



# SMART 6™

Microwave + Infrared Moisture & Solids Analyzer





# Analyze any sample type 10x faster than with traditional drying systems.

The SMART 6 is the most technologically advanced moisture/solids/volatiles rapid analyzer available. The system features two major innovations, compared to other moisture analyzers: the ability to accurately analyze both wet and dry samples, and a significant reduction in sample drying times. These benefits are possible through the development of iPower® technology, which features a patented dual-frequency drying technique.

This unique energy source allows for analysis times now up to 10x faster than traditional IR (infrared) and halogen drying systems. Never before has a moisture analyzer been able to offer so much, with the fastest and most accurate analysis for any sample type.

## Features

- Up to 10x faster than infrared and halogen systems
- Up to 40 % faster than CEM's SMART 5 Turbo
- Analyze both dry and wet products on one system
- Pre-programmed methods for all sample types
- Compact and lightweight for easy at-line placement
- Analyze polar and non-polar solvents

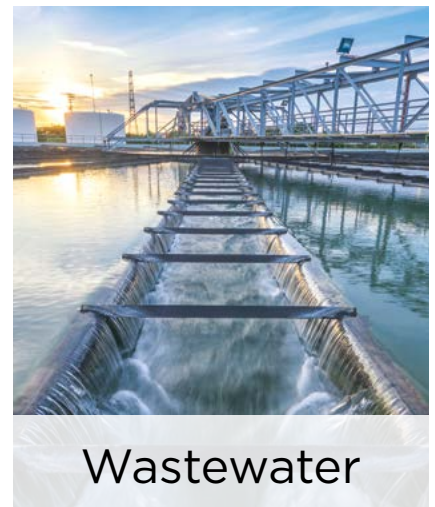
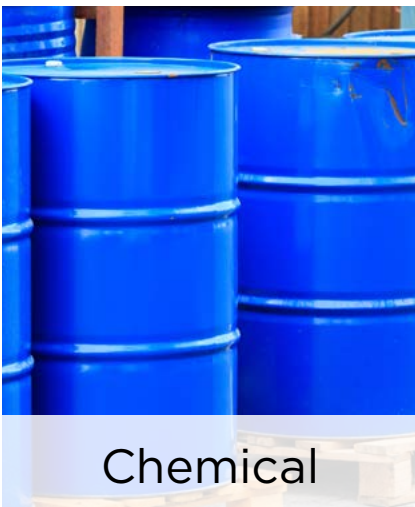
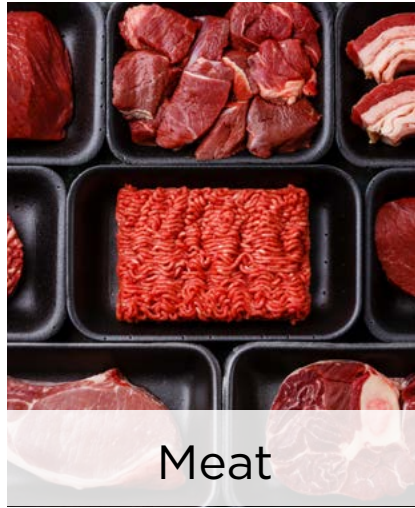
## Validation

- AOAC 985.14
- AOAC 2008.06
- AOAC PVM 1.2004
- Title 21 CFR, Part 11



Over 11,000 moisture analyzers sold worldwide

# Common Applications



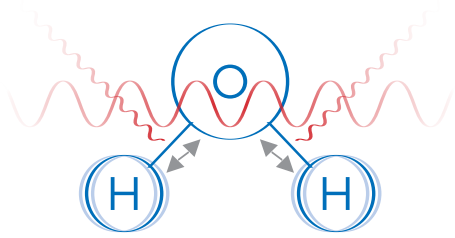
- Adhesives
- Bacon
- Black Liquor
- Butter
- Chicken
- Chips
- Cod
- Condensed Milk
- Cosmetics
- Crackers
- Cream
- Cream Cheese

