

- **PERFORM 80 EXTRACTIONS IN LESS THAN 4 HOURS**
- **USE 90% LESS SOLVENT THAN SOXHLET**
- **MANY TIMES THE THROUGHPUT OF AN ASE® SYSTEM**

## REMARKABLE EXTRACTION SAMPLE THROUGHPUT

Microwave-assisted extraction decreases extraction times, reduces solvent consumption, improves extraction efficiency, and increases the productivity of your laboratory. The MARS™ is a cost-efficient extraction alternative providing excellent recoveries and reproducibility.

### Fast

Reduce extraction time to less than 15 minutes for a batch of 40 samples. Microwave energy quickly heats solvents to elevated temperatures, reducing sample preparation by as much as 50 fold compared to Soxhlet.

### Cost-effective

Perform over 500 microwave-assisted extractions with the same amount of solvent used for 32 Soxhlet extractions. A dramatic cost savings is realized from the reduced quantity of solvent.

### High Throughput

Extract 40 samples per run to increase productivity.

### Efficient

Sample stirring decreases extraction time and solvent consumption while improving analyte recoveries.

### Automated

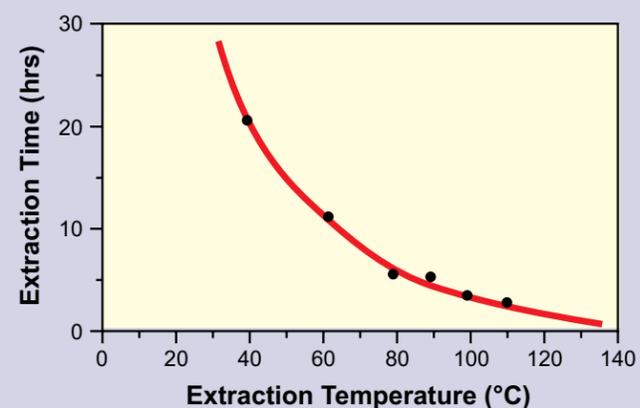
Simply load your samples, push a button, and completed samples are just minutes away.

### Safe

A built-in solvent detector turns off microwave energy in the presence of flammable organic solvent and the safety back-up system turns off microwave energy if the exhaust system is not functioning properly.

## Why is Microwave Assisted Solvent Extraction So Fast?

- Increased analyte capacity of high temperature solvent
- Accelerated desorption and dissolution kinetics:
  - For every 10 degree increase in temperature there is a two-fold increase in kinetics:



## MARSXPRESS™

Our easiest-to use pressure vessels will help you get your samples run quickly! Process up to 40 samples simultaneously in vessels designed for temperatures up to 260 °C (Teflon® PFA) or 300 °C (TFM®) and self-regulating pressure control. MARSXpress vessels work in conjunction with CEM's patented All-vessel Temperature Control™. No external pressure or temperature controls needed! Teflon® PFA liners are available in 10-, 25-, 55- and 75-mL sizes. Some liners are also available in TFM®.



## GREENCHEM™

Perform up to 14 reactions simultaneously at temperatures up to 200 °C or pressures up to 200 psi. These 100-mL vessels are available with Teflon® PFA, TFM® or glass liners.

## SYNERGYPREP™

SynergyPrep software for the MARS and MARSXpress Systems provides documentable control of your reactions from your computer with unmatched ease.



## POLLUTION PREVENTION

*"The EPA has established a preferred hierarchy of environmental management techniques that places pollution prevention as the management option of first choice...Extraction of organic compounds using microwave extraction conforms with EPA's pollution prevention goals. The volumes of solvent employed are smaller than with other extraction procedures."*

*Excerpt from USEPA Method 3546*

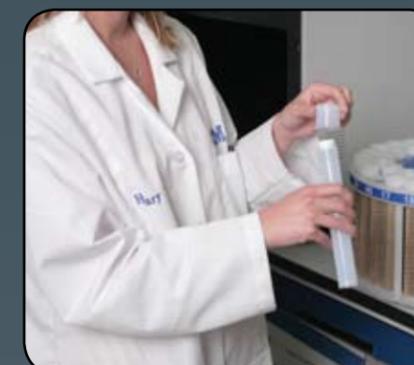
## FILTRATION SOLUTIONS

Designed to directly fit a wide range of containers including TurboVap®, the LABXpress positive pressure filtration accessory is the perfect accompaniment to optimize your high-throughput extractions.



TurboVap® Collection Vessels

THE ADVANCED DESIGN OF THE MARSXpress MAKES PROCESSING YOUR SAMPLE EASY AND FAST.



1. Simply add your sample to the vessel and secure the cap.



2. Place the vessel in the turntable and place in the system.



3. Choose the pre-loaded method and push start.



4. Filter your sample.

## TYPICAL METHODOLOGY

Total extraction time	20 minutes per batch
Samples per batch	up to 40 samples can be run simultaneously
Extraction temperature	100 – 115 °C (110 °C recommended)
Sample size	Normally 1-20 g

Environment Canada holds the patents for the Microwave Assisted Process (MAP™) and CEM is the exclusive licensed manufacturer of the technology.

