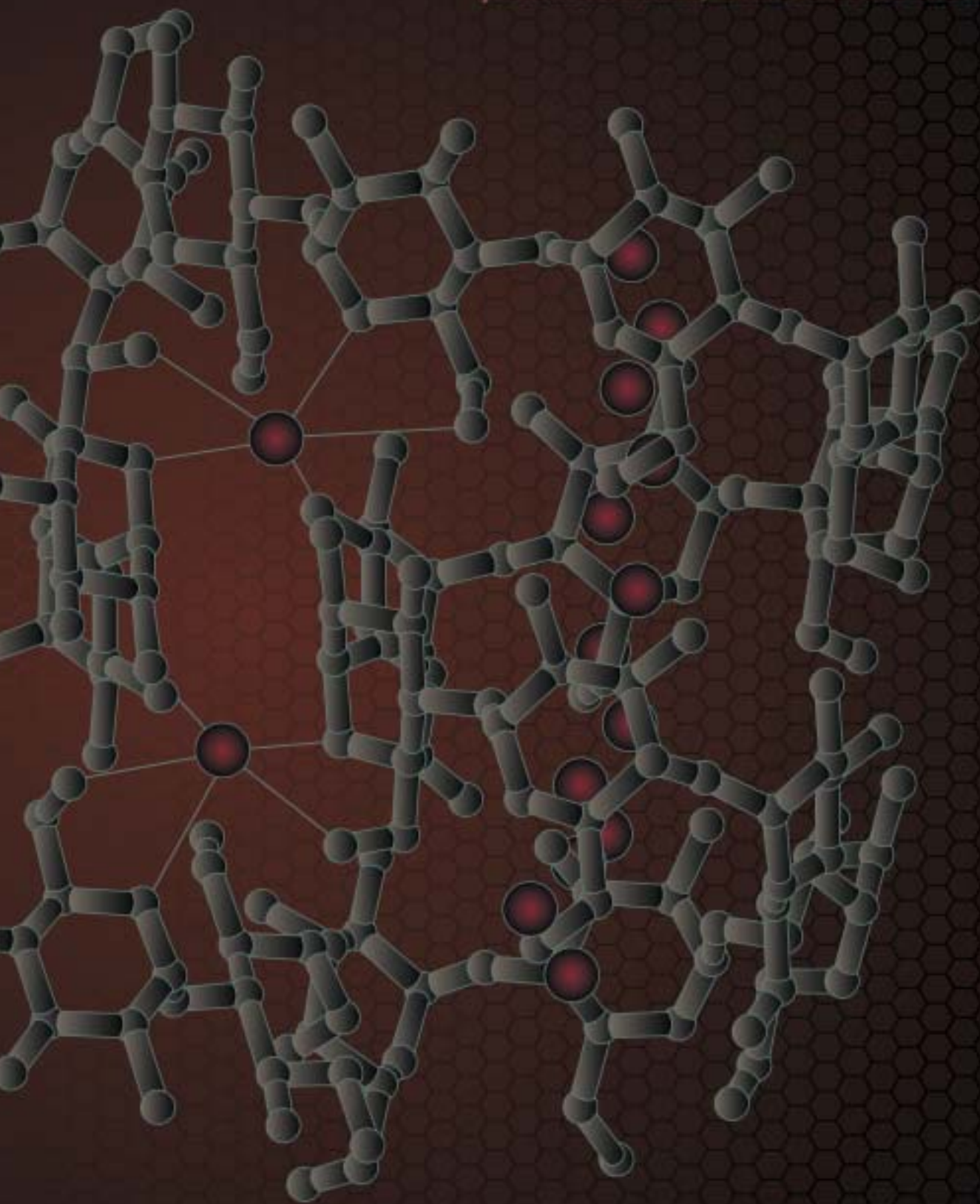


*Ensuring the safety and quality of food,
pharmaceuticals, and cosmetics worldwide.*





0.8456 g
20.00°C
0.0000 g

AQUA
LAB 400

Introduction

ON THE COVER

In addition to binding the outside of molecules, water often plays an integral part in the molecule's structure. The cover shows water stabilizing a hydrated cyclomaltohexaosaose, a starch found in potatoes. Decagon's newly released AquaSorp Isotherm Generator helps translate the effects of this structural water from the molecular level to the product level.

Citation: Gessler, K., Uson, I., et al, V-Amylose at atomic resolution: X-ray structure of a cycloamylose with 26glucose residues (cyclomaltohexaosaose), Proc. Natl. Acad. Sci. USA, Vol. 96,4246-4251.

