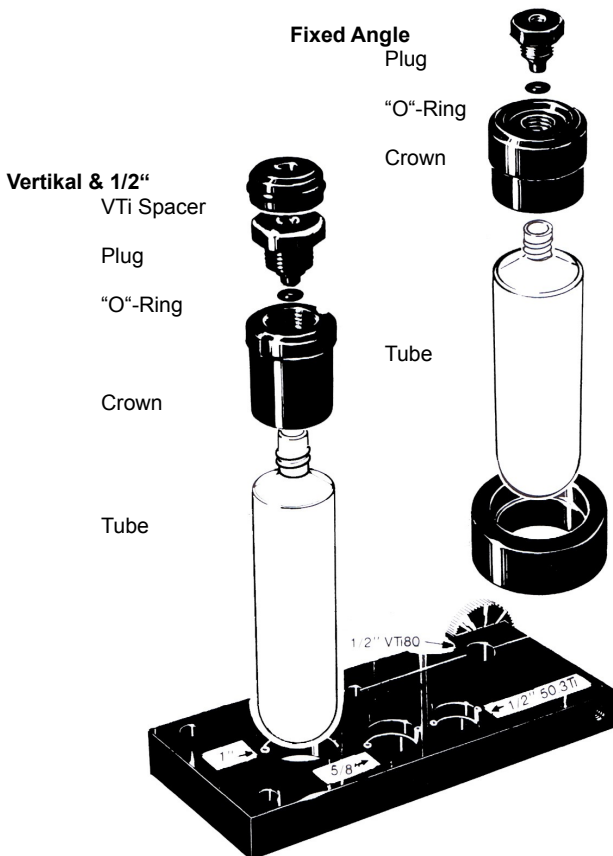
*US-Patent 4,537,320 and UK-Patent GB 2149325.

How To Use

After the Easy-Seal tube is filled, a crown is screwed onto the stem. A plug is screwed into the crown with a hex driver or torque wrench, flaring the stem and making a reliable compression seal. 5/8 and 1" crowns used in fixed-angle rotors can be hand-held when tightened; 7/16 and 1/2" crowns are best held in a vise but are torqued with a hex driver. Crowns and tubes used in vertical rotors may require a torque wrench and are held in a vise. After centrifugation the plug is unscrewed. A fraction recovery device can be screwed directly into the crown using the existing flared seal.

Noryl and aluminum crowns and polyallomer tubes can be sterilized by autoclaving or ethylene oxide gas as an assembly or separated before reuse. Delrin crowns and Polyclear tubes may be sterilized with ethylene oxide gas or by cold methods (3).

All Easy-Seal crowns and tubes are compatible with cesium chloride gradients.



(1) Noryl is a registered trademark of General Electric Co.

(2) Delrin is a registered trademark of E.I. DuPont de Nemours & Co.

(3) Aqueous solutions of 70% ethanol, 70% isopropanol or 10% hydrogen peroxide.

How to Order

Complete systems for Beckman vertical and micro-ultra rotors are available. See page 22. For fixed-angle rotor systems specify the tubes, tools and number of crown assemblies. Examples are:

60Ti fixed angle Rotor

Qty	PN	Item
1	6052	1x3-1/2"ESPA
8	4015	Crown Assy
1	4013	Hex Driver
1	4014	Removal Tool

optional:

1	4023	Fraction Assy
---	------	---------------

TL100.3 Micro-Ultra

Qty	PN	Item
1	6020	1/2x1" ESPA
6	4267	Crown Assy
1	4189	Hex Driver
1	4014	Removal Tool
1	4172	Vise
1	4269	Gripper Tool

Noryl (1) crown assemblies may be used with most acids and bases and gradient forming materials within the limits of the centrifuge tube material. Noryl should not be used with solvents or oils such as mineral or paraffin oil overlays. Noryl can be sterilized by autoclaving, ethylene oxide gas or cold soaking methods (3).

Delrin (2) crown assemblies may be used with most solvents and gradient forming materials within the limits of the centrifuge material. Use with acids and bases is not recommended. Use Delrin with mineral or paraffin overlays or whenever the chemical effects of an organic compound on Noryl is suspected. Delrin can be sterilized with ethylene oxide gas or by cold soaking methods (3).

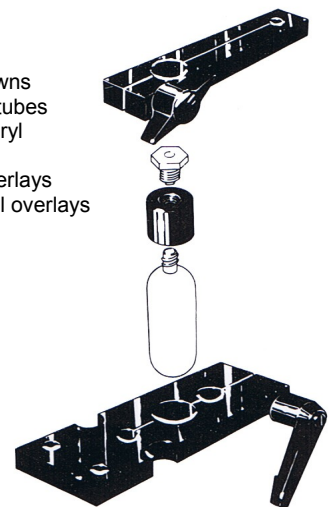
Replacement Parts

Individual replacement parts are available for all assemblies. Contact Customer Service for PN and prices.

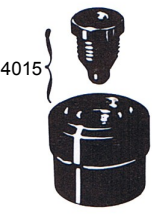


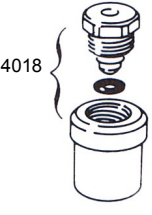
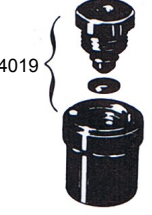
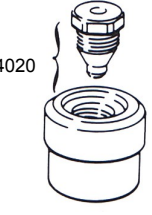
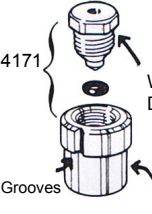
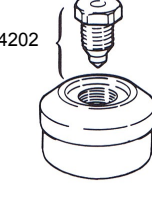
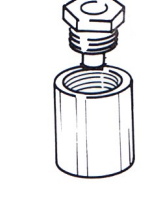

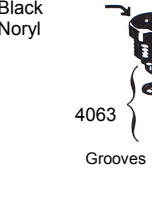
CAUTION

- Do not autoclave Delrin crowns
- Do not autoclave Polyclear tubes
- Do not use solvents with Noryl crowns or Polyclear tubes
- Use Delrin crowns for oil overlays
- Use polyallomer tubes for oil overlays

Micro Ultra



Easy-Seal Crown-Assemblies

 <p>4015</p>	<p>4015 + Black Noryl + 60 KRPM Max + Use Tubes 6052, 8052 + for Rotors 70Ti, 60Ti, 55.2Ti 50.2Ti, 42.1 + Hex Driver 4013</p>	 <p>4016</p>	<p>4016 + White Delrin + 60 KRPM Max + Use Tubes 6052, 8052 + for Rotors 70Ti, 60Ti, 55.2Ti 50.2Ti, 42.1 + Hex Driver 4013</p>	 <p>4017</p>	<p>4017 + Black Noryl + 65 KRPM Max + Use Tubes 6041, 8041 + for Rotors 90Ti, 80Ti, 75Ti 70.1Ti + Hex Driver 4013</p>
 <p>4018</p>	<p>4018 + White Delrin + 65 KRPM Max + Use Tubes 6041, 8041 + for Rotors 90Ti, 80Ti, 75Ti 70.1Ti + Hex Driver 4013</p>	 <p>4019</p>	<p>4019 + Black Noryl + 65 KRPM Max + Use Tubes 6041, 8041 + for Rotors 65.50Ti, 40 + Hex Driver 4013</p>	 <p>4020</p>	<p>4020 + White Delrin + 65 KRPM Max + Use Tubes 6041, 8041 + for Rotors 65.50Ti, 40 + Hex Driver 4013</p>
 <p>4171</p> <p>White Delrin</p> <p>Grooves</p>	<p>4171 + 50 KRPM Max + Use Tubes 6023, 8023 + for Rotors 50.4Ti, 50.3Ti 40.2, 40.3 TFT-45.6 + Hex Driver. 4189</p>	 <p>4202</p>	<p>4202 + White Delrin + 45 KRPM Max + Use Tubes 6060, 8060 + for Rotors 45Ti, Ty35 + Hex Driver. 4013</p>	 <p>4264</p>	<p>4264 + 80 KRPM Max + Use Tubes 6011, 8011 + for Rotors TLA120.2, S150-AT S140-AT, S120-AT2 + Hex Driver. 4189 + Vise 4172</p>
 <p>4267</p>	<p>4267 + 80 KRPM Max + Use Tubes 6011, 8011 + for Rotors TLA100.3, 100.4 S100-AT6, S100-AT4 + Hex Driver. 4189, + Vise 4172</p>	 <p>Black Noryl</p> <p>White Delrin</p> <p>4063</p> <p>4064</p> <p>Grooves</p> <p>clear anodized Aluminium</p>	<p>4063 & 4064 + 80 KRPM Max + Use Tubes 6041, 8041 + for Rotors 90Ti, 80Ti, 75Ti 70.1 Ti + Hex Driver. 4013 + Vise 4184 (1)</p>		

