IQVIA Laboratories "How To" Guide

How To Calculate Centrifuge Speed

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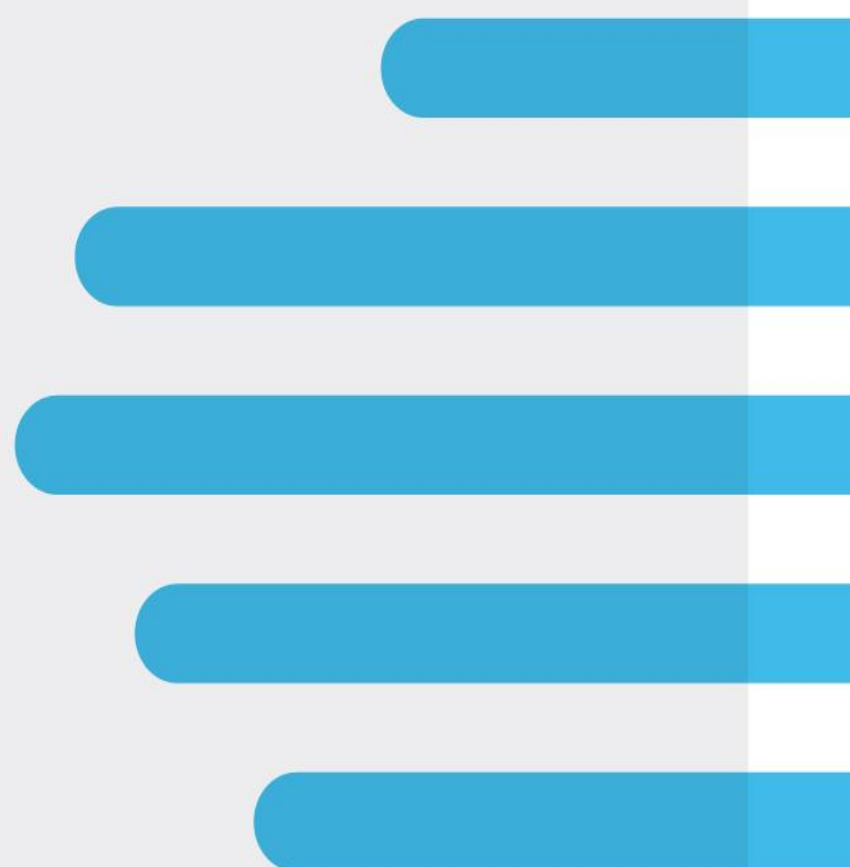
HOW TO CALCULATE CENTRIFUGE SPEED

Conversion of RCF(g) to RPMs (if applicable)

RPM (N) = √ ((89440/rotor radius (r) in cm) x RCF (g))

(Divide 89440 by the rotor radius in cm, then multiply by the required RCF in g. The square root of this number is the required RPM.)
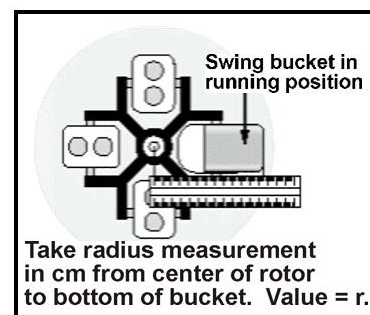
RCF (g) = Relative Centrifugal Force (g)

r = Rotating radius in centimetres (cm) that is measured from the bottom of the bucket/tube holder to the centre of the rotor) (see instructions below)

N = Rotating speed in revolutions per minute (RPM)

How to measure the Centrifuge Rotor Radius:

Using a ruler determine your centrifuge's radius of rotation (cm) by measuring the distance from the centre of the centrifuge rotor to the bottom of the swing bucket when the bucket is in the horizontal position. See illustration.

ENSURE THAT THE RADIUS IN CENTIMETERS (cm) IS MEASURED FROM THE CENTER OF THE SPINDLE POINT ALONG TUBE OR BOTTLE.

Swing bucket in running position

Take radius measurement in cm from center of rotor to bottom of bucket. Value = r.

An average centrifuge rotor radius is 5 – 15 cm. For example, 1750 g requires 4400 rpm with an 8 cm rotor, 4000 rpm with a 10 cm rotor or 3200 rpm with a 15 cm rotor.

See table on next page

Table 1: Centrifuge RPMs required given rotor length and the RCF (g) required.

Rotor radius		RCF (g)						
In mm ↓	In cm ↓	1000 RCF(g)	1200 RCF(g)	1400 RCF(g)	1500 RCF(g)	1600 RCF(g)	1800 RCF(g)	2000 RCF(g)
					RPMs↓			
100	10	3000	3280	3540	3670	3790	4020	4230
120	12	2740	3000	3240	3350	3460	3670	3870
140	14	2530	2770	3000	3100	3200	3400	3580
160	16	2370	2600	2800	2900	3000	3180	3350
180	18	2230	2450	2640	2740	2820	3000	3160
200	20	2120	2320	2510	2600	2680	2840	3000
220	22	2020	2210	2390	2470	2560	2710	2860
240	24	1940	2120	2290	2370	2450	2600	2740
260	26	1860	2040	2200	2280	2350	2490	2630
280	28	1790	1960	2120	2190	2270	2400	2530
300	30	1730	1900	2050	2120	2190	2320	2450
350	35	1600	1760	1900	1960	2030	2150	2270
400	40	1500	1640	1770	1840	1900	2010	2120
450	45	1410	1550	1670	1730	1790	1900	2000
500	50	1340	1470	1590	1640	1700	1800	1900

REVISION LOG

Date/Version	Page(s)	Revision	Notes
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