Wrocławskie Centrum Badań EIT + Sp. z o.o.
ul. Stabłowicka 147, 54-066 Wrocław
tel./fax +48 71 354 33 62
e-mail: biuro@eitplus.pl
www.eitplus.pl

DCMiB

Nr sprawy: ZZ-271-111-D-PN/2015
l.dz. 3333/2015

Wrocław, 24.08.2015 r.

Do wszystkich Wykonawców

Dotyczy: przetargu na dostawę wraz z montażem, uruchomieniem i instruktażem personelu urządzeń drobnych do budynku 9A z podziałem na 20 części

Informacja nr 1
MODYFIKACJA SIWZ - ZMIANA TERMINU SKŁADANIA I OTWARCIA OFERT

Zgodnie z art.38 ust.2 oraz art. 38 ust. 4 i 4a ustawy z dnia 29 stycznia 2004 r. Prawo zamówień publicznych (tekst jedn. Dz.U. z 2013 r. poz.907 z późn.zm.) Zamawiający przekazuje treść zapytań, które wpłynęły do Zamawiającego wraz z odpowiedziami:

Pytanie nr 1
Dotyczy części 3 – Reaktor mikrofalowy:

1. Czy Zamawiający dopuści zaoferowanie reaktora mikrofalowego o następujących parametrach:
   - podstawowe zastosowanie:
   a. chemiczne reakcje syntezy przebiegające w podwyższonym ciśnieniu i podwyższonej temperaturze
   b. reakcje rozkładu próbek metodą mokrą (mineralizacja i wprowadzenie do roztworu)
   - naczynia zamknięte o objętości 80ml w podwyższonym ciśnieniu do 27,5bar
   - maksymalna temperatura do 260°C
   - moc znamionowa 400 W
   - moc magnetronu 300 W i gęstość mikrofal 900 W/dm^3
   - wbudowane mieszadło magnetyczne
   - naczynie reakcyjne szklane z wkładką teflonową
   - brak ograniczeń w stosowanych reagentach w reakcjach syntezy i rozkładu
   - ciągłe monitorowanie i kontrola temperatury i ciśnienia reakcji
   - monitorowanie temperatury za pomocą czujnika podczerwieni IR
   - automatyczna aktywna głowica zaciskająca i monitorująca ciśnienie w naczyniu z możliwością ustawienia dowolnego ciśnienia wentylowania naczynia w zakresie do 27,5 bar
   - brak konieczności stosowania specjalnych otwieraczy – otwieranie ręczne
   - w zestawie komputer z oprogramowaniem do sterowania i monitoringu urządzenia
   - w zestawie kompresor bezolejowy do chłodzenia naczynia podczas procesu
   - brak konieczności chłodzenia głowicy i innych elementów układu poprzez obieg wody
   - akcesoria: 10 naczyń 80ml, 10 wkładek teflonowych, 100 przykrywek

Powyższe parametry spełnia reaktor mikrofalowy **CEM Discover SP-D 80.**

Pytanie nr 2

1. Czy Zamawiający dopuści zaoferowanie reaktora mikrofalowego o następujących parametrach:

INNOWACYJNA GOSPODARKA
UNIA EUROPEJSKA
Projekt współfinansowany przez Unię Europejską ze środków Europejskiego Funduszu Rozwoju Regionalnego

Wrocławskie Centrum Badań EIT+ Sp. z o.o.
ul. Stabłowicka 147, 54-066 Wrocław
tel./fax +48 71 354 33 62
e-mail: biuro@eitplus.pl
www.eitplus.pl

- podstawowe zastosowanie:
a. chemiczne reakcje syntezy przebiegające w podwyższonym ciśnieniu i podwyższonej temperaturze
b. reakcje rozkładu próbek metodą mokrą (mineralizacja i wprowadzenie do roztworu)
- naczynia zamknięte o objętości 65 ml w podwyższonym ciśnieniu do 48 bar
- maksymalna temperatura do 260°C
- moc znamionowa 400 W
- moc magnetronu 300 W i gęstość mikrofal 900 W/dm^3
- wbudowane mieszadło magnetyczne
- naczynie reakcyjne kwarcowe
- brak ograniczeń w stosowanych reagentach w reakcjach syntezy i rozkładu z wyjątkiem kwasu fluorowodorowego
- ciągłe monitorowanie i kontrola temperatury i ciśnienia reakcji
- monitorowanie temperatury za pomocą czujnika podczerwieni IR
- automatyczna aktywna głowica zaciskająca i monitorująca ciśnienie w naczyniu z możliwością ustawienia dowolnego ciśnienia wentylowania naczynia w zakresie do 27,5 bar
- brak konieczności stosowania specjalnych otwieraczy – otwieranie ręczne
- w zestawie komputer z oprogramowaniem do sterowania i monitoringu urządzenia
- w zestawie kompresor bezolejowy do chłodzenia naczynia podczas procesu
- brak konieczności chłodzenia głowicy i innych elementów układu poprzez obieg wody
- akcesoria: 10 naczyń 80ml, 100 przykrywek

Powyższe parametry spełnia reaktor mikrofalowy **CEM Discover SP-D Gold.**

Pytanie nr 3

1. Czy Zamawiający dopuści zaoferowanie reaktora mikrofalowego o następujących parametrach:
- podstawowe zastosowanie:
a. chemiczne reakcje syntezy przebiegające w podwyższonym ciśnieniu i podwyższonej temperaturze
b. reakcje rozkładu próbek metodą mokrą (mineralizacja i wprowadzenie do roztworu)
- naczynia teflonowe zamknięte o objętości 110 ml w podwyższonym ciśnieniu do 35 bar
- maksymalna temperatura do 260°C
- moc znamionowa 2300 W
- moc magnetronów 1800 W
- naczynie reakcyjne wykonane z teflonu TFM
- brak ograniczeń w stosowanych reagentach w reakcjach syntezy i rozkładu
- monitorowanie i kontrola temperatury oraz ciśnienia maksymalnego reakcji
- monitorowanie temperatury za pomocą czujników podczerwieni IR
- otwieranie i zamykanie ręczne za pomocą specjalnego klucza (w zestawie)
- w zestawie komputer z oprogramowaniem do sterowania i monitoringu urządzenia
- brak konieczności chłodzenia głowicy i innych elementów układu poprzez obieg wody
- akcesoria: 10 kompletnych naczyń 110ml, rotor 24 pozycyjny, klucz do zamykania naczyń, statyw na naczynia

Powyższe parametry spełnia reaktor mikrofalowy **CEM Mars 6 Xpress z naczyniami XpressPlus 110ml.**

INNOWACYJNA GOSPODARKA
UNIA EUROPEJSKA
Projekt współfinansowany przez Unię Europejską ze środków Europejskiego Funduszu Rozwoju Regionalnego

Wrocławskie Centrum Badań EIT + Sp. z o.o.
ul. Stabłowicka 147, 54-066 Wrocław
tel./fax +48 71 354 33 62
e-mail: biuro@eitplus.pl
www.eitplus.pl

Odpowiedź na pytanie nr 1, 2, 3

Zamawiający wyspecyfikował minimalne parametry reaktora mikrofalowego, które są dla niego niezbędne. Zgodnie z SIWZ Dostawca może zaoferować urządzenia, których parametry przewyższają wymagane.