(1) Also can use Beckman vise PN 305075 Easy-Seal Tools

Tools

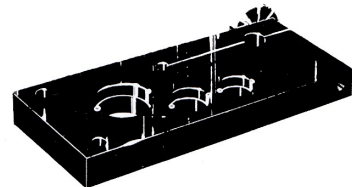
4013 Hex Driver
1/2" for 5/8", 1" and
1-1/2" Crowns
4189 Hex Driver
3/8" for 50.3Ti,
TLA 100.3 Rotors



4014 Removal Tool
Tube assemblies can be
pulled from your rotor after
this tool is threaded into the
top of the Easy-Seal plug

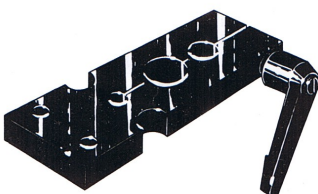


4183 Vise
for 1/2, 5/8, and 1" crowns

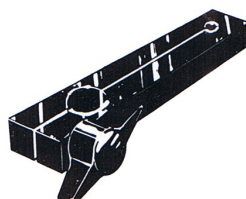


Tools for Micro-Ultra

4172 Vise
for 7/16" and 1/2" crowns



4269 Gripper Tool
for 7/16" and 1/2" crowns



Funnel

4126 Funnel
The funnel fits the top of 5/8", 1" and
1-1/2" Easy-Seal Tubes.



PA, PC | ULTRA

Re-Seal Tubes and Crowns

- Fits Popular Fixed-Angle and Vertical Rotors
- Simple to Seal with Plug and Hex Key
- Resealable
- Thin Wall Polyclear and Polyallomer Tubes
- Puncturable and Sliceable
- Fraction Recovery Attachments
- Volumes from 5 to 33 ml

The Re-Seal tube system was developed and patented to provide a reusable mechanical seal for the popular Quick-Seal tube configuration. Note that unused Quick-Seal tubes from Beckman may be employed as reusable tubes in the Re-Seal system. Re-Seal tubes with crown assemblies can be used in a variety of Beckman vertical and fixed-angle rotors. With the Re-Seal system the use of heat and expensive heat sealing stations is eliminated-the seal is made with a simple hex key wrench. Re-Seal Polyclear and autoclavable polyallomer tubes provide choices in chemical properties and clarity and can be punctured and sliced.

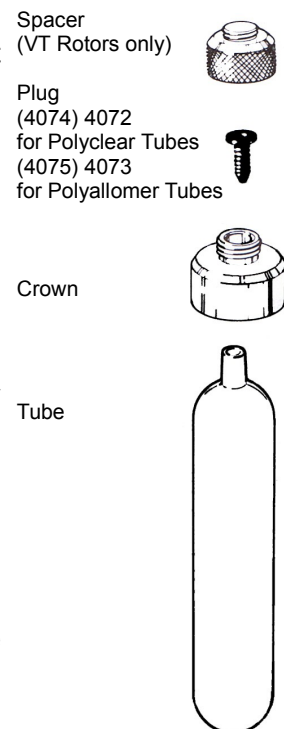
How to Order:

Find your rotor in the chart. You will need one crown assembly and one plug for each hole you intend to use in your rotor. The wrench (PN 4088) for tightening the plug is shown on page 9.

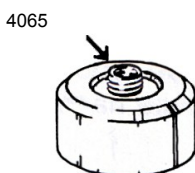
How to Use:

After the Re-Seal tube is filled a crown is placed on the stem of the tube, a plug is screwed into the stem and hand-tightened with the wrench. As the tube and crown are hand-held, no vise is required. As the plug is screwed in, it forms a thread in the stem of the tube providing a reliable compression seal. After centrifugation, the plug is unscrewed. A fraction recovery device can be screwed directly onto the crown and small bore tubing extended through the stem of the tube.

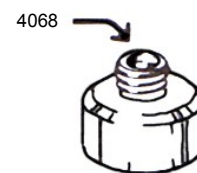
Aluminum crowns, stainless steel plugs and polyallomer tubes can be autoclaved. Polyclear and polyallomer tubes and all crown components can be sterilized with ethylene oxide gas or aqueous of 70% ethanol, 70% isopropanol or 10% hydrogen peroxide.



4065
 + Aluminum
 +60 krpm max.
 + Use Tubes
 9053
 + For Rotors
 70Ti, 60Ti, 55.2Ti
 50.2Ti



4068
 + Aluminum
 + 75 krpm max.
 + for Tubes
 9041R
 + For Rotors
 90Ti, 80Ti, 75Ti
 70.1Ti



Polyallomer and Polyclear Re-Seal Tubes

Tube Size	PN Box of 50	Volume (ml)	Material	Max Speed krpm	Crown PN Seton (Beckman)	Equivalent Beckman	For Rotor			Sorvall Tube PN	Sorvall Crown PN
							Beckman	Sorvall Kontron	Thermo Rotor		
1/2x1-1/2" (13x45mm)	9021 (2)	3,9	PA	100	(342883)	358980	TLN100	---	---	---	---
1/2x2" (13x51mm)	9022(2)	5,1	PA	---	(342883)	342412	NVT100 NVT90 VTi90 VTi65.2	---	70V6	---	79291
	9028(1)		PC	100	4257(3)	---	---		S100-AT6	45248	45321
	3022(2)			---	(342883)	344075	NVT100 NVT90 VTi90 VTi65.2		70V6	---	79291
5/8x2" (16x53mm)	9042	8,3	PA	80	4491(3)	---	---	S80AT3	S80-AT3	45597	45599
5/8x3" (16x76mm)	9041(2)	10	PA	---	(342695) (349289)	342413	90Ti, 70.1Ti NVT65 VTi65.1	TFT65.1 3 TFT50.1 3	---	---	---
	9041R (1)	13,5		75 65	4068(6) 4069(3)	---	90Ti, 80Ti 75Ti, 70.1Ti Ty65		---	---	---
	3041(2)		PC	65	4068(3) 4069(3)	344322	90Ti, 70.1Ti NVT65 VTi65.1		---	---	---
5/8x3" (16x78mm)	9043	13,5	---	58	4491(3)	---	---		S58-A	45809	45599
1x3-3/4" (25x96mm)	9054	30	---	55	4146(3)	---	---		S55-A	7500051 4	7500052 1
1x3-1/2" (25x89mm)	9052(2)	39	PA	70	(342699) (342417)	342414	70Ti, 60Ti 55.2Ti, 50.2Ti VTi50	TFT70.3 8 TFT65.3 8 TFT50.3 8	---	---	---
	9053(1)			60	4065(3)	---	70Ti, 60Ti 55.2Ti, 50.2Ti		---	---	---
	3052(2)		PC	70	(342699) (342417)	344326	70Ti, VTi50		---	---	---
1-1/2x4" (38x102mm)	9060(5)	94	PA	45	4492	345776	45Ti	---	---	---	---

(1) Stem is 260° long for use with Re-Seal plugs.

(2) Stem is 310° long for use with Beckman heat sealer.

(3) Use Seton Re-Seal Plug PN 4075

(4) Tube is Sorvall hole size which is slightly smaller than the Beckman standard.

(5) Box of 25 tubes.

(6) The difference between 4068 and 4069 corresponds to the difference in the rotor counterbore diameters.

