



Recommendation of appropriate operating conditions for conical TubeSpin® Bioreactors 15 / 50 mL

	Mammalian Cell culture		Insect Cells	Plant Cell culture
TubeSpin® bioreactor 15	CHO	HEK-293	SF-9	<i>N. tabacum</i> BY-2
Shaking speed rpm	200 – 300	200 – 300	200 – 300	200 – 300
Throw mm	50	50	50	50
Working volume mL	1.5 – 6	1.5 – 6	1.5 – 6	1.5 – 6

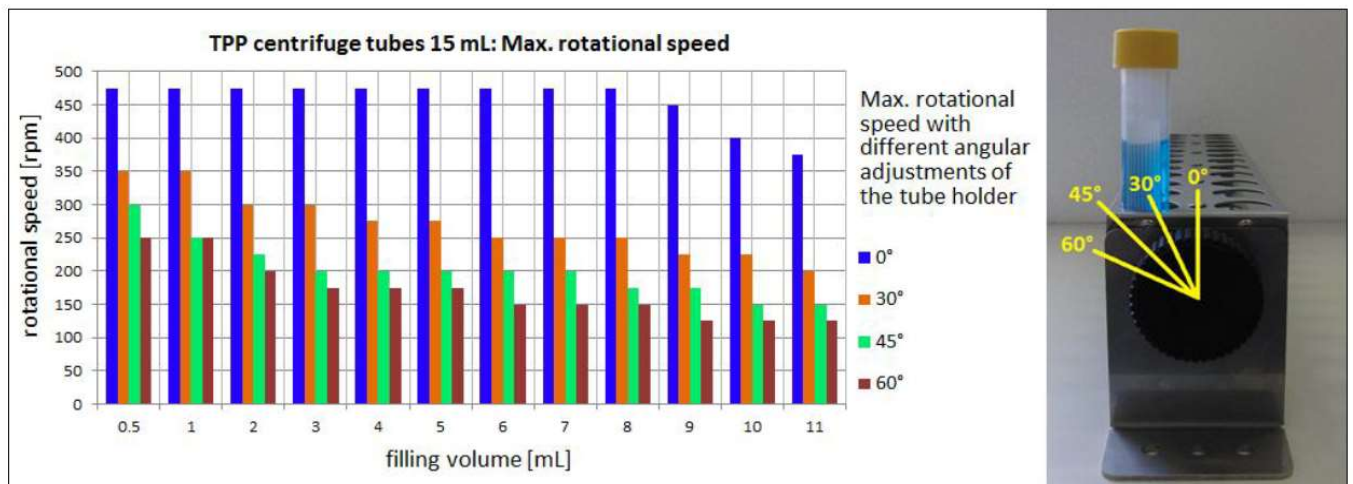
	Mammalian Cell culture		Insect Cells	Plant Cell culture
TubeSpin® bioreactor 50	CHO	HEK-293	SF-9	<i>N. tabacum</i> BY-2
Shaking speed rpm	180 – 250	180 – 250	180 – 250	180 – 250
Throw mm	50	50	50	50
Working volume mL	15 – 30	15 – 30	5 – 10	5 – 10

Max. rotational speed (50 mm shaking diameter) of different volumes of water in 15 mL TPP tubes

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Parameters:

- Different filling volumes of water (0.5 mL – 11 mL)
- Different setting angles of the tube holder (0°, 30°, 45° and 60°)
- 50 mm shaking diameter
- Measured by filming the shaking motion with high speed camera (in 25 rpm steps)

