Alveograph® Series

DOUGH RHEOLOGY ANALYZER

KPM

UNLOCK SECRETS TO PRODUCING
SUPERIOR BAKED GOODS

Alveograph® Series

OVERVIEW

The Alveograph® Series Dough Rheology Analyzers are the industry-standard tools used to measure rheological properties of dough. While the first concept was invented almost a century ago, the Alveograph® continues to evolve with new protocols and completely open testing conditions (speed, time, and temperatures), allowing it to adapt to modern challenges.

Rheological properties of dough indicate how it will perform in the production process, which includes

- Machinability,
- Stickiness,
- Ability to keep its shape, whether it will spread or shrink,
- How it will develop during fermentation.

Measuring these dough properties and understanding the impact on the final quality of your product will ensure consistency in appearance, size, aroma, and structure.

Bakers and millers all over the world use the Alveograph® to serve as a reference measurement for grains and cereals, both for quality control and developing new products.

APPLICATIONS

The Alveograph® Series is used by millers to analyze and optimize blends of flour, adapting them as needed to meet customer specifications. It is used by bakers to validate incoming ingredients, for testing new recipes, and anticipating production performance of flour and dough mixtures. Product-specific applications include:

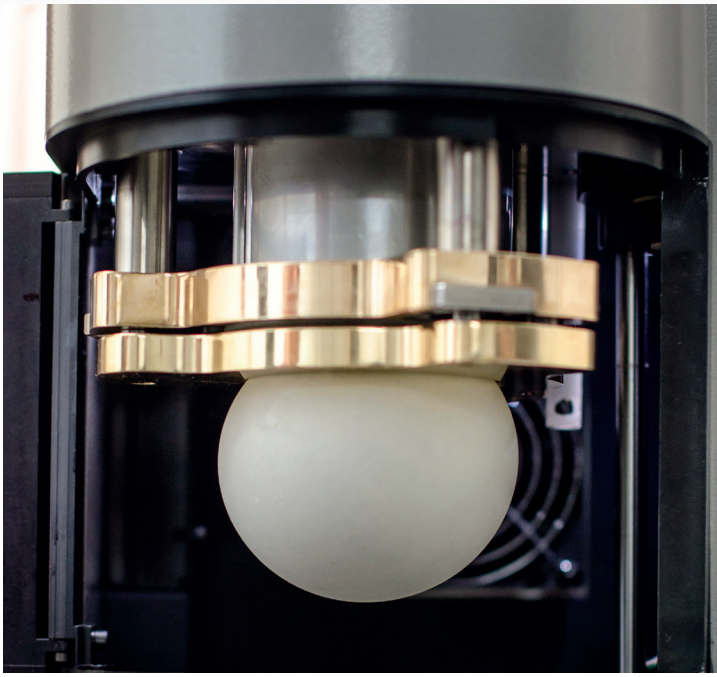
- Wheat selection for baked goods or pasta
- Wheat or flour blends
- Vital gluten
- Salt and sugar impacts
- Durum wheat
- Additives and ingredients (proteases, amylases, deactivated yeasts, etc.)
- Insect contaminated wheat