◀ Introducing the redesigned AquaLab Series 4, the newest development in water activity measurement. New intuitive menu navigation, easy to clean sensor area, and data storage provides increased functionality and utility to your lab.

See pages 8–9 for more information.

WITH THE INTRODUCTION of the CX-1 almost 20 years ago Decagon Devices became the first company to introduce a water activity meter delivering readings accurate enough for research and fast enough for an in-process monitoring tool.

Decagon continues to produce unique instrumentation over the years, holding industry records in speed, accuracy and portability. Innovation at Decagon continues as we announce the availability of the AquaSorp Isotherm Generator and the AquaLab Series 4.

These instruments continue to push the envelope of moisture analysis and utility by providing our customers with innovative sensing technology. ■



Local help is available via Decagon's International Network.

To locate your distributor, visit www.decagon.com/info/aw_distributors

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www.wateractivity.com

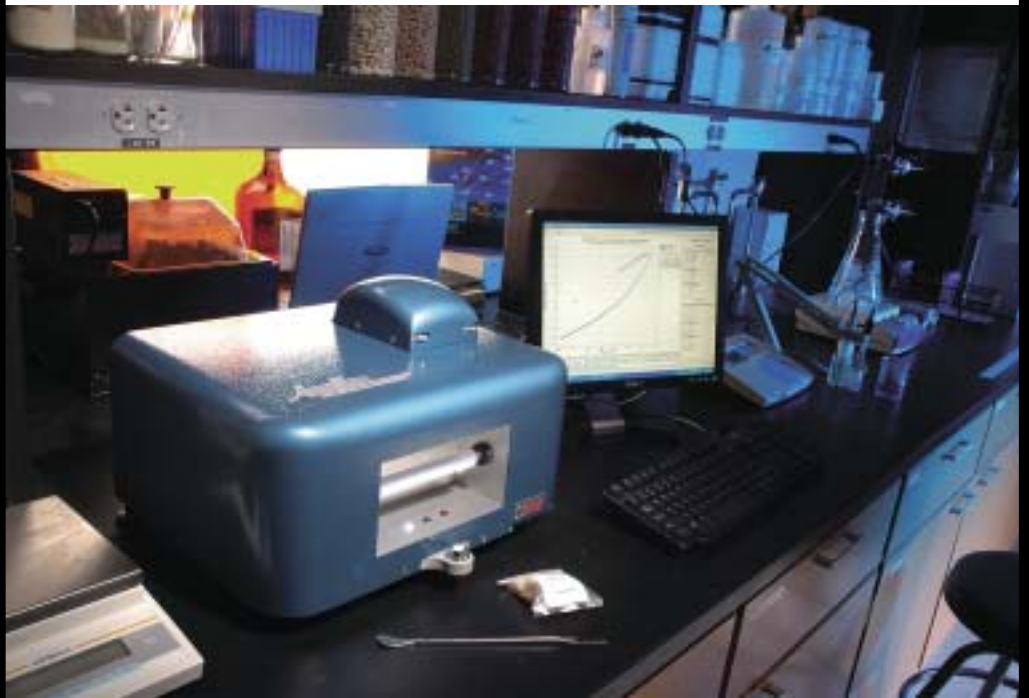
AquaSorp Isotherm Generator



▲ The Institute of Food Technologists recognized AquaSorp with the IFT Food Expo Innovation Award during the group's annual meeting in Chicago, 2007. Applicants were judged based on innovation, technical advancement, benefits to manufacturers and consumers, and scientific merit.

An isotherm is the key to understanding and controlling:

- Formulation
- Product stability
- Phase transitions
- Moisture sensitivity
- Temperature effects
- Drying characteristics



Understand the moisture "fingerprint" of your product with AquaSorp.

SPECIFICATIONS

Water Activity Range 0.03 to 0.95 a_w *

(*3 to 95% Relative Humidity)

Sensor Chilled-mirror dewpoint

Temperature Control 15 to 40 °C

Accuracy $\pm 0.005 a_w$

Resolution $\pm 0.001 a_w$

Range 0.030 to 1.000 a_w

Operating environment

4 to 50°C (39° to 122°F)

0 to 90% relative humidity (non-condensing)

Weight 19.05 kilograms (42 lbs.)