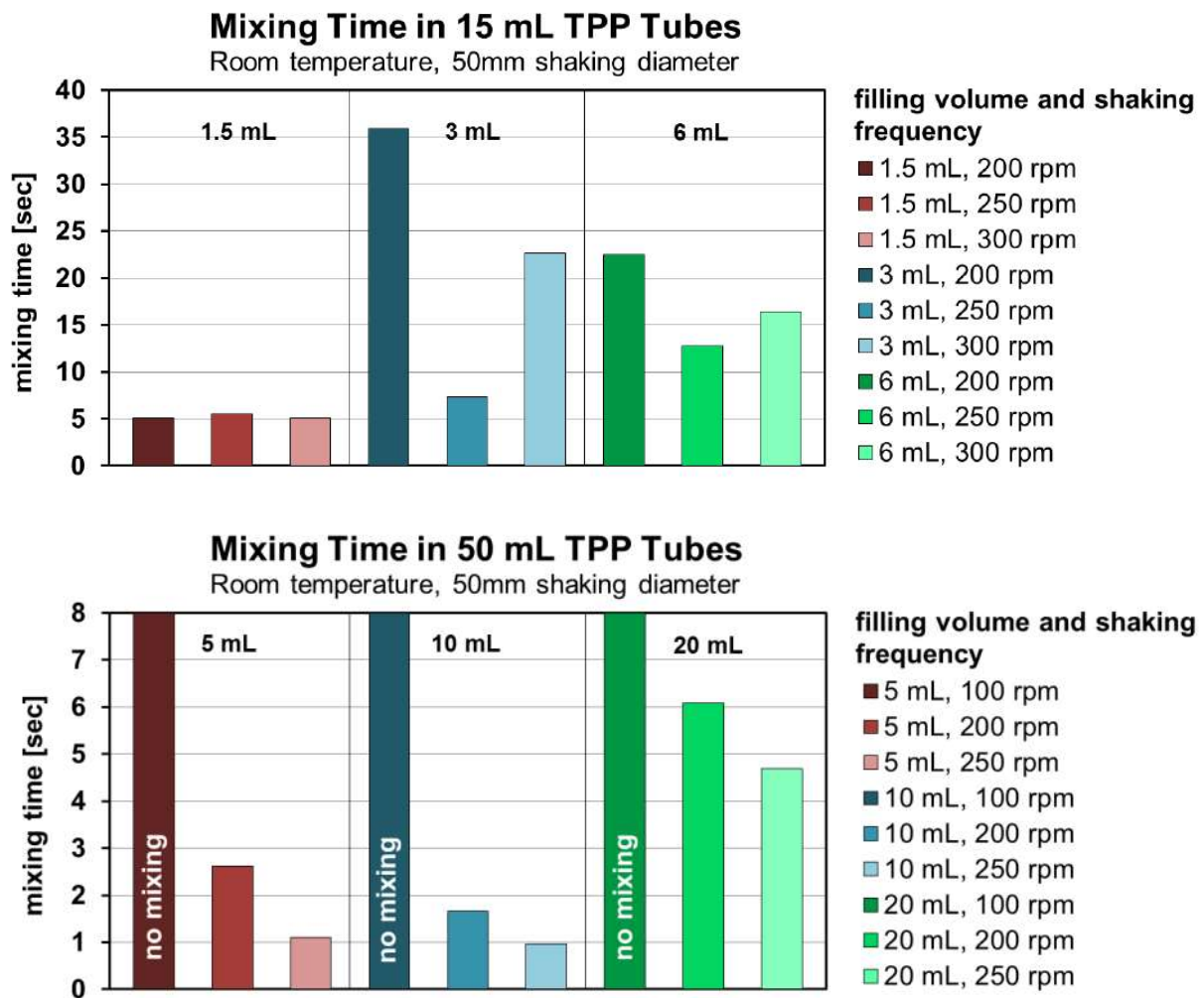




Mixing time of different volumes of water and different shaking frequencies in 15 mL and 50 mL TPP tubes

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Method: Discoloration (with sodium thiosulfate) of amyllum solution colored with Lugol's iodine.



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Methods from the Literature

Reference	Working Volume mL	Throw/Orbit mm	Shaking Speed rpm	TubeSpin® Bioreactor	Cells
Strnad (2010), Biotechnol. Prog.: Vol. 26 (3);pp 653-663	14 – 34	50	180 – 300	50	CHO
Xie (2011), Cytotechnology: Vol. 63 (4); pp 345-350	10 – 35	n.s	160 – 200	50	CHO
Stettler (2007), Biotechnol. Prog.: Vol. 23 (6); pp 1340-1346	5 – 10	50	140	50	CHO
De Jesus (2004), Biochem. Eng. Journal: Vol 17, No. 3; pp 217-223	5	25	200	50	CHO
Shen (2011), BMC Proc.: 5 (Suppl 8); P37	10 – 35	n.s	160 – 200	50	Sf-9
Xie (2011) Biotechnol. Letters Vol 33, pages897–902	10	n.s	75 – 90	50	Sf-9
Hacker (2018) Methods Mol Biol; 1850:123-131	10	50	180	50	CHO/HEK293
Blessing (2019) Mol Ther Methods Clin Dev. 13:14-26.	5 – 10	50	180	50	HEK293