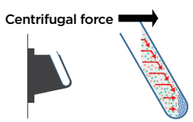
Rotor Selection Guide

Select a rotor type based on use → Select tubes to suit your purpose → Select rotor based on g force and processing capacity → Adapter Spacer

Fixed-Angle Rotors

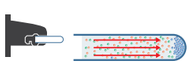


Movement of particles with a fixed-angle rotor

- Processing capacity is large
- Easy to handle
- The pellet leaves traces on the surface of the wall; therefore, the risk of contamination is high

* The numbers represent the recommended order.	Type 100 Ti 8 tubes x 6.0 mL	Type 90 Ti 8 tubes x 13.5 mL	Type 70.1 Ti 12 tubes x 13.5 mL	Type 70 Ti 8 tubes x 39 mL	Type 50.2 Ti 12 tubes x 39 mL	Type 45 Ti 6 tubes x 94 mL	Type 19 6 tubes x 250 mL	Type 50.4 Ti 44 tubes x 6.5 mL	Type 42.2 Ti 72 tubes x 0.23 mL	Type 25 100 tubes x 1 mL	Adapter Spacer
Pellet / Supernatant Collection											
1 Bottle Assembly Easy ultracentrifugation processing is possible with screw-style cap Use from approx. half of the quantity is possible	–	65,000 rpm 362,000 x g 8 tubes x 10.4 mL	65,000 rpm 388,000 x g 12 tubes x 10.4 mL	60,000 rpm 371,000 x g 8 tubes x 26.3 mL	50,000 rpm 302,000 x g 12 tubes x 26.3 mL	45,000 rpm 235,000 x g 6 tubes x 70 mL	19,000 rpm 53,900 x g 6 tubes x 250 mL	–	–	–	–
2 OptiSeal Tubes Can be sealed easily with a plug	–	90,000 rpm 694,000 x g 8 tubes x 8.9 mL	70,000 rpm 450,000 x g 12 tubes x 8.9 mL	70,000 rpm 504,000 x g 8 tubes x 32.4 mL	50,000 rpm 302,000 x g 12 tubes x 32.4 mL	–	–	50,000 rpm 312,000 x g 44 tubes x 4.7 mL	–	–	Spacer is required
3 QuickSeal Tubes Heat-sealing for a complete seal Optimal for infectious samples, such as viruses	100,000 rpm 802,000 x g 8 tubes x 2-6 mL	90,000 rpm 694,000 x g 8 tubes x 4.2-13.5 mL	70,000 rpm 450,000 x g 12 tubes x 4.2-13.5 mL	70,000 rpm 504,000 x g 8 tubes x 15-39 mL	50,000 rpm 302,000 x g 12 tubes x 15-39 mL	45,000 rpm 235,000 x g 6 tubes x 94 mL	–	50,000 rpm 312,000 x g 44 tubes x 2 / 6 mL	–	–	Spacer is required
4 Thickwall Tubes Ultracentrifugation processing is possible from half the quantity * Contains only cases in which centrifugation without caps is possible	–	30,000 / 50,000 rpm 77,000 / 197,000 x g 8 tubes x 4 / 8 mL	30,000 / 50,000 rpm 82,700 / 212,000 x g 12 tubes x 4 / 8 mL	20,000-45,000 rpm 41,200-208,000 x g 8 tubes x 4-16.5 mL	20,000-45,000 rpm 48,000-244,000 x g 12 tubes x 4-16.5 mL	15,000 / 39,000 rpm 26,200-156,000 x g 6 tubes x 4-47 mL	–	30,000-50,000 rpm 112,400-312,000 x g 44 tubes x 1 / 4 mL	42,000 rpm 223,000 x g 72 tubes x 0.23 mL	25,000 rpm 92,500 x g 100 tubes x 1 mL	Adaptor may be required
Intermediate Band: Density gradient centrifugation, etc.											
1 OptiSeal Tubes Can be sealed easily with a plug	–	90,000 rpm 694,000 x g 8 tubes x 8.9 mL	70,000 rpm 450,000 x g 12 tubes x 8.9 mL	70,000 rpm 504,000 x g 8 tubes x 32.4 mL	50,000 rpm 302,000 x g 12 tubes x 32.4 mL	–	–	50,000 rpm 312,000 x g 44 tubes x 4.7 mL	–	–	Spacer is required
2 QuickSeal Tubes Heat-sealing for a complete seal Optimal for infectious samples, such as viruses	100,000 rpm 802,000 x g 8 tubes x 2-6 mL	90,000 rpm 694,000 x g 8 tubes x 4.2-13.5 mL	70,000 rpm 450,000 x g 12 tubes x 4.2-13.5 mL	70,000 rpm 504,000 x g 8 tubes x 15-39 mL	50,000 rpm 302,000 x g 12 tubes x 15-39 mL	45,000 rpm 235,000 x g 6 tubes x 94 mL	–	50,000 rpm 312,000 x g 44 tubes x 2 / 6 mL	–	–	Spacer is required
Floating Fraction: Lipoproteins, etc.											
1 Thickwall Tubes Ultracentrifugation processing is possible from half the quantity	–	–	–	–	–	–	–	30,000-50,000 rpm 112,400-312,000 x g 44 tubes x 1 / 4 mL	42,000 rpm 223,000 x g 72 tubes x 0.23 mL	25,000 rpm 92,500 x g 100 tubes x 1 mL	Type 50.4 Ti Adapter / cap may be required