- Cream Powder
- Deli Chicken
- Deli Ham
- Detergents
- Dressings
- Dry Dog Food
- Duck
- Egg Whites
- Ground Beef
- Heavy Cream
- Hot Dogs
- Ice Cream Mix

- Lamb
- Mayonnaise
- Milk
- Mixed Foods
- Natural Cheese
- Non-Fat Milk Powder
- Noodles
- Poultry Feed
- Powdered Infant Formula
- Processed Cheese
- Processed Meat
- Raw Pork

- Resin
- Salmon
- Sausage
- Sour Cream
- TiO<sub>2</sub>
- Turkey
- Wastewater
- Wheat Flour
- Whey Powder
- Whole Milk Powder
- Yogurt
- And many more...

## iPower®



Analyze wet and dry samples with unmatched speed.

iPower® is an innovative heating process based on the use of a dual-frequency energy source controlled by an intelligent processing system. This prevents burning or incomplete drying, which can arise from other drying technologies. The result is a direct method for virtually any type of sample, with faster drying than traditional microwave or infrared based systems.

- Analyze wet and dry samples with unmatched speed
- Eliminates surface burning
- Little to no “cool down” time between tests

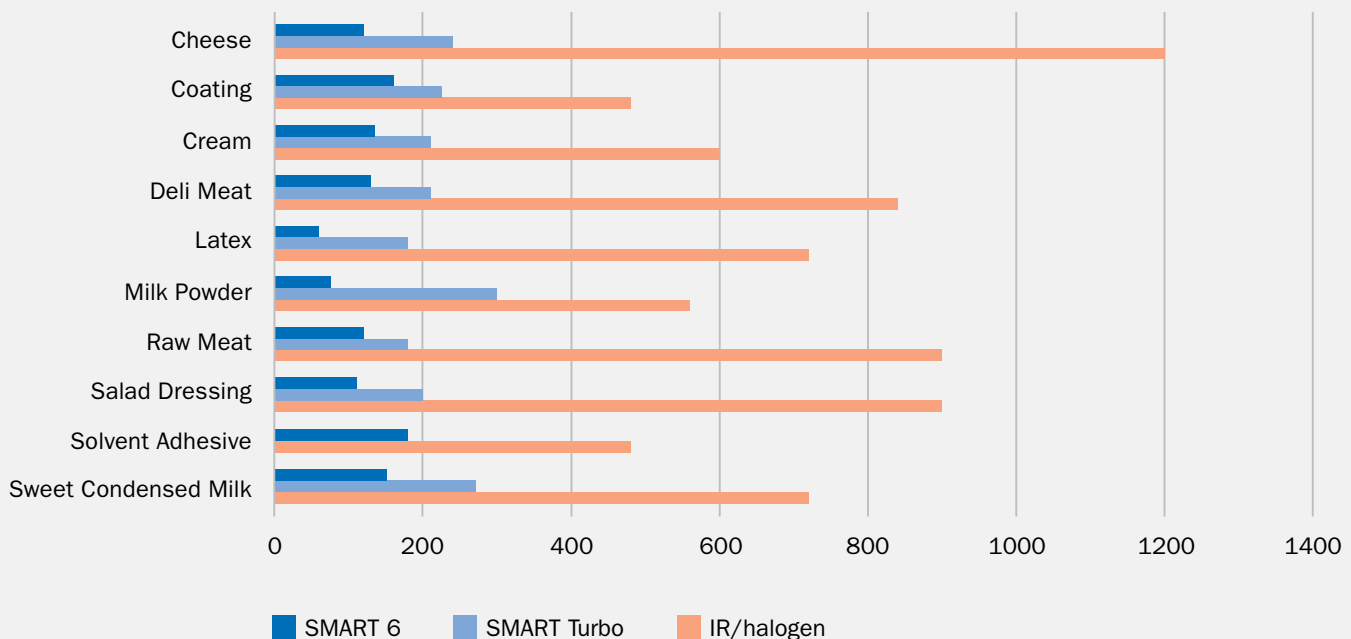
## Collimated Energy



Accurate and repeatable results come standard.