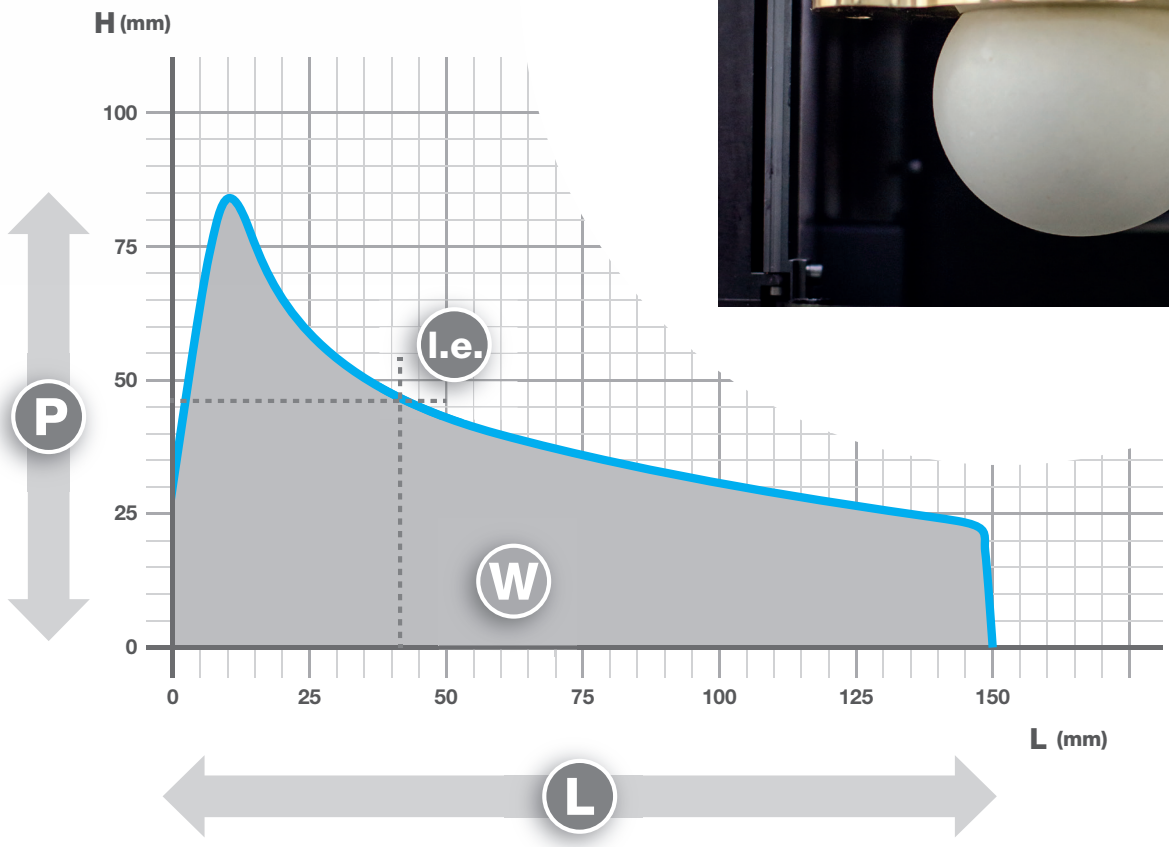
FEATURES

- Provides universally recognized measurements for tenacity, extensibility, elasticity, and baking strength (P, L, W, and I.e. values)
- Two models available: Alveolab and AlveoPC
- Can be used for both soft and hard wheat
- New whole wheat test protocol (Alveolab® only)
- Customizable protocols (Alveolab® only)
- Meets international reference standards for AACC and ISO
- Control testing temperatures automatically with the Alveolab® or with an external chiller for the AlveoPC
- Intuitive User Interface
- Standardized data export for integration into a LIMS

STANDARDIZED MEASUREMENTS

The Alveograph® test is conducted by injecting air into a thin patty of dough to form a bubble, simulating gas (carbon dioxide) release and retention during dough fermentation and baking. The results are expressed in five industry-standard values.





- **P: Tenacity** (capacity to resist deformation). At a given hydration, tenacity represents dough consistency (is the dough hard or soft, for example)
- **L: Extensibility (maximum volume of air the bubble can contain)** This value depends on protein quantity and quality and represents the dough's gas retention capacity.
- **Ie: Elasticity index** represents the capacity of dough to stretch and return to its initial position.
- **W: Dough baking strength (area under the curve) or Energy value** that depends on Protein quantity and quality, Starch damage, Enzymes, Interactions.
- **P/L: Curve configuration ratio of tenacity and extensibility**

Stress/strain, first derivative and consistency recording during mixing: new parameters are available with the Alveolab® and improve the discriminating and predictive potential compared to other models.