**MARSXpress MEETS THE REQUIREMENTS FOR USEPA METHODS 3546, 3015, 3051, 3052 & NPDES.**

## SPECIFICATIONS - MARSXpress SYSTEM



ISO 9001:2000 certifies that the CEM quality management system meets internationally accepted standards.

Emissions and Safety Approvals  
U.S. and Canada Emission & Safety



Complies with FCC part 18 (47 CFR part 18 Industrial, Scientific, and Medical Equipment) US: ETL\* approved to UL standard 3101 (Laboratory Equipment) Canada: ETL\*\* approved to standard CAN/CSA C22.2 No. 1010.1 (Laboratory Equipment)

European Community Emissions & Safety



Conforms to EC standard EN 55011 (Emissions for Industrial, Scientific, and Medical Equipment) Conforms to EC standard EN50082-2 (Electromagnetic Compatibility – Part 1) Conforms to EC standard IEC 1010-1 (Safety requirements for electrical equipment for measurement, control and laboratory use – Part 1)

Overall Instrument Dimensions	25"D x 20"W x 23"H (63.5 x 50.8 x 58.4 cm)
Weight	120 lbs. (without vessels)
Printer Port	25-pin, Epson and IBM-compatible
Sensors	
1. IR Temperature control (recommended)	IR temperature control, confirmation of every vessel's temperature with SynergyPrep®
2. Thermo-Optic Temperature Control System (optional)	Microwave-transparent Thermo-Optic™ temperature control system for in-vessel measurement and control of temperature inside sealed sample vessels. Temperature range (0 – 300 °C)
Microwave Cavity	Heavy-duty, multi-layer fluoropolymer coating
Electrical Requirements	208/230 VAC (200-253 VAC), 60Hz, 15A @ 230 VAC 220/240 VAC (202-250 VAC), 50Hz, 15A @ 240 VAC Detachable power cord, I.E.C. and UL approved. Variance in line voltage can affect microwave power output.
Power Output	1600 watts
Magnetron Protection	Solid-state isolator (US patent 4,835,354) to protect magnetron from reflected energy, ensuring continuous, constant power output.
Patents	CEM microwave systems and vessel designs may be covered by any one of the following US patents: 04835354, 04080168, 05369034, 04672996, RE034373, 05230865, 04877624, 04672996, 05206479, 05427741. Other patents pending.

\*ETL and UL are equivalent NRTLs (Nationally recognized Testing Laboratories)

\*\*ETL is an approved testing lab by the standards council of Canada

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ASE® is a registered trademark of Dionex Corporation.

TurboVap® is a registered trademark of Caliper Life Sciences, Inc.

Teflon® PFA is a registered trademark of DuPont.

TFM® is a registered trademark of Hoechst A.G.

CEM CORPORATION IS A LEADING GLOBAL PROVIDER OF MICROWAVE LABORATORY SYSTEMS FOR ANALYTICAL SAMPLE PREPARATION, CHEMICAL SYNTHESIS, BIOSCIENCE APPLICATIONS, AND COMPOSITIONAL TESTING.

# CEM

*Microwave-Enhanced Science*

## CEM CORPORATION WORLD HEADQUARTERS

3100 Smith Farm Rd  
Matthews, NC 28106  
Tel: (800) 726-3331 [USA & Canada]  
Tel: (704) 821-7015  
e-mail: [info@cem.com](mailto:info@cem.com)  
[www.cem.com](http://www.cem.com)

CEM Microwave Technology Ltd.  
2 Middle Slade  
Buckingham Industrial Park  
Buckingham  
MK18 1WA  
United Kingdom  
Tel: +44 (0) 1280 822873  
e-mail: [info.uk@cem.com](mailto:info.uk@cem.com)

CEM Wave S.A.S.  
Via Dell Artigianato, 6/8  
24055 COLOGNO AL SERIO  
Italy  
Tel: +39 035 896224  
e-mail: [info.srl@cem.com](mailto:info.srl@cem.com)

CEM µWave S.A.S.  
Immeuble Ariane  
Domaine Technologique de Saclay  
4, rue René Razel  
91892 ORSAY Cedex  
France  
Tel: +33 01 69 35 57 80  
e-mail: [info.fr@cem.com](mailto:info.fr@cem.com)  
[www.cemfrance.fr](http://www.cemfrance.fr)

CEM GmbH  
Carl-Friedrich-Gauß-Str. 9  
47475 Kamp-Lintfort  
Germany  
Tel: +49 (0) 2842 9644  
e-mail: [info@cem.de](mailto:info@cem.de)  
[www.cem.de](http://www.cem.de)

# MARS

## Microwave-Assisted Extraction

- REDUCES SOLVENT USAGE **BY 90%!**
- PERFORM 80 EXTRACTIONS AND FILTRATIONS IN LESS THAN 4 HOURS!

Semi-volatile organic compounds

Organophosphorus pesticides

Chlorinated herbicides

Phenoxyacid herbicides

Substituted phenols

PCBs

PCDDs/PCDFs

Total Petroleum Hydrocarbons

Oil/Lipid content of grains & cereals

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