Swing Rotor



Movement of particles with a swing rotor

- When distinct bands in the density gradient are desirable
- Risk of contamination is low
- Suitable for small-volume samples because the pellet is positioned in the center of the tube

	SW 60 Ti 6 tubes × 4 mL	SW 55 Ti 6 tubes × 5 mL	SW 41 Ti 6 tubes × 13.2 mL	SW 40 Ti 6 tubes × 14 mL	Top-loading SW 32.1 Ti 6 tubes × 17 mL	Top-loading SW 32 Ti 6 tubes × 38.5 mL	SW 28.1 6 tubes × 17 mL	SW 28 6 tubes × 38.5 mL	Adapter Spacer
Pellet / Supernatant Collection									
1 UC Tube (Thinwall) Transparent, facilitating visual confirmation of the pellets	60,000 rpm 485,000 x g 6 tubes x 4 mL	48,000 / 55,000 rpm 269,000 / 368,000 x g 6 tubes x 0.8 / 5 mL	41,000 rpm 288,000 x g 6 tubes x 13.2 mL	40,000 rpm 285,000 x g 6 tubes x 14 mL	32,000 rpm 187,000 x g 6 tubes x 17 mL	32,000 rpm 175,000 x g 6 tubes x 38.5 mL	28,000 rpm 150,000 x g 6 tubes x 17 mL	28,000 rpm 141,000 x g 6 tubes x 38.5 mL	SW 55 Ti An adapter may be required
2 PP Tube (Thinwall) Round bottom / conical bottom Select either round bottom and conical bottom Conical bottoms are recommended for a small-volume pellet collection	60,000 rpm 480,000 / 485,000 x g 6 tubes x 1.5 / 4 mL	55,000 rpm 368,000 x g 6 tubes x 3 / 5 mL	41,000 rpm 284,000 / 288,000 x g 6 tubes x 10 / 13.2 mL	40,000 rpm 280,000 / 285,000 x g 6 tubes x 10/14 mL	32,000 rpm 187,000 x g 6 tubes x 14.5 / 17 mL	32,000 rpm 175,000 x g 6 tubes x 31.5 / 38.5 mL	28,000 rpm 148,000 / 150,000 x g 6 tubes x 14.5 / 17 mL	28,000 rpm 141,000 x g 6 tubes x 31.5 / 38.5 mL	For conical bottoms, an adapter is required
3 Thickwall Tubes Enables ultracentrifugation processing from half the quantity, optimal for series of experiments with inconsistent sample volumes	60,000 rpm 485,000 x g 6 tubes x 3 mL	55,000 rpm 368,000 x g 6 tubes x 3.5 mL	–	–	–	32,000 rpm 175,000 x g 6 tubes x 30 mL	–	28,000 rpm 141,000 x g 6 tubes x 30 mL	–
4 OptiSeal Tubes Can be sealed easily with a plug	–	55,000 rpm 368,000 x g 6 tubes x 3.3 mL	–	–	–	32,000 rpm 175,000 x g 6 tubes x 32.4 mL	–	28,000 rpm 141,000 x g 6 tubes x 32.4 mL	Spacer is required
5 QuickSeal Tubes Round bottom / conical bottom Heat-sealing for a complete seal Optimal for infectious samples, such as viruses	60,000 rpm 480,000 / 485,000 x g 6 tubes x 1.3-3 mL	55,000 rpm 368,000 x g 6 tubes x 2 mL	41,000 rpm 284,000 / 288,000 x g 6 tubes x 3.5-8 mL	40,000 rpm 280,000 / 285,000 x g 6 tubes x 3.5-8 mL	32,000 rpm 187,000 x g 6 tubes x 4.2-17 mL	32,000 rpm 175,000 x g 6 tubes x8.4-33 mL	28,000 rpm 150,000 x g 6 tubes x 4.2-17 mL	28,000 rpm 141,000 x g 6 tubes x 8.4-33 mL	Spacer is required For conical bottoms, an adapter is required
Intermediate Band: Density gradient centrifugation, etc.									
1 PP Tube (Thinwall) Facilitates insertion of the needle when collecting bands	60,000 rpm 485,000 x g 6 tubes x 4 mL	55,000 rpm 368,000 x g 6 tubes x 5 mL	41,000 rpm 288,000 x g 6 tubes x 13.2 mL	40,000 rpm 285,000 x g 6 tubes x 14 mL	32,000 rpm 187,000 x g 6 tubes x 17 mL	32,000 rpm 175,000 x g 6 tubes x 38.5 mL	28,000 rpm 150,000 x g 6 tubes x 17 mL	28,000 rpm 141,000 x g 6 tubes x 38.5 mL	–
2 UC Tube (Thinwall) Transparent, facilitating visual confirmation of bands	60,000 rpm 485,000 x g 6 tubes x 4 mL	48,000 / 55,000 rpm 269,000 / 368,000 x g 6 tubes x 0.8 / 5 mL	41,000 rpm 288,000 x g 6 tubes x 13.2 mL	40,000 rpm 285,000 x g 6 tubes x 14 mL	32,000 rpm 187,000 x g 6 tubes x 17 mL	32,000 rpm 175,000 x g 6 tubes x 38.5 mL	28,000 rpm 150,000 x g 6 tubes x 17 mL	28,000 rpm 141,000 x g 6 tubes x 38.5 mL	SW 55 Ti An adapter may be required
3 OptiSeal Tubes Can be sealed easily with a plug	–	55,000 rpm 368,000 x g 6 tubes x 3.3 mL	–	–	–	32,000 rpm 175,000 x g 6 tubes x 32.4 mL	–	28,000 rpm 141,000 x g 6 tubes x 32.4 mL	Spacer is required
4 QuickSeal Tubes Heat-sealing for a complete seal Optimal for infectious samples, such as viruses	60,000 rpm 485,000 x g 6 tubes x 1.5 / 2 mL	55,000 rpm 368,000 x g 6 tubes x 2 mL	41,000 rpm 288,000 x g 6 tubes x 3.5 / 5.9 mL	40,000 rpm 285,000 x g 6 tubes x 3.5 / 5.9 mL	32,000 rpm 187,000 x g 6 tubes x 4.2-17 mL	32,000 rpm 175,000 x g 6 tubes x 15-33 mL	28,000 rpm 150,000 x g 6 tubes x 4.2-17 mL	28,000 rpm 141,000 x g 6 tubes x 15-33 mL	Spacer is required

