

Ultra-High Pressure Nano Homogenizer Series



About TRILOS Ultra-High Pressure Nano Homogenizer Redefining Nanoscale Processing



ND1000

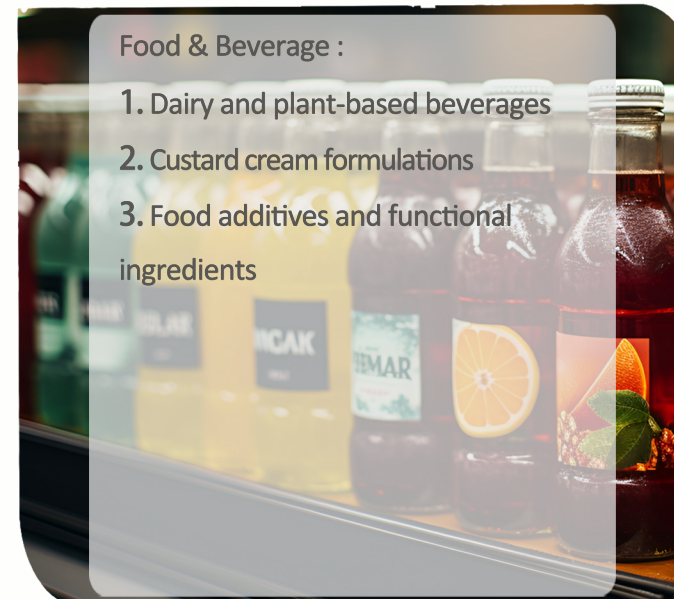
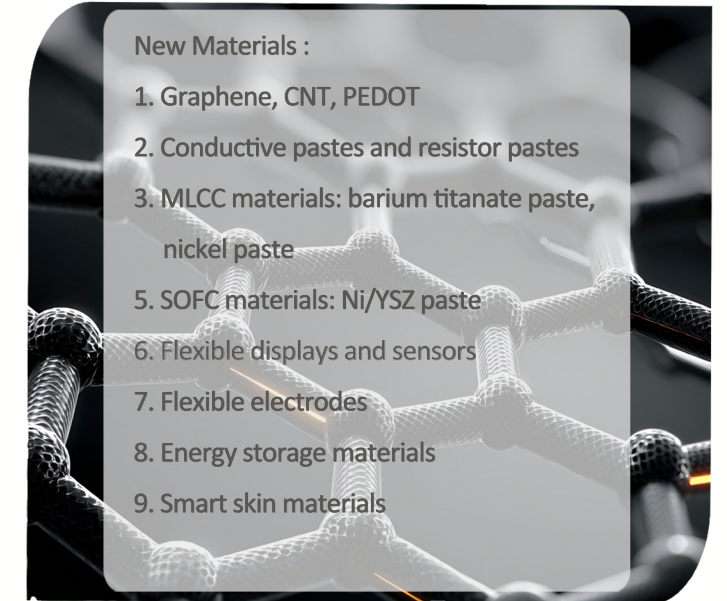
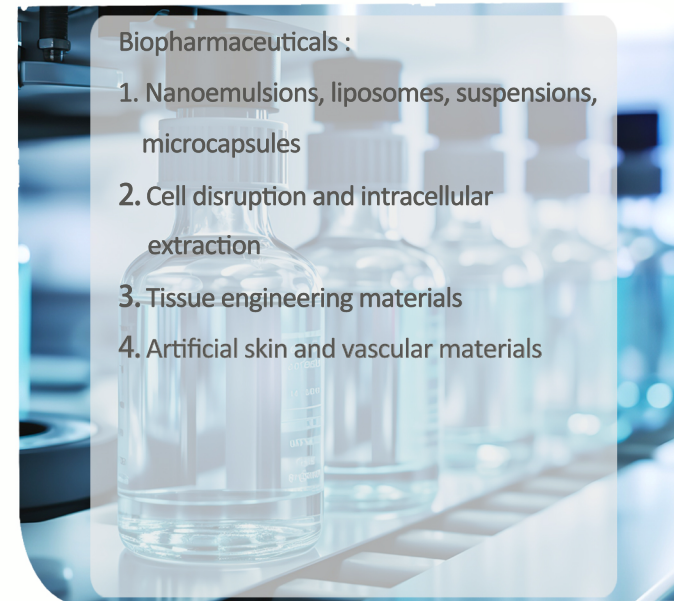
ND500

ND100

TRILOS Ultra-High Pressure Nano Homogenizer is engineered for high-efficiency nanoscale dispersion and homogenization.