Stray infrared irradiation can negatively impact sample temperature readings with the use of infrared temperature sensors. SMART 6 has a unique honeycomb lattice, providing collimated infrared irradiation for sample heating, thereby avoiding stray light. This provides highly accurate temperature control.

## Time Comparison (in seconds)





# The Most Accurate for Moisture/Solids Analysis

| Sample                  | Moisture/Solids Results |       |       |       |       | St Dev | Moisture or Solids | S6 Average | Reference | Difference |
|-------------------------|-------------------------|-------|-------|-------|-------|--------|--------------------|------------|-----------|------------|
|                         | 1                       | 2     | 3     | 4     | 5     |        |                    |            |           |            |
| Milk                    | 11.93                   | 11.94 | 11.94 | 11.99 | 11.94 | 0.02   | Solids             | 11.95      | 11.91     | 0.04       |
| Yogurt                  | 23.31                   | 23.30 | 23.45 | 23.47 | 23.35 | 0.07   | Solids             | 23.38      | 23.25     | 0.13       |
| Sour Cream              | 25.31                   | 25.21 | 25.37 | 25.25 | 25.36 | 0.06   | Solids             | 25.30      | 25.22     | 0.08       |
| Condensed Skim Milk     | 33.45                   | 33.46 | 33.48 | 33.58 | 33.35 | 0.07   | Solids             | 33.46      | 33.39     | 0.07       |
| Ice Cream               | 40.42                   | 40.41 | 40.72 | 40.63 | 40.70 | 0.13   | Solids             | 40.58      | 40.54     | 0.04       |
| Cream                   | 45.42                   | 45.30 | 45.05 | 45.20 | 45.25 | 0.12   | Solids             | 45.24      | 45.24     | 0.00       |
| Milk Powder             | 3.56                    | 3.64  | 3.66  | 3.50  | 3.59  | 0.06   | Moisture           | 3.59       | 3.52      | 0.07       |
| Cream Cheese            | 54.00                   | 53.99 | 53.98 | 53.80 | 53.94 | 0.07   | Moisture           | 53.94      | 53.94     | 0.00       |
| Cheese                  | 45.45                   | 45.23 | 45.31 | 45.22 | 45.27 | 0.08   | Moisture           | 45.30      | 45.36     | -0.06      |
| Salad Dressing          | 49.56                   | 49.66 | 49.55 | 49.52 | 49.57 | 0.05   | Solids             | 49.57      | 49.46     | 0.11       |
| Beef                    | 56.13                   | 56.23 | 55.76 | 56.16 | 56.10 | 0.16   | Moisture           | 56.08      | 55.91     | 0.17       |
| Chicken                 | 66.94                   | 66.55 | 66.77 | 66.84 | 67.12 | 0.19   | Moisture           | 66.84      | 66.86     | -0.02      |
| Deli Meat               | 76.50                   | 76.52 | 76.40 | 76.47 | 76.53 | 0.05   | Moisture           | 76.48      | 76.45     | 0.03       |
| Potted Meat             | 69.98                   | 70.03 | 69.96 | 70.08 | 70.10 | 0.05   | Moisture           | 70.03      | 70.38     | -0.35      |
| Hot dogs                | 52.71                   | 52.66 | 53.28 | 52.74 | 52.62 | 0.24   | Moisture           | 52.80      | 52.89     | -0.09      |
| Pork                    | 57.48                   | 57.54 | 57.37 | 56.95 | 57.11 | 0.22   | Moisture           | 57.29      | 57.47     | -0.18      |
| Latex                   | 56.83                   | 56.82 | 56.70 | 56.80 | 56.78 | 0.05   | Solids             | 56.79      | 56.80     | -0.01      |
| Coating                 | 55.38                   | 55.66 | 55.59 | 55.42 | 55.55 | 0.10   | Solids             | 55.52      | 55.41     | 0.11       |
| Adhesive, Solvent-based | 63.39                   | 63.60 | 63.40 | 63.46 | 63.44 | 0.08   | Solids             | 63.46      | 63.17     | 0.29       |

