

home of tissue culture

TubeSpin® Bioreactor

Suspension Cell System

SWISS QUALITY

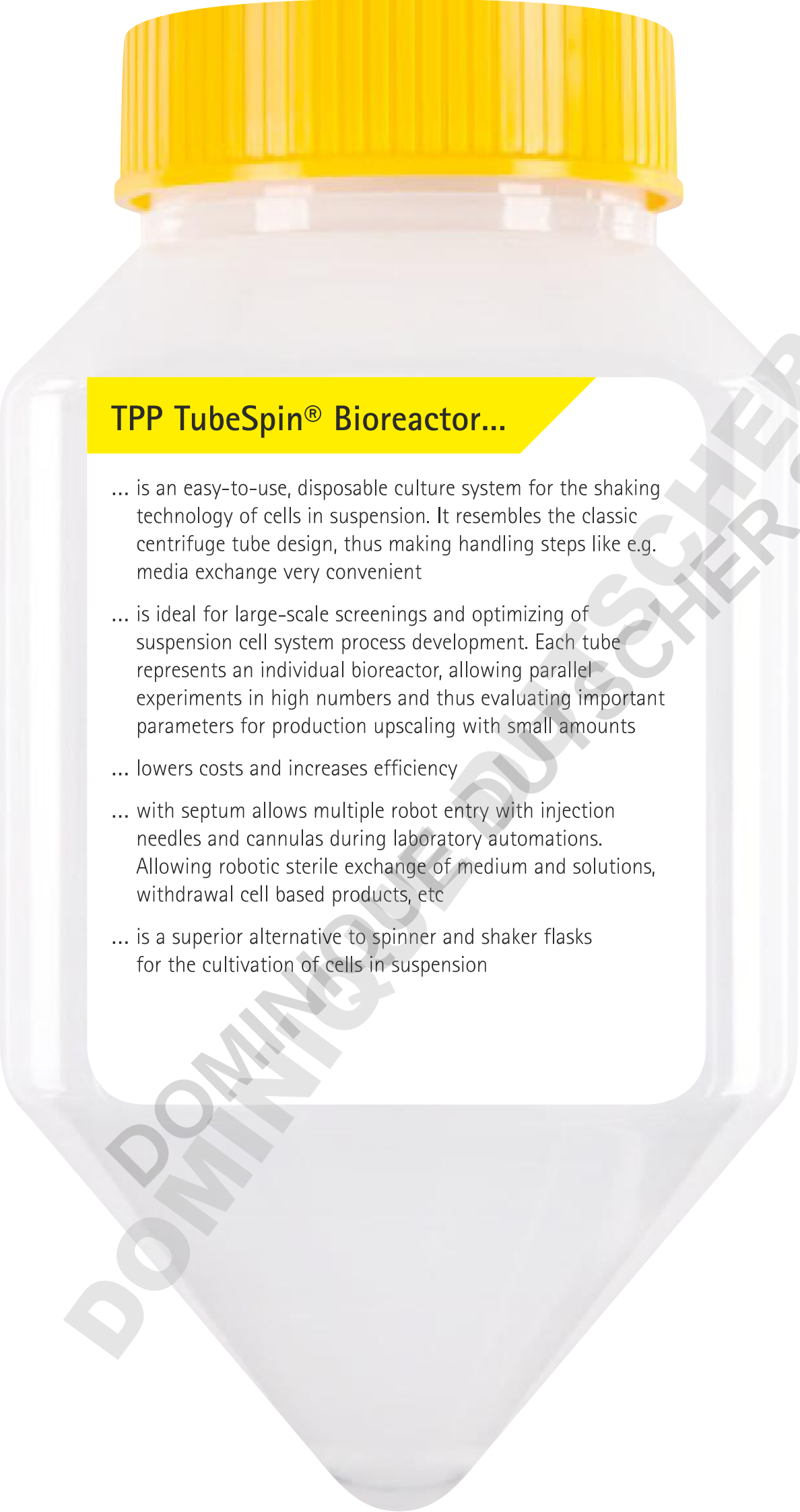
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TubeSpin® Bioreactor

In 2004, a novel container for suspension cultures called TubeSpin® Bioreactor was established. This first disposable bioreactor was made of polypropylene, featured a ventilated screw cap and a volume of 50 ml. It was intended for medium to high-throughput of mammalian cell cultivation. It was developed in collaboration with the Swiss Federal Institute of Technology in Lausanne (EPFL), the company ExcellGene SA in Monthey and TPP Techno Plastic Products AG in Trasadingen (all in Switzerland).