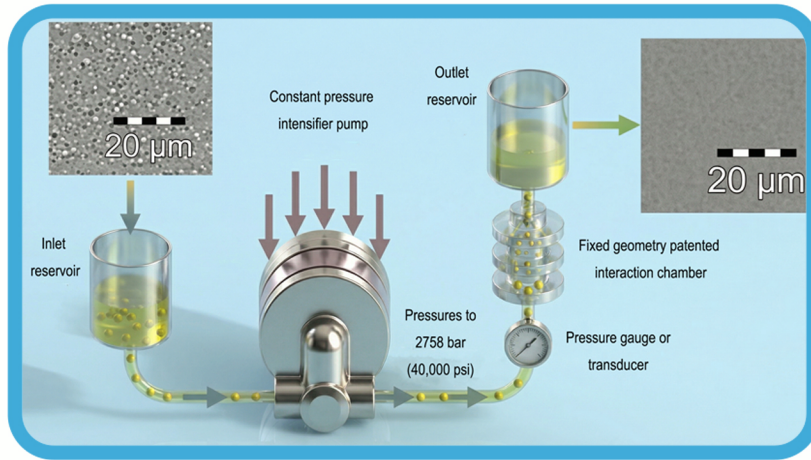
Powered by high-pressure microjet technology, it delivers stable particle size reduction, high reproducibility, and industrial scalability for demanding formulations.

Application



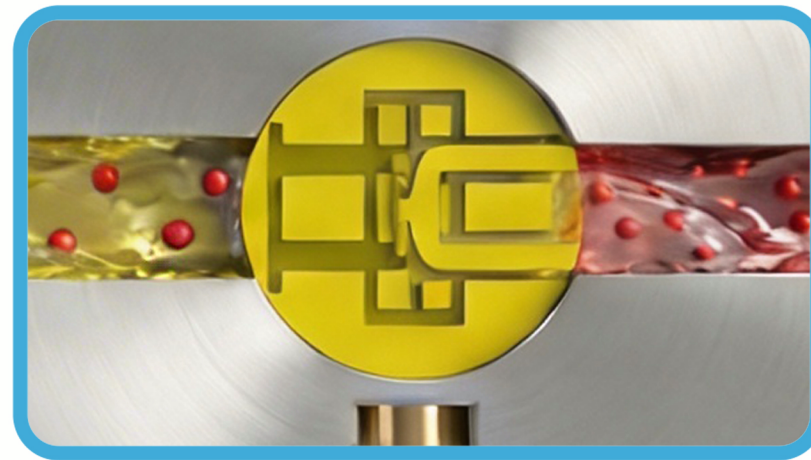
Core Technologies

Diamond interaction chamber



The interaction chamber has X/Y/Z-type fixed geometry. Each type has a different characteristics and wide range of application. It is made of 316L stainless steel outside and 100% synthetic diamond inside.

Special micro-channel



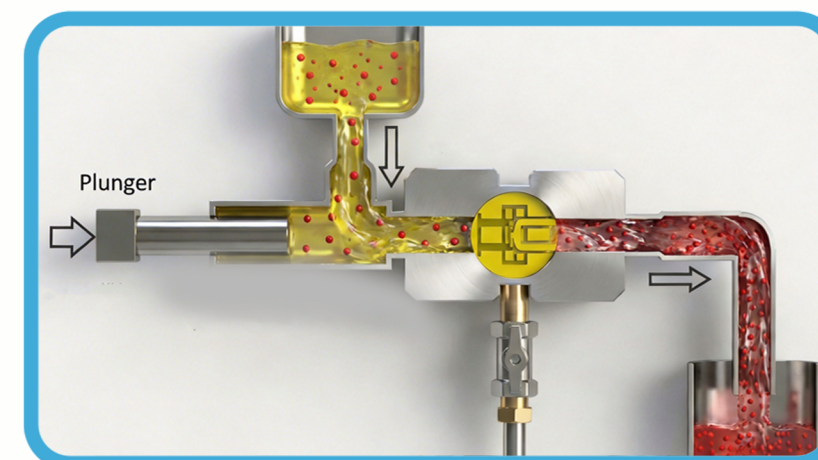
A number of ultra-high pressure homogenizers face the risk of clog and leakage during operation. TRILOS uses a special design on the micro-channel to adapt the particle size and ultra-high pressure. Therefore, the large particles can even pass through micro-channel freely under ultra-high pressure.

