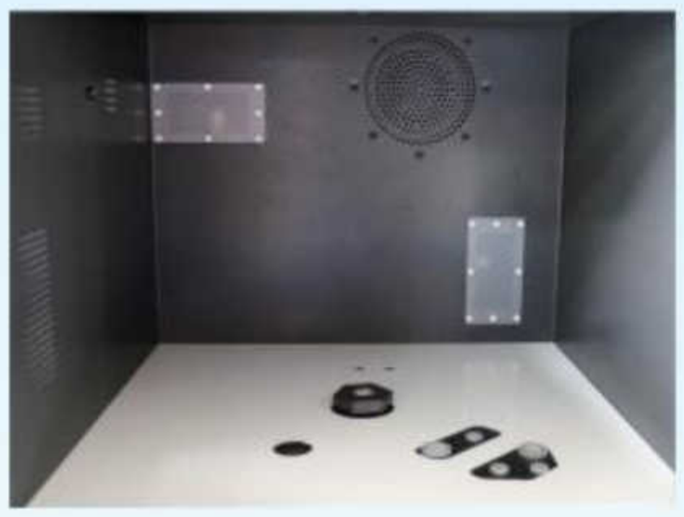
# Microwave Digestion Workstation TANK 40

## Main Features

### Comprehensive safety guarantee, combined with anti-corrosion capability

The furnace cavity is made of Grade 316L stainless steel, with a warranty of 5 years. The 3D adjustable, explosion-proof security door, installed with buffer and choke (to prevent microwave leakage), is self-sealing, impact-resistant and with interlocking linkage mechanism. The aerospace composite fiber outer vessel, wholly sprayed with PFA coating, boasts both higher anti-corrosion and higher pressure-resistance levels, compared to those of PEEK materials. The 70MPa pressure-resistance and the 600 ° C heat-resistance capabilities guarantee the safe operation of users under extreme conditions.



### Dual magnetron inverter control system ensures consistent sample digestion

TANK 40 Microwave Digestion Workstation adopts dual magnetron inverter control system and high-frequency closed-loop PID control, thereby realizing microwave continuous non-pulse output, more uniform microwave field in the cavity, higher energy utilization rate, and consistent sample digestion.

### Two LCD screen, displaying real-time operation and experiment status

The 7-inch color LCD touch screen displays real-time data, such as temperature, power, time, and steps. Swift switch to display of coordinate curves greatly facilitates users to better know what is going on with the experiment. The 5-inch color LCD screen allows clear, real-time observation of operation inside the furnace cavity. Equipped with interfaces, such as USB, network port or Wi-Fi, the vessel, once permitted, can be remotely operated and monitored through computer or Pad.

### Full-vessel pressure control technology

The high-pressure digestion vessel adopts elastic pressure relief and self-sealing technology. Under normal operation conditions, the vessel is completely sealed without leakage. Under overpressure conditions, the pressure is automatically and safely released together with excessive reaction gas (CO2 and nitrogen oxides); then, it is immediately sealed, ensuring smooth progress of subsequent experiments.

## Full-vessel precise temperature control and monitoring, ensuring safety and digestion performance

Non-contact mid-infrared sensors at bottom monitor and visualize real-time temperature change of sample solution inside each digestion vessel. The whole vessel temperature control system effectively monitors abnormal conditions during digestion experiment. Once abnormal temperature is detected, the vessel immediately stops microwave emission and starts to sound the alarm, so that experimental safety is not disturbed.

## Smart software operation, conforming to FDA21CFRPart11

The vessel, running on the Android operating system, is convenient and multi-functional. It offers many functions, such as electronic signature, hierarchical permission and audit trail, all in conformity with relevant regulations of FDA21CFRPart11. The software automatically identifies model of the turntable and automatically counts the number of vessels, making the experiment easier and faster, with the absence of tedious manual counting and input.

