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安拓思纳米技术（苏州）有限公司  
ATS engineering limited



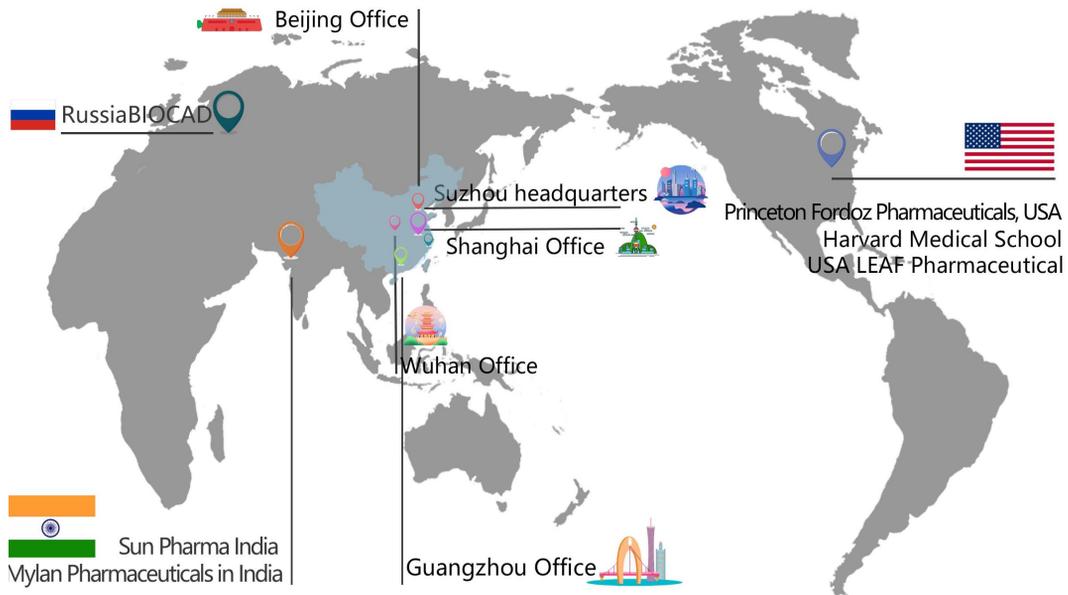
## Introduction of high pressure homogenizer

# Company Profile

ATS affiliated to Shanghai Duoning Group, is located in Suzhou Biomedical Industrial Park, where biological innovation technology is concentrated. Antos is a high-tech enterprise and a gazelle enterprise in an industrial park, focusing on nano-level homogenization, emulsification, crushing, equipment research and process development! Has a number of invention patents and dozens of utility models and copyrights!

In the past 20 years, it has provided homogeneous emulsification equipment for more than 2,000 customers, covering Hong Kong, Macao, Taiwan, the United States, France, Italy, South Korea, New Zealand and other countries!

ATS equipment is widely used in liposome drugs, biological fermentation, enzyme preparation, protein extraction, nanocellulose, IVD latex microspheres, graphene exfoliation, carbon nanoslurry, cosmetic liposomes, microcapsules Buried, Nanoparticle Materials, Chip Polishing Materials and More!



# Company Profile

## CE certification



## Invention patent certification



## Utility model patent certification



- ◆ In 2001, ATOS was established in Shanghai
- ◆ In 2003, the first generation of high pressure homogenizer was launched
- ◆ In 2006, the second generation of high pressure homogenizer AH100 series was launched
- ◆ In 2008, the pilot-scale high-pressure homogenizer AH-PILOT series was launched
- ◆ Moved to Suzhou Bio-Nano Park in 2014, and customized the first liposome production line for CSPC, which passed PDF certification
- ◆ In 2015, the 500-liter extruder system was exported to the United States, and the first generation of hot melt extruder was launched
- ◆ In 2016, it won the title of high-tech enterprise and 3 invention patents
- ◆ Completed the world's largest liposome production line in 2018
- ◆ In 2019, configure 2000 liters cell wall breaking production line and 2000 liters continuous emulsification production line for customers
- ◆ In 2020, 3 sets of anti-tumor liposome systems will be exported to the United States, with annual sales of 60 million yuan
- ◆ Join the Duoning Group in 2021, with annual sales of 120 million yuan

