



Duoning Biotech

State-of-the-Art Laboratory and Production-Scale High-Pressure Homogenizers

ONE-STOP
BIOPROCESSING PLATFORM

www.duoningbio.com





Shanghai Duoning Biotechnology Co., Ltd. is a one-stop bioprocessing solutions provider serving the biopharmaceutical industry, dedicated to delivering comprehensive products and services that support the entire drug development lifecycle—from research and development and pilot-scale studies to commercial manufacturing.

Built around a robust bioprocessing framework, Duoning Biotech has established a comprehensive business portfolio encompassing reagents and consumables, instruments and equipment, as well as professional services. Through this integrated approach, the company helps its partners achieve efficient, stable, quality-controlled, and cost-effective drug development and manufacturing.

At the core of its business, Duoning Biotech leverages its group platform to offer a systematic bioprocessing product portfolio centered on single-use products, bioreactors, cell culture media, and process equipment. Its single-use bioprocessing products are widely applied across critical steps such as preparation, transfer, storage, and use, providing flexible and reliable fluid management solutions. The bioreactor portfolio supports a wide range of process scenarios and scales, addressing diverse biopharmaceutical applications. The cell culture media platform, built on in-depth research into cell metabolism and physiology, delivers high-quality, customizable serum-free media for mammalian cell culture, serving areas including antibodies, cell and gene therapies, and vaccines. In addition, complementary process equipment, reagents, and

consumables provide robust support for process scale-up and stable operation.

Meanwhile, Duoning Biotech continues to expand its bioprocessing ecosystem through its subsidiaries and partner companies. Our subsidiary ATS Engineering Inc specializes in high-pressure homogenization and related mechanical equipment, supporting applications such as liposomes, nanomedicines, and vaccines. Prefuild focuses on peristaltic pump solutions, offering reliable support for fluid transfer and process control. Bogen is dedicated to chromatography resins, enhancing efficiency and robustness in downstream purification processes. RephiLe Bioscience provides laboratory water purification systems to meet stringent requirements for research and quality control, while CMA specializes in laboratory and equipment validation services, supporting customers in compliance and quality system development.

Guided by a customer-centric philosophy, Duoning Biotech is committed to integrating high-quality products, professional technical capabilities, and industry best practices into a unified bioprocessing platform. Driven by the mission of advancing biotechnology and improving human health, the company strives to be a trusted long-term partner, continuously supporting the high-quality development of the global biopharmaceutical industry.

Lab & Pilot-Scale High-Pressure Homogenizer

Duoning Biotech's high-pressure homogenizers are specially engineered for bioprocess optimization, offering outstanding cell disruption efficiency and precise particle size control. The equipment covers the full spectrum from lab-scale development to industrial-scale production. Large-scale systems can be equipped with intelligent control software for parameter recording and traceability, ensuring batch-to-batch consistency and process stability. The structural design of Duoning's homogenizer series emphasizes durability and ease of maintenance, providing robust support to enhance process efficiency and accelerate R&D and time-to-market for customers.

High-pressure homogenizers from lab to pilot scale are designed to support a wide range of applications, from early-stage research to process scale-up. The DH-Basic and DH-Nano series are specifically developed for laboratory use, offering a minimum processing volume as low as 25 mL and flexible operation. The DH-Pilot series is ideal for pilot-scale applications, with a flow rate of up to 40 L/h, making it suitable for continuous production needs. All models are equipped to handle working pressures up to 1500 bar, featuring compact design and stable performance—empowering efficient cell disruption and nano-scale homogenization processes.

Product Advantages

- Pressure up to 1500 bar, suitable for a variety of biological sample disruption needs
- Flexible flow rate ranging from 5 – 40 L/H, balancing both R&D and scale-up requirements
- Pneumatic automatic control version equipped with a 10-inch touchscreen and high-precision pressure sensors, ensuring ease of operation and data traceability
- Built-in heat exchanger to maintain stable temperature during processing
- Standard zirconia plunger, wear-resistant and corrosion-resistant, ensuring long-term operational stability
- Optional yeast-specific homogenizing valve to optimize specific process requirements
- Optional chiller available to support high-frequency operation needs
- Includes maintenance tools and commonly used seals, ensuring ease of use and worry-free after-sales service