Smart PLC & TRILOS IoT platform



The PLC system is an intelligent control system for users to intuitively view the real-time parameters like pressure and time. TRILOS IoT platform is a self-developed platform for users to remotely control and preset process program.

Technical Principle



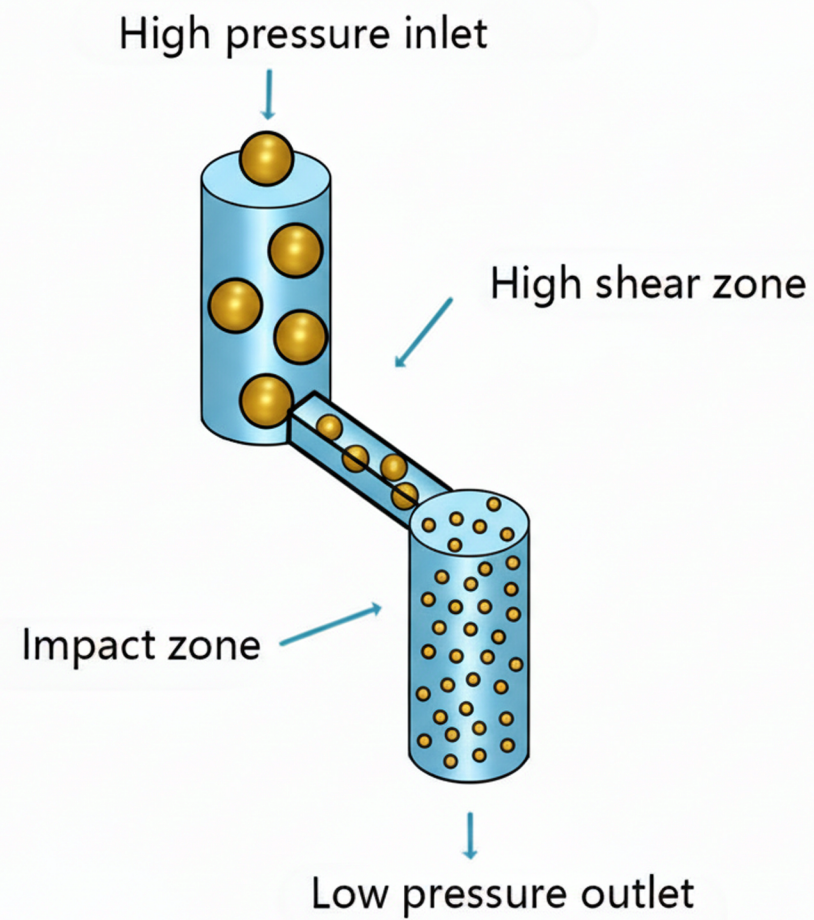
Materials are pumped through an interaction chamber with micro-channels under ultra-high pressure by an intensifier pump, generating high shear force, high-speed particle collision, cavitation and turbulence. These effects rapidly reduce particle size, break agglomerates, disrupt cells, and deliver a highly uniform final product.