Warranty One Year Parts and Labor

THE NEW AQUASORP Isotherm Generator delivers complete moisture sorption isotherms with unparalleled resolution and accuracy. Using the Dynamic Dewpoint Isotherm method (DDI), AquaSorp produces adsorption and desorption isotherm curves in 24 hours or less with unparalleled number of data points — at a cost that researchers and formulators can afford.

Moisture Sorption Isotherms Explained

A moisture sorption isotherm maps the complex, product-specific relationship between water content and water activity. Considered the moisture "fingerprint" of a food product, this curve (usually S-shaped) shows how water activity changes as water content is increased or decreased. ■

Dynamic Dewpoint Isotherm

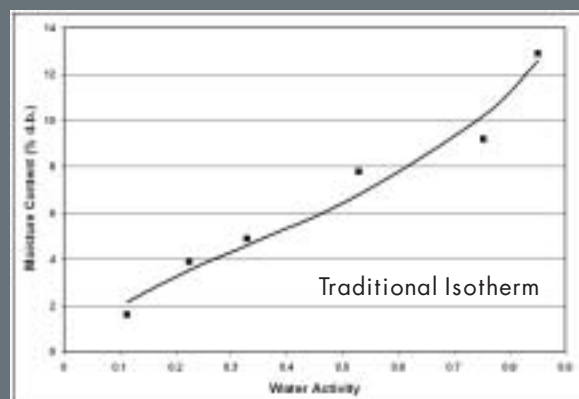
Traditional isotherms are made by placing a sample, either dried (adsorption), hydrated (desorption) or native (working), into controlled humidity chambers at constant temperature and measuring the weight until equilibrium as measured by constant weight is established. One needs six to nine different water activity levels and must wait for vapor equilibration, which may take one to three weeks. Data volume is limited to how many separate chambers are set up, consuming space, time, and resources.

AquaSorp's patented Dynamic DewPoint Isotherm (DDI) technology takes the work out of isotherm generation. Weight is monitored as the sample is either dried or moistened while the water activity of the sample is measured directly. This direct measurement of the water activity, as opposed to relying on equilibration with a humidity chamber, allows AquaSorp to provide unmatched speed, accuracy, and resolution of isotherm data.

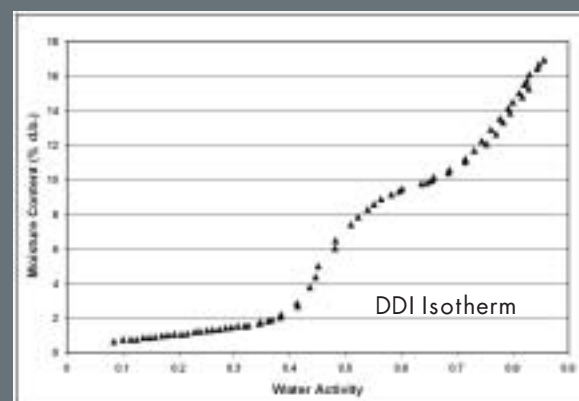
The Dynamic Dewpoint Isotherm Method is a unique analysis method that provides important information not previously possible with other isotherm methods. The DDI method with its unparalleled detail, speed, and amount of information generated from each isotherm curve will greatly aid in the understanding of water interactions within materials. ■

To read more about the Dynamic Dewpoint Isotherm Method, please go to:
http://www.decagon.com/food_science/literature/app_notes.php

Note: Registration required to view application notes.



▲ Traditional methods provide limited data and are consuming to produce.



▲ AquaSorp uses the Dynamic Dewpoint Isotherm (DDI) method to produce isotherms easily and with more data than previously possible

Isotherm Generation Service

Let us show you what the AquaSorp Isotherm Generator can do for you. Decagon's Isotherm Service will run isotherms for your samples and have your results back to you within a week.

BENEFITS

- Low-Cost
- Rapid Generation
- Technical Assistance

APPLICATIONS

- Formulating Decisions
- Ingredient Packing Characterization
- Packaging Requirements
- Other Moisture Research Concerns



AquaSorp Installation Service Options and Accessories

► Call today to learn more about how DDI analysis can help you.



Several installation and servicing options are available with your AquaSorp purchase. On-site installation, including instrument verification and a half day seminar on instrument use and theory from a Decagon application scientist is available to assist you in getting the most from your instrument. Warranty extensions and annual on-site recalibrations help ensure your AquaSorp will serve your lab with the same accuracy and longevity you have come to expect from purchasing other Decagon instrumentation. ■



DESICCANT CARTRIDGES

Replacement sample tubes can be used instead of refilling standard AquaSorp tubes. Pre-filled tubes ensure that desiccant is properly packed and air is properly dried during experiments.