# ATS products for sale



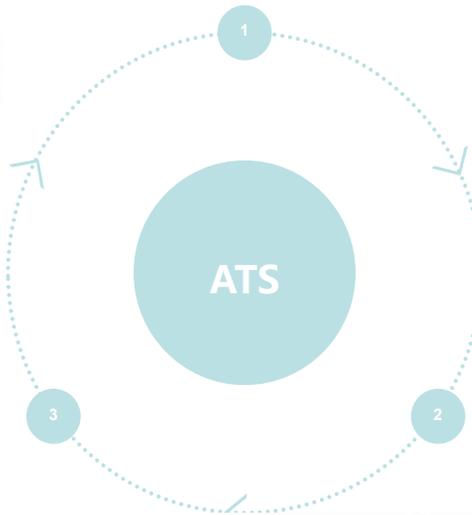
■ High pressure homogenizer



■ Microfluidic nanoparticle processing system



■ Microfluidic homogenizer



■ Material Dispersion Equipment



# High pressure homogenizer

From experimental to large-scale production equipment, sterile and explosion-proof can be realized, and can be customized according to customer needs.

Laboratory dedicated



Pilot-scale production type



mass production

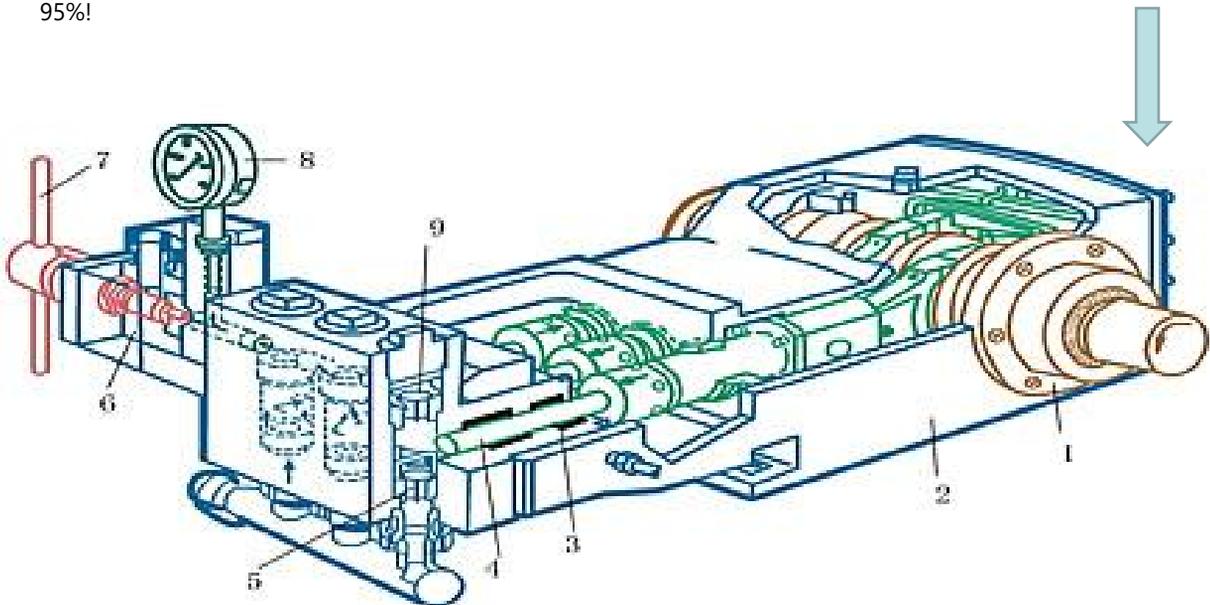
Up to 2000L/H



# High pressure homogenizer

## Equipment principle :

Each high-pressure homogenizer has one or several reciprocating plungers. Under the action of the plunger, the material enters into the valve group with adjustable pressure and passes through the flow-limiting gap of a specific width. After (working area), the material that loses pressure instantly is ejected at a very high flow rate (1000-1500 m/s), and collides with the impact ring of one of the collision valve components, resulting in three effects: cavitation effect, impact effect, shearing effect. After these three effects are processed, the particle size of the material can be uniformly refined to below 100nm, and the crushing rate is greater than 95%!