Process

High-pressure inlet → high shear zone → impact zone → low-pressure outlet

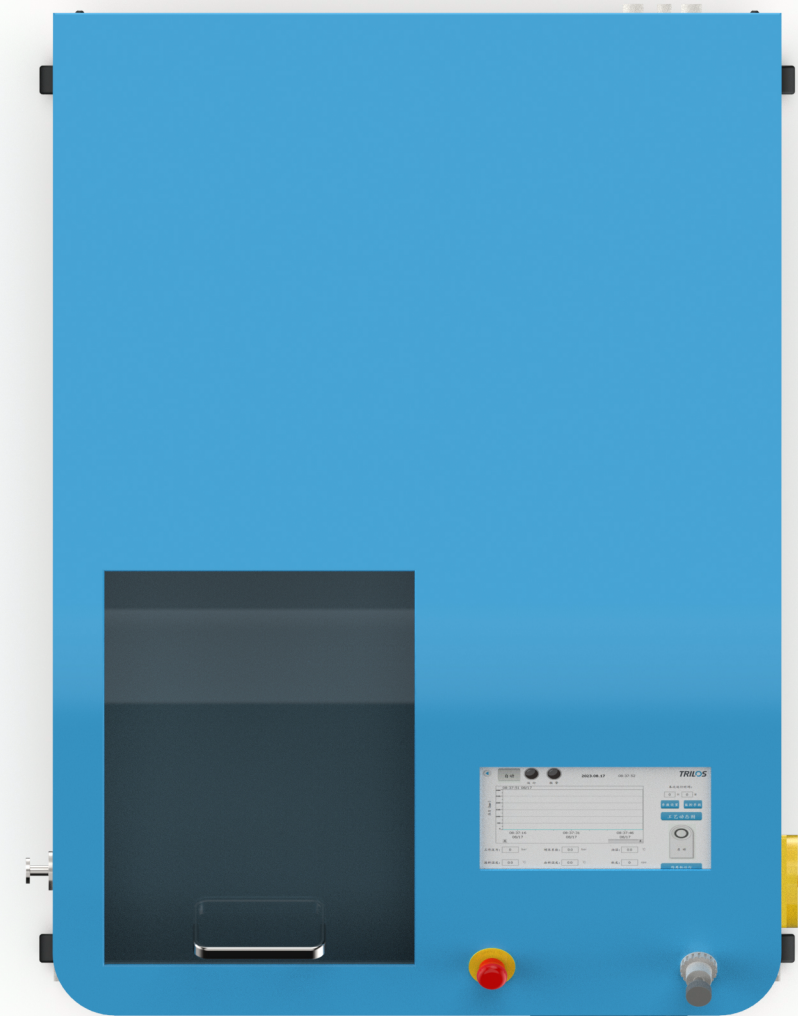
Advantages

- Fixed geometry ensures stable and repeatable results
- Synthetic diamond core delivers extreme wear resistance
- Optimized micro-channels reduce clog risk even with larger particles
- Ideal for nanoemulsions, nanodispersions, liposomes, and cell disruption



Intelligent PLC System

- User-friendly interface for real-time operation and parameter control.
- Pressure and time monitoring
- Mode selection and parameter adjustment
- Multi-stage program execution
- Stable operation for long-running production tasks



Smart Control & IoT Platform

TRILOS integrates our self-developed IoT system designed for modern production requirements.

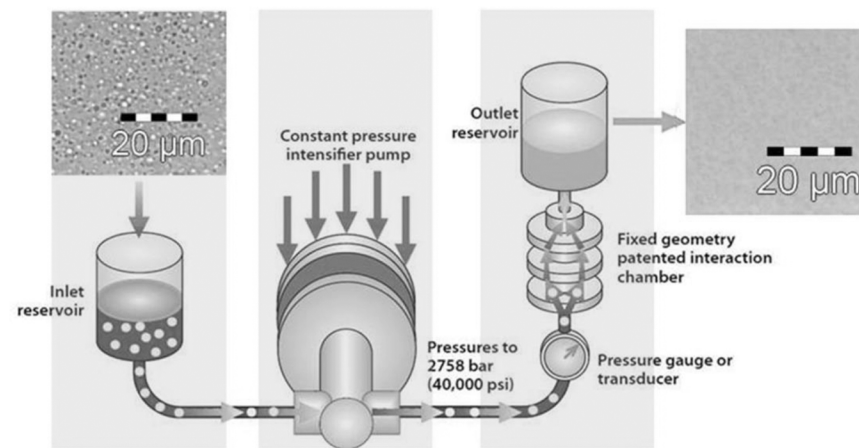
Key Benefits

- Remote monitoring via tablet
- Real-time parameter tracking (pressure, time, temperature, etc.)
- Multi-stage process programming
- Data recording for process traceability and production management
- Designed for automation-ready production lines



Intensifier Pump

- High-pressure performance requires stability, not just power.
- Split-type structure for easier disassembly and maintenance
- Maximum working pressure up to 4000 bar
- Designed for continuous and stable pressure output



Cooling Circulation System

High-pressure processing generates heat. TRILOS provides an efficient circulating water bath to maintain stable temperature.

