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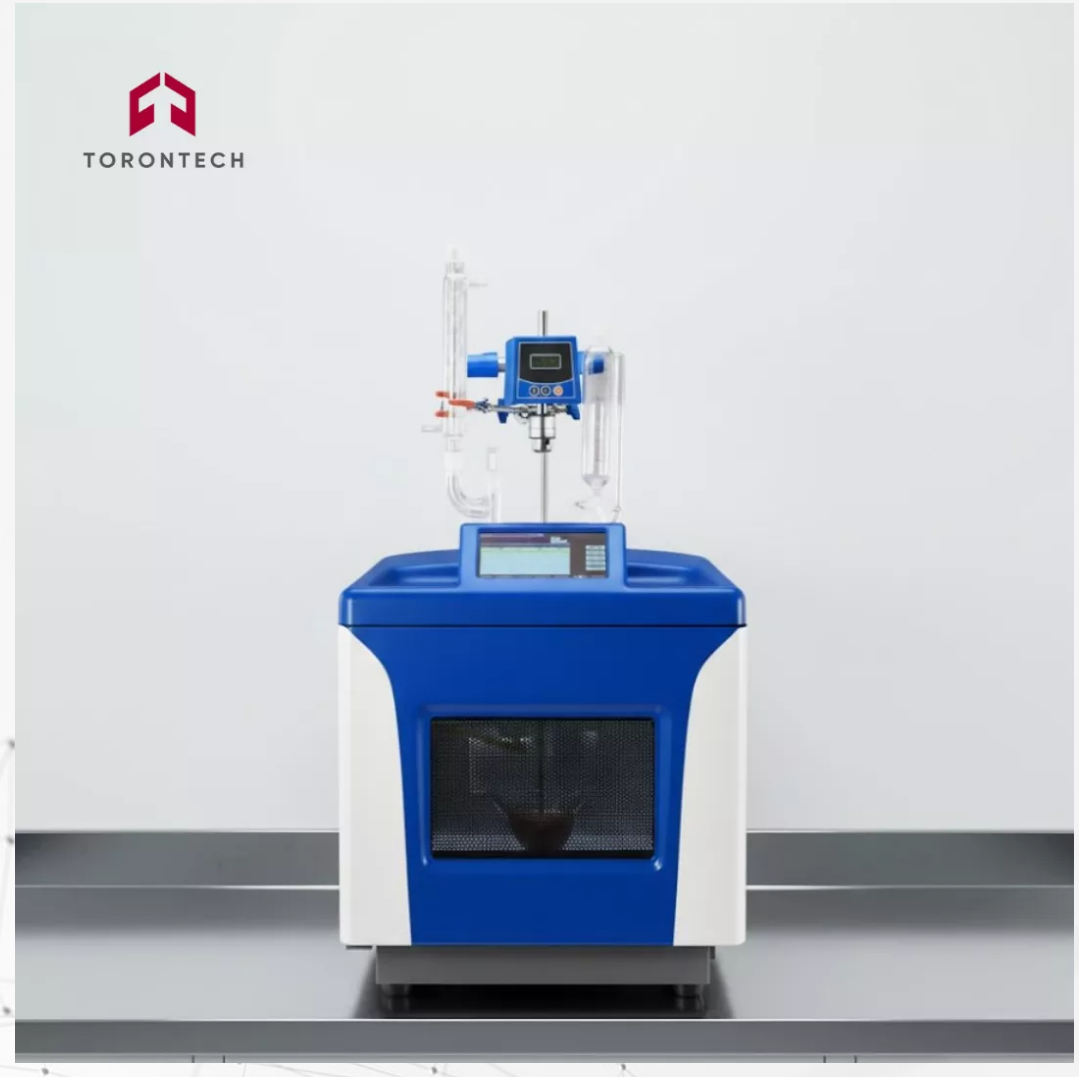


# MICROWAVE ASSISTED SYNTHESIS MULTIFUNCTIONAL CHEMISTRY REACTION WORKSTATION UWAVE-2000

The Microwave Assisted Synthesis Multifunctional Chemistry Reaction Workstation UWave-2000 is a versatile platform designed for modern microwave-assisted chemical research. As an advanced evolution of the UWave-1000, it is built on over 20 years of microwave chemistry expertise and validated scientific research. The system supports both atmospheric pressure and pressurized reactions, offering a flexible solution for a wide range of laboratory workflows.

UWave-2000 integrates microwave heating, ultrasonic energy, and ultraviolet irradiation within a single modular workstation. These energy sources can be combined or used independently, allowing researchers to tailor reaction conditions with precision. An intelligent operating system and a 7-inch touch screen interface provide clear control of reaction parameters, helping simplify complex experimental setups and improve reproducibility.

Designed to support both research and scale-up studies, the UWave-2000 enables reactions up to 2000 ml in open vessels and 500 ml in pressurized vessels. This capacity allows smooth transition from small-scale experiments to mass-production validation. The workstation is widely used in fields such as organic synthesis, pharmaceutical research, protein chemistry, advanced materials, graphene research, and polymer development, where controlled and efficient reaction environments are essential.