## Application Support



### Pre-installed Method Library

A simple touch is all it takes. Leave method development behind with SMART 6 One Touch Technology<sup>®</sup>. Test virtually any sample with a library of ready-to-use methods at your fingertips.



### Application support, when you need it.

The applications team at CEM has developed a library of method notes to guide you in programming methods. View them at [cem.com/methods](http://cem.com/methods).

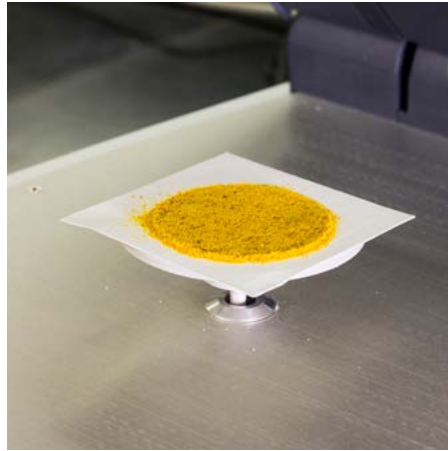
If no method note exists for your application, contact us at [process.support@cem.com](mailto:process.support@cem.com) and we will be happy to develop one for you.

# Simplicity



1

Tare Pads.



2

Add Sample.



3

Press *Start*.

## Simple Work-flow



### Individual User Logins

Password protected and CFR 21 Part 11 compliant.



### Built-In Training Videos

Ensure your technicians run the SMART 6 correctly.



### Method Import

Import from other users or CEM's method library from anywhere in the world.



### Data Export

For easy data storage, transfer, and review.

# System Comparison



**SMART 6™**



**SMART Q™**



**SMART 5 Turbo™**

**Removal Species**

Free + Bound Moisture  
Polar + Non-Polar

Free + Bound Moisture  
Polar + Non-Polar

Free Moisture  
Polar Volatiles

**Moisture/Solids Range**

0.01 to 99.99%,  
0.01% resolution  
(optional 0.001%)

0.01 to 15.00%,  
0.001 % resolution

0.01 to 99.99 %,  
0.01 % resolution  
(optional 0.001 %)

**Energy Source**

Quartz Halogen  
Infrared + Microwave

Quartz Halogen Infrared

Microwave Energy

**Data Analysis**

Advanced Statistical  
Processing

Advanced Statistical  
Processing

Standard

**Exhaust**

15,600 RPM  
(adjustable with  
speed control)

15,600 RPM  
(adjustable with  
speed control)

3,100 RPM  
(non-adjustable)

**Footprint**

- 13.0 (W) x 23.0 (D) in  
(299 in<sup>2</sup>)
- 33.0 (W) x 58.5 (D) cm  
(1931 cm<sup>2</sup>)

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(299 in<sup>2</sup>)
- 33.0 (W) x 58.5 (D) cm  
(1931 cm<sup>2</sup>)

- 22.0 (W) x 23.3 (D) in  
(513 in<sup>2</sup>)
- 55.9 (W) x 59.1 (D) cm  
(3304 cm<sup>2</sup>)

**Weight**

62 lbs (28 kg)

38 lbs (17 kg)

68 lbs (31 kg)



We Simplify Science

cem.com



Over 50,000 systems sold worldwide



CEM has been an ISO-certified facility since 1994



All systems serviced & supported by experts with an average of 15 years of experience



CEM invests 12% of annual revenue into R&D, the result... 11 R&D 100 awards



IQ/OQ/PQ Validation by certified CEM Technicians

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