Plugs

Single Plug PN	Material	Use with Tube	PN Box of 10
4072	SS	PC	4074
4073	SS	PA	4075

How to Order:

Find your rotor in the chart at the top of the page. Note the corresponding crown PN and order one crown for each rotor hole you intend to use. Select the tube material and then choose assembly. For convenience, plugs are supplied individually or in packages of ten. The plug threads are different for use with polyallomer and polyclear because the two materials require different screw holding forces. Specify the wrench and removal tool. Examples are:

VTi 50

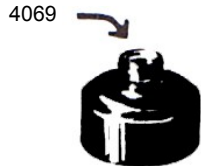
Qty	PN	Item
1	9052	1x3½" RS PA
8	4067	Crown Assy
1	4075	Plugs (Pkg 10)
1	4088	Wrench
1	4077	Removal Tool
optional:		
1	4078	Fraction Assy

50Ti

Qty	PN	Item
1	3041	5/8x3" RS PC
12	4069	Crown Assy
1	4075	Plugs (Pkg 10)
2	4072	Plug
1	4088	Wrench
1	4077	Removal Tool
optional:		
1	4079	Fraction Plug Assy

4069

+ Aluminum, black anodized
+ 65 krpm max.
+ For Tube 9041R
+ For Rotors Ty65, 50Ti



4491

+ Aluminum, black anodized
+ 80 krpm max.
+ For Tubes: 9042, 9043
+ For Rotors: S-80-AT3, S58-A



4257

+ Aluminum, black anodized
+ 100 krpm max.
+ For Tube 9028
+ For Rotors S100-AT6



4146

+ Aluminum, clear anodized
+ 60 krpm max.
+ For Tubes: 9054
+ For Rotors: S55-A



4492

+ Aluminum, black anodized
+ 45 krpm max.
+ For Tube: 9060
+ For Rotor: 45Ti



Tools

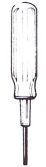
4077 Removal Tool

This tool is used to insert and remove sealed tube assemblies from rotor holes. The threaded socket fits the top of Re-Seal crowns.



4088 Wrench

This hex key with molded plastic handle is used to tighten the 4073/4075 plugs.



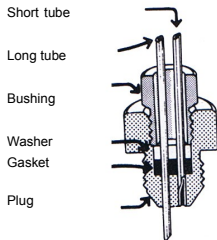
CAUTION

- Do not autoclave Polyclear tubes
- Do not use Polyclear tubes with oil overlays or solvents
- Use the correct plug with your tube material

Fraction Recovery

These fraction recovery accessories replace the seal plug in either the Easy-Seal or Re-Seal tubes after centrifugation. The seal established for centrifugation is re-established for sample recovery. Since the recovery assemblies fasten directly to the tube and crown, deformation of the tube dome as a result of centrifugation does not make attachment of the device difficult as with other systems with clamp the tube from top and bottom and depend on contact with a rubber gasket.

Easy-Seal



4023 Assy

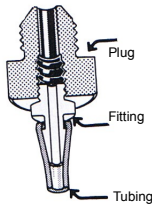
Noryl plug, long stainless steel tube, short stainless steel tube bushing, gasket
4030 and 4031 wrenches

4024 Assy

Delrin plug. Long stainless steel tube, short stainless steel tube bushing, seal
4030 and 4031 wrenches

Spares

4154 Pkg with 6 long stainless steel tubing
4155 Pkg with 6 long stainless steel tubing



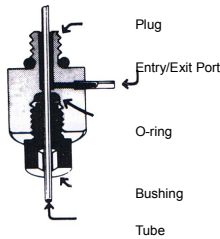
4021 Assy

Noryl plug PP fitting
91cm polyurethane tubing
order 4030 wrench separately

4022 Assy

Delrin plug, PP fitting
91cm polyurethane tubing
order 4030 wrench separately

Re-Seal



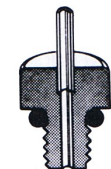
4078 Assy

Anodized aluminum plug,
SS tubes, ss bushing
2 p-rings, order 4030 wrench
separately

4079 Assy

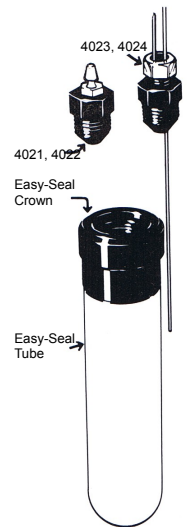
Anodized aluminum plug,
SS tubes, SS bushing
2 o-rings, order 4031 wrench separately
* U.S. Patent 4,537,320 and UK Patent
GB 2149325 are adaptive.
*U.S. Patent 4,690,470 and UK Patent
GB 2185245 are

plug



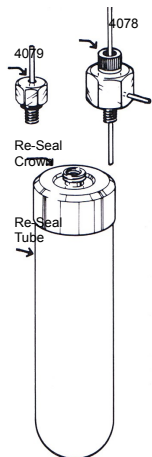
Easy-Out 4023 and 4024 assemblies are recommended for convenient sample recovery from Easy-Seal tubes. After centrifugation the seal plug is removed from the crown and replaced with the Easy-Out assembly. A two port entry allows a neutral fluid to be pumped into one tube and sample collected from the other. The long stainless steel tube can be inserted into the tube in a desired level and locked in place by tightening the bushing. With integral entry and exit ports, the tube need not be punctured and can be resealed. Noryl or Delrin plugs offer a choice of chemical resistance.

Fraction Plug assemblies 4021 and 4022 replace the Easy-Seal plug after centrifugation. A puncturing device can be used for the second entry or exit into the tube.



Fraction Recovery assembly 4078 is recommended for convenient sample recovery from Re-Seal tubes. After centrifugation the plug is removed from the crown and replaced with the 4078 assembly. A two port entry allows a neutral fluid to be pumped into one tube and sample collected from the other. The 18 gage stainless steel tube can be inserted into the tube to a desired level and locked in place by tightening of the bushing. With entry and exit ports, the tube need not be punctured and can be resealed. Use the 4030 wrench to tighten the 4078 assembly.

Fraction Recovery plug 4079 features a single entry or exit port and also replaces the Re-Seal plug after centrifugation. A puncturing device can be used for the second entry or exit into the tube. The plug is made of 18 gage stainless steel tubing and anodized aluminum. Use the 4031 wrench to tighten the 4079 plug.



Tools

4030 Wrench

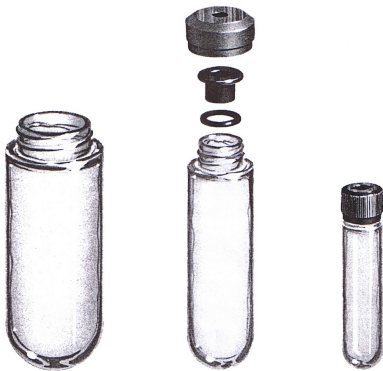
This 1/2" wrench tightens the 4021-4024 fraction assemblies into the Easy-Seal crowns.



4031 Wrench

The 5/16" end of this wrench fits the bushing of the 4023 and 4024 assemblies. The 1/4" end fits the PP fitting of the 4021 and 4022 assemblies.



Polycarbonate Bottles**PCB | ULTRA**

- Transparent
- Thick Wall
- Autoclavable
- Fits Popular Fixed-Angle Rotors
- Volumes from 10 to 70 ml

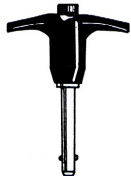
Polycarbonate bottle assemblies are provided in common sizes for use in many fixed-angle rotors. The three-piece cap assembly assures a liquid-tight seal during centrifugation. To cap the bottles, place the o-ring on the underside of the plug flange and insert the plug into the neck of the bottle. The o-ring is compressed and the seal made when the aluminum cap is hand-tightened onto the neck of the bottle.

Polycarbonate is transparent and autoclavable at 121°C. Because autoclaving significantly reduces the cycle life of the bottle, cold sterilization is recommended (1). When autoclaving, separate the cap assembly from the bottle. Because of the thick walls, the bottle cannot be sliced or punctured. Polycarbonate is resistant to neutral salts and dilute acid solutions but is not resistant to alkaline solutions. It is suggested to use the bottles at a pH below 8 to extend bottle life.

