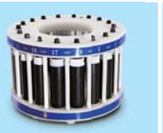
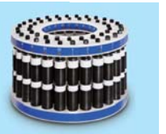
Technical Parameters of MASTER cavity

Power	220-240 VAC, 50/60Hz, 16A
Microwave source	2450MHz, dual magnetron design
Installed power	3600W
Maximum output power	2200W, non-pulse continuous automatic variable frequency control
Cavity	65L stainless steal industrial grade professional chamber, multi-layer chemical resistant PFA coating
Door design	6 layer steel structure and popup cushioning explosion-proof sliding chamber door (Auto-Pop) design, electronic and mechanical dual-control door lock
Video monitoring system (Optional)	Wireless video monitoring system, mobile phones and tablets can realize the observation and monitoring of the reaction
Pressure measurement and control system	Piezoelectric crystal pressure sensor, pressure control range :0-10MPa (1500 psi), accuracy ± 0.01MPa
Temperature measurement and control system	High-precision platinum resistor temperature sensor, temperature range :0-300°C, accuracy ±1℃; IR temperature sensor as optional, temperature range :0-300°C, accuracy ±1℃
Outer vessel material	Explosion-proof outer vessel made of aerospace composite fiber. high temperature and pressure resistance reach 600℃ and 66 Mpa(10000psi).
Inner vessel material	Modified TFM material
Chamber exhaust system	High-power anticorrosion axial fan, 20 minutes cooling time (from 200°C to 60°C)
Working environment	0-40 °C, 15-80%RH
Whole physical size/weight	550*670*700 mm, 70 KG
passive pressure protection system	Adopt Safety Bolt design, quantitative and vertical pressure release when over pressure

Specification of digestion vessels and rotors in different throughput provided:

Name of reaction vessel	16-vessel high pressure rotor	14-vessel high/medium pressure large volume rotor	18-vessel ultrahigh pressure rotor	40-vessel high/medium pressure rotor	100-vessel high/medium pressure totor
Model of reaction vessel	GP-100	LV-200	XXP-100	HP-40	HP-100
Processing capacity in one batch	16	14	18	40	100
Magnetic stirring function	none	optional	optional	none	none
Inner vessel material	TFM	TFM	TFM	TFM	TFM
Outer vessel material	Xtra Fiber	Xtra Fiber	Xtra Fiber	Xtra Fiber	Xtra Fiber
Frame structure of digestion rotor	Independent frame structure of each digestion vessel	Independent frame structure of each digestion vessel	Independent frame structure of each digestion vessel	Independent frame structure of each digestion vessel	Independent frame structure of each digestion vessel
Reaction vessel volume	100ml	200ml	100ml	45ml, 70ml	15ml, 30ml, 50ml
Maximum design pressure	15MPa(2200psi)	8Mpa (1000psi)	18MPa (2600psi)	10MPa (1450psi)	10MPa (1450psi)
Maximum design temperature	310℃	260℃	320℃	300℃	300℃
Maximum sample amount	0.5-1.0g	1-2g	0.5-1.0g	0.1-0.5g	0.1-0.5g
Typical application	Foods, soil, metal, alloy, plastics, cosmetic, agricultural products and semiconductor	environmental samples and biological samples	Indissolvable metal and mineral, plastic, ceramics, Extreme microwave reaction.	Food, environment (such as waste water, sludge and soil etc.) biological samples.	geological samples and biological samples.
Photo					

Certificate No.1610/IN-IST-12

ISO9001: 2008 and UKAS certificate of quality system

SINEO Microwave Chemistry Technology Co., Ltd

SINEO

New

MASTER

Ultra High Throughput Closed Microwave Digestion/Extraction Workstation

100 samples can be digested simultaneously, NO.1 in the world

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MASTER

Ultra High Throughput Closed Microwave Digestion/Extraction Workstation

100 samples can be digested simultaneously, NO.1 in the world

With the most advance technology and material of Shanghai Sineo Microwave Chemistry Technology Co., LTD., MASTER serial ultrahigh throughput microwave digestion/extraction workstation was launched in 2012. MASETER cavity is versatile for 16-vessel independent frame-type high pressure digestion rotor, 18-vessel carousel integrated ultrahigh pressure digestion rotor, 40/100-vessel ultrahigh throughput carousel rotor and 14-200ml-vessel carousel large capacity rotor etc., meets different experiment application requirements. Other core technologies including airplane Xtra Fiber digestion outer vessel, quantitative Safety Bolt patented design, UTH-Caro design of high throughput carousel, unique piezoelectric crystal pressure measuring technology and Uni-Turn technology of one direction continuous rotation of digestion rotor in chamber, et.al.

