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TPP Recommendations
Medium Volumes in TPP Tissue Culture Vessels

For monolayer cultures, TPP recommends a medium volume-to-growth area ratio of 0.2–0.5 mL/cm², corresponding to a medium height of 2–5 mm covering the cells. The upper limit is determined by the gas exchange efficiency through the liquid layer [1]. The medium height—and thus the volume in the culture vessel—is a critical factor for oxygen supply to the cells, as it influences the oxygen transfer rate (OTR) (Gstraunthaler et al., 1999). For adherent cultures, TPP recommends adjusting the medium volume individually for each cell line and cultivation duration.

For suspension cultures, the given volumes serve as general guidelines. TPP recommends adjusting the medium volume based on the specific cell line, cultivation duration, and key parameters such as orbital shaking and RPM in the incubator. Critical factors include the oxygen transfer rate and shear stress.

1. Tissue Culture Flask

Product No.	Version	Growth Area cm²	Recommended Calculated Volume [1] mL	Volume Graduation mL
90025	VENT	25	5 – 12.5	40
90026	Filter			
90075	VENT	75	15 – 37.5	180
90076	Filter			
90150	VENT	150	30 – 75	450
90151	Filter			
90300	VENT	300	60 – 150	800
90301	Filter			

2. Tissue Culture Flask with peel-off foil

Product No.	Version	Growth Area cm²	Recommended Calculated Volume [1] mL	Volume Graduation mL
90028	Filter	25	5 – 12.5	15
90078	Filter	75	15 – 37.5	60
90153	Filter	150	30 – 75	100
90653	Filter, barrier	115	23 – 57.5	100
90303	Filter	300	60 – 150	200

3. Tissue Culture Flask with re-closable Lid

Product No.	Version	Growth Area cm²	Recommended Calculated Volume [1] mL	Volume Graduation mL
90552	Filter	150	30 – 75	100
90652	Filter, barrier	115	23 – 57.5	100

4. Clipmax

Product No.	Version	Growth Area cm²	Recommended Calculated Volume [1] mL
70010	Filter	10	2.0 – 5

5. Slidemax

Product No.	Version	Growth Area cm²	Recommended Calculated Volume [1] mL
71011	1 Well	10.2 one	2 – 5.1
71012	2 Wells	4.85 each	1.0 – 2.4
71014	4 Wells	2.22 each	0.4 – 1.1
71016	6 Wells	1.31 each	0.3 – 0.7
71018	8 Wells	0.94 each	0.19 – 0.47

6. Tissue Culture Tube

Product No.	Version	Growth Area cm²	Recommended volume mL	Volume Graduation mL
91243	Filter	10	2	5
91106	VENT	20	1-3	10

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7. Tissue Culture Test Plate

Product No.	Version	No. of Wells	Growth Area cm²	Recommended Calculated Volume [1] mL
92006 62106 92406		6	9.026	1.8 – 4.5
92012 92112 92412		12	3.464	0.7 – 1.7
92024 92124 92424		24	1.863	0.4 – 0.9
92048 92148 92448		48	0.882	0.2 – 0.4
92096 92196 92696		96	0.342	0.07 – 0.17
92097 92197 92697		96	0.965	0.07 – 0.17

8. Tissue Culture Dish

Product No.	Inner-∅ mm²	Growth Area cm²	Recommended Calculated Volume [1] mL
93040	34	9.2	1.8 – 4.6
93060	53	22.1	4.5 – 6.6
93100	87	60.1	12 – 18
93150	137	147.8	29 – 44

9. Cryo Tubes

Product No.	Volume Graduation mL	Maximum Filling Volume mL	Recommended Volume [2] mL
89012	0.9	1.05	0.9
98020	1.5	1.85	1.6
89040	3.5	3.55	3.2

89050	4.0	4.5	4.0

10. TubeSpin® Bioreactor (Suspension Cells)

Product No.	Volume Graduation mL	Shaker Ø mm / Speed rpm	Recommend Volume mL
86050	50	50 / 250	5-35
87015	15	50 / 250	1-10
87017	15	50 / 180	1-10
87050	50	50 / 150	5-35
87056	50	50 / 150	5-35
87450	450	50 / 150	< 250
87600	600	50 / 150	< 400

Literature/Reference:
[1] Freshney, Ian R. (2016) Culture of Animal Cells: A Manual of Basic Technique and Specialized (7th Ed.) Wiley (p.128)
[2] Negative thermal expansion of water ~ 10%

Disclaimer

TPP products are for research use only and not for clinical, diagnostic or therapeutic use. All products are intended for use by trained personnel that are familiar with safe laboratory practices.

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