

sunshine



UNCHAINED
LABS

The whole nanoparticle shebang

Sunshine is all about helping researchers create the perfect therapeutic nanoparticle. Automate your exploration of ideal flow rates, different mixing options, and the right dilution factors to keep them stable. When you've got everything just right, Sunshine can shift into continuous mode, making tens of liters in a day. Get process development and scale-up on one platform – who would have figured?

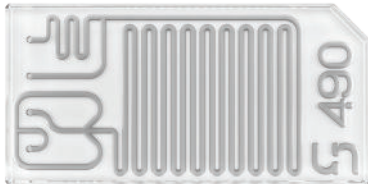
- Automated nanoparticle development
- Fully reusable microfluidics
- Options from 400 μL to continuous flow
- Automated cleaning
- Direct transfer to GMP



Find your flow

Fill one syringe with payloads, the other with lipids or other nanoparticle building blocks, and you're ready to mix up your nanoparticles with a Sunny. Sunnies are infinitely reusable and come in a range of geometries and sizes, with 9 different options to suit any application. Sunnies can be swapped in seconds, are cleaned after each experiment and when you're ready to turn up the volume they can run longer than you can.

Sunny Trident



- Reverse-angle mixing
- In-line dilution

Sunny X



- Cross-type mixing
- Multiple channel sizes

Sunny T



- T-mixing
- Multiple channel sizes

Sunshine wherever you're at

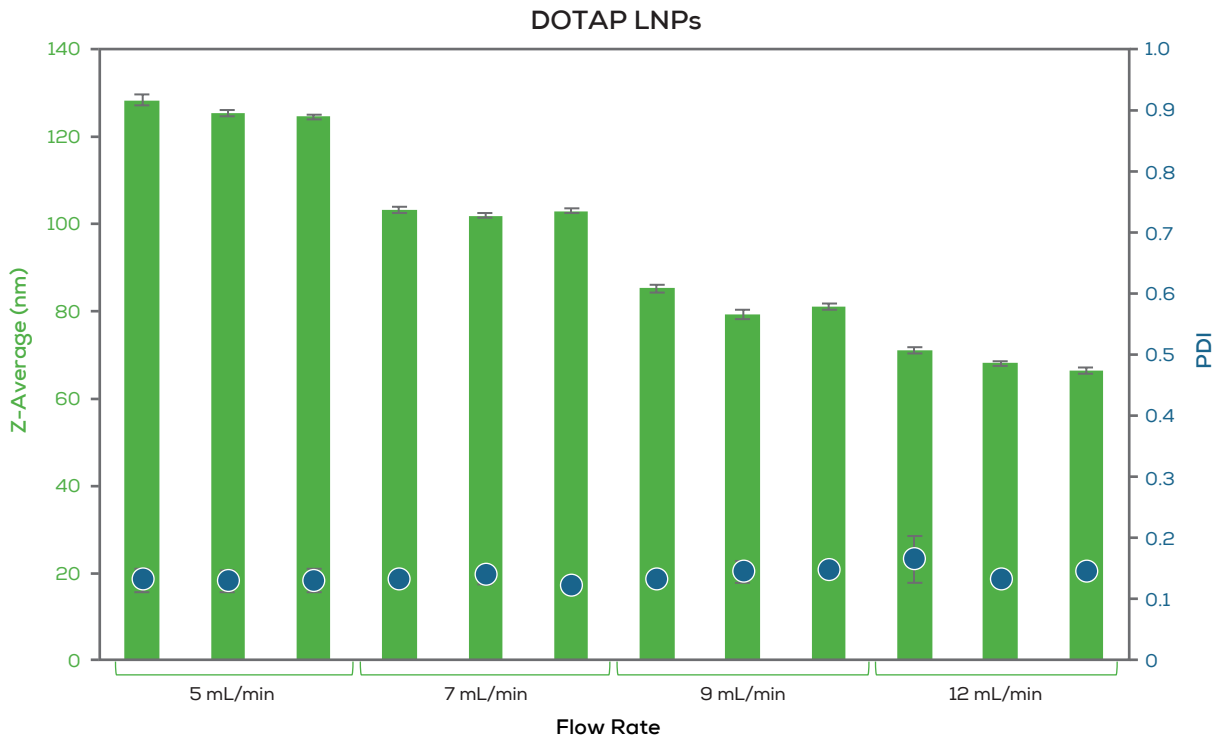
Wherever you're at in development, there's a Sunshine to suit. Fully featured Sunshine covers all the bases to take your nanomedicine from development to manufacturing. For exploring novel nanoparticles without in-line dilution, grab a Sunshine Lite. If you're looking for a one-by-one, walk-up-and-run nanoparticle maker, Sunshine Single is ready to mingle. When you're ready for the next step, you can trade-up to whichever Sunshine fits the bill.