DH-Basic



DH-Nano



DH-Pilot

Lab & Pilot-Scale High-Pressure Homogenizer

Parameters

Model	DH-Basic	DH-Nano		DH-Pilot	
Series	N/A	Basic	Auto	Basic	Auto
Product No.	DH-Basic	DH-Nano	DH-Nano-Auto	DH-Pilot	DH-Pilot-Auto
Weight	130 kg	128 kg		241 kg	
Dimension	700*450*475 mm	720*450*475 mm		840*635*920 mm	
Flow rate	10 L/H	5-8 L/H		20-40 L/H	
Min. working volume	25 ml			50 ml	
Designed pressure	1800 bar				
Max. working pressure	1500 bar				
Voltage	220V/1.5 kw			380V/5.5 kw	
Plunger	1 / zirconia				
Pressure adjustment method	Manual	Manual	Pneumatic rotary knob control	Manual	Pneumatic rotary knob control
Built-in heat exchanger	Yes				
Screen	7"	7"	10"	7"	10"
Pressure sensor	Off-the-shelf brand	Gefran, range 0–2000 bar, accuracy 1 bar			
Toolbox	The toolbox contains: 1 set of maintenance tools; 1 set of commonly used seals; 1 each of 250ml and 1L stainless steel sample feed cups				
Yeast-Specific Homogenizing Valve	Optional				
Chiller	No	Yes			
1-year warranty	Yes				

Production-Scale High-Pressure Homogenizer

Duoning Biotech's high-pressure homogenizers are specially engineered for bioprocess optimization, offering outstanding cell disruption efficiency and precise particle size control. The equipment covers the full spectrum from lab-scale development to industrial-scale production. Large-scale systems can be equipped with intelligent control software for parameter recording and traceability, ensuring batch-to-batch consistency and process stability. The structural design of Duoning's homogenizer series emphasizes durability and ease of maintenance, providing robust support to enhance process efficiency and accelerate R&D and time-to-market for customers.

The industrial-grade high-pressure homogenizer series is designed for applications ranging from large-scale pilot to GMP production. With a single-unit flow rate of up to 600 L/h, it is suitable for a wide variety of processes including recombinant protein production, vaccines, and synthetic biology.

These systems are built to withstand design pressures up to 1600 bar and operate at working pressures up to 1500 bar. Equipped with a robust three-plunger system, they ensure stable and efficient performance. The product line includes a standard base model as well as a GMP-compliant automated version. The GMP version features a 13.3-inch touchscreen, industrial PC, data export capabilities, and audit trail functions to meet regulatory and validation requirements—empowering biopharmaceutical manufacturers to advance toward intelligent, high-end production.

Product Advantages

- Available in multiple specifications ranging from 10–600 L/H, flexibly adapting to different process scale requirements
- Working pressure up to 1500 bar, suitable for high-shear homogenization scenarios
- GMP version equipped with audit trail and data export functions, ensuring regulatory compliance
- Zirconia three-plunger structure, stable and durable, supports high-frequency operation
- 13.3-inch touchscreen + industrial PC, easy operation with a user-friendly interface
- Optional external stainless steel heat exchanger to ensure consistent temperature control
- Includes a standardized toolkit and seals for convenient maintenance

Additional Customizable System Configurations/Functions:

- **Fully Automated Control System (PLC)**
 - Built-in PLC program for automatic pressurization, depressurization, homogenization, and safe shutdown operations, minimizing manual intervention and reducing contamination risks.
 - Supports touchscreen interface for easy monitoring of operational status and parameter settings.
- **Leak Detection and Automatic Alarm System**
 - Sealed chambers are equipped with conductivity sensors that detect changes in cooling water conductivity, signaling plunger seal leakage.
 - The system can trigger automatic alarms and enforce shutdown to ensure the safety of the equipment and production environment.
- **High-Temperature and High-Pressure Sterilization Design**
 - The entire unit can withstand 121°C steam sterilization, with all parts in contact with materials made from high-temperature resistant materials (e.g., 316L stainless steel), capable of enduring $\leq 200^{\circ}\text{C}$ high temperatures and ≤ 1000 bar pressures, meeting aseptic process requirements.
- **Isolated Pressurization Module Design**
 - A physical isolation segment between the material contact area and the power system improves biological safety levels.
 - The isolation segment supports steam-in-place (SIP), meeting GMP sterile requirements.
- **High Processing Capacity Configuration**
 - Models with processing capacities up to 3000 L/H or 4000 L/H can be customized based on customer needs, suitable for large-scale continuous production or process scale-up in commercial projects.