See attachment I for chemical resistance.

4408 Removal Tool

Bottle assemblies can be pulled from your rotor after this tool is locked into the top of the aluminum cap.



(1) Aqueous solutions, 70% ethanol, 70% isopropanol or 10% hydrogen peroxide.

SCIENCE SERVICES

Bottle Size	Material	Nom. Volume ml	Bottle Assy PN (2)	PN Bottle only	Cap Material	PN Plug (Noryl)	PN O-Ring	Maximum Speed krpm (3)	Equivalent to Beckman (Sorvall)	For Beckman Rotor	For Sorvall Rotor
5/8x3" (7a) (16x76mm)	PCB	10.4	4415	2015	4418 (Alum)	4409	4412	65 50(4)	355651 (03020, 03613)	90Ti, 80Ti 75Ti, 70.1Ti 65, 50Ti, 50, 40	T-1270 A-1256 T-865.1 T-875
5/8x3" (7a) (16x76mm)	PCB	10.4	4484	2015	4485 (Noryl)	4409	4412	60 50(5)	355651 (03020, 03613)	90Ti, 80Ti 75Ti, 70.1Ti 65, 50Ti, 50, 40	T-1270 A-1256 T-865.1 T-875
5/8x3" (7a) (16x76mm)	PP	10.4	5071	5072	4418 (Alum)	4409	4412	50 21(4)	--- (03929, 03613)	90Ti, 80Ti 75Ti, 70.1Ti 65, 50Ti, 50, 40	T-1270 A-1256 T-865.1 T-875
5/8x3" (7a) (16x76mm)	PP	10,4	4481	5072	4485 (Noryl)	4409	4412	50 21(5)		90Ti, 80Ti 75Ti, 70.1Ti 65, 50Ti, 50, 40	T-1270 A-1256 T-865.1 T-875
5/8x3" (7b) (16x80mm)	PC	9,7	4427	4495 4494(1 5)	4423 (9)	---	4412	65 50(4)		---	T-1270 A-1256 T-865.1 T-875
5/8x3" (7b) (16x80mm)	PP	9,1	4428	4426 4425(1 5)	4423 (9)	---	4412	50 21 (5)		---	T-1270 A-1256 T-865.1 T-875
1x3-1/2" (7a) (25x89mm)	PC	25	4416	2016	4419 (Alum)	4410	4413	60 (4)	355654 (---)	70Ti, 60Ti 55.2Ti, 50.2Ti 42.1, 45Ti	---
1x3-1/2" (7a) (25x89mm)	PP	25	5073	5074	4419 (Alum)	4410	4413	45 (6)	--- (---)	70Ti, 60Ti 55.2Ti, 50.2Ti 42.1, 45Ti	---
1x3-1/2" (7a) (25x89mm)	PC	25	4486	2016	4487 (Noryl)	4410	4413	30		70Ti, 60Ti 55.2Ti, 50.2Ti 42.1, 45Ti	---
1x3-1/2" (7b) (25x89mm)	PC	23	5085	5079 5082(8)	4501 5086(9) (Alum)	4497	4498	65(16)		---	T-865 T-1250
1x3-1/2" (7b) (25x89mm)	PP	23	5098	5075	4501 5086(9) (Alum)	4497	4498	45(17)		---	T-865 T-1250
1-1/2x4" (7a) (38x102mm)	PC	70	4417	2017	4420 (Alum)	4411	4414	45 (10)	355655	45Ti	---
1-1/2x4" (7b) (39x102mm)	PC	68	5097	5092 5087 (13)	4502 5089 (9)	5093	5094	45(14)		---	T-647.5
250ml Bottle (60x120mm)	PAO	200	4364	4383	4384(12)	---	4367	21(11)		---	A-621

(2) Assembly consists of one polycarbonate bottle, aluminum cap, plug and o-ring.

(3) Bottle must be filled to use at maximum speed.

(4) Bottle filled to one-half volume to be used at 50KRPM maximum.

(5) Bottle filled to one-half volume to be used in 21KRPM maximum.

(6) Bottle must be used at full volume only.

(7a) Beckman-type bottle. (7b) Sorvall-type bottle; bottle/cap threads are different, parts are not interchangeable.

(8) PN 5082 is for a box of 25 bottles.

(9) PN is an assembly of the aluminum cap, plug and o-ring.

(10) Bottle filled to one-half volume to be used at 35 KRPM maximum.

(11) Bottle to be run at full volume only, and the maximum fill volume is 200ml; more than 200ml and it will leak!

(12) PN4384 is an assembly of the Delrin cap, UHMWPE plug and EPDM o-ring.

(13) PN5087 is a package of 6 bottles.

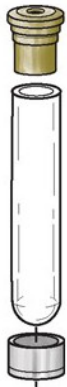
(14) Bottle must always be filled to 80% of full volume; 41 KRPM maximum speed when used at less than full volume

(15) PN4494 is a box of 25 of 4495; PN4425 is a box of 25 of 4426

(16) Bottle must always be filled to 80% of full volume; 45krpm max. speed when used at less than full volume. Max. speed in T-1250 is 50krpm.

(17) Bottle must always be filled to 80% of full volume; 21krpm max. speed when used at less than full volume. Max. speed in T-1250 is 37krpm.

Self-Seal Caps and Tubes



- **No Torquing Tools**
- **Use standard Thin Wall PA Tubes**
- **Use in Fixed-Angle Rotors**

Self-Seal caps seal standard open-top thin wall polyallomer tubes by centrifugal forces. No torque wrench is required to tighten the cap as the two- pieces assembly causes a seal when the gold anodized aluminum body down against the titanium seal ring during centrifugation.

Typically, the bulk fluid contents are first added to the tube and the aluminum body is pushed into the top of tube. The titanium ring is slipped over the bottom of the tube and then upward until it contacts the body at the top.

Additional gradient and sample is then added through a fill hole in the cap body to completely fill the tube. A setscrew is turned into the top of the fill hole and sealed against a nylon bushing at the bottom of the fill hole. The assembly is placed into the fixed-angle rotor hole.

Tube-Size	Seton PN Box of 50	Tube Capacity ml	Cap Assy PN Seton (Thermo Sorvall)	Rotor Thermo-Sorvall Kontron	Like Sorvall Tube PN	Max. Speed krpm
5/16x2" (8x51mm)	5009	1,5	4510 (54459)	TFT80.2	54460	80
7/16x2-3/8" (11x60mm)	5012	4,4	4447 (54366)	TFT80.4	3955	

Tools

4088 Wrench

-The hex key with molded plastic handle is used to tighten and remove the setscrew.



4270 Removal Tool

- Tube assemblies can be pulled from your rotor after this tool is threaded into the top of the aluminum cap.



See attachment I for chemical resistance.

Organic Solvent Resistant (OSR) Bottles and Tubes

These products are to be used with organic solvents in the centrifuge at your own risk.

OSR Threaded Tubes

- Solvent Resistant
- Sealable with Cap
- Easy Access to Contents
- Use in Fixed Angle Rotors
- Reusable

OSR Tubes

- Solvent Resistant
- No Caps
- Use in SW Rotors
- Reusable

Bottles

- Oakridge Type Bottle
- Solvent Resistant
- Reusable



OSR Treated Tubes

These tubes are thick walled Delrin(1) tubes available in several sizes for use in a range of fixed angle-rotors. These tubes are resistant to many organic solvents at ultracentrifugation conditions and have found to be useful in nano particle research applications.

Precision screwthreads have been formed on the outside surface of the tube wall and do not interfere with sample loading or retrieval. A one-piece anodized aluminum cap is screwed onto the tube and a Viton (2).

O-ring is encapsulated in a cap recess to provide a reliable seal. The caps have no fill hole and setscrew; the tubes are opaque and cannot be punctured or sliced. These tubes must always be used with a cap and must be full. They should not be autoclaved but can be sterilized by treatment with ethylene oxide gas or by cold methods (3).