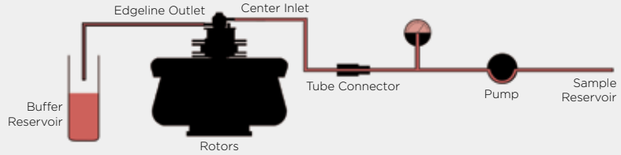
Special Rotors

Continuous Flow Rotor CF-32 Ti

By injecting (loading) samples continuously into the rotor while it rotates at a high speed, the constituents contained in the sample can be collected as pellets on the rotor wall. It can also be used to remove impurities from a sample.

The CF-32 Ti, a continuous flow rotor for use in an ultracentrifuge, is used to separate large-volume samples of 2 L or more in a single centrifugation and to collect pellets efficiently. The amount of sample that can be processed during a single centrifugation operation will be determined by the amount of pellets that are produced as a result of the centrifugation. The speed of sample influx is dependent on the sedimentation coefficient S of the sample particles. It will be possible to increase the flow rate for particles with a large S value (showing a high speed of centrifugal sedimentation), and the maximum rate will be 9 L/h. By using a pump to continuously send the sample into the rotor that is rotating at high speed, pellets will be formed along the inner wall of the rotor, and the supernatant can be recovered from the rotor outlet. After all of the sample has entered the rotor, the rotation will be stopped in order to remove the rotor and recover the pellets.

CF-32 Ti
Maximum Speed: 32,000 rpm
Maximum g Force: 102,000 x g
Rotor Capacity: 430 mL



Core Flow Path Illustration for Continuous Flow

Zonal Rotor Ti-15

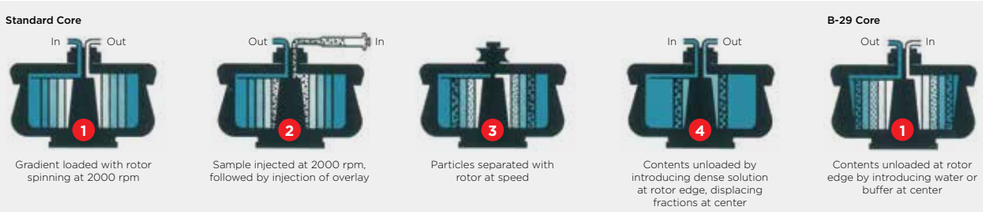
A solution's gradient density is formed (sucrose, etc.) while rotating, a sample from the center of the rotor is injected and density gradient centrifugation is performed. Inject post-separation high-density solution from the rotor wall side, and collect the fraction of the target substance from the center.