Zamawiający dopuszcza: **Znamionowy zakres ciśnień roboczych: max. od 3 MPa (30 bar) do 5 MPa (50 bar) oraz Znamionowy zakres temperatur roboczych: max. Od 260 °C do 300°C.**

W związku z udzielonymi odpowiedziami Zamawiający modyfikuje zapis w Załączniku nr 2.2 do SIWZ – Wzór Formularza Oferty - Część B_Część 3 poz .1 - Reaktor Mikrofalowy w Tabeli „Obligatoryjne (wymagane) parametry lub funkcje" w następujący sposób:

OBLIGATORYJNE (WYMAGANE) PARAMETRY LUB FUNKCJE:	Potwierdzenie wymaganych parametrów i funkcji
Podstawowe zastosowanie: - chemiczne reakcje syntezy przebiegające w podwyższonym ciśnieniu i podwyższonej temperaturze - reakcje rozkładu próbek metodą mokrą (mineralizacja i wprowadzanie do roztworu), w naczyniach zamkniętych, w podwyższonym ciśnieniu, Pobór mocy z sieci zasilającej: 600W , Stalowa głowica ciśnieniowa. Stal 1H18N9T, Wodne chłodzenie głowicy ciśnieniowej, Obieg wody chłodzącej min. 1l/min, Znamionowy zakres temperatur roboczych: ***max. Od 260 °C do 300°C***, Naczynie reakcyjne teflon, Naczynie reakcyjne o kształcie ściętego stożka, Pojemność naczynia do mineralizacji 108 ml, Znamionowy zakres ciśnień roboczych: ***od 3 MPa (30 bar) do 5 MPa (50 bar)***, Brak ograniczeń w stosowanych reagentach w reakcjach syntezy i rozkładu, Monitorowanie temperatury i ciśnienia reakcji, Powtarzalne zamknięcie systemu ciśnieniowego z sygnalizacją siły docisku pokrywki naczynia reakcyjnego, Mikroprocesor z EPROMEM wewnątrz jednostki (1 na każde naczynie n-systemu), Mikroprocesor z EPROMEM w konsolce sterownicze - komunikacja RS232 II, w zestawie komputer do sterowania i monitoringu, Możliwość użycia komputera klasy PC do zadawania poziomów temperatur rożnych dla kolejnych kroków procesu, Otwieracz naczyń teflonowych, Ciągły monitoring ciśnienia oraz temperatury (za pomocą ekranowanego czujnika) pozwalający na pracę w wysokich wartościach roboczych bez odkształceń i degradacji naczyń, Akcesoria: 10 sztuk pojemników reakcyjnych	TAK

Jednocześnie Zamawiający modyfikuje zapisy SIWZ poprzez zmianę terminu składania i otwarcia ofert w przedmiotowym postępowaniu w następujący sposób:

1. Dział XI pkt 1 ppkt 1) otrzymuje brzmienie:

1. Złożenie ofert:

1) Ofertę należy złożyć w siedzibie Zamawiającego we Wrocławiu **ul. Stabłowicka 147; budynek 1A, Recepcja w nieprzekraczalnym terminie**:

Do dnia	**31.08.2015 r.**	do godz.	**12:00**

UWAGA !

W przypadku wysłania oferty pocztą lub kurierem na kopercie należy zaznaczyć miejsce złożenia oferty. Złożenie oferty bez tej adnotacji może skutkować jej nieskutecznym wpłynięciem do Zamawiającego.

2. Dział XI pkt 3 otrzymuje brzmienie:

INNOWACYJNA GOSPODARKA

UNIA EUROPEJSKA

Projekt współfinansowany przez Unię Europejską ze środków Europejskiego Funduszu Rozwoju Regionalnego

Wrocławskie Centrum Badań EIT + Sp. z o.o.
ul. Stabłowicka 147, 54 066 Wrocław
tel./fax +48 71 354 33 62
e mail: biuro@eitplus.pl
www.eitplus.pl

3. **Miejsce i termin otwarcia ofert:**
Otwarcie ofert nastąpi w siedzibie Zamawiającego we Wrocławiu, ul. Stabłowicka 147, Budynek nr 1A (biuro WCB EIT+ sp. z o.o.), Sala Konferencyjna, I piętro

W dniu	**31.08.2015 r.**	o godz.	**12:30**

UWAGA !
Oferty powinny być dostarczone za zwrotnym potwierdzeniem przyjęcia ich przez Zamawiającego. W przypadku korzystania z usług pocztowych, Zamawiający uznaje za termin złożenia oferty – termin i godzinę potwierdzenia odbioru przesyłki przez Zamawiającego.

Jednocześnie Zamawiający informuje, że dokonał modyfikacji Załącznika nr 2.2 do SIWZ – Wzór Formularza Oferty - Część B, który stanowi załącznik do niniejszej Informacji.

W związku z wprowadzonymi przez Zamawiającego zmianami, na Wykonawcy ciąży obowiązek uwzględnienia ich w treści oferty i złożenia oferty wraz z załącznikami o treści po ostatecznych zmianach.

Niniejsze informacje stają się integralną częścią SIWZ i stanowią dla Zamawiającego modyfikację o której mowa w art. 38 ust. 4 i 4a

Z poważaniem
Przewodniczący Komisji Przetargowej

ZAKUPÓW
Agnieszka Jurgielaniec

Dokument opracowała: Komisja Przetargowa

Kontakt: Anna Winnicka
tel. +48 71 720 16 10
e-mai: anna.winnicka@eitplus.pl

INNOWACYJNA GOSPODARKA
UNIA EUROPEJSKA
Projekt współfinansowany przez Unię Europejską ze środków Europejskiego Funduszu Rozwoju Regionalnego

NIP: 894 293 00 22, REGON: 020671635
BZ WBK S. A. 16 oddział we Wrocławiu
50 1090 2402 0000 0001 0804 3436

Spółka jest zarejestrowana w Sądzie Rejonowym dla wrocławia Fabrycznej we Wrocławiu
VI Wydział Gospodarczy Krajowego Rejestru Sądowego pod nr KRS 0000300736
Kapitał Zakładowy: 69 934 000 zł

DISCOVER SP-D

From Routine to Extreme,
The SOLUTION IS CLEAR

Discover SP-D
a better system?

It couldn't be simpler. Get

Using CEM's patented Focused™ Microwave Technology and enhanced cooling, most routine samples are digested in 10 minutes or less—including cool down. It is the perfect solution for laboratories that receive "rush" samples for analysis.

CEM's patented

eliminates the need for tools. Add the sample, the appropriate acid(s), snap the cap on the vessel, and place it into the Discover® SP-D™. Clamps and torque wrenches are not required. The system includes a large library of pre-loaded methods and programming is intuitive.

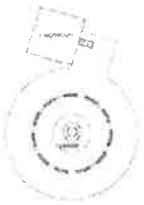
Each sample is . Every sample has its own method, allowing mixed samples and acid types to be run in a sequence. No more waiting for similar samples for batch processing. Temperature, pressure, and power parameters are captured for every digest and can be graphed for verification.

The Discover SP-D system automatically generates a to verify digestion conditions were met for each individual sample, not of the batch. Temperature, pressure and power graphs are documented, as well as the maximum . temperature and pressure, during the digestion.

PLAY
walk away!

The Discover SP-D is more than the latest technology for microwave digestion: it is a new concept in sample preparation. Discover SP-D is a sequential, pressurized microwave digestion system that processes samples completely unattended, allowing laboratory staff to tend to other tasks. Just load the autosampler press play and walk away.

Discover SP-D



The Discover SP-D's Focused™ microwave cavity produces a highly defined and extremely homogeneous microwave field. This cavity design enables the system to process samples faster and more reproducibly than batch style systems.

CEM's patented PowerMAX™ Cooling provides the ability to cool the vessel rapidly and avoid many exothermic reactions that can occur during digestion. In addition, it delivers rapid cooling after digestion, allowing the Discover SP-D to process samples in as little as 10 minutes per sample.

Batch systems use vessels that vent once the vessel reaches a set pressure. With CEM's patented Activent® Technology, the Discover SP-D automatically measures pressure and controls when the vessel vents. This enables discreet venting at pre-set limits, preventing loss of elements, including volatiles such as mercury and arsenic.

WEIGH, SNAP & LOAD

It doesn't get any easier than this!