DESICCANT

Refill AquaSorp desiccant cartridges in the lab. Contains 3.5 lbs desiccant.



STAINLESS STEEL SAMPLE CUPS

Additional Sample Cups can be used in drying ovens to measure moisture content of samples used for isotherm determination. Multiple cups save time between experiments and allow for sample storage.

AquaLab Series 4



▲ A continuation of the industry standard AquaLab Series 3, the Series 4 TE and TEV is unveiled after years of research and development. The redesigned open sensor block forms a vapor seal around samples during testing and enables cleaning without any instrument disassembly. The internal data storage allows for compliance with 21 CFR Part 11. AquaLab 4 TEV also features Decagon's Integrated Sensor Block, the only instrument in the industry to allow push-button toggling between dewpoint and capacitance sensors. ■

AquaLab Series 4 TEV

Sensor Dual sensor block (integrated dewpoint and capacitance sensors)

Temperature Control 15 to 50 °C

Measurement Speed < 5 Min

Accuracy ± 0.003 a_w

Resolution ± 0.001 a_w

Range 0.030 to 1.000 a_w

Warranty 3 Year Parts and Labor

Footprint 26.7 x 27.8 x 12.7 cm

Operating environment

4 to 50 °C (39 to 122 °F)

0 to 90% relative humidity (non-condensing)

AquaLink RG Software



AquaLab Series 4 TE

Sensor Chilled-mirror dewpoint

Temperature Control 15 to 50 °C

Measurement Speed < 5 Min

Accuracy $\pm 0.003 a_w$

Resolution $\pm 0.001 a_w$

Range 0.030 to 1.000 a_w

Warranty 3 Year Parts and Labor

Footprint 26.7 x 27.8 x 12.7 cm

Operating environment

4 to 50 °C (39 to 122 °F)

0 to 90% relative humidity (non-condensing)



AquaLink Report Generator was designed to help users organize and visualize their measurement data and be compliant with 21 CFR Part 11. AquaLink RG captures all measurements made by the Series 4 and allows the user to create reports based on the pertinent information. Saving these personalized reports allows the user to run them on numerous occasions. ■

BENEFITS OF THE AQUALINK RG

- Data storage in a controlled situation.
- User configuration.
- Archives all data—even from multiple Series 4 instruments.
- Savable reporting capabilities (exports in .pdf, .xls, .scv) with filtering.

PART 11

The Title 21 Code of Federal Regulations (21 CFR Part 11) is an FDA ruling that outlines the requirements for paper signature or record to be replaced by electronic records or signatures. The AquaLab Series 4 has the necessary logins and time-stamped data storage capabilities available for users requiring this compliance.



The AquaLab Series 4 TEV, the most versatile water activity instrument.



www.wateractivity.com

AquaLab Series 3



▲ Standard benchtop dewpoint water activity measurements without temperature control. Great option for cost-sensitive labs that do not require temperature control 21 CFR or Part 11 compliance.

Sensor Chilled-mirror dewpoint

Temperature Control No

Measurement Speed < 5 Min

Accuracy $\pm 0.003 a_w$

Resolution $\pm 0.001 a_w$

Range 0.030 to 1.000 a_w

Warranty 3 Year Parts and Labor

Footprint 24.1 x 22.9 x 8.9 cm

Operating environment 4 to 50°C (39° to 122°F)

0 to 90% relative humidity (non-condensing)

AquaLab LITE



▲ Better accuracy than the Pa_wkit but still portable and rugged. Featuring a capacitance sensor and intuitive operation, the LITE is a great choice for student labs.

Sensor Dielectric Humidity

Temperature Control No

Measurement Speed 5 minutes

Accuracy $\pm 0.015 a_w$

Resolution $\pm 0.001 a_w$

Range 0 to 1.000 a_w

Warranty 1 Year Parts and Labor

Footprint 15 X 18 x 4.5 cm

Operation environment 4 to 50°C (39 to 122°F),

0 to 90% Relative Humidity

Pa_wkit Portable a_w Meter



▲ Only water activity instrument to combine portability, reliability and affordability. Ideal for rough environments where quick, in-line water activity measurements are needed. Staple for safety inspectors, meat processors, and consultants.

Sensor Dielectric Humidity

Temperature Control No

Measurement Speed 5 minutes

Accuracy ± 0.02 a_w

Resolution ± 0.01 a_w

Range 0 to 1.000 a_w

Warranty 1 Year Parts and Labor

Footprint 9 X 10 cm oval

Power 2 Li Coin cells (3V)

Operation environment 4 to 50°C (39° to 122°F).

