CENTRIFUGE INSTRUCTIONS

Refer to your manufacturer's instructions for centrifugation operation and maintenance.

Caution: Tubes requiring centrifugation must rest on the bottom of the centrifuge bucket. If the tube does not rest on the bottom of the centrifuge bucket, the cap may loosen or come off during centrifugation. A spacer provided by the centrifuge vendor should be inserted if your tube does not rest on the bottom of the centrifuge bucket.

Calculating the Centrifuge Speed from the Required g Force

In general, Covance CLS recommends serum and plasma samples centrifuge at 1500 to 2000 x g for 15 minutes. Any deviations to these recommendations will be listed in your laboratory requisitions.

Covance CLS provides the gravitational force (g) or relative centrifugal force (RCF) with the collection narrative. However, many centrifuges require the operator to electronically input or "dial in" the desired speed of the centrifuge, not the g force. In order to input the correct speed, two pieces of information are needed: the desired gravitational force (g) and the radius of the centrifuge. The radius of your centrifuge can be obtained from your operator's manual or by calling the customer service representative from the manufacturer/supplier of your centrifuge. If you are unable to obtain this information, the radius can be found by measuring in centimeters (cm) the distances between the center of the rotation and the bottom of the tube in the rotor.

Finding the necessary speed to enter on your centrifuge can be done in several ways. Below are two ways to obtain this information:

Equation for calculating the centrifuge speed:

$$N = \sqrt{\frac{F}{0.00001118(R)}}$$

F = gravitational force (g)
R = Radius (in cm)
N: Speed of centrifuge rotator (RPM)

Example: With a centrifuge radius of 10 cm and 1000 g the required speed (rpm) is:
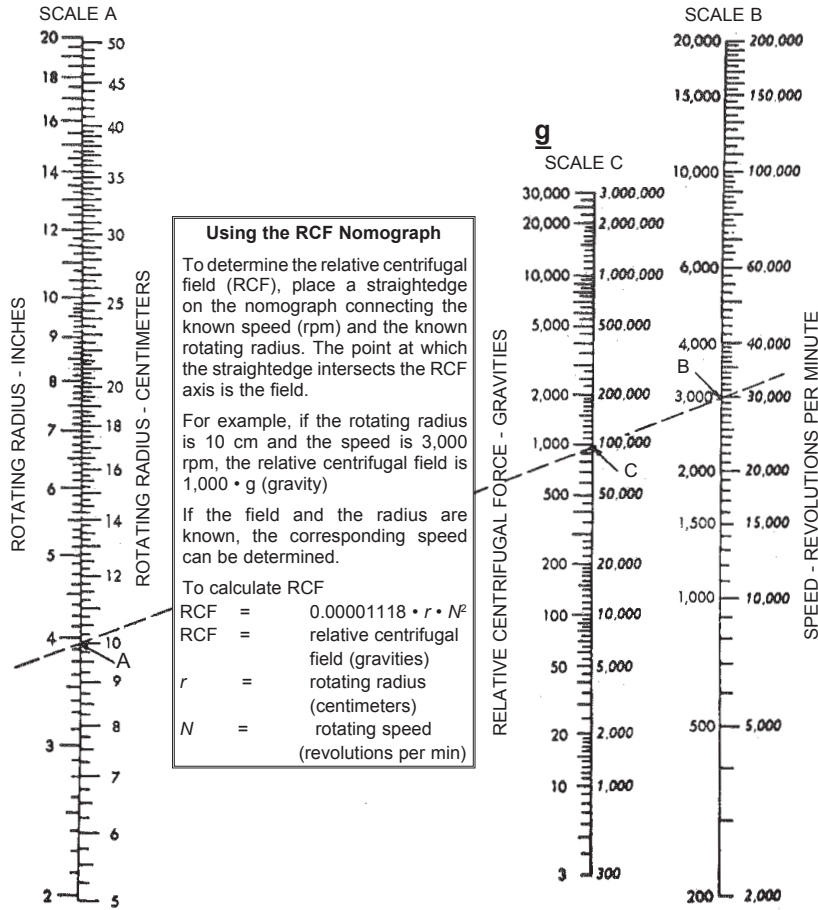
$$N = \sqrt{\frac{1000}{0.00001118(10)}}$$

N = 2990 RPM

Nomograph for calculating the centrifuge speed:

Radius

Speed

SCALE A

SCALE B

g

SCALE C

ROTATING RADIUS - INCHES

ROTATING RADIUS - CENTIMETERS

RELATIVE CENTRIFUGAL FORCE - GRAVITIES

SPEED - REVOLUTIONS PER MINUTE

Using the RCF Nomograph

To determine the relative centrifugal field (RCF), place a straightedge on the nomograph connecting the known speed (rpm) and the known rotating radius. The point at which the straightedge intersects the RCF axis is the field.

For example, if the rotating radius is 10 cm and the speed is 3,000 rpm, the relative centrifugal field is 1,000 • g (gravity)

If the field and the radius are known, the corresponding speed can be determined.

To calculate RCF

RCF	=	$0.00001118 \cdot r \cdot N^2$
RCF	=	relative centrifugal field (gravities)
r	=	rotating radius (centimeters)
N	=	rotating speed (revolutions per min)

The distance measured from the rotor axis to the tip of the liquid inside the tubes at the greatest horizontal distance from the rotor axis is the rotating tip radius. The radius is listed for your convenience in the speed and force tables.

⇐ Rotating Axis

ROTATING RADIUS

ANGLE ROTORS

ROTATING RADIUS

HORIZONTAL ROTORS