1 Weigh the sample and add acid.

2 Snap on the cap and place in auto sampler.

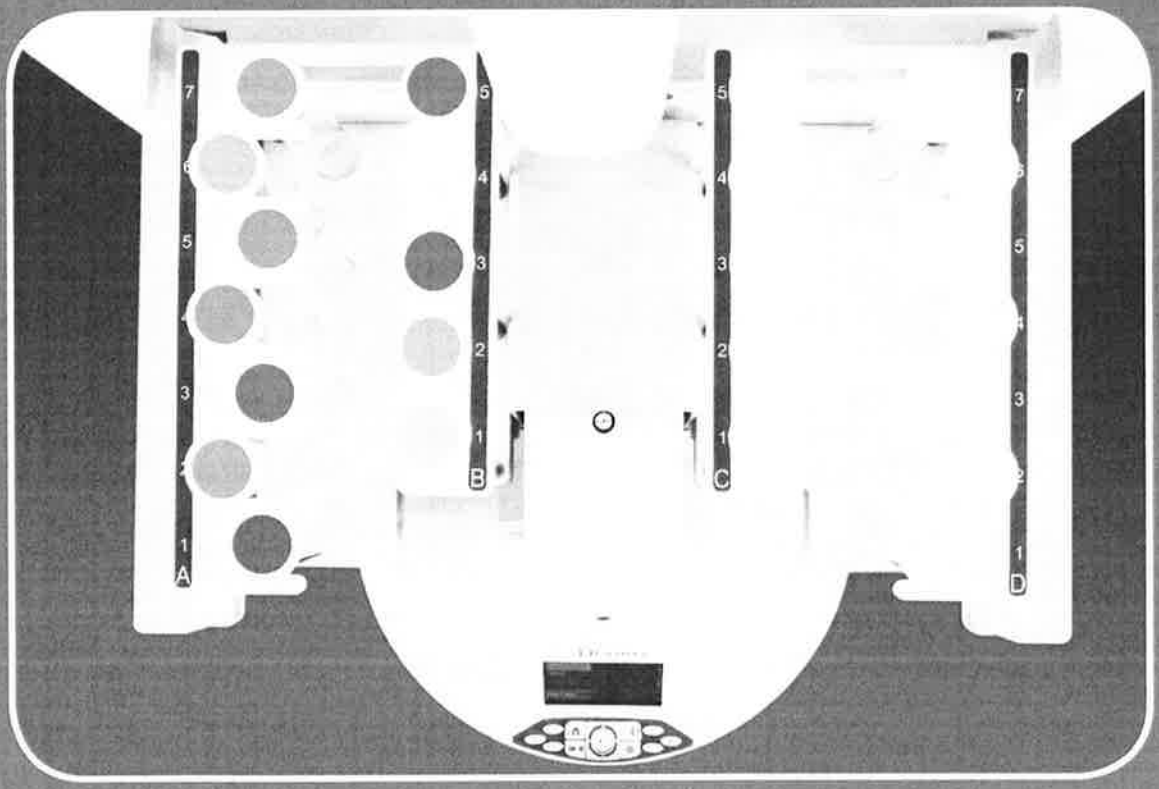
3 Load the Method and press Start.

The sample is digested!

Digest?

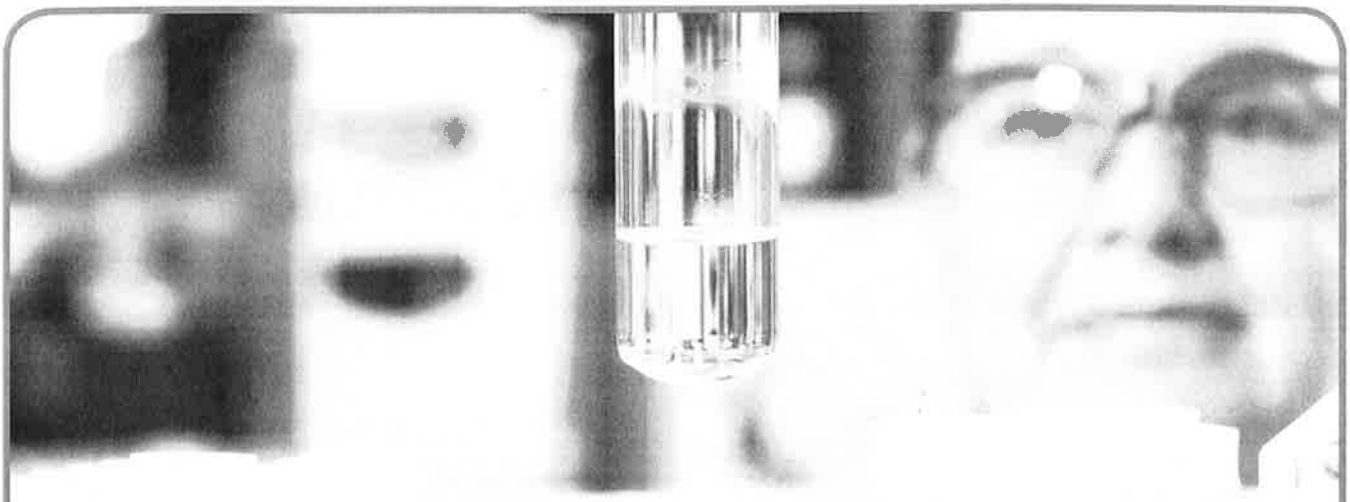
ANY SAMPLE
ANY ACID
VARIED SAMPLE SIZES
COMBINATION OF ACIDS
FULL PRESSURE CONTROL
FULL TEMPERATURE CONTROL

FLEXIBILITY

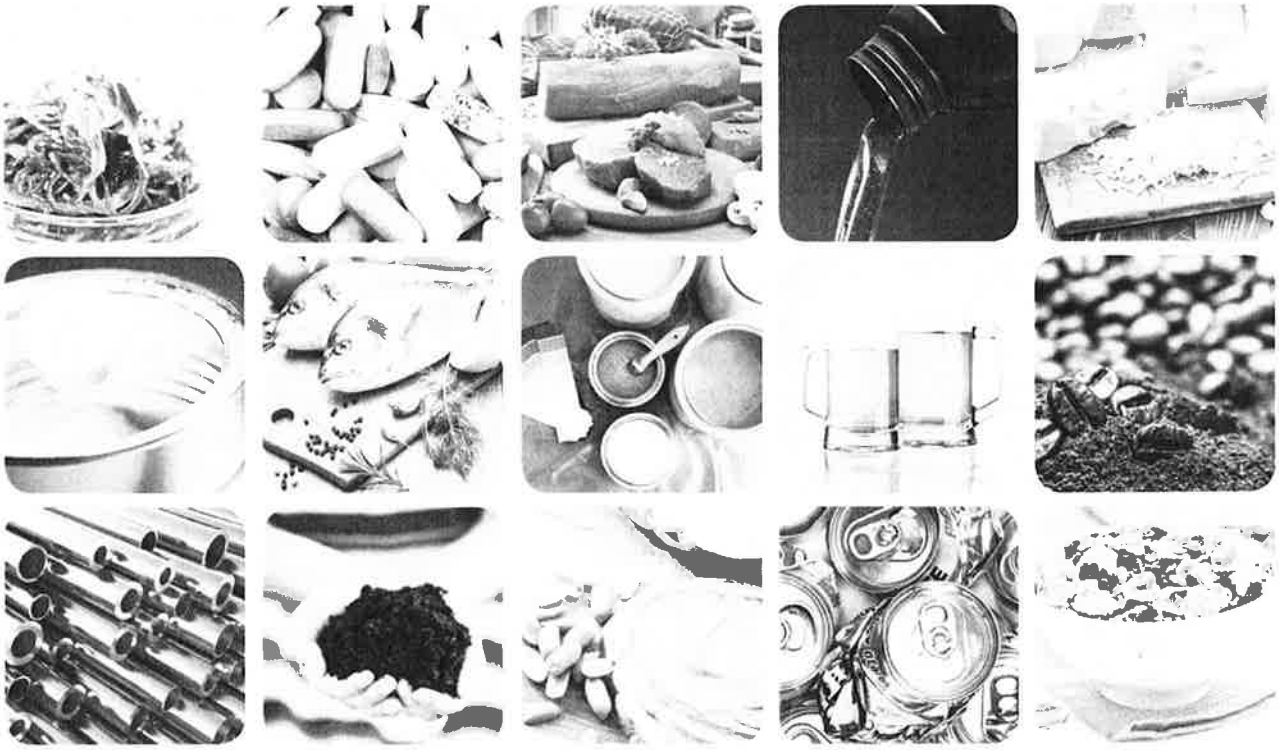


Difficult Samples	Routine Samples
Oil	Aspirin
Coal	Dry Pet Food
HDPE	Lipstick
	Milk Powder

A wide variety of applications have been developed for the Discover SP-D series. To view the Method Notes for over 100 samples, go to **www.cemanalytical.com** or **www.cem.com**. For Analytical Applications Support, email info@cem.com. Our Analytical Chemists will be happy to discuss your specific application with you.



From Routine to Extreme, The SOLUTION IS CLEAR



Air Filters	Calcium Carbonate	Copper	Kevlar	Riboflavin
Aluminum	Catalyst	EPA 3051	Magnesium Oxide	Sand
Aluminum Oxide	Cement	EPA 3052	Motor Oil	Sediment
Animal Tissue	Ceramic	Fish Tissue	Multi-vitamins	Sludge
Aspirin	Cereal	Fertilizer	Nylon	Soil
Bacon	Cheese	Folic Acid	Paint Chips	Talc
Banana Leaves	Citrus Leaves	Gold	Pharmaceuticals	Titanium Alloy
Beer	Clay	HDPE	Peanut Butter	Tuna
Bone	Coal Ash	Infant Formula	Platinum	Zinc Sulfate
Bunker Oil	Coffee	Kelp	Polypropylene	And more...