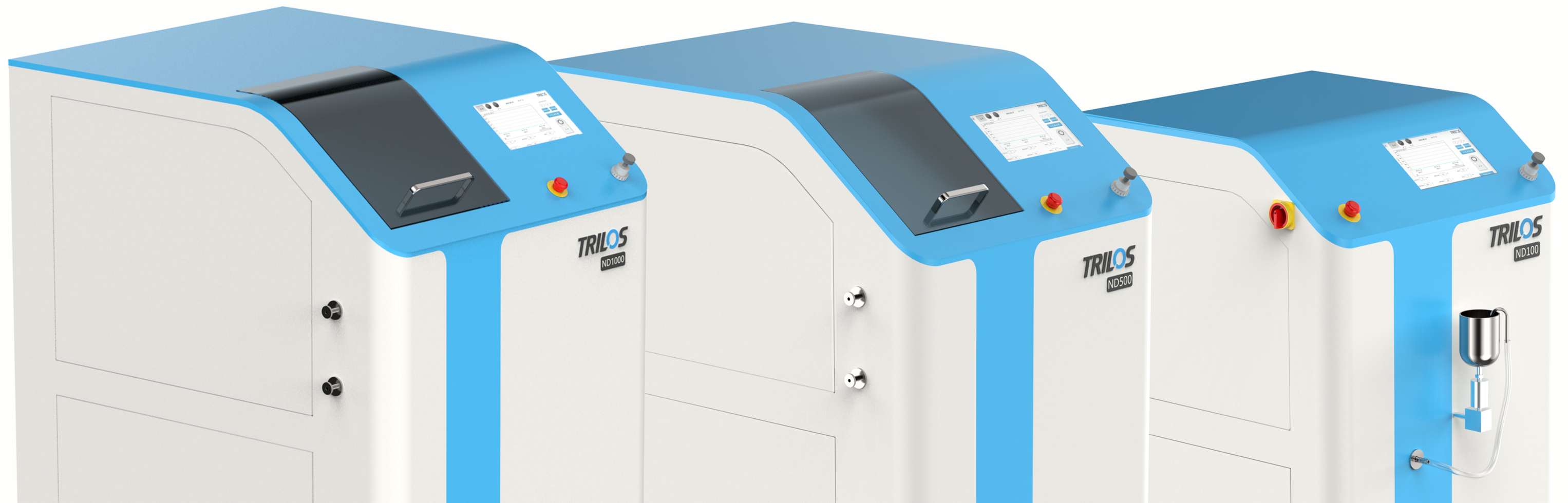
- Circulating water bath removes operational heat
- Continuous cooling exchange ensures better product consistency
- Improved safety for heat-sensitive formulations

Cleaning & Sterilization

TRILOS supports:

- CIP (Clean-in-Place)
- SIP (Sterilize-in-Place)

External CIP/SIP ports enable efficient cleaning while reducing dead corners in pipelines.



TRILOS ND100

TRILOS ND100 is the laboratory model designed for R&D, formulation development, and small sample preparation.



Overview of the TRILOS Ultra-Pressure Nano Homogenizer series

Highlights

- Small-batch sample preparation
- High pressure nano-level performance
- Easy feeding and collection design

Specifications

Model	ND100	
Working Pressure	4000 bar/400 MPa	58,000 psi
Flow Rate	5 L/h	1.32 gal/h
Min. Input	50ml	1.69 fl oz
Max. Particle Size	≤ 300 μm	
Max. Visc.	≤ 3000 cp	
Max. Temp.	≤ 90°C	≤194°F
Dimensions (L×W×H)	650×650×1240 mm	25.59×25.59×48.82 in



TRILOS ND500

TRILOS ND500 is the pilot model which is Ideal for pilot-scale production and process validation.



Overview of the TRILOS Ultra-Pressure Nano Homogenizer series

Highlights

- Stable pilot yield
- Suitable for circulation processing
- Compatible with TRILOS Automated Homogenization System

Specifications

Model	ND500	
Working Pressure	4000 bar/400 MPa	58,000 psi
Flow Rate	60 L/h	15.85 gal/h
Min. Input	1000 ml	33.81 fl oz
Max. Particle Size	< 300 μ m	
Max. Visc.	< 10,000 cp	
Max. Temp.	$\leq 90^{\circ}\text{C}$	$\leq 194^{\circ}\text{F}$
Dimensions (L×W×H)	960×700×1260 mm	37.80×27.56×49.61 in



TRILOS ND1000

TRILOS ND1000 is the production model designed for continuous production and industrial-scale manufacturing.