More than 20 years of experience in microwave

Leader in number of users nationally of 9000+ units

- 6-year supplier of Administration of Quality Supervision, Inspection and Quarantine of P.R.C;
- 100 vessel throughput, NO.1 in the world;
- 4 times BCEIA gold award of China Association for Instrumental Analysis;
- Various choices of vessel configurations, throughput of: 16, 18, 40 and 100 vessels; volume of: 15ml, 30ml, 50ml, 70ml, 100ml, 200ml and 500ml;
- Free lifetime warranty to the core components-magnetron of the Microwave Digestion System;

With the popularity of analytical instruments, e,g, Mass Spectrometer, there are increasing demands of rapid and efficient microwave sample preparation instrument with high productivity. However, the present high throughput microwave digestion products on the market that mostly adopt the spring structure are those which may bear low pressure, be easy to be leaked, and may not be heated evenly and operated easily. The MASTER closed microwave digestion system is developed by aiming at coping all the above mentioned problems, and the followings may show its unique characteristics of the innovative technologies:

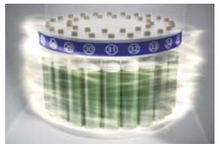
General technical features:

1 High-strength alloy carousel: higher pressure and better digestion performance

The high throughput vessel, since being connected by the high tensile alloy draw bar, may withstand great pressure (≥ 10000Kg). Each digestion vessel may receive great supports from the vessel frame on its top and bottom and it may not be deformed or leaked under the pressure of ≤4MPa and temperature of ≤250℃. (However, those similar products made by other venders generally may bear the temperature of 210℃ maximally.)

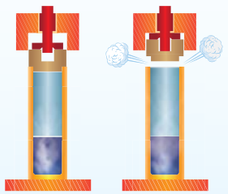
2 UTH-Caro design makes the carousel stir the microwave, guarantee samples digested evenly

The high throughput vessel frame may homogenize the microwave field inside the chamber with the turning and stirring of frame vessel; therefore, up to 100 high throughput vessels may be heated evenly in the microwave field.

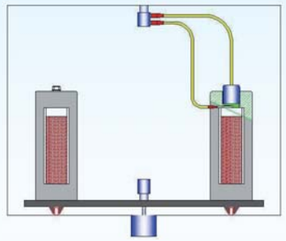


3 Safety Bolt: safer, more accuracy in result and higher recycling rate

Quantified Safety Bolt design, ensures samples be closed completely and triggers a quantified pressure relief while over pressure; Safety Bolt unit, instead of safety membrane and other consumables, ensure the digestion vessel be sealed completely under normal working conditions, which avoids the loss of volatile elements and incomplete digestion. And only when the pressure is too high and may constitute a danger, the Safety Bolt will automatically blow out vertically and the cover auto-up to release the pressure, achieving quantified vertical blast pressure-relief to guarantee its well operation. Under normal operation, the Safety Bolt requires no replacement. In addition, it is easy for venting to open the cover after completion of digestion. (However, those similar products on the market may bear low pressure and temperature, and since the cover is not made of metal, it may not recover after deformation; consequently, it may be not flexible anymore and be useless as it loses its sealing function after several times of recovering. This is why the samples inside the digestion vessel are reduced or dried and it has low recovery rate.)



4 Uni-Turn technology, increased homogeneity and reliability



The whole set of digestion vessels was designed to rotate continuously in one direction, it breaks conventions of<360 ° back and forth rotation, avoiding uneven heating on vessels and reducing impact on turntable motor to extend service life. The temperature and pressure cables are short, that they are free from twisting in running and can be disassembled easily.

5 15 minutes fast cooling

Because of the high thermal conductivity of composite Xtra Fiber outer vessel and the efficient exhaust system, it only needs 15 minutes that the temperature cools from 200 ℃ to 60 ℃, greatly accelerates handling speed.

6 Easy operation with innovative tools

The various convenient operation tools may lessen the working burden of operators and increase the preparation efficiency. Let's take the flexible trolley as an example. Such device may help the experiment personnel to place the high throughput rotary table with fully loaded samples (weighing 15-20kg) in the chamber and take it out easily. In this manner, the operator may not be required to contact the high-temperature and high-pressure digestion vessel directly and will not be injured by acid mist, perfectly ensuring the safety of the operation. The electric tool with fixed moment to close and open the digestion vessel may make the operation of high throughput digestion vessel rapid, simple and fulfilled.

① Explosion-proof outer vessel made of composite Xtra Fiber, better than those similar products on the market

The composite Xtra Fiber material is light, thin, and having better hardness (better than metal) and good rigidity. Moreover, its pressure resistance and corrosion resistance performances are much better than PEEK (Poly-Ether-Ether-Ketone) outer vessel. SINEO applies painted PFA processes, improves the corrosion-proof capacity by packing the composite fibers totally. Moreover, the high tensile invincible composite material may withstand pressure of 10000psi and temperature of 500-600℃.

