INNOVATIVE TECHNOLOGIES

Microwave Digestion Workstation

TANK 40

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The Microwave Digestion Workstation TANK 40 is an advanced microwave digestion workstation designed to streamline sample preparation for elemental analysis. It ensures precise and efficient digestion of complex samples across industries such as environmental testing, food safety, pharmaceuticals, and materials research.

Equipped with high-pressure digestion vessels and intelligent temperature and pressure monitoring, TANK 40 delivers reliable performance while maintaining safety and consistency. Its high-performance microwave control system enhances reaction efficiency, reducing digestion time and ensuring reproducible results.

Built for laboratories requiring high throughput and accuracy, TANK 40 integrates user-friendly software and safety mechanisms, making it an essential tool for modern analytical testing.

FEATURES/ADVANTAGES

Comprehensive Safety & Anti-Corrosion Design

The **316L stainless steel furnace cavity** and **aerospace composite fiber vessels** coated with PFA provide exceptional resistance to corrosion, high pressure **(70 MPa)**, and high temperatures **(600°C)**. A 3D adjustable explosion-proof door with interlocking linkage enhances safety, preventing microwave leakage.

Real-Time Monitoring with Dual LCD Displays

A **7-inch color touchscreen displays** critical operational data, including temperature, pressure, and digestion steps. The additional **5-inch LCD** inside the cavity provides real-time observation of sample digestion. Equipped with USB, network port, and Wi-Fi connectivity, remote operation and monitoring are seamless.

Advanced Dual Magnetron Inverter System

Utilizes a **dual magnetron inverter** and **high-frequency closed-loop PID** control for continuous non-pulse microwave output. This technology ensures uniform energy distribution, higher efficiency, and consistent digestion results.

Intelligent Temperature & Pressure Control

Non-contact mid-infrared sensors continuously monitor vessel temperature, triggering an **automatic stop and alarm** in case of abnormalities. A **safety bolt structure** and **automatic pressure release** system ensure leak-free operation and passive pressure protection.

Smart Software with Regulatory Compliance

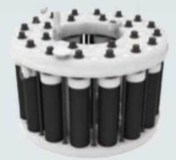
Runs on an **Android-based system**, featuring **electronic signatures**, **hierarchical permissions**, and **audit trails** compliant with **FDA 21 CFR Part 11**. The software automatically detects the number of digestion vessels, reducing manual input and improving workflow efficiency.

Optimized Workflow with Supporting Tools

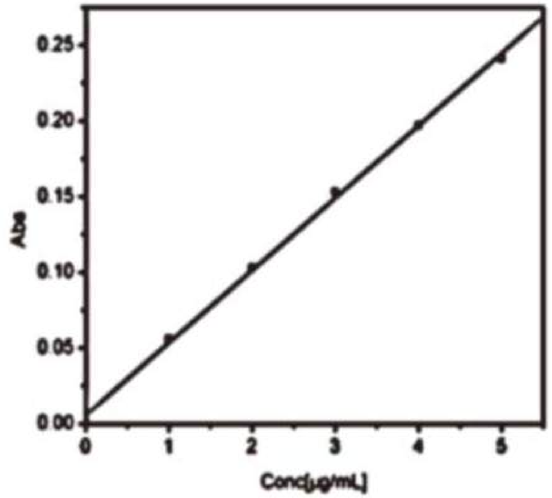
Includes **flexible laboratory accessories**, such as a mobile transfer trolley, reducing operator workload and minimizing direct contact with hot samples, ensuring safe and efficient handling.

TECHNICAL SPECIFICATIONS

SPECIFICATIONS	VALUE
Power	220–240V AC, 50/60Hz, 220A (110V also available upon request)
Working Environment Temperature	0–40°C
Relative Humidity for Working Environment	15–80% RH
Microwave Source	2450MHz; Maximum microwave output power: 2000W, emitted from Dual magnetron inverter high-energy microwave field; non-pulse continuous microwave output
Installed Power	3800W
Microwave Cavity	Grade 316L stainless steel microwave resonant cavity, with a wall thickness of more than 3mm, sprayed with multi-layer PFA coating
Furnace Exhaust System	Automatically adjusted air volume; cooling to room temperature in less than 15 minutes
Software System	Android operating system (8G memory), built-in video SOP, application method library, electronic door lock, etc.
Overall Physical Size / Net Weight	600 × 685 × 660 mm (W × D × H) / 62kg (136,5 lbs)

SPECIFICATIONS	VALUE		
Vessel Type	High-Pressure	Auto-Release	High-Pressure
Vessel Numbers	24 vessels	40 vessels	
Inner Vessel Material	TFM		
Outer Vessel Material	Aerospace composite fiber		
Inner Vessel Volume	110mL	55 mL	70 mL
Maximum Temperature	300°C		
Maximum Pressure	15 MPa		
Image			

TESTING ACCURACY AND PERFORMANCE VALIDATION



Curve equation: $[A] = K_1[C] + K_0$

$K_1 = 0.0478$, $K_0 = 0.0057$ Linear correlation coefficient: 0.99925

NO.	Sample mass/g	Cd concentration /ng·mL⁻¹	Cd content /ng·g⁻¹	RSD/%
1	1.01034	1.562	38.65	1.4252
2	1.01257	1.480	36.54	1.1046
3	1.01083	1.457	35.97	1.0832
4	1.01256	1.529	37.75	1.1430
5	1.01155	1.533	37.85	1.3106
6	1.01281	1.526	37.68	1.0844
Mean value		1.515	37.40	--
RSD/%		3.9		

Spike recovery		Spike amount /ng·mL⁻¹	Recovery rate /%	Quality control sample		Measured value /ng·mL⁻¹	Standard value /ng·mL⁻¹	Uncertainty /ng·mL⁻¹
	1	0.4	98.75					
	2	0.6	97.00		1	75.5	74	3
	3	0.8	92.88		2	76.9		
	4	1.0	93.4		3	74.9		

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