Overview of the TRILOS Ultra-Pressure Nano Homogenizer series

Highlights

- High yield for mass production
- Stable operation under long working cycles
- Compatible with TRILOS Automated Homogenization System

Specifications

Model	ND1000	
Working Pressure	4000 bar/400 MPa	58,000 psi
Flow Rate	100 L/h	26.42 gal/h
Min. Input	5000 ml	169.07 fl oz / 1.32 gal
Max. Particle Size	< 300 μ m	
Max. Visc.	< 10,000 cp	
Max. Temp.	$\leq 90^{\circ}\text{C}$	$\leq 194^{\circ}\text{F}$
Dimensions (L×W×H)	1020×805×1280 mm	40.16×31.69×50.39 in



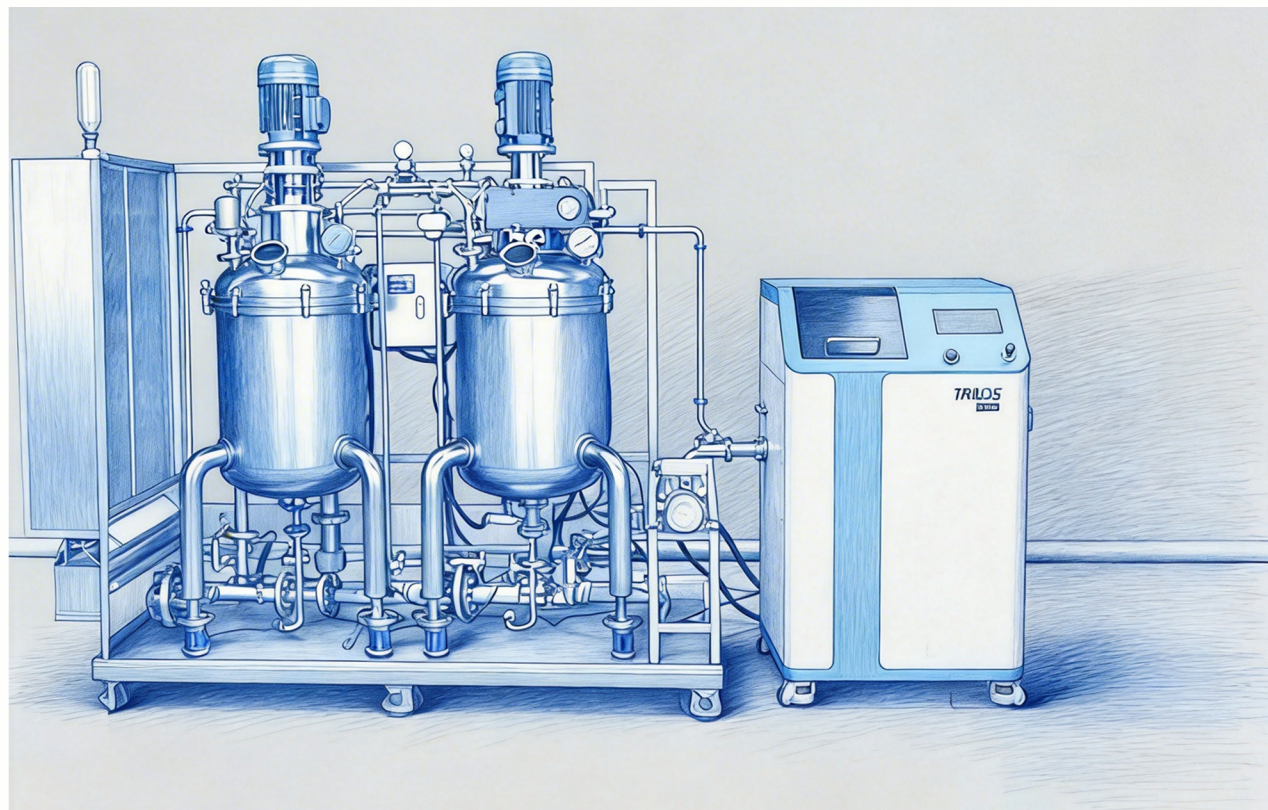
Automated Homogenization System

TRILOS Automated Homogenization System integrates mixing, circulation, and homogenization into one programmable process line.

The system includes mixing tank, storage tank, TRILOS UHP Nano Homogenizer, pipelines, circulating water bath.

Advantages

- Automated multi-cycle homogenization
- Reduced manual operation and labor cost
- Improved batch repeatability
- Scalable system design for industrial production



Customized Service

The pilot model and production model are horizontally scalable on the production line. We can customize based on our customer's requirement.