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TPP TubeSpin® Bioreactor...

... is an easy-to-use, disposable culture system for the shaking technology of cells in suspension. It resembles the classic centrifuge tube design, thus making handling steps like e.g. media exchange very convenient

... is ideal for large-scale screenings and optimizing of suspension cell system process development. Each tube represents an individual bioreactor, allowing parallel experiments in high numbers and thus evaluating important parameters for production upscaling with small amounts

... lowers costs and increases efficiency

... with septum allows multiple robot entry with injection needles and cannulas during laboratory automations. Allowing robotic sterile exchange of medium and solutions, withdrawal cell based products, etc

... is a superior alternative to spinner and shaker flasks for the cultivation of cells in suspension

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Technical specifications

Materials



Tube made of PP



Screw Cap made of PE



Septum made of Silicone



Membrane made of PTFE

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Technical specifications

Measurements



	86050	87015	87017	87050	87450	87600
Volume grad.	50	15	15	50	450	600
Length mm	120	120	120	115	145	183
Diameter mm	30	17.1	17.1	30	96	100
(gx) max	15'500	15'500	15'500	15'500	3'500	3'500
Form	conical	conical	round	conical	conical	conical
Optimal filling volume ml	1 - 35	1 - 10	1 - 10	1 - 35	> 300	> 400
Shaker: Recom. amplitude mm	50	50	50	50	50	50
Shaker: Recom. speed rpm	180	250	250	180	150	150
Barcode / Septum	yes / yes	- / -	- / -	- / -	- / -	- / -
Openings in screw cap	Yes, 5 x	Yes, 5 x	Yes, 5 x	Yes, 5 x	Yes, 10 x	Yes, 10 x
Screw cap „solid"	-	-	-	-	87355	87355
Screw cap „filter"	-	-	-	-	87356	87356

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Key Features and Benefits

- **Passive mixing with no stirring mechanism inside**
  There is a low risk of contamination, less shear stress to cells and negligible foaming when shaken appropriately. The technique provides highest oxygen supply to cells observed in a non-instrumented container as well as conditions of extremely low shear stress
- **Fits standard centrifuge apparatus**
  The standard centrifuge design allows scientists to use standard available apparatus to grow and spin cell suspension in the same vessel, thus reducing the chances of contamination

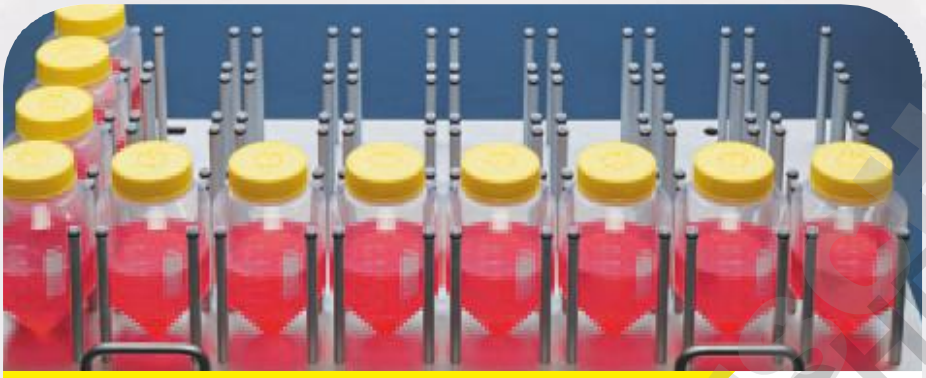
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Key Features and Benefits

- **Saves time/completely disposable**
  Compared to stainless steel equipment, the time required for changeovers between cell lines and batches is reduced. No need for elaborate cleaning or validation procedures. Tubes are sacrificed after the run
- **Low cost**
  The initial investment necessary for equipping a lab or pilot plant is low, as capital costs are exchanged by consumable costs, resulting in a more balanced cost distribution over time. Improved cost effectiveness is particularly important in the context of competition and growing governmental and market price controls

