

# RAYDROP

## Single Emulsion

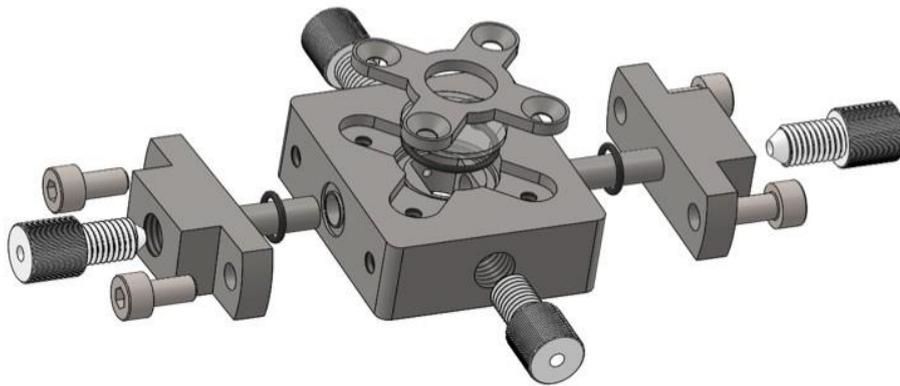


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## DESCRIPTION

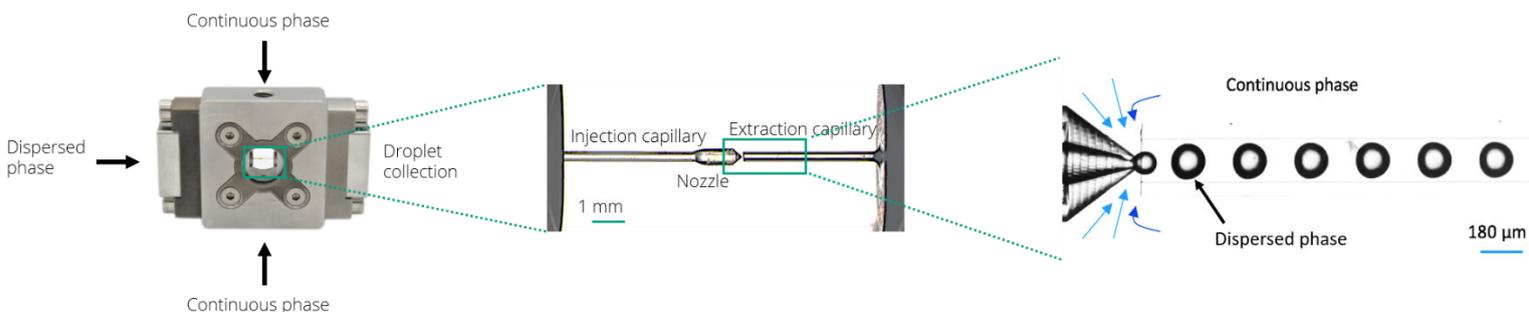
The RayDrop is a microfluidic droplet generator composed of three main components. These are all removable/replacable.

- An injection capillary (nozzle)
- An extraction capillary
- A center chamber to contain the continuous phase



The RayDrop works based on a co-flow focusing principle.

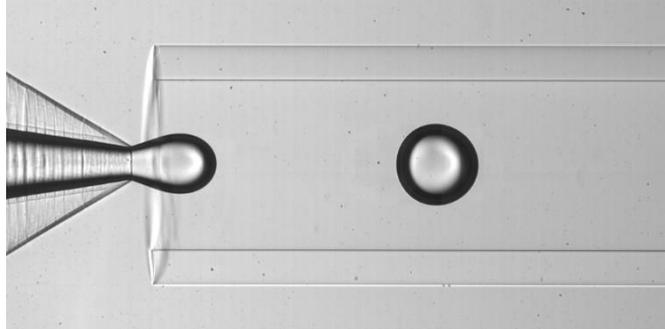
The nozzle and outlet capillary are aligned in the continuous phase chamber. The dispersed phase comes through the nozzle to create the microdroplet into the continuous phase and exit through the extraction capillary.



# PRODUCT DATASHEET

The RayDrop is available in three standard configurations (Nozzle size-Extraction capillary size), to target a broad range of droplet/particle sizes:

- 30 $\mu$ m-150 $\mu$ m
- 60 $\mu$ m-300 $\mu$ m
- 90 $\mu$ m-450 $\mu$ m



For flexibility and compatibility, the nozzle insert is also available in two different materials:

- **Methacrylate resin:** Ideal for use of non-harsh solutions (Water, mineral oil, fluorocarbon oil, ethyl acetate...)
- **Glass nozzle :** Ideal for use of stronger chemicals such as Chloroform, Dichloromethane, DMSO, etc...

*Additional components:*



The RayDrop is a versatile device. Components including the Nozzle and collecting capillary are easily exchangeable. This allows one to target different droplet sizes as well as for potential cleaning if needed.