	Sunshine	Lite	Single
Automated runs	✓	✓	✓
Multiple experiments	✓	✓	
Continuous flow	✓	✓	
In-line dilution	✓		
Typical volume (3:1)	≥1 mL	≥1 mL	0.4–6.3 mL

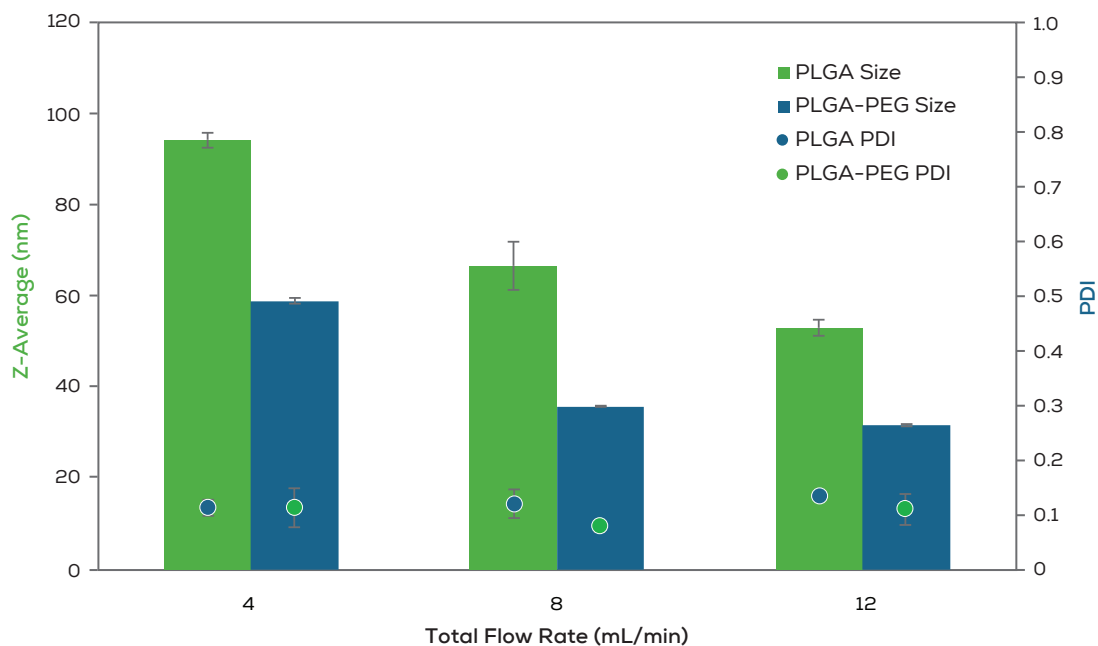
Dial it in

Size really does matter for nanoparticle performance – Sunshine fully automates flow rate ratio, total flow rate and dilution experiments to help you size your particles right and keep them stable, with spot-on repeatability. Set your parameters for each individual experiment, and let Sunshine serve them up.



