

Centrifugation g-force Conversion

Convert rotor RPM to RCF (x g) for common rotor radii, so protocols stay rotor-independent.

$$RCF\ (\times\ g) = 1.118 \times 10^{-5} \times r \times N^2$$

r = rotor radius in cm (centre of rotation to the bottom of the tube). N = rotor speed in RPM.

RPM → RCF (× g), by rotor radius

RPM	r = 5 cm	r = 7.5 cm	r = 10 cm	r = 12.5 cm	r = 15 cm
1,000	55.9 x g	83.8 x g	112 x g	140 x g	168 x g
2,000	224 x g	335 x g	447 x g	559 x g	671 x g
3,000	503 x g	755 x g	1,010 x g	1,260 x g	1,510 x g
4,000	894 x g	1,340 x g	1,790 x g	2,240 x g	2,680 x g
5,000	1,400 x g	2,100 x g	2,800 x g	3,490 x g	4,190 x g
6,000	2,010 x g	3,020 x g	4,020 x g	5,030 x g	6,040 x g
8,000	3,580 x g	5,370 x g	7,160 x g	8,940 x g	10,700 x g
10,000	5,590 x g	8,390 x g	11,200 x g	14,000 x g	16,800 x g
12,000	8,050 x g	12,100 x g	16,100 x g	20,100 x g	24,100 x g
15,000	12,600 x g	18,900 x g	25,200 x g	31,400 x g	37,700 x g

Values rounded to 3 significant figures.

Always report RCF (× g), never RPM: rotors differ in radius, so the same RPM gives a different RCF on a different machine. RCF keeps a protocol rotor-independent.

Source: Sambrook & Russell, Molecular Cloning: A Laboratory Manual, Ch 8 appendix; Beckman Coulter public rotor guides.

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For the theory behind centrifugation, see the Biotech Techniques Bible series.

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