



# Cultivation Systems From Discovery to Production



Engineering for Life

# Micro-Flask by Duetz | Cultivation in Microtiter Plates

- Simultaneous and reproducible sampling of 96 frozen glycerol stocks
- Low and uniform evaporation rates for every well
- Seal and sterile barrier for individual wells prevents cross contamination

The Micro-Flask system facilitates reproducible and reliable culturing on microtiter plates. The system consists of sandwich covers, cover clamps and a cryo-replicator (for simultaneous inoculation of the plate without having to thaw the frozen stock). The Micro-Flask enables a single person to grow and test thousands of strains simultaneously with a minimum of repetitive handling.



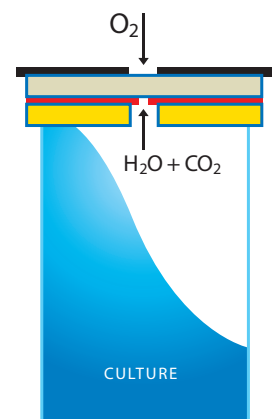
Cryo-Replicator for simple inoculation of 96-well microtiter plates

## Features

- Turns 6, 24 and 96-well microtiter plates into individual micro-reactors
- Oxygen transfer similar to fermenters




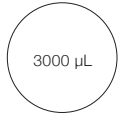








## Applications

- High throughput screening and distribution of mutant and construct libraries e.g. in *E. coli* or yeast
- Metabolic flux studies and high-throughput screening for high activity prokaryotic or eukaryotic mutants
- Comparative studies, e.g. clinical isolates
- Growth medium optimization for cell lines or production strains