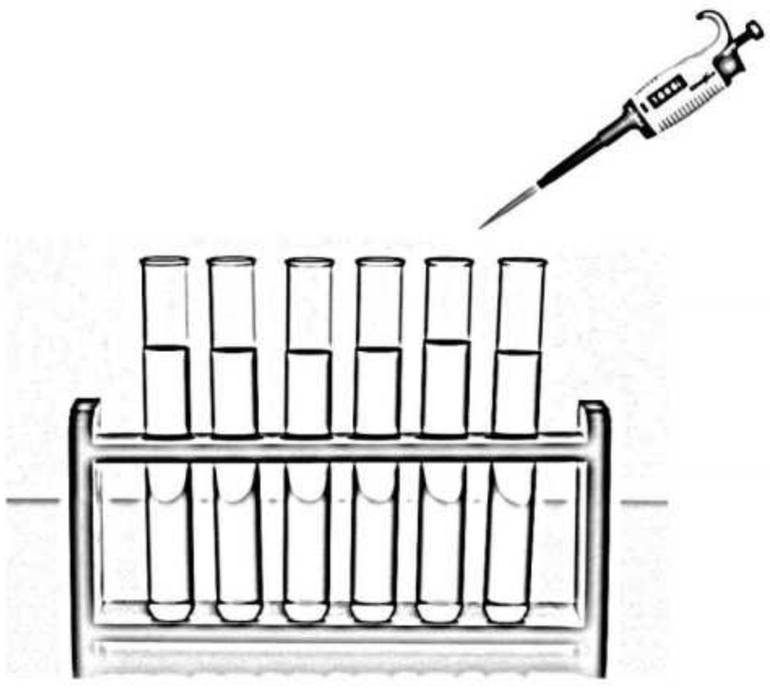

## Various supporting tools, making experiment easy and convenient

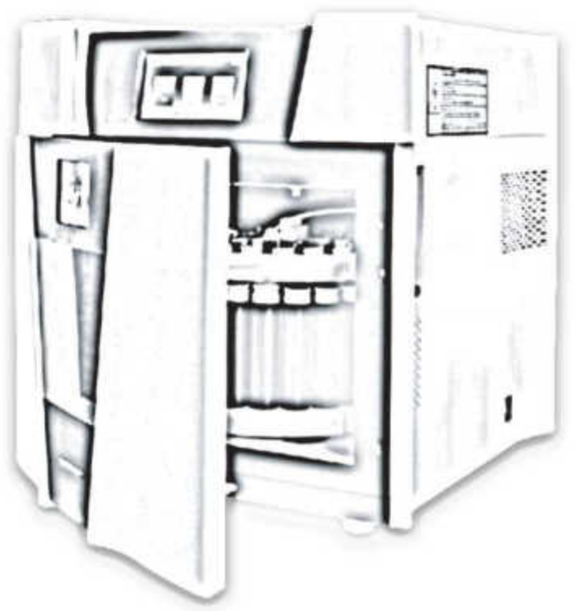
Various tools are supplied to reduce workload for operators and improve the work efficiency of sample preparation. For example, a mobile and flexible tool trolley is able to transfer rotor loaded with sample into and out of furnace cavity, avoiding direct contact between operator and digestion vessel for safety concerns.

## TANK40 Microwave Digestion Workstation Parameters:

| | |
|---|---|
| Power | 220~240VAC50/60Hz20A |
| Working environment temperature | 0~40°C |
| Relative humidity for working environment | 15~80%RH |
| Microwave source | 2450MHz; Maximun 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 (W*D*H) /62kg |

| | | |
|---|---|---|
| Batch amount | 24 vessels | 40 vessels |
| Inner vessel material | TFM | TFM |
| Outer vessel material | Aerospace composite fiber | Aerospace composite fiber with TEFLON coating |
| Inner vessel volume | 110mL | 55/70mL |
| Maximum temperature | 300°C | 300°C |
| Maximum pressure | 15Mpa | 15Mpa |
| Image |  |  |





## Wide range of applications

Microwave digestion technology heats reagents and samples in closed containers through microwave penetration and activation. It greatly speeds up reaction and shortens sample preparation time, with increased pressure and reaction temperature in digestion vessel. Microwave digestion is a commonly seen digestion technology widely applied in many fields.


Environmental monitoring

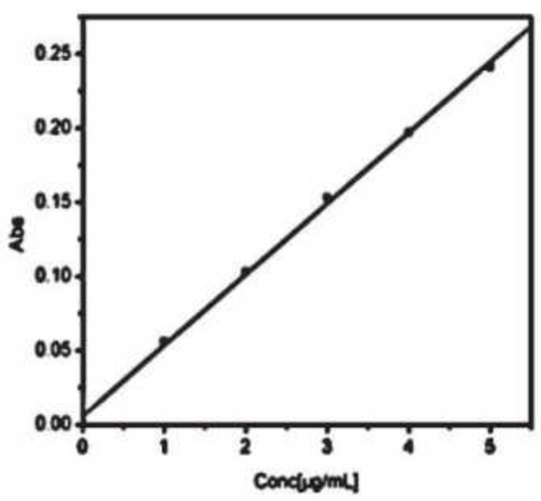

Food safety


Public health and disease prevention and control


Petrochemical industry


Education and research


Metallurgy




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 /% |
|---|---|---|---|
| | 1 | 0.4 | 98.75 |
| | 2 | 0.6 | 97.00 |
| | 3 | 0.8 | 92.88 |
| | 4 | 1.0 | 93.4 |

| Quality control sample | | Measured value /ng·mL⁻¹ | Standard value /ng·mL⁻¹ | Uncertainty /ng·mL⁻¹ |
|---|---|---|---|---|
| | 1 | 75.5 | 74 | 3 |
| | 2 | 76.9 | | |
| | 3 | 74.9 | | |