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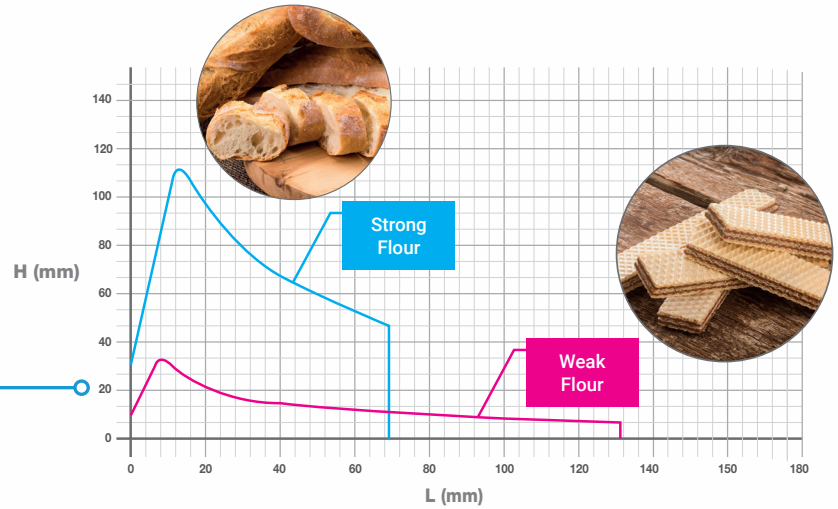
DETERMINE WHICH FLOUR IS SUITABLE FOR YOUR PRODUCTION

One flour is not “better” than the other, it depends on each industrial process and the product you are producing. You may prefer low tenacity for cookies, wafers, etc. or higher tenacity for sliced bread, panettone bread, etc.

The Alveograph® test will allow you to determine the main characteristics of dough suitable for your end-product.

Example: Bread Flour Vs. Biscuit Flour



COMPREHENSIVE AND INTUITIVE DATA

The Alveograph® software provides comprehensive, and intuitive data about tenacity, extensibility, elasticity, baking strength and more. A standard analysis certificate is automatically generated for use in checking the test results.

The software displays easy-to-understand test data live on your PC and a backup is generated for perfect traceability.

Results are provided in graphical and table format to quickly assess the dough behavior.

CHOPIN TECHNOLOGIES — Alveolab graph

CHOPIN Technologies 36 avenue Marc Sangnier 92390, Villeneuve-la-Garenne, FRANCE +33 1 41 47 50 33	CHOPIN Technologies 36 avenue Marc Sangnier 92390, Villeneuve-la-Garenne, FRANCE +33 1 41 47 50 33

Protocol : Alveograph CH
File name : 2204140101[1165]
Test name : Modif 74 Forte 20 T1
Comments :

Test date and hour : : 4/14/2022 9:07:25 AM
Partner name : CHOPIN Technologies
Product : Laboratory wheat flour
S/N : 74
A. : 1.4.0

Temperature

Water : 21,7 °C
Mixer : 23,7 °C
Resting chamber : 24,7 °C
Alveo chamber : 19,2 °C

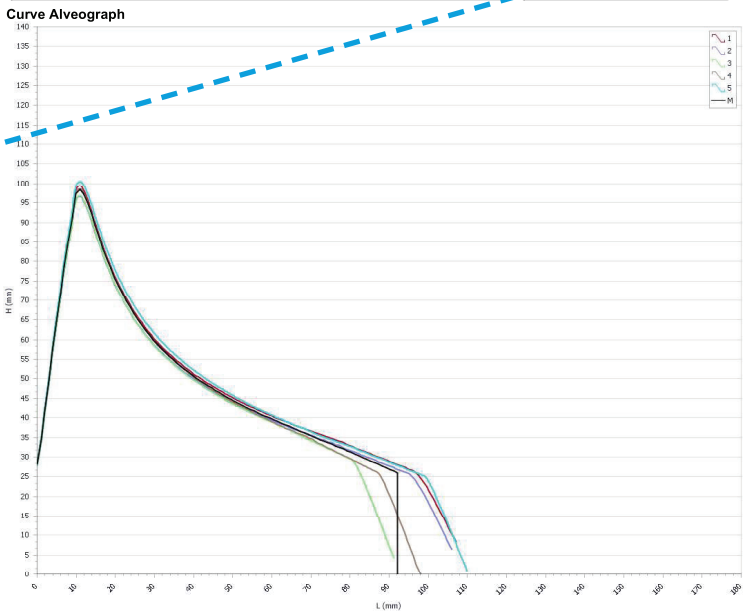
Settings

humidity : 61,8 %
Moisture content : 14,1 %
Hydration : 50 %
Hydration basis : B15% H20
Water quantity : 128,97 mL
Flour weight : 250 g

