MARS™ 6 Extraction

Microwave Extraction System

MARS 6 for Extraction

The MARS 6 brings an intelligent design and remarkable ease of use to solid-liquid extractions. With an industry leading 2000 watts of installed power, it is the perfect tool for preparing samples for USEPA 3546. The MARS 6 can easily prepare up to 40 samples in a single batch, providing the highest throughput and lowest cost per test.

How It Works

The MARS 6 heats samples in a sealed environment, allowing for elevated solvent temperatures, rather than the atmospheric boiling points achievable with Soxhlet. This accelerates the extraction process, yielding results equivalent to the standard Soxhlet method, but in a fraction of the time and using significantly less solvent.

USEPA 3546 extractions, in only 25 minutes.

Preparing samples in the MARS 6 to meet USEPA 3546 is as simple as weighing a sample into each of the vessels, adding the solvent, and hand torquing the cap. Just place the turntable into the cavity and press “Start”. The MARS 6 does the rest.

ONE TOUCH TECHNOLOGY

Preinstalled methods, one touch away.

By selecting the One Touch™ icon on the MARS 6 touchscreen, you’ll be able to choose the sample type from the preinstalled methods. The system will automatically detect the type of vessel you are using, count the vessels, adjust the power accordingly, and perform the extraction for you. It couldn’t be easier.

iLink

Monitor your MARS 6, on a mobile device.

With the iLink® app, you can monitor your MARS 6 and get results on your mobile device. You’ll be free to move about the lab, and to focus on other tasks.

Download on the App Store | GET IT ON Google Play | Get it from Microsoft

Basic Specs

These are the specs that come standard on a MARS 6 for extraction. There are many upgrades available; such as an internal camera, additional safety locks, or extra sensors to make the system even easier to use. By utilizing our in-house engineers, chemists, and manufacturers we can quickly customize a MARS 6 thats right for you.

CONSTRUCTION

- 316 solid stainless steel cavity
- Corrosion-resistant casing
- Heavy-duty, spring-mounted, pressure-relieving door with safety interlocks

CAPACITY

- 55 L cavity size
- Up to 40 vessels

SOFTWARE

- Reaction conditions are documented for each sample and easily exported as a laboratory report
- Easily access past runs

POWER

- Wattage: 2,000 Watts
- Power Density: 36 Watts per Liter

TECHNOLOGY

- iLink®
  (Results on your mobile devices)
- One Touch Technology®
  (For preinstalled methods, vessel recognition, and power regulation)

CONNECTIVITY

- Connect multiple peripherals such as a keyboard, printer, or computer
- 5 USB ports
- 1 USB-B port
- 2 Ethernet ports
- 1 RS-232 port

LCD TOUCHSCREEN

- Easily navigate through methods with the high definition, 7-inch LCD touchscreen
- Capacitive touchscreen is corrosion-resistant, yet does not require a stylus
- Ergonomically located above the door, closer to eye level
- The 8GB on-board controller saves bench space by eliminating the need for a laptop or external controller

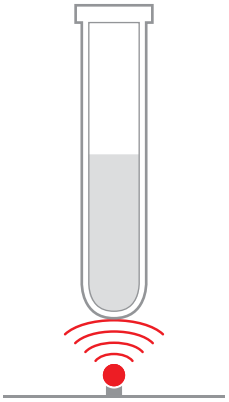
METHODS

- Run a preinstalled CEM method using One Touch or create and save your own custom methods
- Get more methods as they come out with software updates
- Contact our support team for specific questions (free lifetime support)

SAFETY

- 4 independent door safety interlocks, including an interlock monitoring system
- Safety switch prevents instrument operation in case of improper door closure or misalignment
- Complies with HHS standards under 21 CFR, Part 1030.10, Subparts (C)(1), (C)(2) and (C)(3)
- Optional door lock prevents door from being opened unintentionally during run

Sensors



IR Sensor

Dual, floor mounted IR sensor provides close contact for accurate temperature measurement for each vessel in the turntable.

Solvent Sensor

The solvent sensor resides in the exhaust system and constantly checks for the presence of solvents. If any solvent is detected, the MARS 6 alerts the operator and shuts down immediately. The sensor is uniquely designed to identify both a rapid venting of gas, and slow sustained leaks.

Recommended Accessories

AutoCal™

Simple and fast NIST-traceable calibration source for iWave and IR sensors.

MARSXpress™ Capping Station

Provides for rapid and automated capping and uncapping of MARSXpress vessels.