Discover SP-D

Discover SP-D 10/35

Max Temp: 240 ° C
Controlling Pressure: 350 psi

Sample Type	Sample Size
Pharmaceuticals	0.25 g
USEPA	N/A
Food Materials	0.5 g
Plant/Animal Tissue	0.5 g
Light Oil	0.2 g
HDPE	0.2 g
Al_2O_3	0.25 g
Ceramics	N/A
Toray Filter	N/A
Bunker Oil	N/A
Catalyst	N/A
Coal	N/A

Conostan Oil Reference Standard 50 ppm As, Se, HGOMS Mineral Oil Standard 50 ppm Hg

Average Recovery	51.3	52.9	52.9
Percent Recovery	102	106	106
Standard Deviation	3.46	4.18	0.64

A 0.25 g sample of Conostan Oil was digested in the Discover SP-D 10/35 System with 10 mL of $HN0_3$ in 10 minutes, including cool down.

Discover SP-D 80

Max Temp: 260 ° C
Controlling Pressure: 400 psi

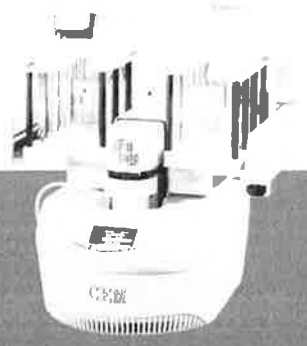
Sample Type	Sample Size
Pharmaceuticals	0.5 g
USEPA	0.5 g / 50 mL
Food Materials	1.0 g +
Plant/Animal Tissue	1.0 g
Light Oil	0.5 g
HDPE	0.4 g
Al_2O_3	0.5 g
Ceramics	0.25 g
Toray Filter	1 filter
Bunker Oil	N/A
Catalyst	N/A
Coal	N/A

Folic Acid SP-D Spike Recovery Results of 125 ppb Metal Impurities

Average	114.8	118.3	119.3	120.2	122.3
% Recovery	92	95	95	96	98
RSD	4.96	0.86	1.05	5.57	1.76

A 0.5 g sample of Folic Acid was digested in the Discover SP-D 80 system with 9 mL of $HN0_3$ & 1 mL HCl with a quartz vessel in under 10 minutes, including cool down.

is right for my lab?



Discover SP-D Gold

Max Temp: 260 ° C
Controlling Pressure: 700 psi

Sample Type	Sample Size
Pharmaceuticals	1.0 g +
USEPA	0.5 g / 50 mL
Food Materials	up to 2.0 g
Plant/Animal Tissue	up to 2.0 g
Light Oil	0.75 g
HDPE	0.75 g
Al_2O_3	0.5 g
Ceramics	0.25 g
Toray Filter	1 filter
Bunker Oil	0.25 g
Catalyst	0.25 g
Coal	0.25 g

Number 6 Bunker Oil Customer Sample Results based on Triplicate Analysis Recoveries reported in ppm

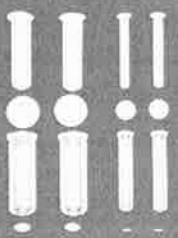
Average Recovery	19.48	19.53	16.09	35.32	8.69
Standard Deviation	2.10	2.10	3.91	9.71	0.23

A 0.25 g sample of Bunker Oil Number 6 was completely digested by the Discover SP-D Gold system in just over 20 minutes, including cool down.

ACCESSORIES

Synergy-D Software

- Real-time display of temperature, pressure, and microwave power
- Pre-installed methods for many sample types
- Sample queues that mix methods and sample types in a single run
- 21 CFR Part 11 Compliant



Vessels & Accessories

- 10 mL vessels available in Pyrex®
- 35 mL vessel is available in Pyrex® or quartz
- 80 mL and HPQ vessels are available in quartz
- Snap-on caps available for all vessels
- Teflon® liners available for 35 and 80 mL Pyrex® vessels (required when using hydrofluoric acid)
- Stir bars available in 2 sizes (required for running digestions)

NIST Traceable Calibration Device

Ensures accurate temperature measurement and complies with the requirements of GLP/ cGMP, ISO, and IQ/OQ/ PQ documentation.

why should I buy from CEM?

Over 50,000 systems sold worldwide

CEM has been an ISO-certified facility since 1994

Serviced & supported by system experts with an average of 15 years of experience

CEM invests 11% of annual revenue into R&D, the result... 11 R&D 100 awards

IQ/OQ/PQ Validation by certified CEM Technicians

"Our commitment to you doesn't end when your system is shipped: ***it begins.***"

~Michael J. Collins, President CEM

who do I contact about my Discover SP-D?

CEM Corporation:
PO Box 200
Matthews, NC 28106
United States

800-726-3331
704-821-7015
Fax: 704-821-7894
info@cem.com
www.cem.com

France: **CEM µWave S.A.S.**
Immeuble Ariane
Domaine Technologique de Saclay
4, rue Rene' Razel, 91892 ORSAY Cedex
33 (01) 69 35 57 80 • Fax: 33 (01) 60 19 64 91
info.fr@cem.com • www.cemfrance.fr

Germany, Austria, Switzerland: **CEM GmbH**
Carl-Friedrich-Gauss-Str.9, 47475 Kamp-Lintfort
(49) 2842-9644-0 • Fax: (49) 2842-9644-11
info@cem.de • www.cem.de

Ireland: **CEM Technology (Ireland) Ltd.**
Sky Business Centre, 9a Plato Business Park,
Damastown, Dublin 15
+353 (0) 1 885 1752 • Fax: +353 (0) 1 885 1601
info.ireland@cem.com • www.cemmicrowave.co.uk

Italy: **CEM S.R.L.**
Via Dell' Artigianato, 6/8
24055 Cologno al Serio (Bg)
(39) 35-896224 • Fax: (39) 35-891661
info.srl@cem.com • www.cemmicroonde.com

Japan: **CEM Japan K.K.**
2-18-10 Takanawa, Minato-ku, Tokyo 108-0074
+81-3-5793-8542 • Fax: +81-3-5793-8543
info@cemjapan.jp • www.cemjapan.co.jp

United Kingdom: **CEM Microwave Technology Ltd.**
2 Middle Slade, Buckingham Industrial Estate,
Buckingham MK181WA
(44) 1280-822873 • Fax: (44) 1280-822873
info.uk@cem.com • www.cemmicrowave.co.uk