### Key Highlights

- Microwave assisted synthesis workstation for advanced chemical research
- Supports both atmospheric and pressurized reaction modes
- Combines microwave, ultrasonic, and ultraviolet energy in one system
- Modular design for flexible experimental configuration
- Large reaction capacity for research and scale-up studies
- Intelligent control system with intuitive touch screen operation
- Suitable for laboratory research and pilot-scale development

## APPLICATIONS

- **Organic Synthesis**: Supports multi-step organic reactions, esterification, condensation, and selective photochemical synthesis under controlled conditions.
- **Pharmaceutical Research**: Accelerates drug discovery, formulation studies, and protein chemistry with precise reaction control.
- **Polymer & Material Science**: Facilitates polymerization, nanomaterials development, graphene studies, and composite material research.
- **Environmental Analysis**: Enables microwave-assisted extraction of pollutants, organics, and trace elements from soil and water samples.
- **Biotechnology & Life Sciences**: Optimized for DNA and RNA preparation, protein denaturation, and biochemical pathway studies.
- **Nanotechnology**: Produces uniform nanostructures using combined microwave, ultrasonic, and UV irradiation techniques.
- **Academic & Industrial R&D**: Provides scalable experiments (50 ml–2000 ml), bridging laboratory research with pilot-scale production.
- **High-Pressure Reactions**: Safely performs sealed reactions up to 230°C and 5 MPa, enabling advanced chemical synthesis.

## FEATURES

### Advantages of the Microwave Assisted Synthesis Multifunctional Chemistry Reaction Workstation UWave-2000

Innovative Integration: Incorporates atmospheric pressure and pressurized reactions, microwave, ultrasonic waves, ultraviolet irradiation, and other functions, providing maximum flexibility.

Consistent Reproducibility: Utilizes microwave automatic frequency conversion control, dual temperature control technology, and piezoelectric crystal pressure for precise recording and representation of each reaction.

Stringent Safety Measures: uses pressurized mode, an intelligent safety pressure control system, real-time overpressure alarms, active pressure relief, and a composite fiber outer vessel, ensuring top-tier safety.

User-Friendly Interface: Features a 7-inch color LCD touch screen, intelligent software, safe and remote control, and video recording of reaction processes for ease of operation.

Reliable Durability: Features a multi-layer Teflon coating on 316L stainless steel chamber and robust reaction container materials, ensuring smooth progression of various chemical reactions.

Extensive Experience and Certification: Offers 20 years of industry experience, ISO and CE certifications, and has a leading number of national users.

The Microwave Assisted Synthesis Multifunctional Chemistry Reaction Workstation UWave-2000 enables the combination of three energy sourcesâ€”microwave, ultrasonic, and ultraviolet irradiation. Its software controls the timing of their activation and deactivation, enabling a synergistic effect from multiple energies.

The system includes an immersion ultrasonic launcher with adjustable ultrasound power ranging from 0 to 800W, operating at a frequency of 28KHZ with automatic frequency sweeping and locking.

Additionally, equipped with two sets of ultraviolet sources, with a standard UV lamp power of 300W (dominant wavelength 365nm) and an optional UV lamp power of 100W (dominant wavelength 254nm), it facilitates selective photochemical research.

The Microwave Assisted Synthesis Multifunctional Chemistry Reaction Workstation UWave-2000 offers multiple reaction vessels, accommodating glass flasks ranging from 50 to 2000ml for routine use, and optional quartz reaction flasks meeting standards suitable for photochemical reactions under ultraviolet radiation.

Microwave Assisted Synthesis UWave-2000

The Microwave Assisted Synthesis Multifunctional Chemistry Reaction Workstation UWave-2000 facilitates high-pressure sealed reactions and comes with three sealed reaction vessels of varying capacities: 100ml, 200ml, and 500ml. This resolves the scaling-up process from laboratory research to production verification. These sealed reaction vessels support prolonged reactions at temperatures up to 230°C and pressures up to 2Mpa, significantly broadening the temperature and pressure parameters beyond those of standard atmospheric pressure reactions.

Operating under pressurized mode, the Microwave Assisted Synthesis Multifunctional Chemistry Reaction Workstation UWave-2000 uses an intelligent safety pressure control system that triggers real-time overpressure alarms and ensures active pressure relief. Additionally, its external vessel, reinforced with composite fiber and a high-strength metal frame, guarantees a safe and seamless reaction process.

Microwave Assisted Synthesis UWave-2000

The Microwave Assisted Synthesis Multifunctional Chemistry Reaction Workstation UWave-2000 features a high-precision dual-channel infrared temperature sensor and platinum resistor temperature sensor that can automatically switch between them. The infrared temperature measurement spans from 0 to 900°C (standard configuration of 300°C), while the platinum resistor temperature measurement covers 0 to 250Â°C with a precision of ±1°C.

