

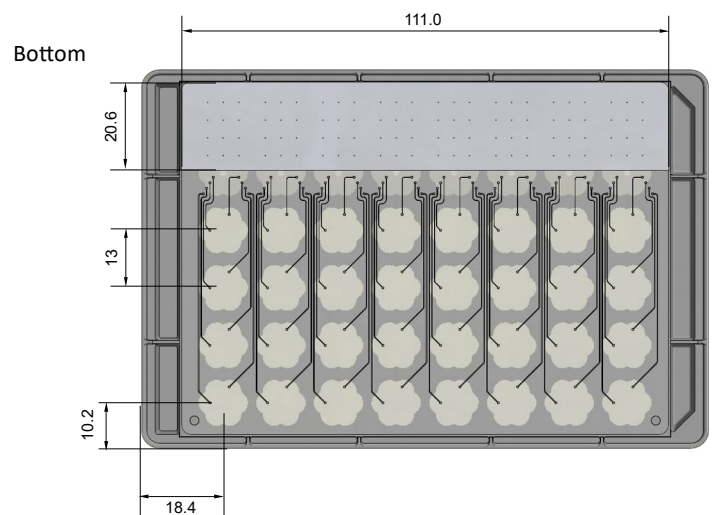
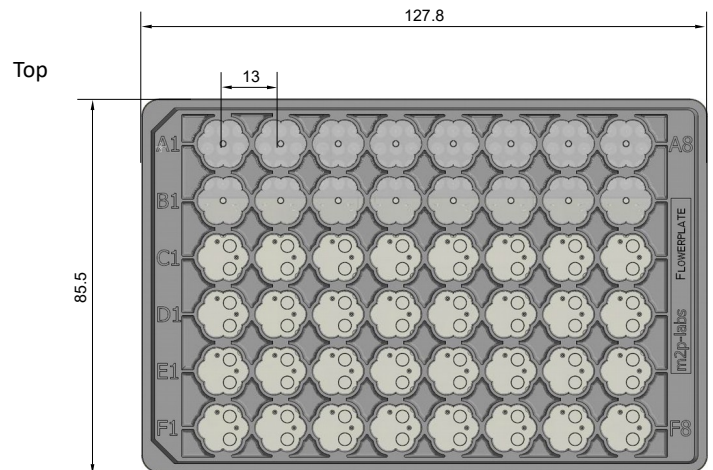
Microfluidic FlowerPlate® (48 well MTP, flower) MTP-MF32-XXXX

Flat microfluidic bottom, flower-shaped well, high-purity polystyrene

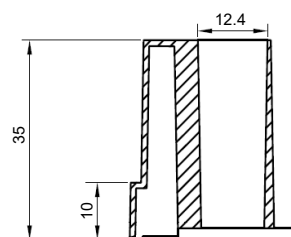
Technical parameters

Specification	Description
Type	<ul style="list-style-type: none"> - High-purity polystyrene microplate - 48 flower-shaped wells: <ul style="list-style-type: none"> 16 reservoir wells, 32 cultivation wells - Transparent microfluidic polystyrene flat bottom - Free of heavy metal
Dimension (standard SBS/SLAS footprint)	<ul style="list-style-type: none"> - Length: 127.8 mm - Width: 85.5 mm - Height: 35 mm - Cavity depth: 33 mm
Volume / well	<ul style="list-style-type: none"> - Total well volume: 3200 μL - Working volumes: refer to next page - Note: Maximum filling volumes may vary with altered characteristics of fermentation broth
Microfluidic features	<ul style="list-style-type: none"> - Pump stroke volume: ca. 120 nL (H_2O, depending on media) - Maximum pump rate per well: ca. 80 $\mu\text{L/h}$ (665 pump strokes per hour)
Technical data (performance)	<ul style="list-style-type: none"> - Refer to next page for detailed data on OTR within recommended conditions - Approx. range of OTR: 30 – 110 mmol/L/h - Approx. range of $k_L a$: 100 – 650 h^{-1} - Effective mixing: flower shape acts similar like baffles - No optical cross talk from well to well (black plate corpus) - Range of operation temperature: -20 – 60 $^\circ\text{C}$
Measurement options	<ul style="list-style-type: none"> - Biomass (via scattered light) - Fluorescence (intensity measurement) - pH value with pre-calibrated optodes - DO (dissolved oxygen) with pre-calibrated optodes
Sterilization	<ul style="list-style-type: none"> - 20 kGy (β-radiation) - Sterile packed (single plate)
Other information	<ul style="list-style-type: none"> - Only to be used in combination with sealing foil F-GPRSMF32-1 - Sedimentation of biomass may occur at shaking frequencies lower than 600 rpm ^{*1} - Autoclavability: no - For single use only - Centrifugation: max. 4000 x g (with swinging-bucket rotor for microplates)

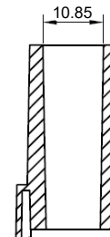
MTP geometry for automation purpose [mm]



Section (length)



Section (width)



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OTR: Oxygen transfer rate [mmol/L/h]
 $k_L a$: Volumetric oxygen transfer coefficient [h^{-1}]
^{*1}: Shaking diameter 3 mm (measured in BioLector®)