0 to 90% relative humidity (non-condensing)

AquaLab is
calibrated to a
National Institute
of Standards &
Technology (NIST)
traceable
temperature
standard.

Annual Calibration Services

Document HACCP, ISO9001 or ISO17025, and GLP / GMP compliance with an annual calibration service. A loaner will be sent for your use while our technicians ensure your instrument is working within factory specifications and provide you with a dated Calibration Certificate. Services available for all AquaLab models and can be purchased in advance with new instruments or for older instruments. ■



AquaLab service options provide documentation for HACCP, ISO9001, ISO17025 and GLP / GMP compliance.

**DECAGON
DEVICES**

www.wateractivity.com

Water Activity Accessories

Are you running low on calibration standards? Does your AquaLab travel between labs? Would you like to increase the speed of water activity measurements? AquaLab accessories serve to increase the functionality and effectiveness of your AquaLab. Decagon calibration standards ensure accurate readings while a customized travel case protects instruments on the move. From software to cleaning kits, the following products will help you get the most from your water activity investment.



DISPOSABLE SAMPLE CUPS

One hundred standard 15ml, HDPE sample cups come with your new AquaLab. Additional sample cups can be purchased in boxes of 100 or 500 with discounts for multiple box orders. Order cups with or without lids.

Standard sample cups are used by all Decagon water activity meters. Clean, new sample cups ensure that instruments are reading correctly and samples are free from contamination. Re-using cups may result in inaccurate results and added maintenance costs.



PERFORMANCE VERIFICATION STANDARDS

Water activity standards are used to verify instrument calibration. A properly calibrated instrument is essential for compliance with company and governmental regulations. Decagon recommends instrument validation before each use or shift. Available at 1.000, 0.984, 0.760, 0.500, and 0.250 a_w . Come in boxes of 50 single-use vials. NIST traceable. Certificate of Analysis and MSDS included.



CLEANING KIT

The long-term accuracy of your AquaLab is vitally dependent on the cleanliness of the instrument's measurement components. That's why we have developed the AquaLab cleaning kit. It is designed with special tools allowing you to reach all the surfaces you need to clean, and will not leave residues on the mirror surface.



AQUATHERM-TEMPERATURE EQUILIBRATION TRAY

Pre-equilibrate samples to an isothermal temperature or rapidly heat or cool samples for faster water activity measurements.



AQUALINK SOFTWARE

A Windows-based application to collect and graph data from the AquaLab Series 3 and LITE. The program logs a_w , temperature, time of measurement, a time and date stamp (from the computer clock), as well as real-time sample identification and comments fields.



SERIAL PRINTER

Connect this miniature dot matrix printer to AquaLab's serial port to instantly document your water activity results. The printer is only 4.5"W x 5"L x 2.2"H and uses standard 2.25" adding machine paper.



TRAVEL CASE AQUALAB

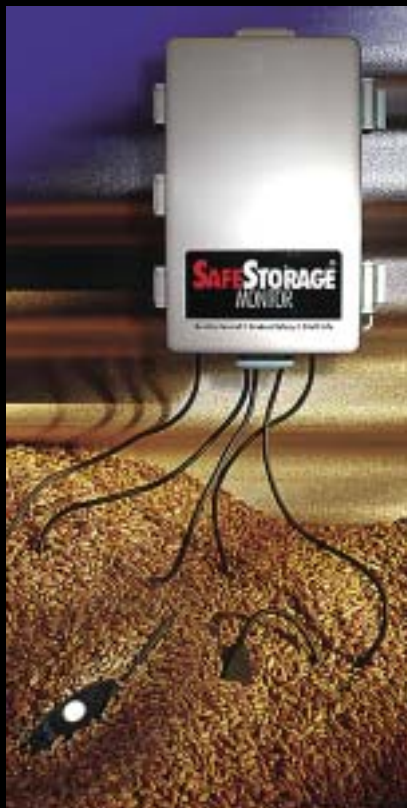
Protective travel case protects your AquaLab on the road. The case is airtight, watertight, and virtually unbreakable. Extra thick wall construction and latch lock for security help keep your AquaLab safe.



TRAVEL CASE LITE

Custom-made protective travel case protects your AquaLab LITE on the road. The case allows you to safely transport your AquaLab LITE for offsite water activity analysis. The custom foam construction and latch lock for security. Holds cups, standards, and power adapter.