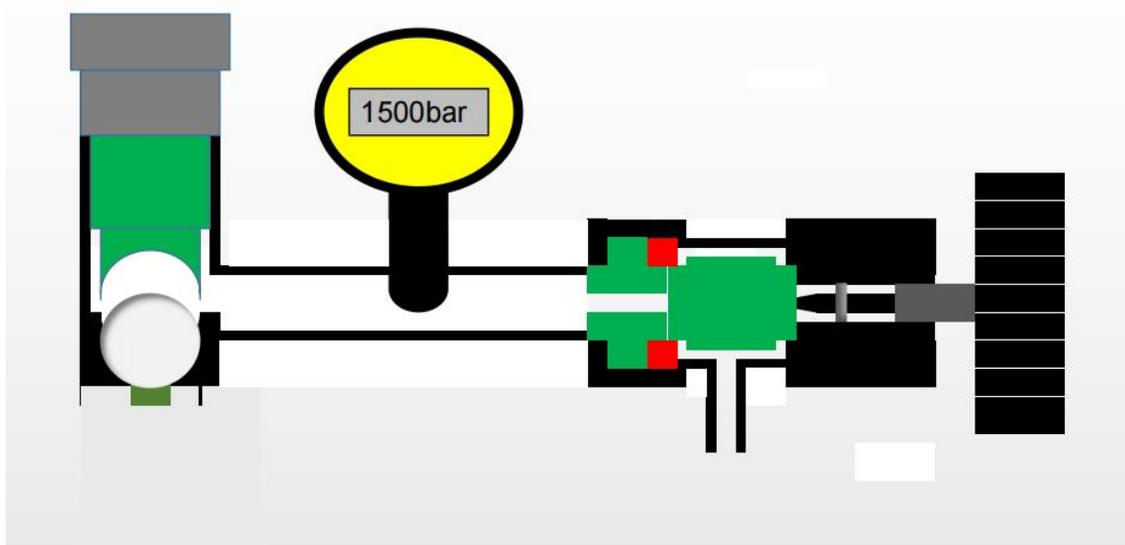
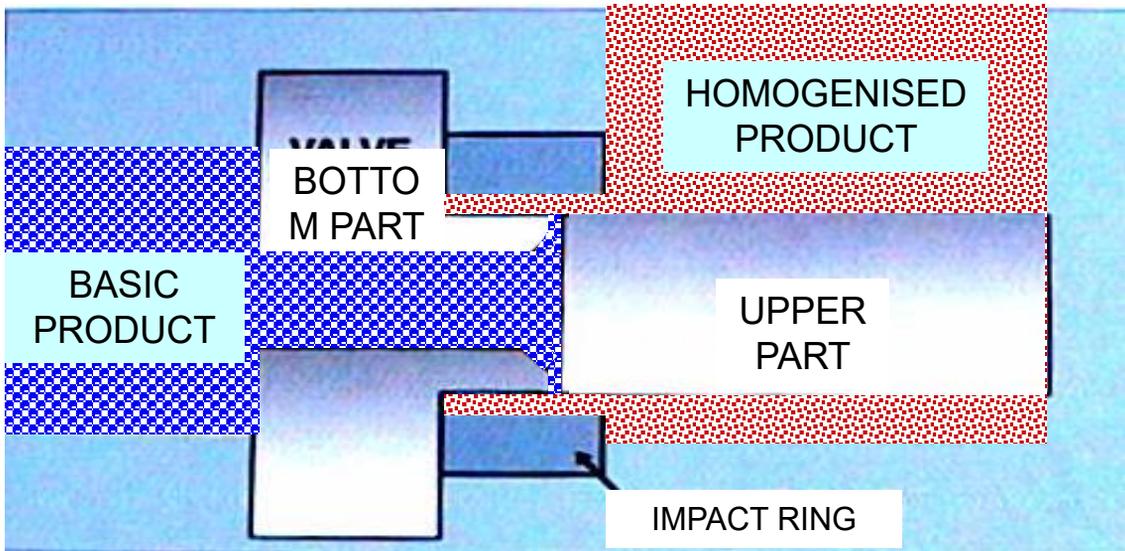
- 1- Drive shaft
- 4-plunger
- 5-Suction valve
- 6- Homogenizing valve
- 7-Stem

Homogenizer core components

# High pressure homogenizer

## working principle :

Due to the special structure of the homogeneous valve, three effects will occur: cavity effect, blasting effect, and shearing effect. So as to achieve the effect of emulsifying, homogenizing and dispersing



ATS has more than ten types of homogenizing valve manifolds to suit different sample applications

# High pressure homogenizer

## Technical Support

### 1.Fluid Mechanics Analysis and Mechanical Stress Analysis

In the high-pressure homogenization process, the fluid is ejected at a high speed under a high pressure of 2000 bar, which is a great challenge to the system design and mechanical structure! ATS uses professional fluid mechanics analysis software and cloud map technology to provide professional technical solutions for the fluid design and structural strength optimization of the homogenizer.