For pressurized reactions, it incorporates a patented piezoelectric crystal for pressure control ranging from 0 to 5MPa with a precision of ±0.01MPa. This ensures thorough pressure monitoring during reactions, enhancing safety and comfort during experiments. The system can identify the type of reaction vessel automatically, preventing erroneous operations.

The Microwave Assisted Synthesis Multifunctional Chemistry Reaction Workstation UWave-2000 is equipped with both mechanical and magnetic stirring devices. The digital constant-speed mechanical stirring is ideal for high-viscosity liquid reactions, with a rotation speed ranging from 30 to 1600 revolutions per minute (r/min). It offers real-time speed regulation and displays rotation speed (±10r/grade), with a torque of 300 N.m.

It allows stirring in clockwise or anti-clockwise directions, with the mechanical stirring rod made of PEEK or quartz. Additionally, the built-in magnetic stirring has a rotation speed ranging from 0 to 800r/min, featuring adjustable speed

programs and real-time display.

Its intelligent control software enables data transmission of reaction parameters and curves when connected to a computer. It can indefinitely record each reaction process and curve, enabling real-time control or modification of reaction parameters via the computer interface. This facilitates user-programmed activation or deactivation of the three energy source, microwave, ultrasonic, and UV radiation.

The 7-inch color LCD touch screen enables accurate setting and real-time display of various reaction parameters and curves, showcasing real-time images of the reaction. The chamber is equipped with a color recording system that displays reaction images in real time through the color LCD screen and outputs image signals for user recording or external connection purposes.

Microwave Assisted Synthesis UWave-2000

The Microwave Assisted Synthesis Multifunctional Chemistry Reaction Workstation UWave-2000 features a spacious 316L stainless steel industrial oven chamber. This extra-large chamber, treated with a high-strength anti-corrosive coating, accommodates atmospheric pressure reactions up to 2000 ml. Equipped with a high-speed fan, the oven chamber ensures an air rate of 3m3/min.

The system automatically adjusts the fan's 3-gear speed according to the ongoing reaction conditions. Additionally, it includes reflux condensation, liquid dropping, water diversion systems, and an inlet for inert shielding gas. This product is certified with both IS09001:2008 and EU safety CE certifications.

## TECHNICAL SPECIFICATIONS

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| Power supply | 220-240VAC 50/60Hz 9A (110V is also available. Please specify when ordering) |
| 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 |

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| Temperature measuring and control system | Dual-channel temperature detection DTD technology, switchable control. Infrared temperature sensor range 0~900℃, precision ±1℃, PT-100 resistor temperature sensor range 0~250℃, precision ±1℃ |
| Pressure measuring and control system | Piezoelectric crystal pressure sensor, pressure control range: 0~5MPa (750psl), precision of ±0.01 MPa |
| Working temperature | In standard configuration, the instrument can operate at a maximum temperature of 300℃, while its theoretical maximum operating temperature reaches 900℃ with a unique configuration. The standard maximum working temperature for high-pressure reactions is 230℃. |
| 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 offers the option to include two sets of ultraviolet lights: one with a UV power of 300W and a dominant wavelength of 365nm (standard), and another with a UV power of 100W and a dominant wavelength of 254nm (optional). |
| 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 | It features digital constant-speed mechanical stirring, capable of rotating between speeds of 30 to 1600 revolutions per minute (r/min). This stirring mechanism allows real-time speed adjustment and displays within a range of ±10 revolutions per grade, delivering a torque of 300 N.m. The stirring can operate in both clockwise and anticlockwise directions. Additionally, it includes a built-in magnetic stirring system with an adjustable speed program, offering real-time display of speeds ranging from 0 to 800r/min. |
| Software system | Equipped with Windows software and a 7-inch color LCD touch screen, it enables precise configuration and real-time display of diverse parameters and curves. By connecting to a computer, it can transmit reaction parameters and curves, record each reaction process, and facilitate unlimited control or modification of the reaction processes. |
| Video system | It's fitted with a color image recording system that enables real-time display of the reaction process via a 7-inch color LCD screen. This system can also transmit and record data when connected to a computer. |
| Interface | USB2.0 Serial port |
| Exhaust system | The oven chamber includes a high-speed hot blast fan with a capacity of 3m3/min. It automatically adjusts between three different speed settings based on the ongoing reaction conditions. |
| Atmospheric pressure reaction vessel | It comes with a standard high borosilicate glass reaction vessel ranging from 50 to 1000ml, along with condensation, reflux, and charging accessories. There's an option for a 2000ml high borosilicate glass vessel, as well as an optional 50 to 1000ml quartz reaction vessel. |

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| High pressure reaction vessel | It includes TFM high-pressure digestion inner vessels in capacities of 100ml, 200ml, and 500ml. Additionally, it features an aerospace composite fiber explosion-proof outer vessel and a high-strength alloy frame. |
| Working environment temperature/humidity | 0~40℃/15~80% RH |
| Physical size of whole machine | 19.7 inches X 24.6 inches X 22.8 inches |
| Weight | 106 lbs. |

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