Tool

Gripping tool PN4293 - for unscrewing the caps after ultracentrifugation

Removal tool PN4270 - for extracting the sealed tube assembly from the rotor

OSR Tubes

These tubes are thick walled Delrin and Kynar (4) (PVDF) tubes available in several sizes for use in several swinging Bucket (SW) rotors. They are resistant to many organic solvents at ultracentrifugation conditions and have found to be useful in nano particle research applications. These tubes are used with caps but must be used full, i.e., the meniscus 2-3mm from the top of the tube.

These tubes should not be autoclaved but can be sterilized by treatment with ethylene oxide gas or by cold methods(1).

Bottles

These bottles are similar to the Polycarbonate- Bottles but all of the components are made from chemical resistant materials. The bottles are polypropylene and the caps are either aluminum or Delrin. The cap plugs are made of Delrin and the o-rings of Viton.

Delrin should not be autoclaved but can be sterilized by treatment with ethylene oxide gas or by cold methods(1).

Tool

Removal tool PN4408 - used to pull the bottle assembly from the rotor

(1) Delrin is a registered trademark of E.I. DuPont de Nemours & Co.

(2) Viton is a registered trademark of DuPont Performance Elastomers LLC.

(3) Aqueous solutions of 70% ethanol, 70% isopropanol or 10% hydrogen peroxide.

(4) Kynar is a registered trademark of Elf Atochem North America, Inc.

OSR Threaded Delrin Tubes

Tubes Size	Vol. ml Nom/Fill I	Assembly PN (1)	PN Tube(4)	PN Cap Assy(2)	PN o-ring (Viton)	Max Speed krpm Fill/Part Fill(3)		Rotors	
						4 C°	25 C°	Beckman	Sorvall Kontron
7/16x2-3/8" (11x60mm)	4.4/2.1	4522	4532	4389	4390	55/50	50/45	---	TFT80.4
1/2x2-1/2" (13x64mm)	6.5/3	4523	4533	4279	4280	45/45	45/40	50.4Ti, 50.3Ti 40.3, 40.2	TFT45.6
5/8x3" (16x76mm)	13.5/9	4524	4534	4283	4284	50/40	40/40	90Ti, 80Ti, 75Ti, 70.1Ti, 65, 50Ti, 50, 40	T-1270, T-865 A-1256 TFT80.13
1x3-1/2" (25x89mm)	38.5/25	4525	4535	4287	4288	50/35	50/35	90Ti, 80Ti 75Ti, 70.1Ti 65, 50Ti, 50, 40	TFT: 70.38 65.38, 55.38 50.38
1-1/2x4" (38x102mm)	94/50	4516	4517	4291	4292	40/35	40/35	45Ti, 35	TFT45.94

(1) Assembly consists of one Delrin tube, aluminum cap and Viton O-ring

(2) Assembly consists of one aluminum cap and Viton o-ring.

(3) Tubes must be centrifuged with caps and tubes must be full to use at any speed.

(4) Delrin must not be autoclaved

OSR Tubes for use in SW Rotors

Tube Size	Vol. ml Nom/Fill	PN Tube	Material	Max Speed krpm (1) 4 C°	Rotor	
					Beckman	Sorvall Kontron
7/16x2-3/8" (11x60mm)	4.4/2.1	4519	Delrin (2)	45	SW60Ti	TH-660
		4528	Kynar (3)			
1/2x2" (13x51mm)	6.5/2.4	4520	Delrin (2)	45	SW55Ti	AH-650
		4529	Kynar (3)			
9/16x3-1/2" (14x89mm)	12/8.3	4518	Delrin (2)	30	SW41Ti	TH-641
		4530	Kynar (3)			
9/16x3-3/4" (14x95mm)	12/8.3	4536	Delrin (2)	30	SW40Ti	---
		4537	Kynar (3)			
1x3-1/2" (25x89mm)	38.5/25	4521	Delrin (2)	23	SW28 SW32	AH629/36 Surespin630/ 36
		4531	Kynar (3)			

(1) Tubes must only be used filled to within 2-3mm of top and used at 4 C°

(2) Delrin is a registered trademark of E.I. DuPont de Nemours & Co.

(3) Viton is a registered trademark of DuPont Performance Elastomers LLC.

OSR Polypropylene bottles

Bottle Size(4)	Vol.	PN				O-ring only	Max Speed krpm (3)	Rotor	
		Bottle Assy (6)	Bottle only	Cap	Plug only			Beckman	Sorvall
5/8x3“(1a) (16x76mm)	10.4	4479 (Alum. cap)	5072	4418 (Alum.)	4500	4493	50	90Ti, 80Ti 75Ti, 70.1Ti 65, 50Ti 50, 40	T-1270 A-1256 T-865 T-875
5/8x3“(1a) (16x76mm)		4489 (Delrin cap)		4499 (Delrin)				90Ti, 80Ti 75Ti, 70.1Ti 65, 50Ti 50, 40	
5/8x3“(1b) (16x76mm)	9.1	5104 (Alum. cap)	4426 4425(5)	4424 (Alum.)	5081	5077	45	---	
5/8x3“(1b) (16x76mm)		5105 (Delrin cap)		5080 (Delrin)				---	
1x3-1/2(2a) (25x89mm)	25	5073 (Alum. cap)	5074	4419 (Alum.)	4500	5077	30	70Ti, 60Ti 55.2Ti 50.2Ti, 45Ti 42.1	---
1x3-1/2(2a) (25x89mm)		5102 (Delrin cap)		5103 (Delrin)				70Ti, 60Ti 55.2Ti 50.2Ti, 45Ti 42.1	
1x3-1/2(2b) (25x89mm)	23	5101 (Alum. cap)	5075	4501 (Alum.)	4500	5077	45	---	T-865 T-1250
1x3-1/2(2b) (25x89mm)		5100 (Delrin cap)		5076 (Delrin)				---	

(1a) Beckman-type bottle

(1b) Sorvall-type bottle. Bottle/cap threads are different, parts are not interchangeable, but Beckman-type complete bottle assembly can be used in Sorvall bottle.

(2a) Beckman-type bottle

(2b) Sorvall-type bottle. Bottle/cap threads are the same but bottle length and cap/hole diameter are different. Parts are not interchangeable. Beckman-type to be used in Beckman rotors and Sorvall-type in Sorvall rotors.

(3) Bottle must be used at full volume only regardless of the speed.

(4) Material Polypropylene.

(5) PN4425 is a box of 25 of PN4426.

(6) Assembly consists of one bottle, cap, plug and o-ring.

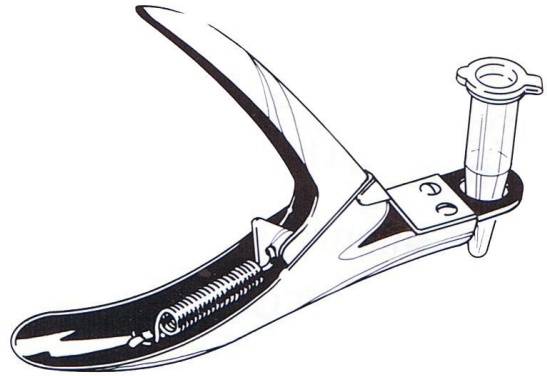
See attachment I for chemical resistance.

Accessories

Microtube Cutter

PN	Item
4195	Microtube Cutter
4116	Replacement Blade

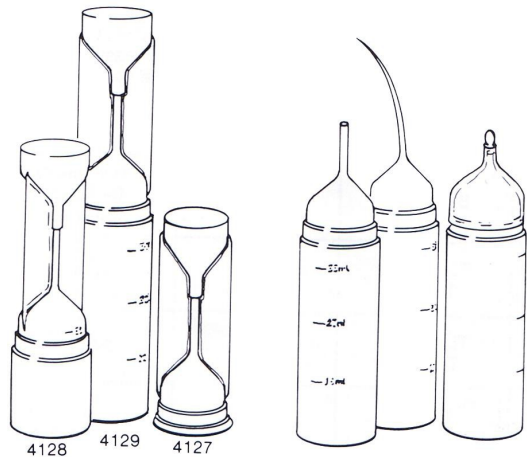
The special blade assembly has a large loop for use with all microtubes up to 1.5 ml. It will cut all brands and materials of tubes and pipette tips including PA, PP, high and low density PE. Tubes can be cut anywhere along the length from the cap flange to the conical tip. By cutting at the conical tip, access can be gained to radioactive pellets eliminating the need for resuspension of the pellet. The hazardous use of razor blades and splashing of radioactive materials can be eliminated. Cap flanges can be removed for inserting of tubes into special holders, racks and centrifuge adapters. The conical tips of UltraCone tubes can be removed for retrieval of RNA pellets.



