

Technical Note

Comparison of incubator space usage between Greiner Bio-One CELLdisc™ and rectangular multilayer devices

The aim of mass cell culture is to produce large quantities of cells e.g. for industrial or clinical applications. Users can choose from a variety of different disposables and concepts. To constrain side cost of such a scale up process to a minimum different factors have to be evaluated.

If multilayer devices such as the Greiner Bio-One CELLdisc™ are used, not only growth area and number of cells per device should be considered but also the effective usage of the given incubator space.

The innovative CELLdisc™ with its round and ergonomic design differs from ancient existing rectangular devices. The latter by their dimensions seem to imply optimal usage of a cubic space like an incubator. However it has to be taken in account that length and width of such systems do not correlate with the corresponding dimensions of standard incubators leaving a lot of space unused. Additionally such devices cannot be positioned closely next to each other to assure equal thermal distribution.

Contrariwise based on its round design, thermal equilibration space for CELLdisc™ is given already even when the devices are in absolute close proximity (see Fig. 1b). Due to this fact and the 40 % higher surface/volume ratio than standard competitive systems, utilization of incubator space is much better for CELLdisc™ than for rectangular devices (see Table 1).

Table 1: Utilization of incubator space - exemplary calculation of multilayer devices with compareable dimensions.

	CELLdisc™ 16 layers	Competitor A 10 layers, rectangular form	Competitor B 10 layers, rectangular form (high density version)
Dimensions (L x W x H incl. screw cap)	ø 20 cm, H 22 cm	33 cm x 20 cm x 20.5 cm	33 cm x 23 cm x 21 cm
Growth surface (device)	4.000 cm ²	6.360 cm ²	8.216 cm ²
Max. devices / shelf	6	2	2
Max. devices / incubator	12	4	4
Growth surface (incubator load)	12 x 4.000 = 48.000 cm ²	4 x 6.360 = 25.440 cm ²	4 x 8.216 = 32.864 cm ²
Utilization	100 %	53 %	68,47 %



Fig. 1: Standard incubator, e.g. HeraCell 240 (Thermo Fisher Scientific) Incubator size internal dimensions: W 56 cm, H: 67 cm

Fig. 1a: Front view of the incubator:

- 1) Top shelf: Rectangular multilayer devices
- 2) Lower shelf: CELLdisc™

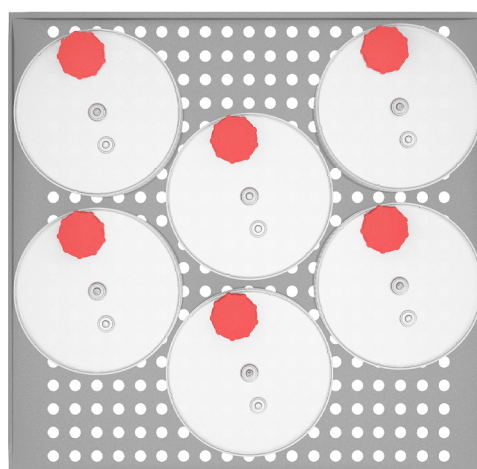


Fig. 1b: Cross section of the incubator.

Optimal positioning of CELLdisc™ and utilization of incubator space.

Ordering Information

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CELLdisc™

Order no.	Layers	Surface treatment	Surface [cm²]	Max. working volume [ml]	Ø [mm]	Cap colour	Sterility SAL 10 ⁻⁶	Quantity per bag	Quantity per case
678101	1	TC	250	70	200	● red	x	1	8
678104	4	TC	1.000	280	200	● red	x	1	4
678904	4	Adv. TC	1.000	280	200	● blue	x	1	4
678108	8	TC	2.000	560	200	● red	x	1	3
678908	8	Adv. TC	2.000	560	200	● blue	x	1	3
678116	16	TC	4.000	1.120	200	● red	x	1	2
678916	16	Adv. TC	4.000	1.120	200	● blue	x	1	2
678140	40	TC	10.000	2.800	200	● red	x	1	1
678940	40	Adv. TC	10.000	2.800	200	● blue	x	1	1

Accessories

Order no.	Product description	Quantity per bag	Quantity per case
878070	CELLswing™ - for the automation of CELLdisc™ suitable for CELLdisc™ with 4, 8 and 16 layers Size: 335 x 216 mm, weight: 17 kg	1	1
878071	CELLlevator™ Stacking device for easy and secure stacking of two CELLdisc™ devices	1	9
878074	CELLhandle™ Gripper for secure, easy transportation of large-sized CELLdisc™ formats	1	1
878075	CELLring™ Levelling ring compensating surface irregularities (e.g. working bench / incubator)	1	3