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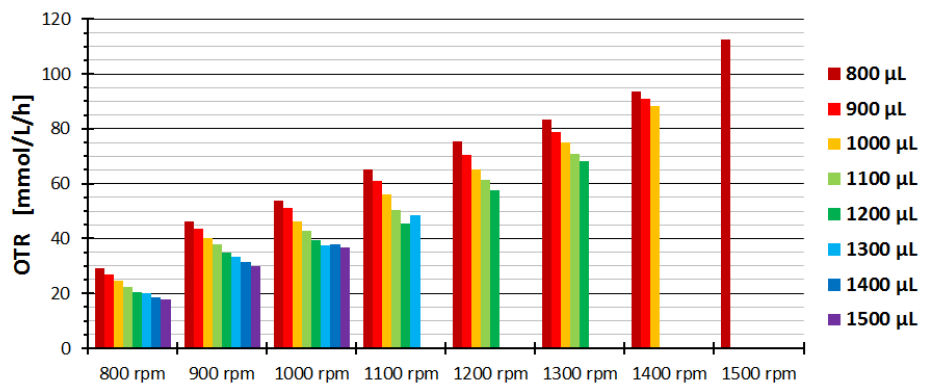
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Operating conditions in the Microfluidic FlowerPlate®

Working volumes *2

Shaking frequency	Max. filling volume A + B	Max. filling volume C - F	Min. filling volume
800 rpm	1800 µL	1900 µL	800 µL
900 rpm	1800 µL	1700 µL	800 µL
1000 rpm	1800 µL	1500 µL	800 µL
1100 rpm	1800 µL	1500 µL	800 µL
1200 rpm	1800 µL	1400 µL	800 µL
1300 rpm	1800 µL	1200 µL	800 µL
1400 rpm	1800 µL	1000 µL	800 µL
1500 rpm	1800 µL	900 µL	800 µL

Oxygen transfer rates for the recommended conditions *2 *3

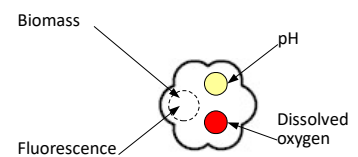


Optode (optical sensor spots) parameters

Dissolved oxygen measurement	MTP-MF32-BOH1	MTP-MF32-BOH2	MTP-MF32-BOH3
Measurement range	0 – 100 % O ₂ (air saturation)	0 – 100 % O ₂ (air saturation)	0 – 100 % O ₂ (air saturation)
Accuracy (depending on batch calibration)	± 5 % dissolved oxygen (DO)	± 5 % dissolved oxygen (DO)	± 5 % dissolved oxygen (DO)
Wavelength	ex.: 520 nm; em.: 600 nm	ex.: 625 nm; em.: 775 nm	ex.: 625 nm; em.: 775 nm
Response time (t90)	At 25 °C < 30 s	At 25 °C < 30 s	At 25 °C < 30 s
Temperature range	15 – 50 °C	10 – 40 °C	10 – 40 °C
Compatibility (useable with)	pH 1 – 14, CO ₂ , H ₂ S, SO ₂ , salinity	ethanol (≤ 5 % v/v), methanol (≤ 5 % v/v)	ethanol (≤ 5 % v/v), methanol (≤ 5 % v/v)
Cross sensitivity to	Organic solvents (acetone, chloroform, ...)	Organic solvents (acetone, chloroform, ...)	Organic solvents (acetone, chloroform, ...)

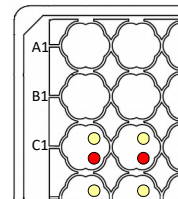
pH measurement	MTP-MF32-BOH1	MTP-MF32-BOH2	MTP-MF32-BOH3
Measurement range	4.5 – 7.5 pH	4.5 – 7.0 pH	4.0 – 6.0 pH
Accuracy (depending on batch calibration)	at pH = 7: ± 0.1 pH	at pH = 7: ± 0.1 pH	at pH = 5: ± 0.1 pH
Wavelength	ex.: 470 nm; em.: 525 nm	ex.: 508 nm; em.: 550 nm	ex.: 625 nm; em.: 750 nm
Response time (t90)	At 25 °C < 30 s	At 25 °C < 30 s	At 25 °C < 30 s
Temperature range	15 – 50 °C	15 – 50 °C	15 – 50 °C
Compatibility (useable with)	Aqu. solutions, ethanol (≤ 5 % v/v), methanol (≤ 5 % v/v)	Aqu. solutions, ethanol (≤ 5 % v/v), methanol (≤ 5 % v/v)	Aqu. solutions, ethanol (≤ 5 % v/v), methanol (≤ 5 % v/v)
Cross sensitivity	At red. ionic strength (< 100 mM); fluorescent metabolites in yellow/green wavelengths (GFP, Riboflavine, YFP)	At red. ionic strength (< 100 mM); fluorescent metabolites in yellow/green wavelengths (GFP, Riboflavine, YFP)	At reduced ionic strength (< 100 mM)

Measuring position for



Configuration of optodes

MTP-MF32-BOHX



Solution	Recommended Concentration
Glucose, Fructose, Glycerin (≥ 25 °C)	max. 500 g/L
NaOH, KOH	3 M
Ammonia Solution	10 %
H ₃ PO ₄ , H ₂ SO ₄ , HCl	3 M
CH ₃ COOH	30 %

- *2: Measured in BioLector®Pro (shaking diameter 3.0 mm, 25 °C, humidity off, horizontal alignment, test fluid: water with Coomassie Blue)
- *3: OTR determined with aqueous sulfite oxidation system (0.5 M)
- *4: Depending on the composition of the liquid medium, the maximum working volume at a defined shaking frequency may be less.

Available plate types

Art. No.	Description
MTP-MF32-BOH1	Microfluidic FlowerPlate® (48 well MTP) incl. HP8/PSt3 pH/DO optode/cultivation well
MTP-MF32-BOH2	Microfluidic FlowerPlate® (48 well MTP) incl. LG1/RF pH/DO optode/cultivation well
MTP-MF32-BOH3	Microfluidic FlowerPlate® (48 well MTP) incl. pH51/RF pH/DO optode/cultivation well

BOH1/2/3 BOH1: HP8/PSt3 (ID 202/203); BOH2: LG1/RF (ID 221/228); BOH3: pH51/RF (ID 424/228)

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