Anti-Static Ionizer

Perfect for weighing solid materials into Teflon® vessels, especially powders.

Vessels designed with you in mind.

All of the vessels for the MARS 6 have been designed to have the fewest number of parts possible for easy assembly and disassembly. They are durable to stand up to constant high temperature exposure, and have built-in safety features to release pressure, if needed. After a run, they cool quickly, so that you can get to your sample quickly and safely.

The MARSXpress Vessel

The 75 mL vessel is the perfect choice for USEPA 3546. It allows for sample sizes of up to 20 g to be extracted. The simple, 3-part design makes them remarkably easy to use. Up to 40 samples can be processed simultaneously, providing laboratories the lowest cost per test of any system on the market.

The MARSXpress Plus Vessel with Optional Glass Liner

The 110 mL vessel allows you to process samples of up to 30 grams. It can also be used with a convenient, disposable, glass liner to eliminate washing steps between runs. In addition, the glass liner protects the Teflon® vessel from highly concentrated contaminants.

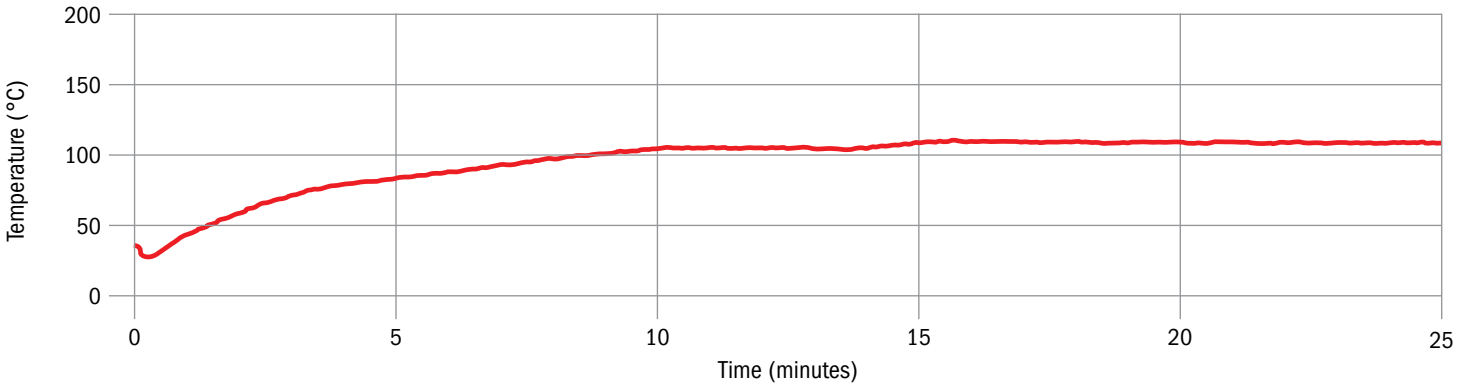
Results

A batch of 40, standard reference, soil samples were prepared in the MARS 6, as follows:
Sample: EPA Priority Pollutant CLP Soil
Sample Size: 20 grams
Solvent System: Acetone: Hexane 1:1 (v/v) 25 mL

Heating Program for Extraction of Soil (US EPA 3546) Ramp to Temperature Control

Max. Power (W)	Power (W)	Ramp (min.)	Temperature (°C)	Hold (min)
1800	100	15:00	115	10:00

Heating Curve for Extraction of Soil by US EPA Method 3546



Chlorinated Pesticide Residue Recovery from Certified Reference Material (Soil*)

	Certified Value (mg/kg)	EPA Methods 12 Lab Mean Recovery (%)	Microwave Extraction Recovery[1] (%)
Aldrin	338	88	92
alpha-Chordane	313	78	93
beta-BHC	148	75	82
4,4' DDE	340	89	92
Heptachlor	384	86	90
alpha-BHC	235	80	96
Lindane	425	81	88
Dieldrin	324	81	99
Endrin	233	91	96
4,4' DDD	196	89	97
4,4' DDT	229	79	90

Conclusion:

The MARS 6 can prepare up to 40 samples in a single batch in 25 minutes, thus providing the highest throughput and lowest cost per test available. With patented PowerMax™ and temperature control of every vessel, it provides superior results, as illustrated. As observed in the Chlorinated Pesticide Residue Recovery data in the chart above, the MARS 6 offers better results than conventional methods. In addition, 500 extractions may be performed in the MARS 6 with the same amount of solvent needed for 32 Soxhlet extractions, saving both time and money.

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