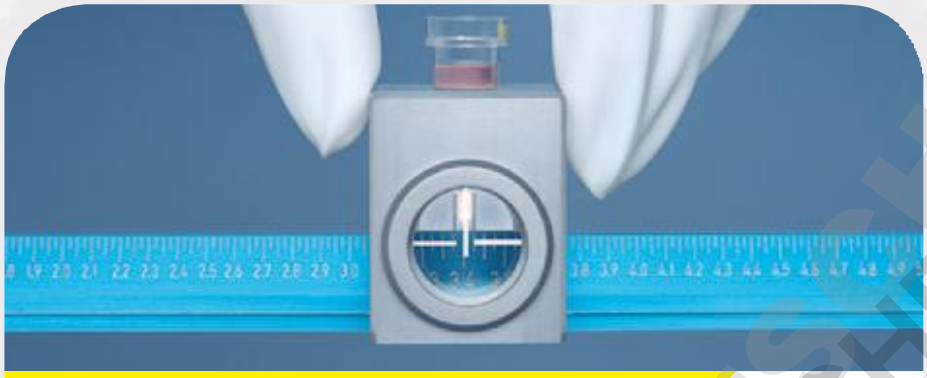
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Key Features and Benefits

- **Smaller footprint**
  The smaller footprint print than a shaker flask allows more vessels to be placed on a shaker platform. This in turn allows a high number of experiments to be performed parallel
- **Shake it on shaker plates**
  The shaker plate from TPP guarantees largest possible volume per shaker plate

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Key Features and Benefits

- **Easy read with easy-read**
  The measuring device with the PCV tube provides a fast, easy to use, reproducible and accurate method for determination of cell number density. This system is particularly convenient as it requires neither special training nor sophisticated expensive machines

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Applications

- Initial cell line screening and development
- Clone selection
- Bioprocess media optimization

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Applications

- Therapeutic protein development for biochemical and pre-clinical studies
- TubeSpin® Bioreactor can also be used for the cultivation of insect cels, yeast and microbial cells
- Various other applications

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Dr. Shaker's Recommendations