SafeStorage



If you store raw ingredients or product, the SafeStorage System is for you. Help prevent caking, clumping, and biological spoilage by monitoring water activity in storage and transport conditions of key ingredients or product. Monitor one site to hundreds of sites via our wireless solution. ■

APPLICATIONS

- Process Control
- Shelf-Life/In-Package Monitoring
- Bulk Storage Monitoring

BENEFITS

- Monitoring over extended period of time.
- Tight process control.
- Process optimization.

Sensor Capacitance

Accuracy

$\pm 0.02 a_w$ for the range 0.10 to 0.90 a_w

$\pm 0.03 a_w$ for the range 0.0 to 0.10 a_w and
0.90 to 1.00 a_w

Repeatability $\pm 0.01 a_w$

Range 0 to 1.00 a_w

Warranty 1 Year Parts and Labor

Operation Environment

-40 to 60 °C (-40 to 140 °F)

0 to 100% Relative Humidity

DA7200

The DA7200 is the closest to in-line water activity measurement available.

Developed in partnership with Perten Instruments of Springville, Illinois, the DA7200 measures water activity in 6 seconds along with protein, moisture content, fat, and ash. ■

Measurement time: 6 seconds

Accuracy: $\pm 0.02 a_w$

Range: 0.100 to 1.000 a_w

Wavelength Range: 950 – 1650 nm

Ambient Temperature: 5 – 35 °C

Sample Presentation: Non-contact, down view, rotating sample dish.

*For more information please visit http://www.decagon.com/food_science/instrumentation/da7200.php

The DA7200 delivers water activity readings in 6 seconds, faster than any instrument in the market.



Decagon's Water Activity Comparison Chart

	Series 4 TEV	Series 4 TE	Series 3	LITE	Pa_wkit
Sensor Type	Capacitance and Chilled Mirror Dewpoint	Chilled Mirror Dewpoint	Chilled Mirror Dewpoint	Dielectric Humidity	Dielectric Humidity
Accuracy	±0.003a _w	±0.003a _w	±0.003a _w	±0.015a _w	±0.02a _w
Repeatability	±0.001a _w	±0.001a _w	±0.001a _w	±0.005a _w	—
Resolution	±0.001a _w	±0.001a _w	±0.001a _w	±0.001a _w	±0.01a _w
Range	0.030 to 1.000a _w	0.030 to 1.000a _w	0.030 to 1.000a _w	0.0 to 1.000a _w	0.0 to 1.0a _w
Measurement Time	< 5 minutes	< 5 minutes	< 5 minutes	5 minutes	5 minutes
Temperature Control	Internal 15–50°C ±0.2°C	Internal 15–50°C ±0.2°C	None	None	None
Part 11 Compliance	Yes	Yes	No	No	No
Warranty	3 years parts and labor	3 years parts and labor	3 years parts and labor	1 year parts and labor	1 yr parts & labor (extension)

TERMS & CONDITIONS

WARRANTY One to three years, parts and labor (see above chart.)

SATISFACTION GUARANTEE 30 days from delivery.

TECHNICAL SUPPORT Unlimited technical support.

RETURNS AND REPAIRS Please contact us for instructions before shipping to Decagon.

DELIVERY TIME 30–45 days ARO.

SHIPPING POLICY All shipments are FOB USA. Domestic orders FOB destination.

INTERNATIONAL ORDERS CIP or EXW. Prices listed do not include freight and insurance. Freight and insurance costs are added to the invoice.

TERMS Net 30 days to domestic universities and major institutions. Others prepay via credit card, bank draft, letter of credit, or wire transfer on approval of credit.



Water Activity Instruments

THE SCIENTISTS OF DECAGON

Anthony J. Fontana Jr., Ph.D. is the Senior Research Scientist at Decagon Devices. Prior to his work at Decagon, he managed a quality control laboratory for a large cheese and whey protein concentrated manufacturer. Dr. Fontana received his bachelor degree in Biochemistry from University of California, Riverside in 1985, and his doctorate degree in Agricultural and Environmental Chemistry from University of California, Davis in 1994. He is an editor on a new book "Water Activity in Foods: Fundamentals and Applications" released October 2007.



Brady Carter, MS is a Research Scientist at Decagon Devices. Before joining Decagon, he was an Assistant Professor/Scientist at Washington State University. Mr. Carter received his bachelor degree in Botany from Weber State University in 1997 and his master's degree in Cereal Chemistry from Washington State University in 1999.



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