Results standard

P : 108 mmH2O
L : 91 mm
G : 21,2
W : 310 10-4J
P/L : 1,19
Ie : 51,9 %

Curve Alveograph



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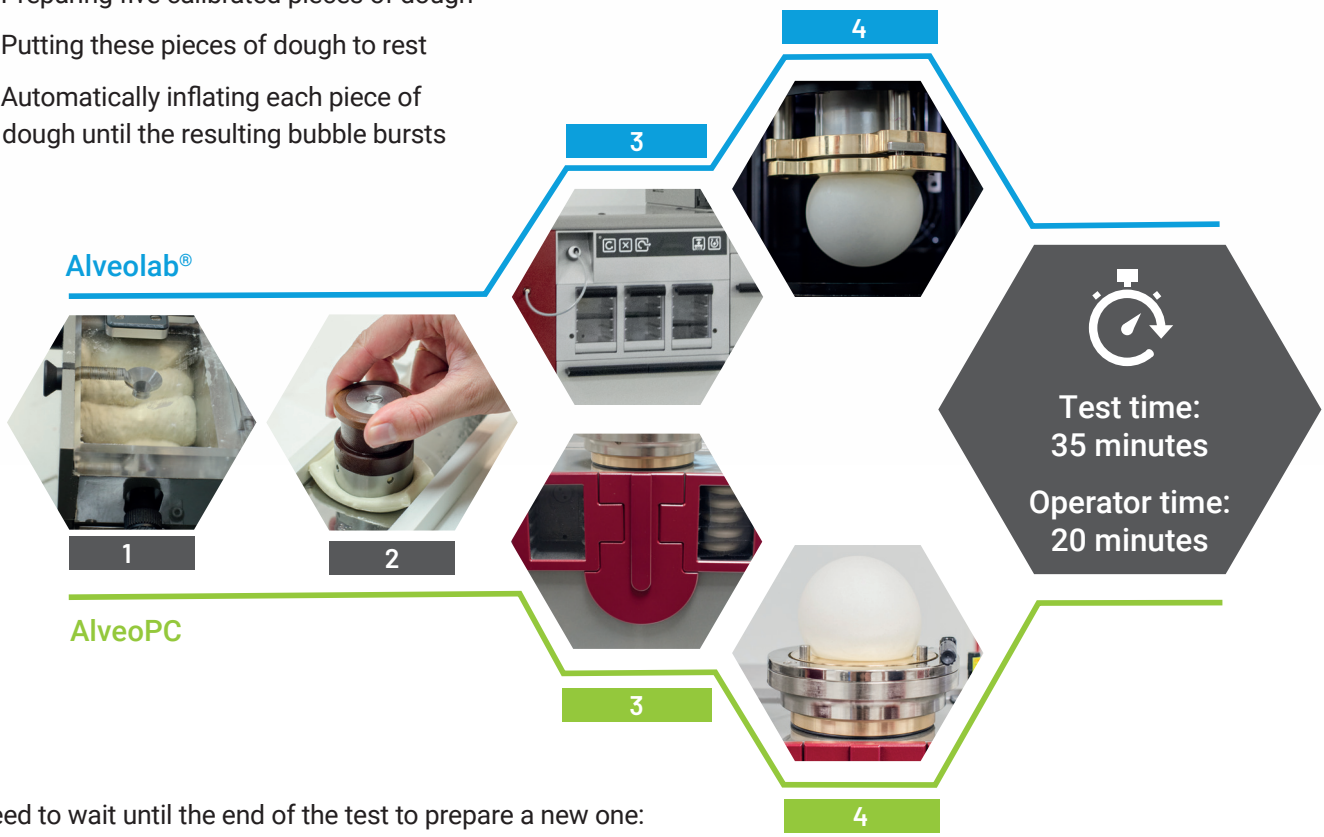
Results standard

P : 108 mmH2O
L : 91 mm
G : 21,2
W : 310 10-4J
P/L : 1,19
Ie : 51,9 %

SIMPLE TESTING PROCEDURE

The Alveograph® test involves four simple steps:

1. Mixing flour and salted water
2. Preparing five calibrated pieces of dough
3. Putting these pieces of dough to rest
4. Automatically inflating each piece of dough until the resulting bubble bursts



No need to wait until the end of the test to prepare a new one: as soon as the mixing bowl is free, you can start the next test.

ACCESSORIES TO STREAMLINE TESTING

The Alveograph® includes several helpful accessories to make testing easier and faster for users:

- Semi-automatic cutter for consistent patty size samples, and ease of processing
- Teflon™ -coated resting plates to avoid sticky residue and easy cleaning
- Reference flours to ensure accurate testing (optional)
- Dedicated CPU (MiniPC) running under Windows 10 IOT.