Reservial Containers

PN	Item
4127	10ml Reservial, Box of 12
4128	20ml Reservial, Box of 12
4129	44ml Reservial, Box of 12
4127B	10ml Reservial, 1000 Bulk
4128B	20ml Reservial, 1000 Bulk
4129B	44ml Reservial, 1000 Bulk

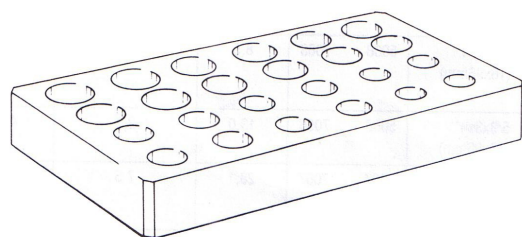
This vial is a heat-sealable storage container made of polyethylene. It can be used as a large volume storage and dispensing pipette for samples, gradients, etc. It has an integral 5ml funnel which can be cut-off after filling, then turned over, heat-sealed and used as a closure for the stem or reused or discarded. The stem of the Reservial container can be drawn to a pipette tip or heat-sealed by placing in an open flame to make a hermetic seal. Reservial containers can be frozen in liquid nitrogen. It is an unusual and unique product which has found uses too numerous to list. Some are even strange.



Tube Racks

PN	Item
4131	Tube Rack for 7/16" and 1/2" Dia Tubes
4132	Tube Rack for 9/16" and 5/8" Dia Tubes
4133	Tube Rack for 1" Dia Tubes (8 holes)
4134	Tube Rack for 1-1/2" Dia Tubes (6 holes)
4134	Tube-Racks for 1- 1/2" Ø -Röhrchen (6 holes)

Tube racks are made of white Delrin and are designed to precisely fit Science Service, Beckman and DuPont/Kontron ultracentrifuge tubes. Use one for loading and unloading tubes or for transporting tubes from your lab to another centrifuge. Because they are designed specifically for ultracentrifuge tube diameters, the racks are low in profile and the maximum length of your tubes are visible above the rack.



Accessories QS and Ultracrimp

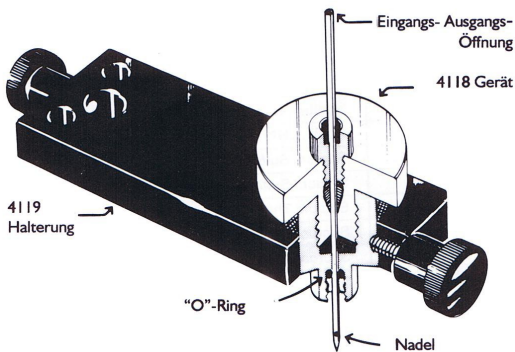
Removal Tool



4117

The serrated jaws of this tool grip the stem of the Quick-Seal tube for removal of even "sticking" tubes. Ultra-Clear tubes when run at warm temperatures and polyallomer when run at cold temperatures may be difficult to extract from the rotor immediately after the run. This tool is guaranteed not to slip and will eliminate the possibility of scratching the rotor cavity.

Fraction Recovery



After pulling a Quick-Seal tube from your rotor, screw on this assembly, turn the knob and easily puncture the stem with a pencil point needle with side hole. The assembly will make a positive seal to the stem. The extensive permanent deformation of the tube during centrifugation has no effect on the ability to seal as the assembly attaches only to the outside of the stem. By also puncturing the tube bottom with your present device you can pressurize the tube and drip out, or pump a neutral fluid through the bottom and out the top of our device through the 16 Gage needle. Needle depth is adjustable. The bracket assembly will fit the Beckman PN 343890 fraction recovery system.

PN	Item
4118	Fraction Recovery Assembly, includes needle Assy and O-ring.
4119	Bracket Assy with Knob
4120	Needle Assy, 16 ga SS (spare)
4121	O-ring (spare)

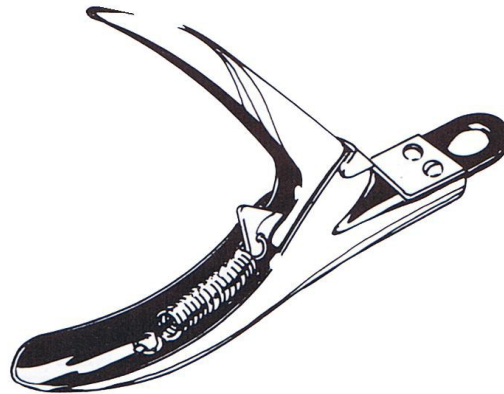
Tube Cutter



PN	Item
4208	Tube Cutter for 7/16" Tubes
4089	Tube Cutter for 1/2" Tubes
4095	Tube Cutter for 5/8" Tubes
4098	Tube Cutter for 1" Tubes
4101	Tube Cutter for 1-1/2" Tubes
4104	Replacement Blade

If you have ever disturbed your separated sample after a run by performing plastic surgery on the top of a Quick-Seal tube with a scalpel, then please consider the Tube Cutters. By holding a tube and turning the Tube Cutter around the tube, the top can be cut off quickly and smoothly. You can cut to any depth in any thin wall tube material by simply continuing to turn the Tube Cutter. As shown in the picture, the blade bevels should be facing upwards.

Stem Clipper for QS & UltraCrimp Tubes



This easy-to-use device cuts off the Beckman heat-sealed stem or the DuPont crimp-sealed stem while the tube remains in the vertical position. The stem clipper easily cuts through all stem materials with no agitation of the tube contents. Razor blades and scalpels can be eliminated.

PN	Item
4115	Stem Clipper
4116	Replacement Blade

*TM of E.I. DuPont de Nemours & Co.

Attachment I - Tables

Chemical Resistance

Information presented in the following table is to serve as a guide for the use of Science Services tubes. The chemical resistance data has been generated in tests at 27°C and below. Science Services tubes may be frozen but should be warmed to at least -5°C before centrifugation is begun. For chemicals not listed in this table, please test your solutions before spinning your valuable samples. The data presented here is to be used as a general guideline only and is not meant to imply or express a guarantee of safety for use of tubes in the ultracentrifuge.

