

# UWave-2000

## Multifunctional Microwave Chemistry Reaction Workstation

*Microwave / Ultrasonic / Ultraviolet 3 in 1  
Open Vessel / High pressure Reactions*





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## Multifunctional Microwave Chemistry Reaction Workstation

UWave-2000 Multifunctional Microwave Chemistry Reaction Workstation is the upgrade of Sineo's best seller UWave-1000, with Sineo's 20 years of microwave chemical experience and scientific achievements of many scientists. It integrates the atmospheric pressure and pressurized reactions, microwave heating, ultrasonic wave and ultraviolet irradiation and other functions, and provides the workstation with flexibility and reliability for the microwave chemical research. UWave-2000 has an intelligent operating system, and 7-inch touch screen control is simple and friendly; It realizes the multi-energy and multifunctional free combination and collocation with the modular design, giving inspiration to your experiment; It can conduct the 2000ml open vessel reaction and 500ml pressurized reaction maximally, thus can help researchers conduct the mass production experiment. Regardless of organic extraction, pharmaceutical research, protein chemistry, novel material science, research of the graphene, polymer synthesis and many other fields, UWave-2000 will provides various imaginations and feasibility of the microwave chemical research.



## Unique advantage

### Good Innovation:

Integrate the atmospheric pressure and pressurized reaction, microwave, ultra-sonic wave and ultraviolet irradiation and other functions, giving full flexibility;

### High reproducibility:

Microwave automatic frequency conversion control, dual temperature control technology, and piezoelectric crystal pressure can ensure the accurate record and representation of each reaction;

### Severe safety:

Pressurized mode, intelligent safety pressure control system, real-time overpressure alarm and active pressure relief, outer vessel with composite fiber and other safety protection measures at the highest level;

### Friendly operation:

7-inch color LCD touch screen, intelligent software, safe and remote control, and reaction process videography facility;

### Reliable durability:

Multi-layer Teflon coating 316L stainless steel chamber and durable reaction container material ensure that all kinds of chemical reactions proceed smoothly;

### Reliable experience:

20 years' industry experience, ISO and CE certificated, and national leading number of users;

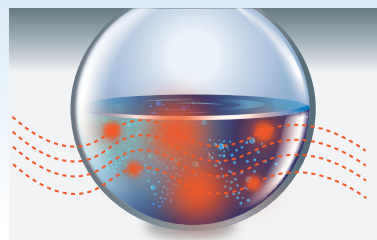




Ultraviolet irradiation



Ultrasonic effect



Microwave heating

Three energy sources - microwave, ultrasonic and ultraviolet irradiation can be free combined and work together, and software control them timing on and off, achieving the synergistic effect by multi energies. UWave-2000 adopts immersion ultrasonic launcher, with an adjustable scope of ultrasound power: 0 - 800W, frequency of 28KHZ, and automatic frequency sweeping and frequency locking; With high energy density ultraviolet source (LED type UV lamp power is 100W, dominant wavelength is 365nm), it can conduct selective photochemical research. UWave-2000 is equipped with multiple reaction vessels, 50-2000ml glass flasks can meet the routine use, and optional multi-standards quartz reaction flasks can meet photochemical reaction under the ultraviolet radiation.

UWave-2000 can conduct the high-pressure sealed reaction, and is equipped with three vessels - 100ml, 200ml and 500ml, solving the amplification process from the laboratory research to the production verification. The sealed reaction vessel can meet the reaction process under 230°C and 2Mpa, greatly expanding the temperature pressure conditions of atmospheric pressure reaction. Under pressurized mode, UWave-2000 has intelligent safety pressure control system for realizing the real-time overpressure alarm and active pressure relief, and composite fiber outer vessel and high strength metal frame ensure the safe operation.



High-precision dual-channel infrared temperature sensor and platinum resistor temperature sensor can switch automatically, with infrared temperature measurement range of 0~900°C (standard configuration of 300°C), platinum resistor temperature measurement range of 0~250°C. The pressurized reaction is equipped with the patented piezo-electric crystal (pressure control range of 0~5MPa, precision of  $\pm 0.01$ MPa), realizing the pressure monitoring of reaction process and ensuring the safe and comfortable experiment. The same system can conduct the microwave atmospheric pressure and pressurized reaction and the software can judge the type of the reaction vessel automatically to prevent wrong operation.



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UWave-2000 adopts PID technology with non-pulse continuous microwave power (0 - 1000W), conducting automatic frequency conversion control along with reaction parameters. The reaction power can be set in each step. Under the temperature control mode, temperature program conducts the feedback regulation along with the linear slope of setting temperature and time, making accurate control of the microwave output power.