Density gradient centrifugation of large-volume (approx. 50 mL) samples can be performed. In general, the resolution is better than with a swing rotor, and in most cases, separation using almost the same density gradient conditions as with the swing rotor is possible. A Standard Core and B-29 Core can be used. The Standard Core is a core for collecting from light fractions. On the other hand, the B-29 Core can collect from both light and heavy liquids. However, effective centrifugal path has been shortened because the rotor wall is tilted, and the maximum g force is also reduced. The B-29 Core is used mainly in the preparative isolation of floating fractions (flotation separations, put sample in from side and collect at center).

Ti-15
Maximum Speed: 32,000 rpm
Maximum g Force: 102,000 x g
Maximum Capacity: 1,675 mL

Basic Specifications

	Standard Core	B-29 Core
Maximum Speed (rpm)	32,000	2,000
Maximum g Force (x g)	102,000	96,500
***K* Factor**	481	468
Nominal Capacity (mL)	1,675	1,350



Step Operation Software

In continuous flow separation and zonal centrifugation, operation of the main unit is burdensome because a peristaltic pump injects / ejects the sample. With the Optima X series, each step from the sample injection (load) to the ejection (unload) is displayed on the screen, allowing anyone to easily perform the operation.

Floor-model Ultracentrifuge Optima X Series Specifications

Main Unit Specifications	Premier Model Optima XPN Series			Basic Model Optima XE Series	
	XPN-100	**XPN-90**	**XPN-80**	**XE-100**	**XE-90**
Product Number (Standard System)	A94469	A94468	A95765	A94516	A94471
Product Number (Biosafe System)	B10048	B10047	B10046	B10045	B10044
Maximum Speed (rpm)	100,000	90,000	80,000	100,000	90,000
Maximum g Force (x g)	802,000	694,000	548,300	802,000	694,000
Overspeed prevention function	Dynamic rotor inertia check (DRIC), optical sensor overspeed disk, magnetic rotation monitoring functionality				
Display	15-inch full-color LCD touch screen				
Chamber / drive unit cooling system	Electrical heating and cooling system (completely CFC-free) / air cooling				
Drive unit warranty	10-year warranty				
Rotor compatibility	Compatible with existing Beckman Coulter floor rotors				
Rotation control precision	± 2 rpm (with revolutions at 1,000 rpm or higher)				
Preset temperature range	0 to 40°C at 1°C intervals				
Temperature control precision / temperature indicator	± 0.5°C (within the set temperature range) / in 0.1°C increments				
Rotor acceleration / deceleration	10 types / 11 types				
Operating System Software	Embedded Windows operating system-based				
Interface	USB ports (3), Ethernet port (1)			USB ports (3)	
Calorific Power	3,400 Btu/hr (1.0 kW)				
Idle-Time Electrical Consumption	60 W or less				
Operating Noise	<51 dBA				
Installation Environment (temperature / humidity)	10 to 35°C / 80% or less				
Power Supply	200-240 V, 30 A, 50/60 Hz				
Dimensions and Weight	940 (W) × 681 (D) × 1,257 (H) mm, 485 kg				

Conformance with Safety Standards: International Standard IEC 61010-2-020-compliant, EMC Directive EN 61326 Standards, CSA and CE mark requirements, and manufactured in an ISO 13485-certified factory

Software Specifications	Premier Models Optima XPN Series	Basic Models Optima XE Series
Rotor catalog	O	O
Tube catalog	O	O
Help function	O	O
RPM, RCF, ω^2t indicator	O	O
Self-diagnostics history export function	10,000 messages	10,000 messages
Run history management	More than 5,200 events	×
Delayed start	O	×
Chemical resistances table	O	×
Rotor logging by serial number	O	×
Remote control and monitoring function	O	×
User ID and password setting	50 people	×
3-level access authentication setting	O	×
Manages electronic signatures and run logs	O	×
Export run history (main unit / rotor)	O	×
User Defined Programs/Steps	1,000 programs of up to 30 steps each	×
Operational Status Real-time Plotting Feature (speed/temperature)	O	×
eXpert Simulation Software	O	×

Optima XPN-100 / 90 / 80

Optima XE-100 / 90