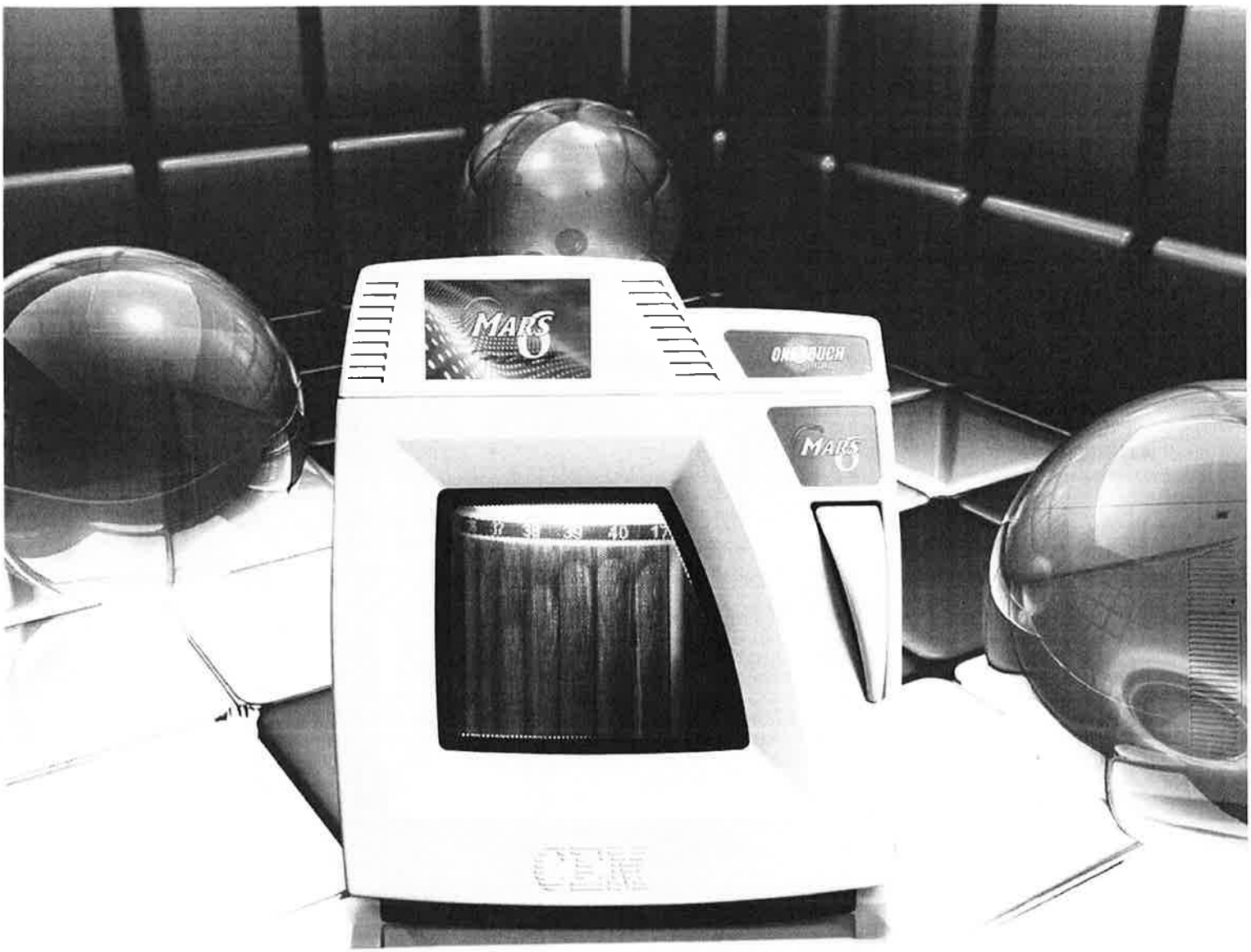
PATENTS

www.cem.com

B088.4

MARS 6
MICROWAVE REACTION SYSTEM

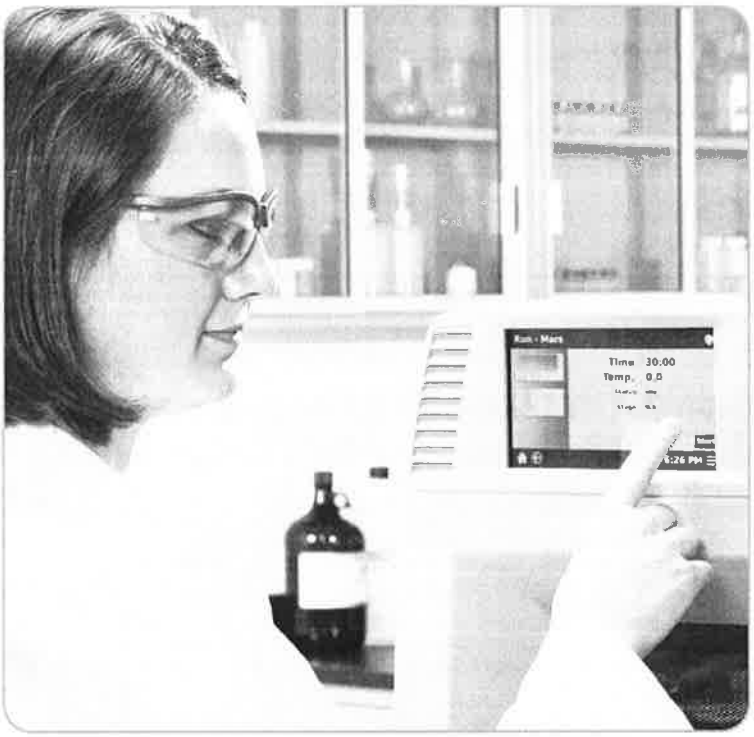
SOLUTIONS MADE SIMPLE



Tomorrow's Science Today

Versatility
The MARS 6 is incredibly versatile and can be configured for digestion, extraction, or both. It can also perform a variety of other chemistries including parallel or batch synthesis, protein hydrolysis, and evaporation/concentration.

MICROWAVE REACTION SYSTEM



CEM brings a remarkable intelligence and ease of use to microwave sample preparation with the new MARS 6 System. Totally redesigned with an impressive list of features and capabilities, MARS 6 was developed to make microwave sample preparation virtually effortless.

- Choose from simple CEM One Touch™ Technology* or MARS Classic method programming
- PowerMAX™ power control technology delivers maximum energy to the sample for more complete digestions
- 1800 Watts - more power delivery than any other microwave digestion system
- Large (7") wide-format, high-resolution, acid-resistant touchscreen – no external controllers needed
- Remarkably easy-to-use, intuitive onboard software
- Advanced sensor technology for vessel recognition, temperature and pressure control
- Improved connectivity – 5 USB, 1 USB-B, 2 Ethernet, 1 RS-232 allow connections to multiple peripherals such as keyboards, printers, or computers

*Worldwide patents pending

Easy as 1, 2, 3

1 LOAD YOUR SAMPLES.

2 CHOOSE YOUR SAMPLE TYPE.

3 Press "Start."

CEM's innovative One Touch Technology does the rest.

MICROWAVE REACTION SYSTEM

MARS

Features

HIGH-RESOLUTION, FULL COLOR TOUCHSCREEN WITH SPEAKERS
Large 7" (800 x 480) glass capacitive LED screen serves as controller and display

8-GIGABYTE ONBOARD CONTROLLER
No need for a laptop or external controller

POWERMAX™ POWER CONTROL
Delivers maximum energy to the sample, ensuring complete digestions

ONE TOUCH OR MARS CLASSIC METHOD PROGRAMMING
Select which program is best for you

ACID- AND IMPACT-RESISTANT COMPOSITE SHELL
Better system protection in a laboratory environment than a metal wrap

I/O PORT
Standard 0.500" I.D. port or optional 0.3125" I.D. ports for 6mm tubing allows for introduction of multiple components into the cavity

METHOD LIBRARY
Pre-loaded with USEPA and other internationally recognized methods

DATA AT A GLANCE
Touchscreen interface provides easy access to stored methods, real-time data, results of past runs, and training videos

CONNECTIVITY
Available ports: 5 USB, 1 USB-B, 2 Ethernet, and1 RS-232

TOUCHSCREEN TRAINING VIDEOS
Learn more about your system, how to use different vessel sets and options, and running samples right on the MARS 6.

INTEGRATED PRINTER
Print graphs and data for documentation

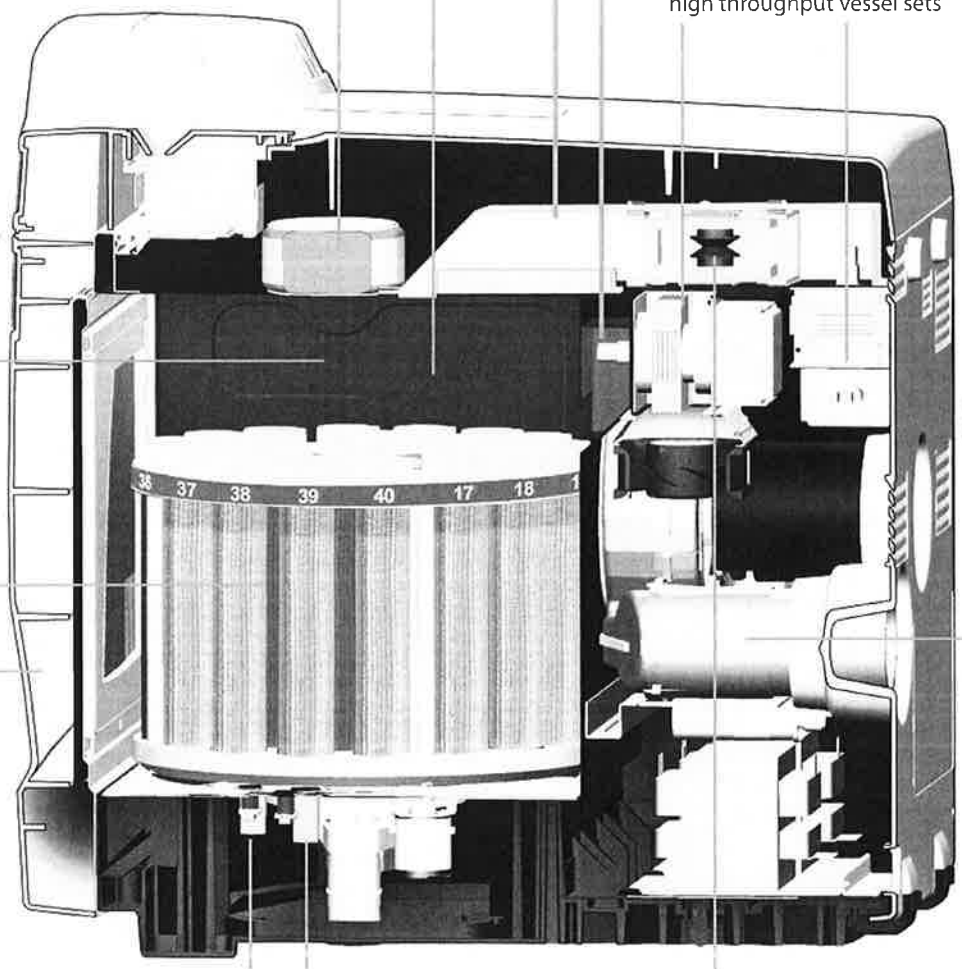
MICROWAVE REACTION SYSTEM

ISOLATION TRANSFORMER
Filters variations of incoming line current to protect electrical components

