

# Micro-Flask by Duetz, cultivation in microtiter plates

The Micro-Flask system facilitates reproducible and reliable culturing on microtiter plates. The system consists of sandwich covers, cover clamps and cryo-replicator. The Micro-Flask enables a single person to grow and test thousands of strains simultaneously with a minimum of repetitive handling.



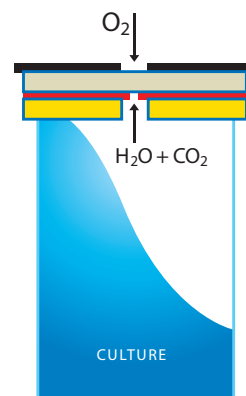
Cryo-Replicator for simple inoculation of 96-well microtiter plates

## Features

- Conversion of 24 and 96 microtiter plates (both deep- and low-well plates) into individual micro-reactors
- Low and uniform evaporation rates for every well
- Sterile barrier for individual wells prevents cross contamination
- Oxygen transfer rates similar to shake flasks in standard orbital shakers
- Simultaneous and reproducible sampling of 96 frozen glycerol stocks




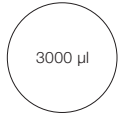








## Applications

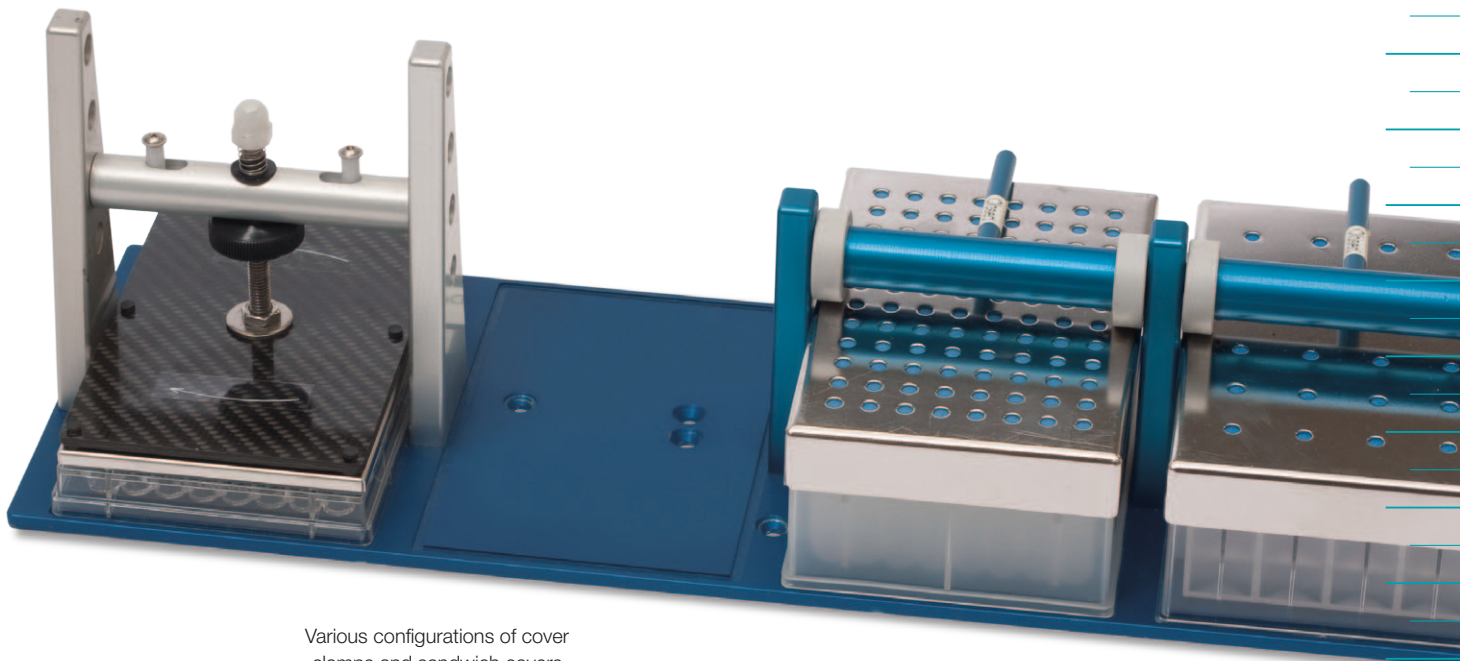
- High throughput screening and distribution of mutant and construct libraries e.g. in *E. coli* or yeast
- Metabolic flux studies and high-throughput screening for high activity prokaryotic or eukaryotic mutants
- Comparative studies, e.g. clinical isolates
- Growth medium optimization for cell lines 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.	
								25 mm	50 mm
24-square deep-well polypropylene, 17x17 mm, depth 40 mm		2500 µl	300 rpm	50 mm	51 mmol O <sub>2</sub> /l/h	2.5 ml/min	<b>50% humidity:</b> 50 µl H <sub>2</sub> O per day		
		2500 µl	300 rpm	25 mm	39 mmol O <sub>2</sub> /l/h	(1 VVM)			
		2500 µl	220 rpm	50 mm	35 mmol O <sub>2</sub> /l/h				
		4000 µl	300 rpm	50 mm	24 mmol O <sub>2</sub> /l/h	2.5 ml/min			
		4000 µl	220 rpm	25 mm	24 mmol O <sub>2</sub> /l/h	(0.6 VVM)			
							2500 µl	2500 µl	
24-round low-well polystyrene, Ø 16 mm, depth 18 mm		750 µl	300 rpm	50 mm	40 mmol O <sub>2</sub> /l/h	1.1 ml/min	<b>50% humidity:</b> 30 µl H <sub>2</sub> O per day		
		750 µl	300 rpm	25 mm	25 mmol O <sub>2</sub> /l/h	(1.4 VVM)			
		1000 µl	300 rpm	50 mm	30 mmol O <sub>2</sub> /l/h	1.1 ml/min			
		1000 µl	300 rpm	25 mm	19 mmol O <sub>2</sub> /l/h	(1.1 VVM)			
							1000 µl	1000 µl	
96-square deep-well polypropylene, 8x8 mm, depth 40 mm		500 µl	300 rpm	50 mm	38 mmol O <sub>2</sub> /l/h	1 ml/min	<b>50% humidity:</b> 22 µl H <sub>2</sub> O per day		
		500 µl	300 rpm	25 mm	12 mmol O <sub>2</sub> /l/h	(2 VVM)			
		750 µl	300 rpm	50 mm	24 mmol O <sub>2</sub> /l/h	1 ml/min			
		750 µl	300 rpm	25 mm	7 mmol O <sub>2</sub> /l/h	(1.3 VVM)			
		1000 µl	300 rpm	50 mm	18 mmol O <sub>2</sub> /l/h	1 ml/min			
							750 µl	750 µl	
96-round low-well polystyrene, Ø 6.5 mm, depth 11 mm		100 µl	300 rpm	50 mm	39 mmol O <sub>2</sub> /l/h	250 µl/min	<b>50% humidity:</b> 6 µl H <sub>2</sub> O per day		
		100 µl	300 rpm	25 mm	20 mmol O <sub>2</sub> /l/h	(2.5 VVM)			
		150 µl	300 rpm	50 mm	32 mmol O <sub>2</sub> /l/h	250 µl/min			
		150 µl	300 rpm	25 mm	16 mmol O <sub>2</sub> /l/h	(1.7 VVM)			
		200 µl	220 rpm	50 mm	12 mmol O <sub>2</sub> /l/h	250 µl/min			
							150 µl	150 µl	



Various configurations of cover clamps and sandwich covers