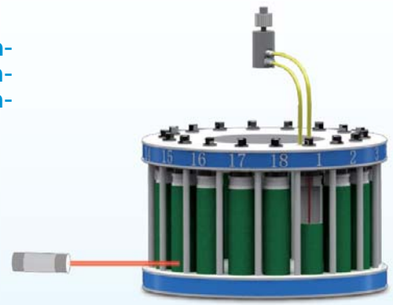
② Advanced and reliable pressure measuring technology by piezoelectric crystal

At present, the air-pipe is generally applied to transmit, measure and control the pressure inside the vessel for most venders. The air-pipe has apparent demerit that is too long, usually 400-600mm in length. Hence, the digestion turntable shall rotate back and forth in 360 degrees to avoid the air-pipe being twisted. Besides, the samples in master vessel may be polluted easily, and it may not withstand high pressure to prevent breaking the air pipe. Therefore, after years of research and development, SINEO acquires the pressure measuring technology by piezoelectric crystal, reliable and durable. Such technology may measure and control the pressure under 12MPa. The measuring and control cable is quite short, only 120-140 mm, therefore, there will be no twisting, sealing joint or leakage. Such technology allows easy operation and its greats merit is the absolute isolation of measuring and controlling component and sample, thus giving no chance to cross contamination.
Integrating the technology of synchronous rotation of temperature-pressure device and digestion vessel with the rotary table in one direction and the patented technology of junction box, the turntable plate may rotate towards one directly constantly. The pressure control system is the standard configuration of SINEO's product, more reliable than units with temperature monitoring only.

Piezoelectric crystal is installed on the bottom or top of the vessel frame like an electronic balance, and the parameter of pressure will be delivered via electrical signal.

③ The temperature inside the digestion vessel can be controlled by the combination of precise measure of temperature inside master vessel and IR temperature scanning

The precise measurement and control of temperature inside the master vessel (Pt or optical fiber) combines with the IR temperature scanning, and the computer may identify the master vessel automatically and give the real-time comparison of temperature with standard vessel, more precise and reliable than only IR temperature measuring.



MASTER

MASTER

Ultra High Throughput Closed Microwave Digestion/Extraction Workstation

④ High throughput rotor with optional strong magnetic stirring function specially for extraction or synthesis

Ultra high pressure and high temperature 18-vessel digestion vessel and carousel may work under 6MPa and 260℃, quite suitable for digestion of insoluble samples or closed microwave synthesis under extreme conditions. The strong magnetic stirring function is available for this configuration.

⑤ 200ml vessels for large volume sampling

LV-200 carousel with14-200ml vessels can be reacted simultaneously, and the sample size can reach 1-2 g. Magnetic stirring makes samples be digested faster and thoroughly. The patented design of innovative Safety Bolt can guarantee the safe as well as a completely digestion. The demand of large sampling digestion can be met.

⑥ Wireless remote visual monitoring system make reaction be clear at a glance

Innovative remote wireless video monitoring system, makes the digestion process clearly visible. Mobile phones and tablets can realize the observation and monitoring of the reaction, making the operation safer and more convenient.

⑦ 100-vessel ultrahigh throughput closed microwave digestion vessel and carousel, breakthrough products for the industry

To adapt to the rapid development of advanced analytical instrument, the requirement for limit of detection, volume of sample, acid amount and blank interference are decreased, but the amount of samples to be detected are increased. Therefore, small volume, good pressure-bearing capacity and excellent batch processing performance, has become the trend for the development of microwave digestion technology. After releasing the first microwave digestion apparatus with 40 vessels at home, Sineo cooperated with National Research Centre of Geoanalysis and developed MASTER-100. Its unique UTH-Caro design is based on the previous designs and technologies of high throughput products. Such product is well received by the users in geological industry, food industry, sanitary inspection industry and environment industry. The 100-vesssel digestion carousel has 3 volume specifications, 15ml, 30ml and 50ml, and it may be customized according to the specific requirement of the user.

⑧ One for All

This MASTER series product, may suit different digestion vessel sets and satisfy the requirements of users in different industries and application areas. You may use vessels and rotors in different quantity, temperature/pressure bearing capacities and volume flexibly.

Regular Digestion: 16-vessel independent frame type high pressure rotor and 40-vessel ultrahigh throughput carousel;

Special Digestion: 18-vessel ultrahigh pressure carousel, 100-vessel ultrahigh throughput carousel and 16-vessel 200ml large volume carousel.

⑨ Industrial chamber structure, safer operation

Sturdy and durable industrial-grade chamber design strengthen its impact resistance, and multi-layer chemical resistant coating greatly improves the service life and safety of the system; the pop up cushioning explosion-proof sliding chamber door (Auto-Pop structure) builds a passive safety protection system, and it can disable the microwave power automatically once explosion happens; efficient exhaust system design achieves fast and safe forced air cooling (15 min cooling time from 200℃ to 60℃), improving operational efficiency.

The Popup Cushioning Explosion Proof Sliding Chamber Door

⑩ The complete digestion database with over 1000 methods after safety verification, and has been referred to in several international standards, industrial standards and pharmacopoeia. The high-definition LED display may show the reaction parameters and change of curves in real time on different interfaces, convenient for the modification of the setting of reaction parameters and the saving of digestion solutions as per their types.

⑪ SINEO has 20 years of experience on the research and development of microwave chemistry instrument. It has ISO 9001:2008 certificate in design of microwave products. Moreover, its products have gotten EU CE safety certificate, and its corporate standards in electromagnetic compatibility, microwave leakage and electric protection go beyond national and international standards. In addition, the company has fully participated in the preparation, issuance and implementation of national standard for Microwave Digestion Device (GB/T 26814-2011)