Reagent	PA	PC	PCB	Reagent	PA	PC	PCB	Reagent	PA	PC	PCB
Acetic Acid, 5%	S	M	S	Ethylene Glycol	S		M	Potassium Chlorate	S	S	S
Acetic Acid, 60%	S	U	U	Ferric Chloride	S			Potassium Chloride	S	S	S
Acetic Acid, glacial	S	U	U	Formaldehyde, 40%	S	U	S	Potassium Hydroxide, 5%	S		U
Acetone	M	U	U	Formic Acid, 100%	S		M	Potassium Hydroxide, conc.	S	U	U
Alconox	S	M	M	Gallic Acid	S	S	S	Potassium Permanganate	S		S
Allyl Alcohol	S		S	Glycerol	S	U	M	Rubidium Bromide	S	S	S
Aluminium Chloride	S	S	S	Guanidine Hydrochlorid	S	S	S	Rubidium Chloride	S	S	S
Aluminium Fluorid	S		U	Guanidine Thiocyanate	S	S	S	Silicone Fluids	M	U	
Ammonium Acetate	S	S	S	Hexane	U	U	U	Silver Cyanide	S		
Ammonium Carbonate	S	S	U	Hydrochlorid Acid, 10%	S	U	S	Silver Nitrate	S	S	S
Ammonium Hydroxid, 10%	S		U	Hydrochlorid Acid, 50%	M	U	M	Sodium Bromide	S	S	S
Ammonium Hydroxid,conc.	S	U	U	Hydrofluoric Acid, 10%	S		M	Sodium Carbonate	S	S	U
Ammonium Sulfate	S	S	S	Hydrofluoric Acid, 100%	S	U	U	Sodium Chloride, 10%	S	S	S
Ammonium Sulfide	S		U	Hydrogen Peroxide, 3%	S	S	S	Sodium Chlorid, sat'd	S	S	S
Amyl Alcohol	M		S	Hydrogen Peroxide, 100%	S	S	S	Sodium Dichromate	S		
Aniline	U	U	U	Isobutyl Alcohol	S	U	U	Sodium Hydroxide, 1%	S		U
Aqua Regia	U	U	U	Isopropyl Alcohol	S	U	U	Sodium Hydroxide, 10%	S	U	U
Barium Salts	S	S	S	Kerosene	U	U	U	Sodium Hydroxide, conc.	M	U	U
Benzene	U	U	U	Lactic Acid, 20%	S		S	Sodium Hypochlorite	S		S
Benzyl Alcohol	U	U	U	Lauryl Alcohol	S			Sodium Iodide	S		S
Boric Acid	S	S	S	Lead Acetate	S	S		Sodium Metaborate	S		
n-Butyl Alcohol	S	U	M	Linseed Oil	S	U	U	Sodium Nitrate, 10%	S	S	U
n-Butyl Phtalate	M	U	U	Magensium Chloride	S	S	S	Sodium Sulfate	S	S	S
Calcium Chloride	S	U	S	Magnesium Hydroxide	S		U	Sodium Thiosulfate	S		S
Calcium Hypochloride	S		M	Maleic Acid	S			Sucrose	S	S	S
Carbon Tetrachloride	U	U	U	B-Mercaptoethanol	S	U	U	Sucrose, alkaline	S	U	U
Cesium Acetate	S		S	Mercury	S		U	Sulfuric Acid, 10%	S	S	U
Cesium Bromide	S	S	S	Methanol	S	U	U	Sulfuric Acid, 50%	S	U	U
Cesium Chloride	S	S	S	Methylethylketone	S	U	U	Sulfuric Acid, 75%	S	U	U
Cesium Formate	S	S	S	Methylene Chlorid	S	U	U	Sulfuric Acid, conc.	S	U	U
Cesium Iodide	S	S	S	Mineral Oil	S	U	M	Tannic Acid	S		
Cesium Sulfate	S	S	S	Nickel Salts	S	S	S	Tetrahydrofuran	U	U	U
Chlorobenzene	U	U	U	Nitric Acid, 10%	S		S	Toluene	U	U	U
Chloroform	M	U	U	Nitric Acid, 50%	S	U	M	Trichloroacetic Acid	S	U	M
Chromic Acid, 10%	S	S	M	Nitric Acid, 95%	M	U	U	Trichloroethane	U	U	U
Chromic Acid, 50%	S	U	U	Oleic Acid	S	U	S	Trichloroethylene	U	U	U
Citric Acid, 10%	S	S	S	Oxalic Acid	S	U	S	Tris Buffer	S	S	S
Cresol Mixture	M	U	U	Paraffin Oil	S	U	M	Trisodium Phosphate	S		
Cyclohexanol	S	U	M	Petroleum Oils	S		M	Turpentine	M	U	U
Dextran Sulfate	S	S	S	Phenol, 5%	S	U	U	Urea	S	S	S
Dimethylformamide	S	U	U	Phenol, 50%	U	U	U	Urine	S	S	S
Dioxane	M	U	U	Phosphoric Acid, 10%	S		S	Water, distilled	S	S	S
Ethyl Acetate	M	U	U	Phosphoric Acid, conc.	M	U	U	Xylene	U	U	U
Ethyl Alcohol, 50%	S	U	U	Phosphorous Trichloride	S	S	U	Zinc Chloride	S	S	S
Ethyl Alcohol, 95%	S	U	U	Potassium Acetate	S	S	M				
Ethylene Dichloride	M	U	U	Potassium Bromide	S	S	S				
Ethyl Ether	M	U	U	Potassium Carbonate	S	S	S				

Compatibility Key: S = Satisfactory
M = Marginal; performance depends on temperature, run time, speed and rotor type
U = Unsatisfactory; not recommended
PA = Polyallomer; PC = Polyclear; PCB = Polycarbonat

SCIENCE SERVICES

Tubes listed by Beckman Rotor

Fixed Angle Rotors			Vertical Rotors			SW40Ti, 9/16" (14mm)		
90Ti, 80Ti, 75Ti, 70.1Ti, 65, 50Ti, 40, 5/8" (16mm)			VTi 90, Vti80, NVT80, Vti65, Vti65.2, 1/2" (13mm)			PN	Description	Replaces Beckman
PN	Description	Replaces Beckman	PN	Description	Replaces Beckman	5031	Open Top PA	331374
3041	Re-Seal PC	344322	3022	Re-Seal PC	344075	5033	THK PA	none
4281	THK Thd PCB	none	6024	Easy-Seal PA	none	5065	UltraCone PA	358121
5041	Open Top PA	326814	8024	Easy-Seal PC	none	7031	Open Top PC	344060
5045	THK PA	355640	9022	Re-Seal PA	342412	7031W	UltraCote W	none
5068	UltraCone PA	none				7065	UltraCone PC	none
6041	Easy-Seal PA	none	Vi65,1, NVT65 5/8" (16mm)			7074	UltraThin PC	none
7041	Open Top PC	344085	PN	Description	Replaces Beckman	7074W	UltraThin W	none
7041W	UltraCote W	none	3041	Re-Seal PC	344322	9032	Open Top PC	355537
7068	UltraCone PC	none	6041	Easy-Seal PA	none	SW30, 1" (25mm)		
8041	Easy-Seal PC	none	8041	Easy-Seal PC	none	PN	Description	Replaces Beckman
9040	Cone-Top PA	345830	9041	Re-Seal PA	342413	5053	Open Top PA	346599
9041	Re-Seal	342413				7053	Open Top PC	346598
			VTi50, VC53, VAC50, 1" (25mm)			7053W	UltraCote W	none
70Ti, 60Ti, 55.2Ti, 50.2Ti, 42.1, 1" (25mm)			PN	Description	Replaces Beckman	7077	UltraThin PC	none
PN	Description	Replaces Beckman	3052	Re-Seal PC	344326	7077W	UltraThin W	none
3052	Re-Seal PC	344326	6052	Easy-Seal PA	none	9050	Cone-Top PA	343664
4285	THK Thd PCB	none	8052	Easy-Seal PC	none	SW30.1 5/8" (16mm)		
5052	Open Top PA	326823	9052	Re-Seal PA	342414	PN	Description	Replaces Beckman
5055	THK PA	355642				5043	Open Top PA	346601
5067	UltraCone PA	none	Swinging bucket			7043	Open Top PC	346600
6052	Easy-Seal PA	none				7043W	UltraCote PC	none
7052	UltraCote W	none	SW60Ti, 7/16" (11mm)			7075	UltraThin PC	none
7067	UltraCone PA	none	PN	Description	Replaces Beckman	7075W	UltraThin W	none
8052	EasySeal PC	none	5010	Open Top PA	328874	9040	Cone-Top	345830
9050	Cone-Top PA	343664	5061	UltraCone PA	358117	SW28, 1" (25mm)		
9052	Re-Seal PA	342414	7010	Open Top PC	344062	PN	Description	Replaces Beckman
			7010W	UltraCote W	none	5052	Open Top PA	326823
45Ti, 35, 21, 1-1/2" (38mm)			7061	UltraCone PC	none	5055	THK PA	355642
PN	Description	Replaces Beckman	7071	UltraThin PC	none	5067	UltraCone PA	358126
4289	THK Thd PCB	none	7071W	UltraCote W	none	7052	Open Top PC	344058
5060	Open Top PA	345775	9011	Cone-Top PA	344624	7052W	UltraCote PC	none
6060	Easy-Seal PA	none	9012	Cone-Top PA	344625	7067	UltraCone PC	none
7060	Open Top PC	345777				7079	UltraThin W	none
7060W	UltraCote W	none	SW65Ti, SW55Ti, SW50.1, SW50, 1/2" (13mm)			7079W	UltraThin	none
8060	Easy-Seal PC	none	PN	Description	Replaces Beckman	9050	Cone-Top PA	343664
			5022	Open Top PA	326819	SW28.1, 5/8" (16mm)		
Type 50, 5/8" (16mm)			5024	THK PA	349623	PN	Description	Replaces Beckman
PN	Description	Replaces Beckman	5063	UltraCone PA	358119	5042	Open Top PA	337986
5040	Open Top PA	326826	7022	Open Top PC	344057	5046	THK PA	without
5066	THK PA	355646	7022W	UltraCote	none	5066	UltraCone PA	358123
7040	Open Top PC	344089	7063	UltraCone PC	none	7042	PC open	344061
			7072	UltraThin PC	none	7042W	UltraCote W	none
Type 50.3Ti, 1/2" (13mm)			7072W	UltraCote	none	7066	UltraCone PC	none
PN	Description	Replaces Beckman	9024	Cone-Top PA	345829	7076	UltraThin PC	none
5025	THK PA	355644	9025	Cone-Top PA	349621	7076W	UltraThin W	none
5023	Open Top PA	326820				9040	Cone-Top PA	345830
5069	UltraCone PA	none	SW41Ti, 9/16" (14mm)			SW25.1, 1" (25mm)		
6023	Easy-Seal PA	none	PN	Description	Replaces Beckman	PN	Description	Replaces Beckman
7023	Open Top PC	344088	5030	Open Top PA	331372	5050	Open Top PA	326825
7023W	UltraCote W	none	5032	THK PA	none	5054	THK PA	355638
7069	UltraCone PC	none	5064	UltraCone PA	358120	7050	Open Top PC	344063
8023	Easy-Seal PC	none	7030	Open Top PC	344059	7050W	UltraCote W	none
9025	Cone-Top PA	349621	7030W	UltraCote W	none	7078	UltraThin PC	none
			7064	UltraCone PC	none	7078W	UltraThin W	none
			7073	UltraThin PC	none	9050	Cone-Top PA	343664
			7073W	UltraThin W	none			
			9032	Cone-Top PA	355537			