REACTIGUARD SENSOR
Constantly monitors cavity for vessel problems

SPECIALLY DESIGNED WAVEGUIDES
Ensures microwave uniformity and eliminates the need for motor-driven diffusers or mode stirrers

SEQUENTIAL MAGNETRONS
1800 watts of delivered energy, providing the power needed for difficult samples and high throughput vessel sets



LARGE MULTI-LAYERED TEFLON®-COATED CAVITY

RUGGED, HIGH-GRADE 316 SOLID-STEEL CAVITY

UP TO 40-VESSEL CAPACITY

HIGH-CAPACITY EXHAUST

HEAVY-DUTY, SPRING-MOUNTED, PRESSURE RELIEVING DOOR WITH SAFETY INTERLOCKS

FLOOR-MOUNTED IR SENSORS
- Temperature
- Vessel Recognition
- Vessel Counting

PATENTED ISOLATOR
Absorbs reflected microwave energy prior to reaching magnetron and allows magnetrons to run at 100% power

MICROWAVE REACTION SYSTEM

ONE TOUCH TECHNOLOGY

ONE TOUCH
MAKES ALL THE DIFFERENCE

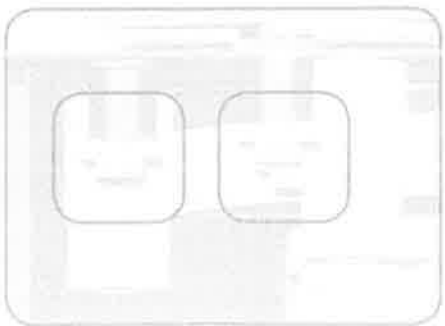
CEM's patent-pending One Touch Technology brings intelligent simplicity to microwave sample preparation. It's like having a CEM applications chemist built into the system. CEM's One Touch combines more than 30 years of microwave chemistry experience with today's most advanced software and hardware technologies to give laboratories the easiest-to-use microwave sample preparation system ever designed.

One Touch Methods

CEM's One Touch takes the guess work out of sample preparation. Simply choose from more than 70 preinstalled methods and the MARS 6 does the rest. One Touch automatically determines all of the parameters, adjusts power output, and performs the digestion for all major sample types including environmental and regulatory, foods, plant and animal tissues, inorganic chemicals, oils and plastics, organic compounds, semiconductors, pharmaceuticals, and more.

One Touch Sensor Technology

The MARS 6 features integrated sensor technologies designed to make the system so simple to operate, it's virtually effortless. Located in the top and bottom of the cavity, CEM's One Touch vessel recognition and vessel counting sensors automatically recognize the type and number of vessels that have been placed in the cavity. Based on this information, optimum digestion conditions for sample type and number of vessels are selected and temperature and pressure sensors monitor the reaction and adjust the microwave power to ensure a complete digestion.

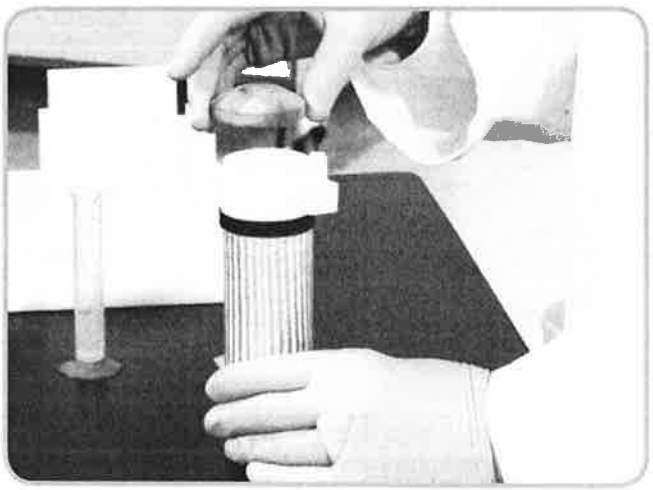


One Touch Vessel Technology

One Touch samples can be digested in the MARSXpress and EasyPrep families of vessels. The simple-to-use MARSXpress and MARSXpress Plus are the easiest-to-assemble vessels on the market and are ideal for high-throughput labs. The simplest to assemble high-temperature and high-pressure vessels available are the EasyPrep and EasyPrep Plus, which are well suited for large or difficult applications.

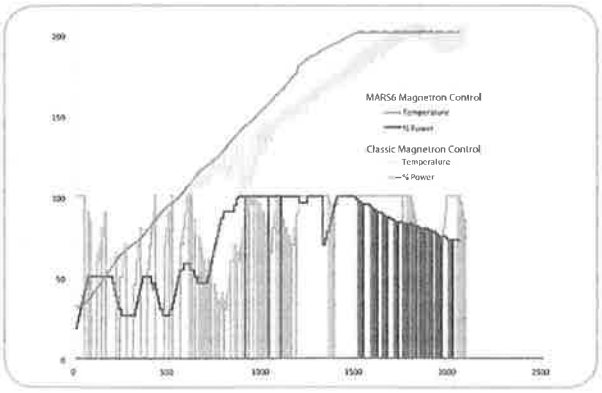
One Touch Sample & Vessel Preparation Technology

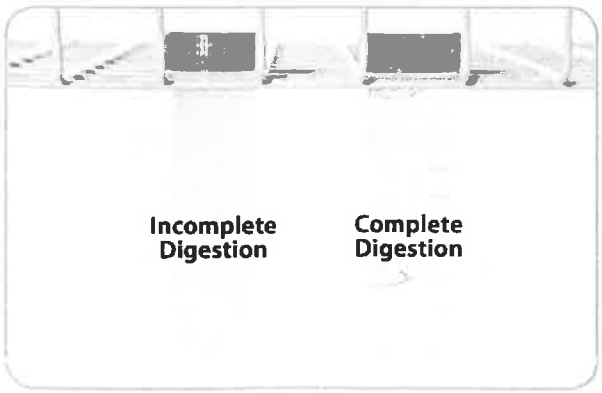
With the MARS 6, operators of all levels will be able to achieve complete digestions of even their most difficult samples. Every One Touch method contains recommendations for sample mass, acid type and volume, and preparation, as well as tips to ensure complete and safe digests every time. The MARS 6 also features onboard training videos for sample preparation, vessel assembly, system use, and maintenance that are viewable on the high resolution touchscreen.



PowerMAX™ Automatic Power Control

Consistent results every time. Traditional microwave systems introduce an excessive amount of power to the sample, causing fluctuations in temperature that result in the magnetron shutting down for significant amounts of time. This frequently results in incomplete digestions. The MARS 6 uses CEM's PowerMAX Technology to automatically maximize the amount of microwave energy to the reaction for a complete digest regardless of the number of vessels and sample size. PowerMAX dynamically adjusts the power throughout the run, providing the control necessary for complete digests, while preventing exothermic reactions.





1800 Watts of Delivered Microwave Energy

The MARS 6 employs sequential magnetrons to precisely deliver an industry-leading 1800 watts to completely digest even the most difficult matrices. These sequential magnetrons work with CEM's PowerMAX Technology to help fine tune and maximize microwave power throughout the runs.