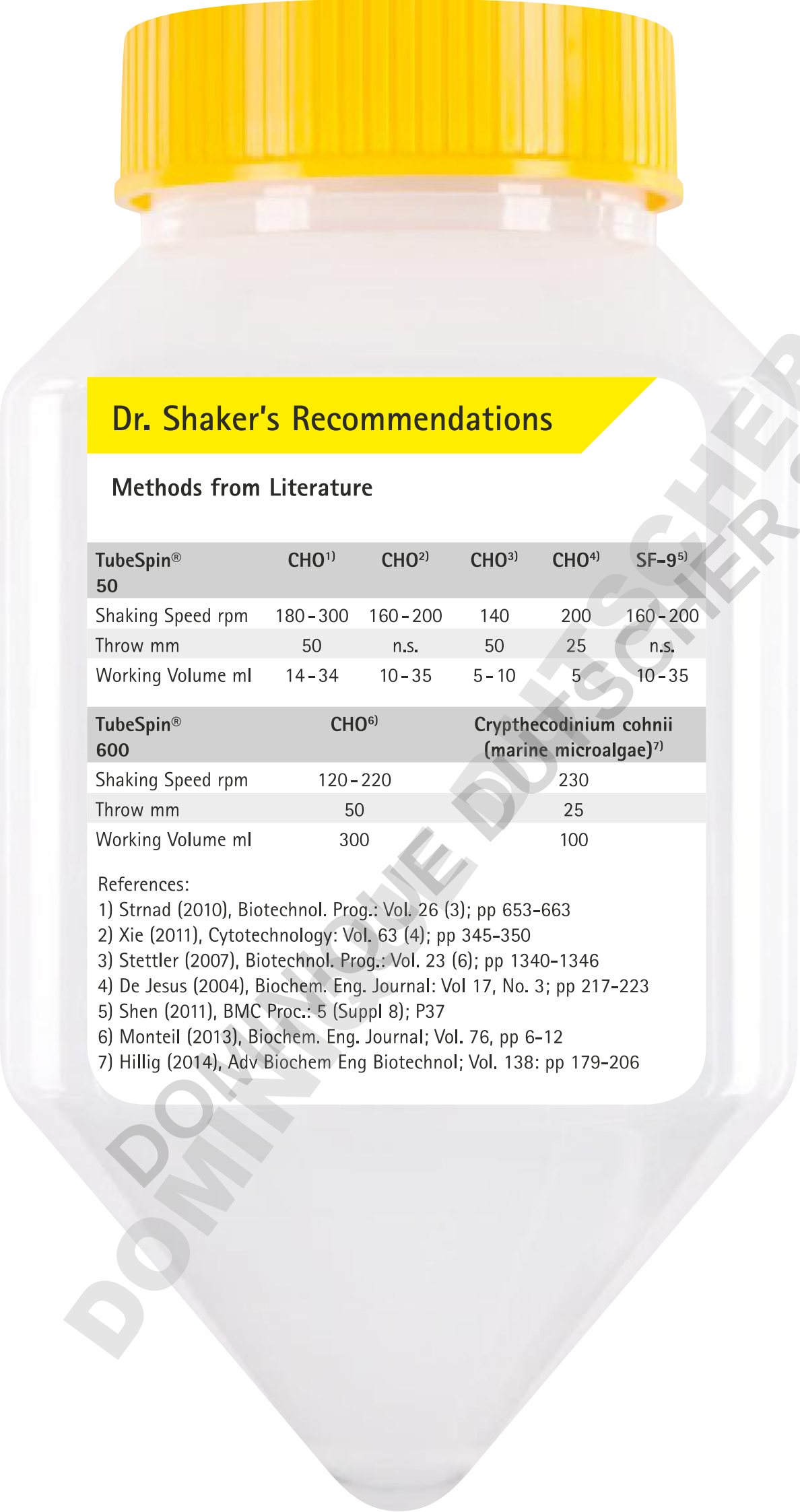


TubeSpin® Bioreactors

TubeSpin® 50	Mammalian Cell culture CHO	HEK-293	Insect Cells SF-9	Plant Cell culture N. tabacum 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

TubeSpin® 450/600	Mammalian Cell culture CHO	HEK-293	Insect Cells SF-9	Plant Cell culture N. tabacum BY-2
Shaking Speed rpm	180 - 250	180 - 250	180 - 250	180 - 250
Throw mm	50	50	50	50
Working Volume ml	300	300	200	150

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Dr. Shaker's Recommendations

Methods from Literature

TubeSpin® 50	CHO[1)]	CHO[2)]	CHO[3)]	CHO[4)]	SF-9[5)]
Shaking Speed rpm	180 - 300	160 - 200	140	200	160 - 200
Throw mm	50	n.s.	50	25	n.s.
Working Volume ml	14 - 34	10 - 35	5 - 10	5	10 - 35

TubeSpin® 600	CHO[6)]	Crypthecodinium cohnii (marine microalgae)[7)]
Shaking Speed rpm	120 - 220	230
Throw mm	50	25
Working Volume ml	300	100

References:
1) Strnad (2010), Biotechnol. Prog.: Vol. 26 (3); pp 653-663
2) Xie (2011), Cytotechnology: Vol. 63 (4); pp 345-350
3) Stettler (2007), Biotechnol. Prog.: Vol. 23 (6); pp 1340-1346
4) De Jesus (2004), Biochem. Eng. Journal: Vol 17, No. 3; pp 217-223
5) Shen (2011), BMC Proc.: 5 (Suppl 8); P37
6) Monteil (2013), Biochem. Eng. Journal; Vol. 76, pp 6-12
7) Hillig (2014), Adv Biochem Eng Biotechnol; Vol. 138: pp 179-206

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Ordering Information

Type	Product-No.	Version
	87015	15 ml, conical
	87017	15 ml, round
	86050	50 ml, conical, with septum, with barcode
	87050	50 ml, conical
	87450	450 ml, conical
	87600	600 ml, conical
	87355	Screw cap "solid"
	87356	Screw cap "filter"
	99013	Rack for 87450/87600
	99017	Rack for 87015/87017/87050
	87611	Kühner plate 32 for TubeSpin® Bioreactor 600
	87612	Kühner plate 20 for TubeSpin® Bioreactor 600
	87613	Kühner plate 16 for TubeSpin® Bioreactor 600
	87631	Infors Multitron plate 32 for TubeSpin® Bioreactor 600
	87633	Infors Minitron plate 16 for TubeSpin® Bioreactor 600

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Volume ml	Dimensions Ø x l mm	Material	Centrifugal Acceleration max gx
15	17.1 x 120	PP	15'500
15	17.1 x 120	PP	15'500
50	30.0 x 115	PP	15'500
50	30.0 x 115	PP	15'500
450	96 x 145	PP	3'500
600	100 x 183	PP	3'500
450 / 600	70 x 21	PE	-
450 / 600	70 x 21	PE	-
3 x 450 / 600	366 x 146 x 70	PP	-
18 x 15 / 10 x 50	209 x 98 x 62	PP	-
8 x 4	800 x 420 x 139	Alu	-
5 x 4	500 x 420 x 139	Alu	-
4 x 4	420 x 420 x 139	Alu	-
8 x 4	850 x 470 x 139	Alu	-
4 x 4	480 x 420 x 139	Alu	-

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