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A Guide to Choosing Your Centrifuge

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Factors to Consider

01 - TEMPERATURE

Refrigerated?

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02 - SIZE, TYPE, & NUMBER

Tubes, Bottles or Microplates? How many?

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03 - FORCE & SPEED

RCF or G-Force needed?

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04 - ROTOR TYPE

Swing Out or Fixed Angle Rotor?

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05 - BIORISK MANAGEMENT

Are Sealed Rotors required for Biocontainment?

FACTOR ONE

Refrigerated?

The rapid spinning of the rotor causes temperatures within to rise higher than the surrounding room temperature by several degrees. It is vital to know if the samples going to be placed in the centrifuge are temperature sensitive. If yes, then it is recommended to refrigerated centrifuge which allows stable and precise temperature control.

FACTOR TWO

Tubes, Bottles or Microplates? How many?

Assess what size of tubes, bottles or microplates will commonly be used? Examples are 1.5mL microcentrifuge tubes, vacutainer blood collection tubes, 50mL Falcon conical tubes, microplates or a mixture of different types? How many tubes or microplates are you wanting to spin at a time?

FACTOR THREE

RCF or G-Force needed?

Relative Centrifugal Force (RCF) or G-Force is the measurement of the gravitational force that a sample is subjected to. RCF, which takes in consideration of the speed of rotation while also measuring the distance from the center of rotation, is the most useful parameter in assessing the right centrifuge for your requirements.

FACTOR FOUR

Swing Out or Fixed Angle Rotor?

Swing out rotors ensure that the sediment settles at the bottom of the tube and reduce the risk of sediment getting swept back up into the supernatant. This is ideal for separations prior to sensitive analysis or applications requiring extremely precise separation. Swing out rotors are also used for gradient centrifugation, as the gradient layers are able to stay in position. Swing out rotors are also needed for centrifugation of plates.

Fixed angle rotors have greater centrifugal force which makes it suitable for separating biological material such as DNA and very compact pellets. Fixed angle rotors generally requires less time for centrifugation which can be ideal for processing large numbers of samples.

Comparison
Swing Out vs. Fixed Angle

Swing Out Rotor

-Samples are free to swing out at various angles depending on the centrifugal force

-Sediment forms at the bottom of the tube

-Typically withstands a lower centrifugal force than fixed angle

-Tends to hold fewer samples to accommodate 'swing out' space

Fixed Angle Rotor

-Holds samples at 'fixed angle' – typically around 45 degrees to the ground

-Sediment forms at an angle on the tube

-Can usually withstand higher centrifugal force than swing out rotors

-Tends to hold more samples due to more efficient sample spacing

FACTOR FIVE

Are Sealed Rotors required for Biocontainment?

In cases of clinical and gene therapy applications, a centrifuge with certified biocontainment features needs to be considered. This is to protect samples against contamination while also protecting users from highly contagious clinical samples. It is highly advised to choose models with sealed rotors and certified biocontainment lids to reduce risk of bio-hazardous substances spreading.

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