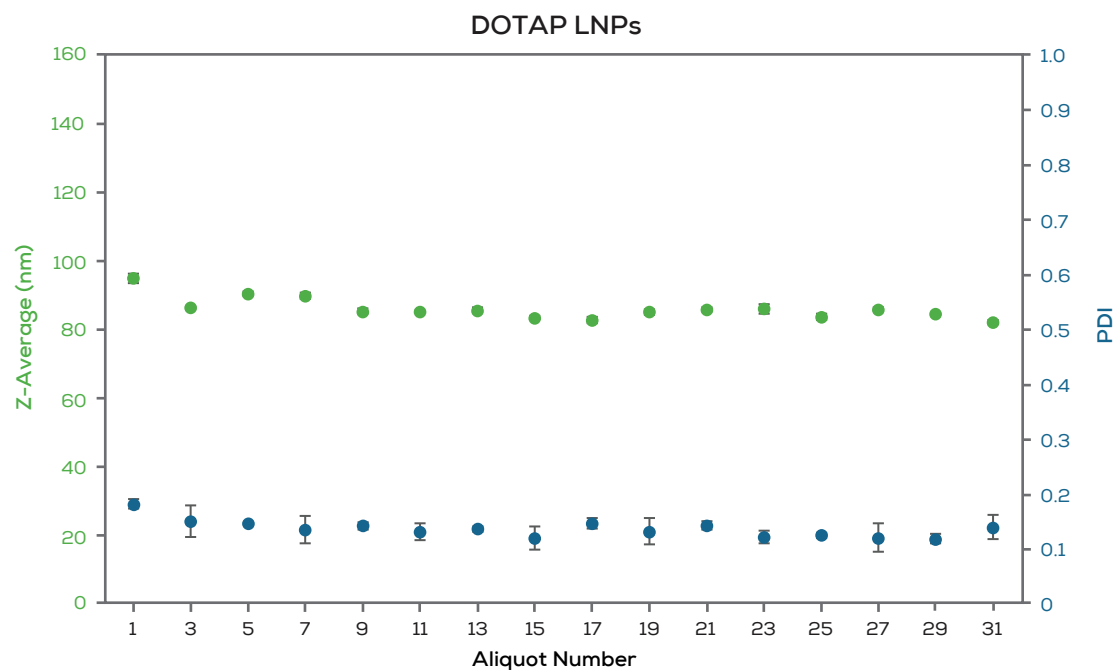
Game for anything

Sunshine can be used to produce a wide range of different nanoparticle types, including LNPs, polymer nanoparticles, liposomes, and other novel particles. The chemically resistant flow path means you can work with all sorts of solvents and reagent types without worry, so you can finesse your chosen particles in record time.



Particles-a-plenty

After larger volumes of nanoparticles? Sunshine and Sunshine Lite’s continuous production mode allows you to set flow conditions and run the pumps for as long as you need. Sunshine can make from milliliters to liters of particles while keeping size and PDI consistent, no matter how much you’re cooking up.



End-to-end with the Sunny Suite

The Sunny Suite has a killer solution for every step of your nanoparticle development.

Sunscreen automates high-throughput screening of up to 96 formulations, then **Sunshine** homes in on the perfect mixing process conditions, with both automated experiments and continuous flow modes. When you're ready for clinical trials, **Sunbather** dials up your particles in a fully GMP-compliant environment.