Wave Guide Power Delivery Ensures Microwave Uniformity

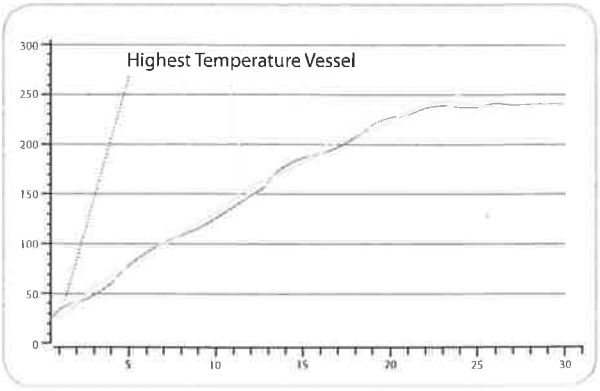
CEM engineers designed precisely tuned wave guides for the MARS 6, eliminating the need for motor driven diffusers or attenuators. The MARS 6 wave guides deliver microwave energy directly to the center of the cavity and disperse it uniformly across the vessels, ensuring reproducible results every time.

DuoTemp™ Control

DuoTemp & MARSXpress DuoTemp All Vessel Temperature Control

The patented DuoTemp technology provides the ultimate control by automatically choosing the "Control Vessel" based upon reaction conditions. The control vessel will dynamically change during the run to always control the temperature based on the most reactive vessel, providing reproducible, safe digests every time without excessive venting or exothermic reactions. DuoTemp's combination of fiber optic and IR temperature sensors with the innovative built-in software controls of the MARS 6 creates a temperature control option that is unmatched.

Control Vessel Shifts to Most Reactive



Patented DuoTemp Control automatically measures the temperature in each vessel and dynamically controls the run based on the most reactive vessel.

MICROWAVE REACTION SYSTEM

SENSORS AND CONTROLS

CEM offers a complete line of sensors and control options to meet the sample preparation needs of your laboratory.

Direct Fiber Optic Temperature Sensor of the Reference Vessel

The fiber optic temperature probe is the gold standard in temperature measurement. Unlike metal thermocouples, which can self-heat in the microwave and give imprecise readings, CEM's fiber optic temperature probe provides accurate measurement every time. An optional NIST-traceable fiber optic temperature probe is also available.

Single Vessel Reference Pressure Sensor

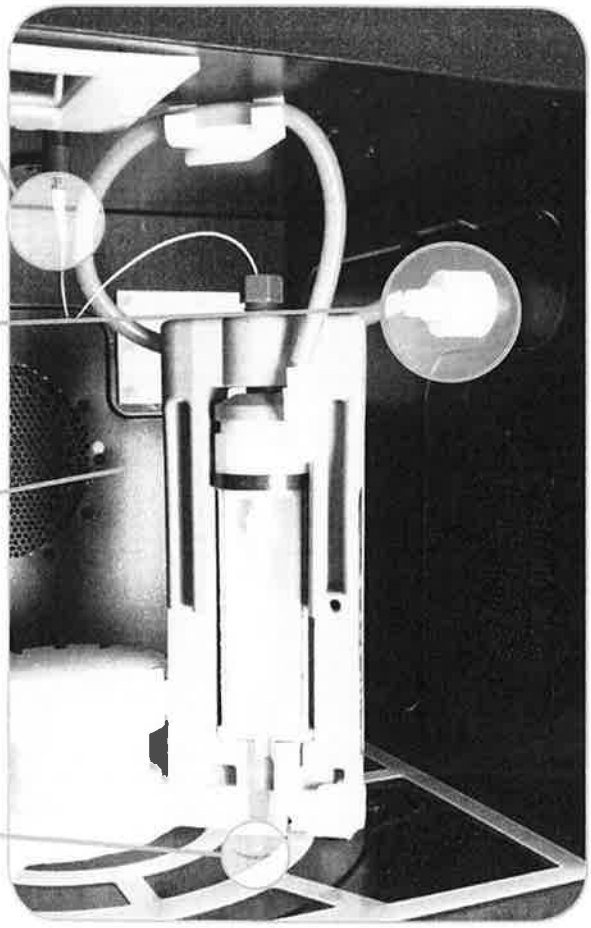
Accurate and simple to use, the ESP-1500 Plus is a simple pop-in device that can be immediately removed from the cavity after the run for fast processing of multiple vessel racks. It measures and controls pressure up to 1500 psi.

Contactless Pressure Sensor

CEM's UPS Sensor provides pressure control for every vessel by monitoring the exhaust system. This controller is not limited to NO_x fumes, but can identify small quantities of all acid vapors. It will automatically reduce power or turn off the magnetron based upon the concentration of gas in the cavity.

Contactless All-Vessel Temperature Sensors

The MARS 6 features patented, NIST-traceable, calibrated, dual IR sensors with the shortest path length to the vessel, ensuring more accurate readings and better control than systems with side-mounted IR sensors.

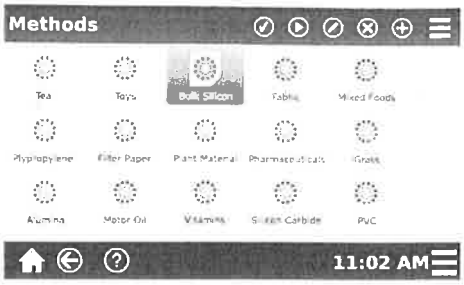


SOFTWARE CONTROL & FLEXIBILITY

The MARS 6 can be controlled using the onboard touchscreen interface.

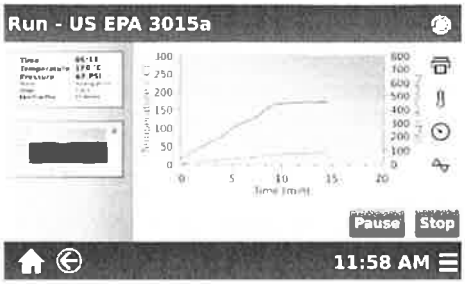
Simple Method Programming

MARS 6 gives you the flexibility to select the method programming style which best suits your needs. With over 70 to choose from, One Touch methods take the guess work out of sample preparation by automatically determining the digestion parameters and performing the digestion. If you need to set your own method parameters, you can choose a Classic Method and quickly develop a program that contains your unique method parameters. The choice is yours.



Graphical Output

The large, high-resolution, full color touchscreen provides a convenient, built-in interface. Easily monitor an active run from the graphical output of the touchscreen. Navigate between screens to view temperature, pressure, and microwave power, or view the relative temperature of all vessels with the temperature viewer.



Easily Manage System Settings

The Tools and Settings menus can be easily accessed from anywhere in the software. Set up Administrator and User login privileges, check and calibrate temperature and pressure sensors, and customize your MARS 6 by selecting from seven language settings.

Data Management

Data management is easy with the MARS 6. Import or export methods, instrument settings, and data using any of the 6 USB ports or print results and reports with the internal printer or by connecting to an external printer.

Onboard Help and Training Videos

Have a question about your MARS 6 or vessel assembly? Watch detailed training videos or access the Operator's Manual right on the touchscreen of the MARS 6.

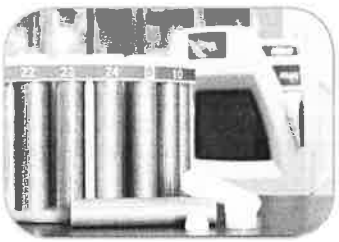
MICROWAVE REACTION SYSTEM

VESSEL TECHNOLOGY

As the proven innovator in CAD-designed vessel technology, CEM led the way with the original patented vent-and-reseal vessel for our first generation MDS-81D in 1985. Since then, we have designed and improved upon a wide variety of vessels for an array of chemistries. Our revolutionary open architecture, closed vessel design cools faster than any other microwave vessel — no need for chillers, water baths or external cooling systems — and our composite vessel sleeves give added strength, ensuring that you can depend on CEM vessels to be strong and effective. Our newest vessel designs continue to improve upon our vent-and-reseal technology, providing the most reliable mechanism available without the cost or maintenance of springs or membranes.

Vessels for CEM's One Touch Technology

The introduction of the MARS 6 adds two new vessels to the CEM line of microwave digestion accessories. These vessels may be utilized with CEM's One Touch Methods or MARS Classic Methods.