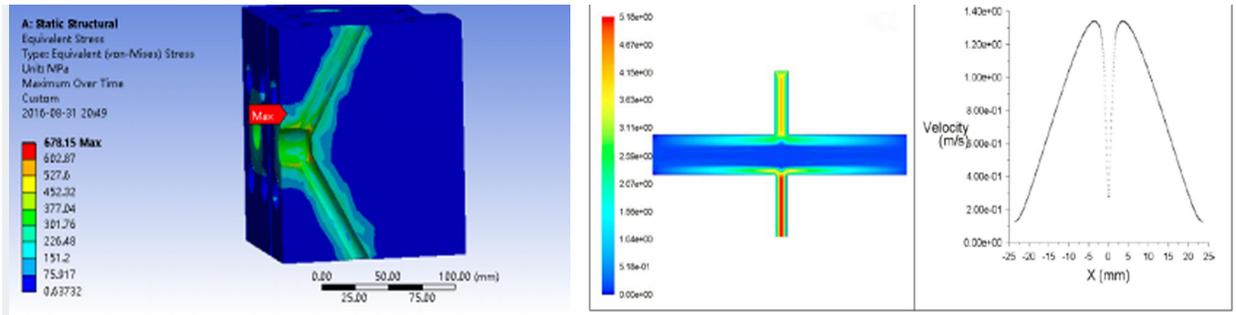
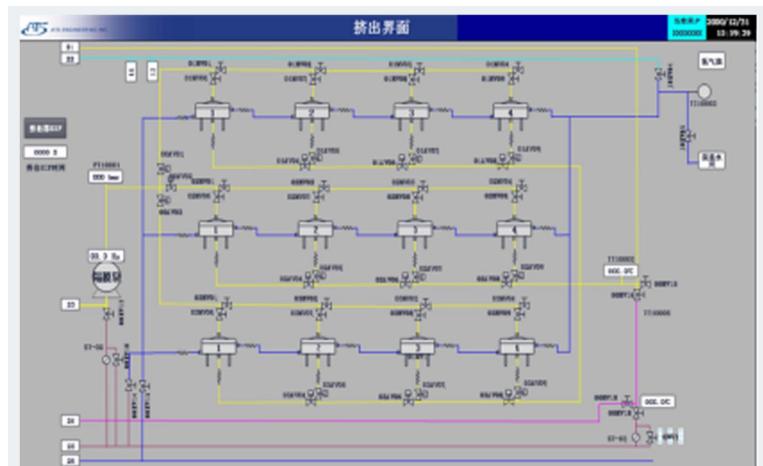


图3 速度场分布以及滤膜表面流体速度分布曲线

### 2.Fully automatic control system

ATS professional team can realize control software that meets GMP and FDA standards under WIN CC system and PLC system



# High pressure homogenizer

## Application field

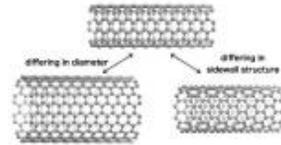
### Pharmaceutical/Biotechnology

- cell disruption
- injection, inhalation
- Nutrients
- ointment



### Chemical/Material

- Lithium battery, hydrogen energy
- Graphene, carbon tube, carbon black
- Nanocellulose
- semiconductor



### Health Products/Cosmetics

- hair care products
- Liposome emulsion
- nail polish
- skin cream



### Food/Dairy

- drinks
- fat substitute
- milk
- Flavours, Food Additives



# High pressure homogenizer

## Some customer cases



2000L cell wall breaking high pressure homogenization system



2000L continuous emulsification system

# High pressure homogenizer

## Some customer cases



The largest sterile inhalant production line in China



Sterile injectable suspension production line

# High pressure homogenizer

## Some customer cases



The first HPV production line in China

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