Tube Cross Reference

SCI	BECKMAN	DUPONT	KONTRON	Sorvall	Nalgene	Fisher	BioComp
5041	326814	03128	9091-90202	03128	3410-1613		
5022	326819	03127	9091-90219	03127	3410-1351	NC9945014	
5023	326820	03958	9091-90227		3410-1306		
5052	326823	03141	9091-90196		3410-2539	NC9811962	
5050	326825						
5040	326826						
5010	328874	03955	9091-90212	03955			
5030	331372	03699	9091-90221	03699	3410-1489	NC9871611	
5031	331374	03954	9091-90215		3410-1495	NC9905635	
5042	337986	03126	9091-90217	03126		NC9964548	
4352	342080	03243					
9022	342412						
9041	342413						
9052	342414						
9050	343664	06774	9091-90541				
7022	344057	06712	9091-90471	46101		NC9149514	151-513
7052	344558		9091-90477	75000471		NC9115402	151-525
7030	344059	06752	9091-90474	06752		NC9863486	151-514A
7031	344060		9091-90475			NC9836096	151-514B
7042	344061	06750	9091-90476	06750			151-518
7010	344062		9091-90470			NC9823933	151-511A
7050	344063						
3022	344075						
7041	344085	06714	9091-90473				
7023	344088		9091-90472				
7040	344089						
7020	344092						
7021	344093						
3041	344322						
3052	344326						
5051	344367		9091-90197				
9011	344624	06762	9091-90536	75000501			
9012	344625	06764	9091-90537	75000459		NC9636615	
5060	345775		9091-90207		3410-3894		
7060	345777		9091-90478			NC9851561	
9024	345829	06766	9091-90538	75000458			
9040	345830	06772	9091-90540	75000450			
7053	346598						
5053	346599						
7043	346600						
5043	346601						
5007	347287						
7011	347356			45242 / 45315			
5011	347357			45240		NC9860203	151-511B
9025	349621			75000456		NC0045387	
2001	349622		9091-90224	45238	3425-1351		
5024	349623		9091-90223	46100			
9032	355537	06770	9091-90539	75000454			
2004	355630		9091-90205		3420-1613	NC9694895	
2006	355637						
2009	355631		9091-90200		3425-2537	NC0004557 / NC9694896	
5008	355636		9091-90213			NC9776911	
5055	355642	03020	9091-90198		3420-2539	NC9104118	
5025	355644	03719	9091-90228		3420-1306		
2002	355645	03232	9091-90229		3425-1306		
2003	355647	03930					
2015	355651	03146			3432-0010		
2016	355654	03147			3432-0026		
2017	355655				3432-0070		
5061				75000517			
5062		06776	9091-90504	75000472			
5063		06758	9091-90505	75000473			
				75000519			
5064	358980	06724	9091-90507	75000474			
5065	362248						
5066	362305	06720	9091-90510	75000475			
5067			9091-90511	75000476			
9021							
9029							
2010				45239			

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SCI	BECKMAN	DUPONT	KONTRON	Sorvall	Nalgene	Fisher	BioComp
4385 4387 5009 4293 6011 6020 6021 6022 7062		54361 54460 06700 06704 06740 06744 06778	9091-90300 9091-90275 9091-00174 9091-00286	54361 75000502 75000512 75000509 75000508			
7063 7064 7066 7070 8011 8020 8021 8022 9014 9026		06760 06726 06722 45316 06702 06706 06742 06746 45246 45319	9091-90513 9091-90515 9091-90518	75000519 75000467 75000465 75000463 75000503 75000510 45246 75000513		NC0015457	
5054 5045 9027 9028 4411 4409 4410 4419 4420 2007	355638 355640 334545 335256 335258 338824 339165 343778	45247 45248	9091-90203	45247 45248 45237	3420-1613		
7009 9051 9060 4484 4486 4416 4417 2011 4383 2008	344090 344623 345776 355603 355616 355618 355622 355628 355635			75000427 314250H01	3430-2526 3430-2526 3431-3870 3425-3894	NC9092503 NC9576286	
5057 5044 5056 2012 9056 4249 4414 4413 4412 4408	355643 355646 355658 355659 356291 362307 870384 870358 870409 878133				3420-3894		
4285 4281 4277 4386 5012 4075 4256 4257 4247 4246			9091-90201 9091-90206 9091-90242 9091-90210	03955 45307 45318 45321 75000457 75000460			
2018 5047 9042 5026 4491 9043 5053 4389 4447				45595 45596 45597 45598 45599 45809 03288 54365 54366			

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SCI	BECKMAN	DUPONT	KONTRON	Sorvall	Nalgene	Fisher	BioComp
5087				314460		NC9926016	
5089				314462			
9055				75000411			
9056				75000414			
4359				357007			
4216				75000428			
4075				75000451			
4248				75000452			
4219				75000455			
7067				75000461			
4230				75000462			
4227				75000468			
7062				75000469			
4226				75000470			
4088				75000478			
4250				75000479		NC0015459	
4209				75000480			
4172				75000481			
9058				75000482			
9059				75000483			
4264				75000504			
4269				75000505			
4189				75000506			
4014				75000507			
4267				75000511			
9054				75000514			
7061				75000516			
4229				75000464		NC0015458	
4146				75000521			
5024					3420-1351		
4484					3430-1610	NC9748666	
7079						NC9949037	
6052						NC9088254	
5085						NC9744471	
5032						NC9776914	
5073						NC9849120	

*Beckman conical and Science Services UltraCone tubes are very similar. However, Science Services UltraCone tubes must be used with Science Services adapters and Beckman Konical tubes with Beckman adapters.

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