MARSXpress™ & MARSXpress™ Plus

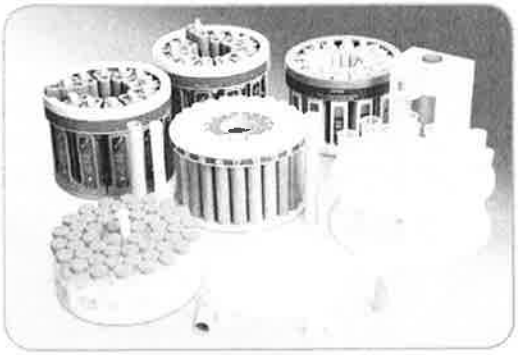
The easiest-to-use, high-throughput vessel on the market, this patented three-piece vessel assembles in seconds. The open turntable design and composite sleeves allow for quick cooling. MARSXpress vessels have a self-regulating pressure control to eliminate the risk of over pressurization. MARSXpress vessels work in conjunction with CEM's patented Contactless All-Vessel Temperature Control and now MARSXpress Plus with DuoTemp combines the fiber optic and IR temperature sensors in a high throughput format.

EasyPrep™ & EasyPrep™ Plus

The gold standard in high-temperature, high-pressure reaction vessels. Simple-to-use EasyPrep vessels have fewer pieces to assemble and do not require membranes or springs for reliable pressure control. Process up to 12 samples simultaneously. EasyPrep vessels feature a control cover with an integrated thermowell for an all TFM-wetted surface, while EasyPrep Plus vessels feature a control cover that utilizes a sapphire thermowell for greater temperature control.

MARS 6 Digestion Vessels

						
	MARSXpress TFM	**MARSXpress PFA**	**MARSXpress Plus**	**MARSXpress Plus w/ DuoTemp**	**EasyPrep**	**EasyPrep Plus**
Number of Vessels	up to 40	up to 40	up to 24	up to 24	up to 12	up to 12
Temperature Control	Every Vessel	Every Vessel	Every Vessel	Every Vessel	Every Vessel	Every Vessel
Thermowell	n/a	n/a	n/a	Sapphire	TFM-encased Sapphire	Sapphire
Liner Material	TFM	PFA	TFM	TFM	TFM	TFM
Volume	55 mL	10, 25, 55, or 75 mL	110 mL	110 mL	100 mL	100 mL
HF Resistant	yes	yes	yes	yes	yes	yes
Typical Applications	Plant materials, animal tissues, foods, fertilizers, feed grains, ores, filters, pharmaceuticals, some precious metals and alloys, polyethelyene, propylene, and extractions, soils, motor oil, mixed edible oils, polymers, wastewater				MARSXpress samples plus ceramics, soils, precious metals and alloys, oils, plastics, electrical boards, coal, slags, high-temperature inorganics, & more.	



MARS Classic Vessel Technology

Designed with flexibility in mind, MARS 6 also runs all previous vessels from the CEM MARS and MDS vessel families.

Service & Support

All CEM Systems are backed by our experienced applications support team and award-winning service department. CEM's factory-trained field technicians and in-house service team are well known in the industry for their prompt response and problem-solving capabilities.

About CEM

Since 1978, CEM has been the world's leading provider of microwave laboratory systems with a complete portfolio of award-winning instruments and industry-leading, CAD-designed technology for the analytical laboratory, synthetic chemistry, bioscience, and process control markets.

CEM systems can be found in Fortune 500 companies, leading universities, and research facilities around the world. From ceramics to organic materials to moon rocks, chances are we already have an application method for your sample. If not, we will work diligently with you to solve any of your sample preparation questions. Our commitment to you does not end when your system is shipped; it begins.

SPECIFICATIONS

Overall Instrument Dimensions	63.5 cm (25 in.) height x 53.3 cm (21 in.) width X 63.5 cm (25 in.) depth
Weight	63.6 kg (140 lbs.)
Touchscreen	7" (800 x 480) TFT-LED glass capacitive touchscreen display
One Touch	A combination of vessel recognition and vessel counting sensor technology, software technology, and applications knowledge that enables a user to select a One Touch method that matches their sample type. Based on the sample type, One Touch Technology determines the vessel type and count, digestion temperature, ramp and hold times, and microwave power input.
PowerMAX	Power control technology provides the maximum amount of energy to the sample to ensure complete digestions.
Ports	5 USB, 1 USB-B, 2 Ethernet, 1 RS-232
Sensors	All sensors, including pressure and temperature sensing devices located within the microwave cavity, are microwave-transparent or shielded to ensure accurate readings and to eliminate arcing (ignition) hazards.
Languages	Software available in English, German, French, Italian, Spanish, Chinese, and Japanese.
Sample Stirring	In-vessel magnetic stirring of samples at three levels of speed.
Turntable Design	PerfectCircle™ design provides absolute radial symmetry. Turntable operates in alternating or continuous mode.
Door Lock	An optional software controlled solenoid lock is engaged to lock the door at the beginning of a digestion run and automatically unlocks after the digestion run at a user defined temperature.
Inlet/Outlet Ports	Standard 0.500" I.D. port or optional 0.3125" I.D. ports for 0.250" (6mm) tubing
Microwave Cavity	Heavy-duty, multi-layer Teflon® coating
Electrical Requirements	200/208/230 VAC (200-253 VAC), 60 Hz, 15A @ 230 VAC 220/240 VAC (202-250 VAC), 50 Hz, 15A @ 240 VAC
Magnetron Frequency	2450 MHz
Power Output	1800 W – Continuous power available at all power levels to provide more control for reactions. (IEC 705 Method – 1988)
Magnetron Protection	Solid-state isolator (US patent 4,835,354) to protect magnetron from reflected energy, ensuring constant power output.
Speakers	8 Ω, 2 W, 86 dB
Printer	Onboard thermal printer and USB-B compatible printer port
Safety Features	Three independent door safety interlocks, including an interlock monitoring system plus three independent thermal switches, are used in each instrument to prevent instrument operation and microwave emissions in case of improper door closure or misalignment. The instrument complies with HHS standards under 21 CFR, Part 1030.10, Subparts (C)(1), (C)(2) and (C)(3). Reactiguard continuously monitors the cavity and disables the magnetron if disturbances occur inside the cavity.
Emissions and Safety Approvals	Europe/Global Community Conforms to EN61010-1 (Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use Part 1) Conforms to EN61326-1 (EMC requirements for Electrical, Control and Laboratory Use) United States Complies with FCC Part 18 regulations (47CFR part 18: Industrial, Scientific and Medical Equipment) US Safety Approval to UL61010-1 (ETL Testing Laboratories) Canada Complies with FCC Part 18 regulations (47CFR part 18: Industrial, Scientific and Medical Equipment) Canadian Safety Approval to CAN/CSA C22.2 No. 61010.1
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.

CEM has been an ISO-certified facility since 1994.

CEM Corporation
PO Box 200
Matthews, NC 28106
Tel: 800-726-3331
Tel: 704-821-7015
Fax: 704-821-7894
Email: info@cem.com
www.cem.com

France
CEM µWave S.A.S.
Immeuble Ariane
Domaine Technologique de Saclay
4, rue Rene' Razel
91892 ORSAY Cedex
Tel: 33 (01) 69 35 57 80
Fax: 33 (01) 60 19 64 91
Email: info.fr@cem.com
www.cemfrance.fr

Germany, Austria, Switzerland
CEM GmbH
Carl-Friedrich-Gauss-Str.9
47475 Kamp-Lintfort
Tel: (49) 2842-9644-0
Fax: (49) 2842-9644-11
Email: info@cem.de
www.cem.de

Ireland
CEM Technology (Ireland) Ltd.
Sky Business Centre
9a Plato Business Park
Damastown
Dublin 15
Tel: +353 (0) 1 885 1752
Fax: +353 (0) 1 885 1601
Email: info.ireland@cem.com
www.cemmicrowave.co.uk

Italy
CEM S.R.L.
Via Dell' Artigianato, 6/8
24055 Cologno al Serio (Bg)
Tel: (39) 35-896224
Fax: (39) 35-891661
Email: info.srl@cem.com
www.cemmicroonde.com

Japan
CEM Japan K.K.
2-18-10 Takanawa
Minato-ku, Tokyo
108-0074
Tel: +81-3-5793-8542
Fax: +81-3-5793-8543
Email: info@cemjapan.jp
www.cemjapan.co.jp

United Kingdom
CEM Microwave Technology Ltd.
2 Middle Slade
Buckingham Industrial Estate
Buckingham MK181WA
Tel: (44) 1280-822873
Fax: (44) 1280-822873
Email: info.uk@cem.com
www.cemmicrowave.co.uk