Screen



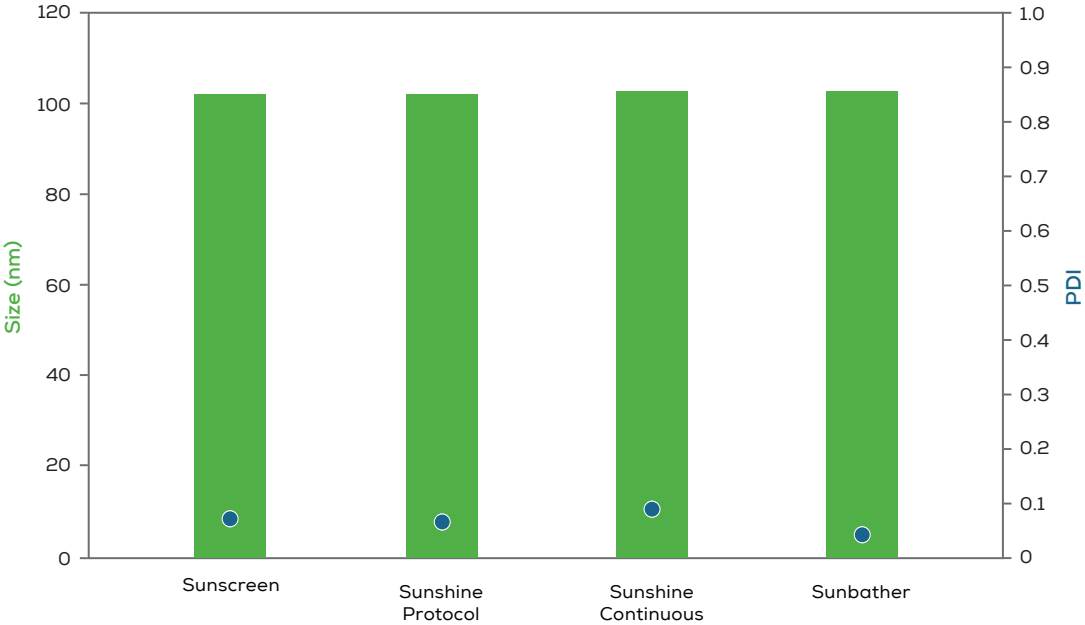
Optimize



Produce

Trust the process

With identical fluid delivery and microfluidic mixing at every stage, the Sunny Suite makes for smooth sailing in every transition from formulation screening to process development to GMP production. Whether you're screening through hundreds of formulations or producing liters of particles for clinical trials, the Sunny Suite's the total package.



Specifications

Application	Sunshine	Sunshine Lite	Sunshine Single
Throughput	10 samples in 15 minutes	10 samples in 15 minutes	1 sample in 5 minutes
Total flow rate range (Sunny dependent)	0.1–30 mL/min	0.1–20 mL/min	0.1–20 mL/min
Typical sample volume (3:1 FRR)	≥1 mL	≥1 mL	0.4–6.3 mL
Minimum input volume (including dead volume)	≥170 µL	≥170 µL	≥170 µL
Continuous mode	Yes	Yes	No
In-line dilution	Yes	No	No
Flow rate ratio range (aqueous to organic)	1:1 to 10:1		
Typical particle size	40–200 nm*		
PDI	<0.2*		
Encapsulation efficiency	>90%*		
Instrument			
Physical			
Weight and dimensions (cm)	31 kg, 53 H x 60 W x 40 D	23 kg, 53 H x 40 W x 40 D	20 kg, 35 H x 40 W x 40 D
Electrical			
Voltage input	100 V–240 V AC, 50–60 Hz		
Communications	USB		
Other information			
Sample loop size	1, 5 and 10 mL	1, 5 and 10 mL	5 mL
Wetted materials	PTFE, PCTFE, FEP, ETFE, PEEK, Polypropylene, FFKM, Hastelloy C276, Stainless Steel T316, Glass, Tygon (waste tubes), PET (waste bottle)		
Computer	Separate computer with Win 11, monitor, keyboard and mouse (not included in Dimensions)		
Consumable			
Sunnies	Glass microfluidic mixing devices of various geometries and channel sizes		
Available types	Sunny 490 Trident T, Sunny 100 X, Sunny 100 T, Sunny 190 X, Sunny 190 T, Sunny 275 X, Sunny 275 T, Sunny 150 3D, Sunny 50 Micromixer		

* Formulation dependent



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