Cross-section of Micro-Flask sandwich cover

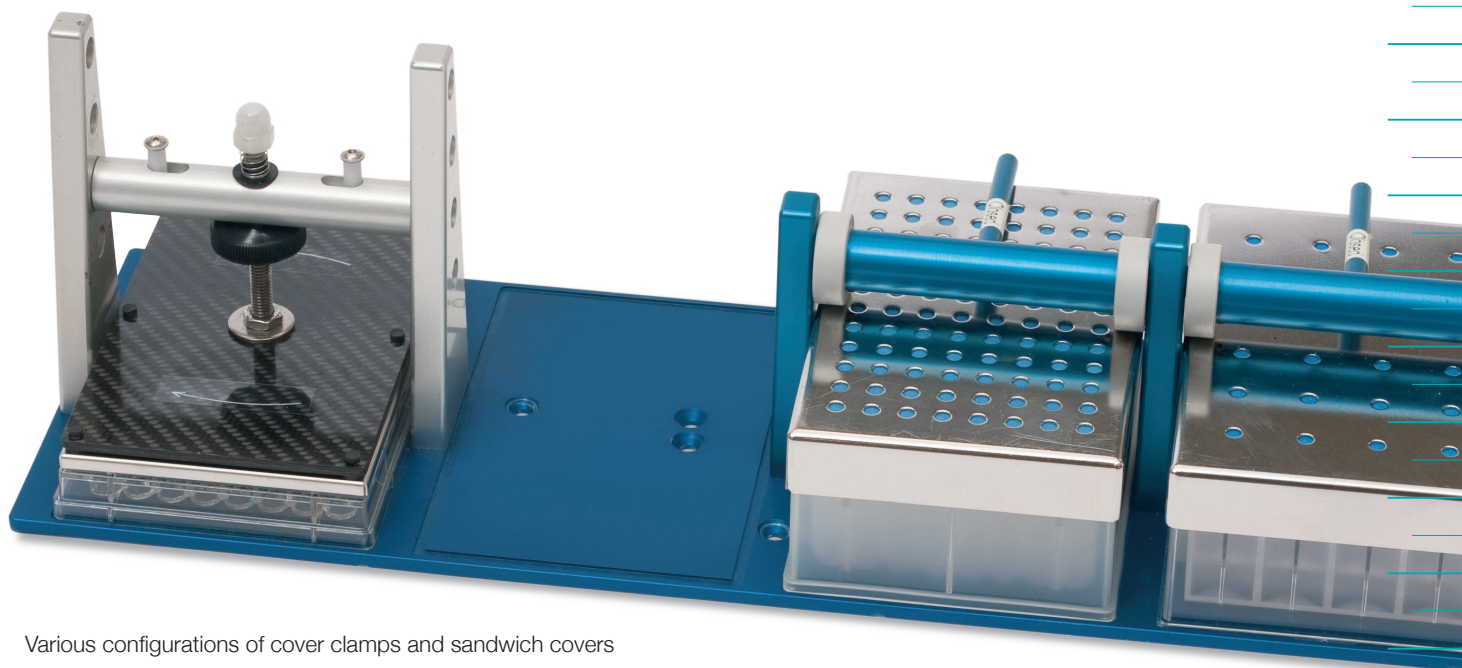
# Specifications

Type of microtiter plate	Well volume	Culture volume	Orbital shaking frequency	Shaking amplitude	O <sub>2</sub> -transfer rate (30°C, air, 1 bar)	Headspace refreshment rate	Evaporation rate per well (at 30°C)	Mixing pattern at 300 rpm			
								ampl.	ampl.		
24-square deep-well polypropylene, 17x17 mm, depth 40 mm		2500 µL	300 rpm	50 mm	51 mmol O <sub>2</sub> / 1 / h	2.5 mL / min	<b>50% humidity:</b> 50 µL H <sub>2</sub> O per day <b>75% humidity:</b> 25 µL H <sub>2</sub> O per day				
		2500 µL	300 rpm	25 mm	39 mmol O <sub>2</sub> / 1 / h	(1 VVM)				2500 µL	2500 µL
		2500 µL	220 rpm	50 mm	35 mmol O <sub>2</sub> / 1 / h						
		4000 µL	300 rpm	50 mm	24 mmol O <sub>2</sub> / 1 / h	2.5 mL / min					
		4000 µL	220 rpm	25 mm	24 mmol O <sub>2</sub> / 1 / h	(0.6 VVM)					
24-round low-well polystyrene, Ø 16 mm, depth 18 mm		750 µL	300 rpm	50 mm	40 mmol O <sub>2</sub> / 1 / h	1.1 mL / min	<b>50% humidity:</b> 30 µL H <sub>2</sub> O per day <b>75% humidity:</b> 15 µL H <sub>2</sub> O per day				
		750 µL	300 rpm	25 mm	25 mmol O <sub>2</sub> / 1 / h	(1.4 VVM)				1000 µL	1000 µL
		1000 µL	300 rpm	50 mm	30 mmol O <sub>2</sub> / 1 / h	1.1 mL / min					
		1000 µL	300 rpm	25 mm	19 mmol O <sub>2</sub> / 1 / h	(1.1 VVM)					
96-square deep-well polypropylene, 8x8 mm, depth 40 mm		500 µL	300 rpm	50 mm	38 mmol O <sub>2</sub> / 1 / h	1 mL / min	<b>50% humidity:</b> 22 µL H <sub>2</sub> O per day <b>75% humidity:</b> 11 µL H <sub>2</sub> O per day				
		500 µL	300 rpm	25 mm	12 mmol O <sub>2</sub> / 1 / h	(2 VVM)				750 µL	750 µL
		750 µL	300 rpm	50 mm	24 mmol O <sub>2</sub> / 1 / h	1 mL / min					
		750 µL	300 rpm	25 mm	7 mmol O <sub>2</sub> / 1 / h	(1.3 VVM)					
		1000 µL	300 rpm	50 mm	18 mmol O <sub>2</sub> / 1 / h	1 mL / min					
		1000 µL	300 rpm	25 mm	3 mmol O <sub>2</sub> / 1 / h	(1 VVM)					
96-round low-well polystyrene, Ø 6.5 mm, depth 11 mm		100 µL	300 rpm	50 mm	39 mmol O <sub>2</sub> / 1 / h	250 µL / min	<b>50% humidity:</b> 6 µL H <sub>2</sub> O per day <b>75% humidity:</b> 3 µL H <sub>2</sub> O per day				
		100 µL	300 rpm	25 mm	20 mmol O <sub>2</sub> / 1 / h	(2.5 VVM)				150 µL	150 µL
		150 µL	300 rpm	50 mm	32 mmol O <sub>2</sub> / 1 / h	250 µL / min					
		150 µL	300 rpm	25 mm	16 mmol O <sub>2</sub> / 1 / h	(1.7 VVM)					
		200 µL	220 rpm	50 mm	12 mmol O <sub>2</sub> / 1 / h	250 µL / min					
		200 µL	300 rpm	25 mm	12 mmol O <sub>2</sub> / 1 / h	(1.3 VVM)					

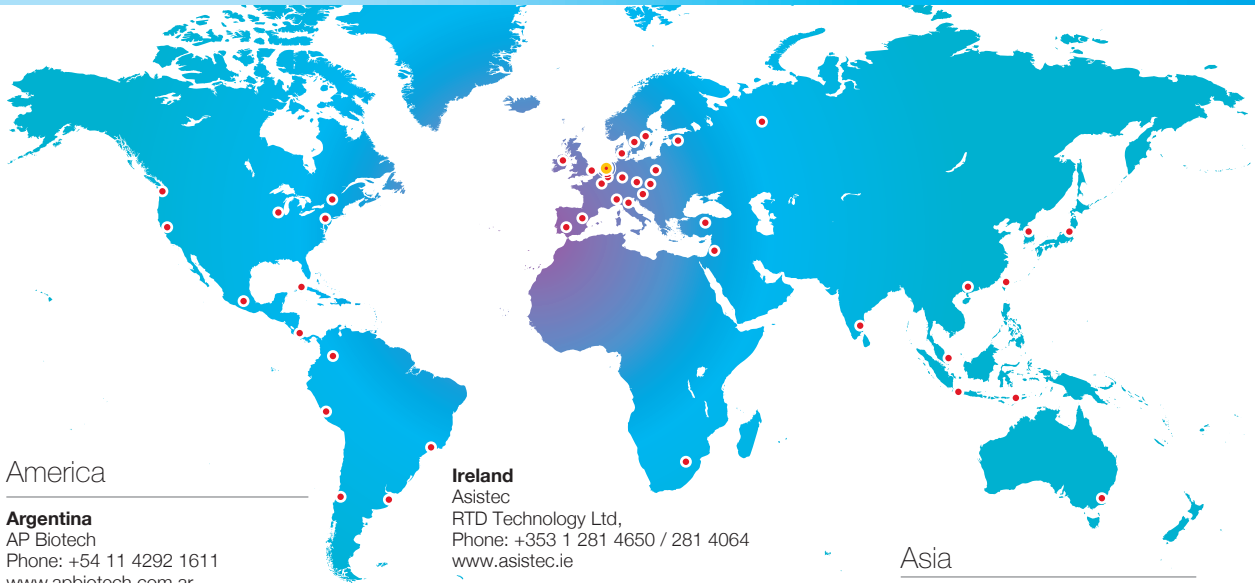
## Related products

Microtiter plates:

- 24-square deep-well plates
- 24-round low-well plates
- 96-square deep-well plates
- 96-round low-well plates



Various configurations of cover clamps and sandwich covers



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