UWave-2000 is equipped with mechanical and magnetic stirring device. Digital constant speed mechanical stirring is especially applicable to the high viscosity liquid reaction, with rotation speed of 30~1600r/min. It can realize real-time speed regulation and displays the rotation speed ( $\pm 10$ r/grade), with torque of 300 N.m. It can stir clockwise or anticlockwise, with mechanical stirring rod material of PEEK or quartz. Built-in magnetic stirring rotation speed is 0~800r/min, speed program is adjustable and of real-time display.

UWave-2000 is equipped with intelligent control software. It can transmit the reaction parameters and curves by connecting with computer, and can record each reaction process and curve unlimitedly; It can conduct real-time control or change the reaction parameters of the host through computer, realizing user's programmed on or off of three energy sources - microwave, ultrasonic and UV radiation. 7-inch color LCD touch screen can make accurate setting and real-time display of various reaction parameters and curves, and conduct the real-time display of reaction color image. The chamber is equipped with recording system, which can show real-time reaction image through the color LCD screen, and can output the image signal for facilitating user's recording or external connection.



It has large volume 316L stainless steel industrial oven chamber. The large oven chamber with high-strength anticorrosive coating treatment can meet the maximum 2000 ml atmospheric pressure reaction and; Oven chamber is equipped with high-speed fan, with air rate of 3m<sup>3</sup>/min. 3-gear speed change will be made automatically according to the reaction situation; It is equipped with reflux condensation, dropping liquid, water diversion and other devices, and is equipped with inert shielding gas access pipe; This product passes ISO9001:2008 and EU safety CE certification.

## Technical Parameters

Power supply	220~240VAC 50/60Hz 9A
Microwave source	2450MHz, 0~1000W, continuous, non-pulse and automatically adjustable along with the temperature program, PID technology
Microwave oven chamber	Large volume, 316L stainless steel chamber, applied with multi-layer anticorrosive PFA Teflon spray inside and outside
Temperature measuring and control system	Dual-channel temperature detection DTD technology, switchable control. Infrared temperature sensor range 0~900°C, precision $\pm 1^\circ\text{C}$ , PT-100 resistor temperature sensor range 0~250°C, precision $\pm 1^\circ\text{C}$
Pressure measuring and control system	Piezoelectric crystal pressure sensor, pressure control range: 0~5MPa (750psl), precision of $\pm 0.01$ MPa
Working temperature	Standard configuration instrument's maximum operating temperature is 300°C and the maximum theoretical operating temperature is 900°C (peculiar configuration). The standard maximum working temperature of high-pressure reaction is 230°C.
Working pressure	The standard maximum working pressure of high-pressure reaction is 2 MPa, with constant pressure control valve, and constant pressure value of 2 MPa.
UV light source system	It can be equipped with high energy density ultraviolet source. LED type UV lamp power-100W, dominant wavelength is 365nm
Ultrasonic system	Immersion ultrasonic launcher, with adjustable scope of ultrasound power: 0~800W, frequency of 28KHZ, and automatic frequency sweeping and frequency locking
Stirring system	Digital constant speed mechanical stirring, with rotation speed of 30~1600r/min. It can realize real-time speed regulation and displays $\pm 10\text{r}/\text{grade}$ , with torque of 300 N.m. It can stir clockwise or anticlockwise; Built-in magnetic stirring rotation speed of 0~800r/min, speed program is adjustable and of real-time display.
Software system	With Windows software and 7-inch color LCD touch screen, it can make accurate setting and real-time display of various parameters and curves, and can transmit the reaction parameters and curves by connecting with the computer, and record and realize the control or change of each reaction process unlimitedly;
Video system	Color image recording system is equipped, which can realize real-time display of reaction process through 7-inch color LCD screen. And it can realize the transmission and recording by connecting the computer.
Interface	USB2.0 Serial port
Exhaust system	Oven chamber is equipped with high-speed hot blast fan, with blast capacity of 3m <sup>3</sup> /min. 3-gear speed change will be made automatically according to the reaction situation
Atmospheric pressure reaction vessel	Standard 50~1000ml high borosilicate glass reaction vessel and condensation, reflux, charging accessories, optional 2000ml high borosilicate glass vessel, optional 50~1000ml quartz reaction vessel
High pressure reaction vessel	100ml, 200ml and 500ml TFM high pressure digestion inner vessel, aerospace composite fiber explosion-proof outer vessel, high-strength alloy frame
Working environment temperature/humidity	0~40°C/15~80% RH
Physical size of whole machine	500 × 625 × 580 (Width×depth×height), 48kg

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No. OK 151217.SMCQC69



ISO9001:2008 and UKAS quality system authentication

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