## BENEFITS AND FEATURES

- Highly flexible: can perform water-in-oil and oil-in-water droplets
- No need for surfactants to form droplets
- Coating- free surfaces
- Up to 10 000 Hz droplet generation rate
- Droplet sizes from 15µm to 450µm diameter
- Easy to clean, exchangeable capillaries
- No leakage, uses standard HPLC PEEK connectors
- Easy microscopic visualization

## Product offering

PN	Product name	Capillary sizes	Nozzle type
1DPRD01	Raydrop	30µm-150µm	Methacrylate Resin
ORDRPSE-60-300	Raydrop	60µm-300µm	Methacrylate Resin
ORDRPSE-90-450	Raydrop	90µm-450µm	Methacrylate Resin
ORDRPSNO-30	Simple nozzle insert	30µm	Methacrylate Resin
ORDRPSNO-60	Simple nozzle insert	60µm	Methacrylate Resin
ORDRPSNO-90	Simple nozzle insert	90µm	Methacrylate Resin
ORDRPCOL-150	Collecting capillary insert	150µm	Glass
O-SP-CCI300-CO	Collecting capillary insert	300µm	Glass
O-SP-CCI450-CO	Collecting capillary insert	450µm	Glass
O-SE-RDRPC01G-EUP	Raydrop	30µm-150µm	Glass
O-SE-RDRPC02G-EUP	Raydrop	60µm-300µm	Glass
O-SE-RDRPC03G-EUP	Raydrop	90µm-450µm	Glass
O-SE-GSNO30-EUP	Simple nozzle insert	30µm	Glass
O-SE-GSNO60-EUP	Simple nozzle insert	60µm	Glass
O-SE-GSNO90-EUP	Simple nozzle insert	90µm	Glass

# PRODUCT DATASHEET

## Specification

### RAYDROP RESIN NOZZLE

Chip characteristics	Co-flow focusing design
	2 inputs, 1 output
	Water-in-oil and oil-in-water droplets
Connectors	Standard 1/4-28 Flat-Bottom connectors
Droplet size	From 15 µm to 450 µm outer diameter droplet size
Generation rate	10 000 Hz (measured for the smallest droplet size) can go higher under specific conditions
Capillary dimensions* <i>*Depending on Raydrop configuration</i>	Nozzle size <ul style="list-style-type: none"><li>• 30 µm ID</li><li>• 60 µm ID</li><li>• 90µm ID</li></ul> Inlet and outlet capillaries: <ul style="list-style-type: none"><li>• 150 µm ID</li><li>• 300 µm ID</li><li>• 450 µm ID</li></ul>
External dimensions	L * I * h = 60 mm * 40 mm * 13 mm
Weight	205 g
Operating pressure	0-5 bar
Burst pressure	10 bar
Wetted materials-continuous phase	PEEK, FEP, glass, stainless steel, polyimide, Kalrez(seal), methacrylate resin (nozzle)
Wetted materials-dispersed phase	PEEK, FEP, Glass, methacrylate resin (nozzle)
Internal Volume	600 µL

## RAYDROP GLASS NOZZLE

Chip characteristics	Co-flow focusing design
	2 inputs, 1 output
	Water-in-oil and oil-in-water droplets
Connectors	Standard 1/4-28 Flat-Bottom connectors
Droplet size	From 15 µm to 450 µm diameter droplet size
Generation rate	10 000 Hz (measured for the smallest droplet size) can go higher under specific conditions
Capillaries dimensions* <i>*Depending on Raydrop configuration</i>	Nozzle: <ul style="list-style-type: none"> <li>• 30 µm ID</li> <li>• 60 µm ID</li> <li>• 90µm ID</li> </ul> Inlet and outlet capillaries: <ul style="list-style-type: none"> <li>• 150 µm ID</li> <li>• 300 µm ID</li> <li>• 450 µm ID</li> </ul>
External dimensions	L * l * h = 60 mm * 40 mm * 13 mm
Weight	205 g
Operating pressure	0-5 bar
Burst pressure	10 bar
Wetted materias- continuous phase	PEEK, FEP, glass, stainless steel, polyimide, Kalrez(seal)
Wetted materials-dispersed phase	PEEK, FEP, Glass
Internal Volume	600 µL

# PRODUCT DATASHEET

## COMPATIBILITY CHART

### RAYDROP RESIN NOZZLE

Solvent	Short run (1h)	Long run (24h)
Acetone	✓	✓
Dichloromethane	✓	✗
Isopropanol	✓	✓
Ethanol	✓	✓
Ethyl acetate	✓	✓
Toluene	✓	✗
DMSO	✓	✗
THF	✓	✓
Sulfuric acid 5%	✓	✓
Mineral oil	✓	✓
Silicone oil	✓	✓
Fluorinated oil	✓	✓

### RAYDROP GLASS NOZZLE

Solvent	Short run (1h)	Long run (24h)
Acetone	✓	✓
Dichloromethane	✓	✓
Isopropanol	✓	✓
Ethanol	✓	✓
Ethyl acetate	✓	✓
Toluene	✓	✓
DMSO	✓	✓
THF	✓	✓
Sulfuric acid 5%	✓	✓
Mineral oil	✓	✓
Silicone oil	✓	✓
Fluorinated oil	✓	✓



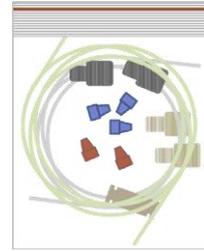
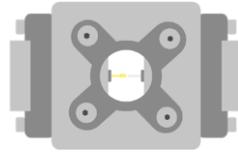
# PRODUCT DATASHEET

## DETAILED CONTENTS

### Contents

1\* RayDrop

1\* RayDrop connector and fitting kit



### RayDrop connector and fitting kit

RayDrop kit contents	Quantity	Picture
Tubing 1/32" OD, 127µm ID	2 * 10cm	
Output tubing 1/16" OD, 254 µm ID	1 * 2m	
Tubing 1/16" OD, 508µm ID	2 * 5cm	
Sleeves for 1/32" OD tubing	2	
Union with XP-235 fittings	3	
10-32 plugs	3	
XP235+ferrules	4	
Additional ferrules	4	
Raydrop support	1	

# PRODUCT DATASHEET