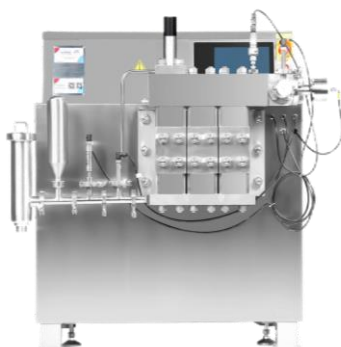
Production-Scale High-Pressure Homogenizer

Parameters

Model	DH12-150		DH22-100		DH22-150		DH37-150	
Series	Basic	GMP	Basic	GMP	Basic	GMP	Basic	GMP
Product No.	DH12-150	DH12-150-GMP	DH22-100	DH22-100-GMP	DH22-150	DH22-150-GMP	DH37-150	DH37-150-GMP
Weight	800 kg	820 kg	1265 kg	1295 kg	1265 kg	1295 kg	2400 kg	2430 kg
Dimension (mm)	1315*795*1135	1555*795*1135	1710*1040*1155	1965*1040*1155	1710*1040*1155	1965*1040*1155	2060*1570*1330	2110*1570*1330
Flow rate	10-150 L/H		500 L/H		250 L/H		600 L/H	
Min. working volume	2 L		3 L				5 L	
Designed pressure	1600 bar		1200 bar		1600 bar			
Max. working pressure	1500 bar		1000 bar		1500 bar			
Voltage	380 V/11 kw		380 V/18.5 kw				380 V/37 kw	
Plunger	3 / zirconia							
Pressure adjustment method	Pneumatic rotary knob control	Automatic (touchscreen activated)	Pneumatic rotary knob control	Automatic (touchscreen activated)	Pneumatic rotary knob control	Automatic (touchscreen activated)	Pneumatic rotary knob control	Automatic (touchscreen activated)
Built-in heat exchanger	Yes	No						
Screen	10"	13.3"	10"	13.3"	10"	13.3"	10"	13.3"
Industrial computer	No	Yes	No	Yes	No	Yes	No	Yes
Audit trail Data export	No	Yes	No	Yes	No	Yes	No	Yes
Pressure sensor	Off-the-shelf brand	Gefran, range 0–2000 bar, accuracy 1 bar						
Toolbox	The toolbox contains: 1 set of maintenance tools; 1 set of commonly used seals							
Heat exchanger (optional)	0.24 m ² stainless steel heat exchanger		0.48 m ² stainless steel heat exchanger					
Feed pump (optional)	1/2" stainless steel feed pump		1" stainless steel feed pump					



DH12-150



DH22-100/DH22-150



DH37-150

High-Pressure Microfluidizer Homogenizer

Working Principle

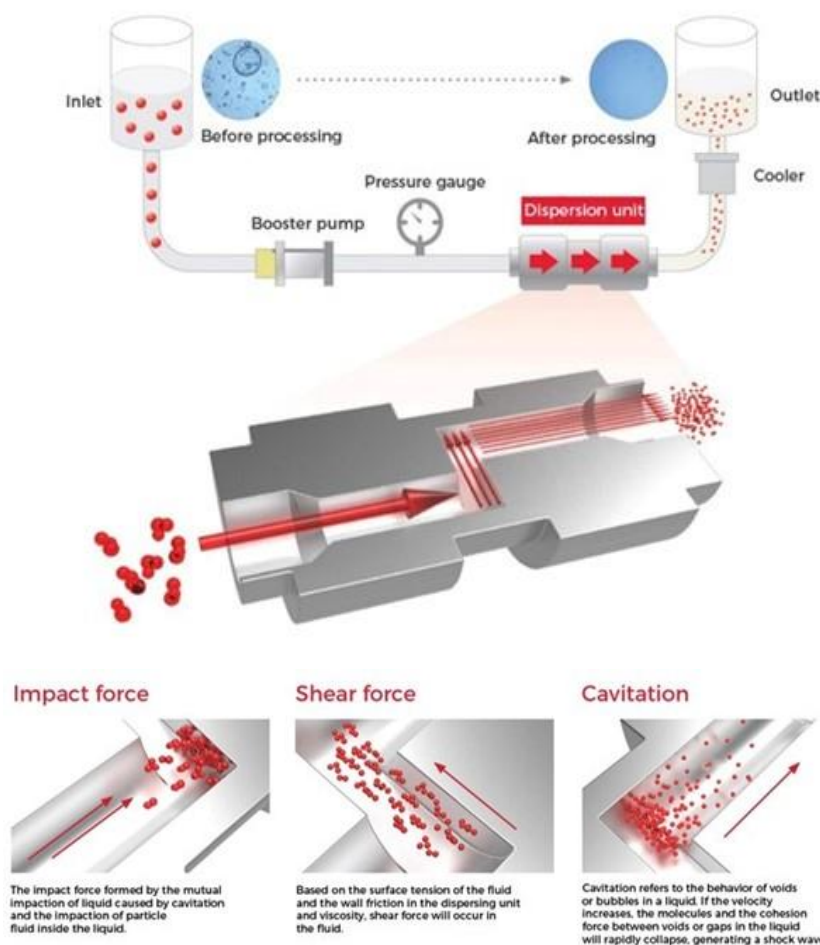
The microfluidizer homogenizer is a new generation of high-pressure homogenizer. Its unique diamond micro-channel supersonic jetting technology can achieve smaller and more uniform nano-scale particle sizes. Compared with ordinary high-pressure homogenizers, it can be used in applications with extremely narrow particle size distribution requirements and high added value.

The high-pressured fluid quickly passes through the narrow gaps in the dispersion unit, during which, the pressure on the fluid drops sharply to form a supersonic flow rate. The particles in the fluid collide, cavitate and leak. The shear force acts on splitting nanometer-sized molecules. Which will be exist in a completely homogeneous state. The system's unique diamond micropore jetting technology can achieve extremely small and uniform nanoscale particle size distribution results., and the hydraulic booster power mode can provide stable working pressure up to 200Mpa.

The core homogenization component of the microfluidizer homogenizer is the diamond interactive cavity. Different from the homogenization valve with adjustable gap in ordinary high-pressure homogenizers, the internal micropores are fixed in size and cannot be adjusted. When using the same model of diamond interactive cavity and under the same homogeneous process parameters, it can ensure that the particle size results of the products between batches are very stable.

The capacity expansion of the microfluidizer homogenizer is achieved through the parallel arrangement of microchannels inside the diamond interaction cavity. Multiple microchannels with the same micropore as the lab-scale systems, combined with a high-power booster pump, can achieve linear scaling-up of the development process. The manufacturing systems can increase capacity without changing the homogenization effect, which is an advantage that ordinary high-pressure homogenizers are difficult to achieve. Therefore, many applications with higher requirements choose microfluidizer homogenizers to avoid the inability to successfully scale up after expensive development efforts.

The microfluidizer homogenizer uses hydraulic boosting mode to provide homogenization power. The hydraulic station can output homogenization pressure as high as several hundred MPa under a lower pressure of several tens of MPa. In this state, the hydraulic power unit can operate continuously and stably, while also ensuring high homogenization pressure. Compared to the complicated connecting rod of ordinary high-pressure homogenizers, the high-frequency action design can greatly reduce the equipment failure rate and ensure smooth production.



High-Pressure Microfluidizer Homogenizer

Research-Scale High-Pressure Microfluidizer Homogenizer AMH-MINI



Item	Specification
Model	AMH-MINI
Throughput	3–5 L/H
Minimum Throughput	7 mL
Operating Pressure	0–2000 bar
Voltage	220 V, single-phase three-wire system, 2 kW, socket specification: 10 A
Power System	Servo direct-drive electric cylinder system
Chamber Configuration	Optional 300 μ m diamond secondary chamber + 100 μ m diamond Y/Z-type primary chamber
Control System	Siemens (Germany), Emerson (USA) servo control system
Dimensions	709 × 419 × 345 mm
Weight	50 kg

Lab-Scale High-Pressure Microfluidizer Homogenizer AMH-NANO



Item	Specification
Maximum Operating Pressure	2000 bar
Throughput	5–10 L/H
Minimum Batch Volume	10 mL
Power System	Servo direct-drive electric cylinder system
Chamber Configuration	300 μ m diamond secondary chamber + 100 μ m diamond Y/Z-type primary chamber
Voltage	380 V, three-phase four-wire system
Motor	2.5 kW
Control System	Siemens (Germany), Emerson (USA) servo control system

High-Pressure Microfluidizer Homogenizer

Pilot-Scale High-Pressure Microfluidizer Homogenizer AMH-500



Item	Specification
Maximum Operating Pressure	2000 bar
Flow Rate	30 L/H
Rated Voltage	380 V
Rated Power	6 kW
Chamber Specification	75/100 μ m (Z/Y type)
Weight	550 kg
Dimensions	957 (W) $\times$ 776 + 60 (D) $\times$ 1280 (H)
Brand	ATS

60L High-Pressure Microfluidizer Homogenizer AMH-1000



Item	Specification
Maximum Operating Pressure	2000 bar
Flow Rate	60 L/H
Rated Voltage	380 V
Rated Power	11.5 kW
Chamber Specification	75/100 μ m (Z/Y type)
Weight	600 kg
Dimensions	1176 (W) $\times$ 806 + 60 (D) $\times$ 1346 (H)
Brand	ATS

**For more system configurations, please contact Duoning Technical Support Team or your local Duoning Sales Representatives.*

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