Reference flours

MiniPC

Semi-automatic cutter

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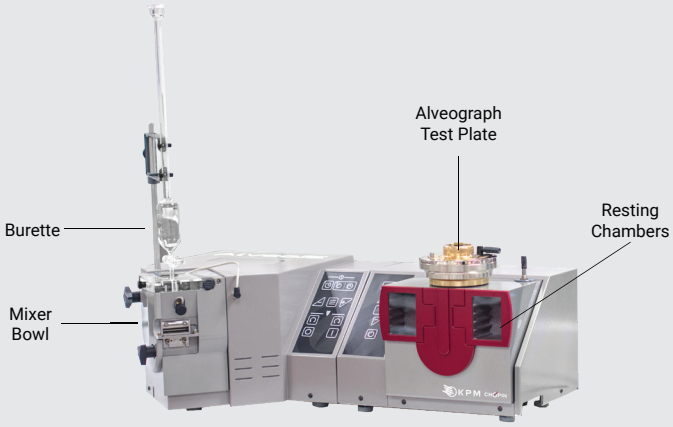
TWO MODELS

The Alveograph® devices are composed of two main elements: a kneading machine to create a dough sample for testing, and the Alveograph® itself, which measures the extension of a dough bubble formed by air pressure.

Alveolab® - For Quality Control, Research & Development, New Product Development

The Alveolab® is user-friendly, with constant or adapted hydration. It has a self-controlled cooling system, automatic water injection, and automatic positioning, crushing, and blowing of dough patties. Operators can adjust temperature, mixing speed, air flow, humidity, and test timing.

This flexibility allows testing of different formulations for new recipes and understanding dough performance in production. The data helps determine the best flour mixture and final production process.



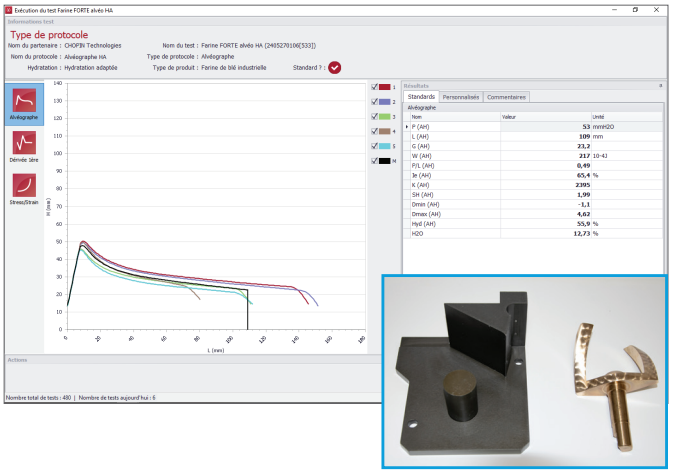
AlveoPC - For Quality Control

The AlveoPC is a benchtop analyzer for technicians that only conduct standard Alveograph tests at constant hydration, and work in a laboratory where temperature and humidity are perfectly controlled.

The AlveoPC is a simplified version of the Alveolab® and meets international standards for use in analyzing key parameters of dough. It is easy to use with a simple, modern user interface and meets standardized testing procedures.

ADAPTED HYDRATION TEST (ALVEOLAB EQUIPED WITH THE ALVEO-AH KIT ONLY)

The Alveolab, equipped with its “Adapted Hydration Kit,” allows testing of flours based on their actual absorption capacities. The protocol requires an initial Consistograph test, which lasts only 5 minutes, to determine the flour's water absorption capacity. After the Consistograph test, the adapted hydration Alveograph test proceeds as normal. This process provides users with a better understanding of their flour’s functionality using a water level more consistent with production conditions, especially for hard wheat flour types.



WHOLE WHEAT TEST (ALVEOLAB ONLY)

Whole wheat flour is challenging to test due to its high hydration capacity, longer development times, and fragility from large particles. A unique feature of the Alveolab® is its ability to analyze whole wheat flour with a new testing protocol, enabling bakeries to test all types of flour using a single instrument.

COMPARE AND CHOOSE THE ALVEOGAPH THAT BEST SUITS YOUR NEEDS

			AlveoPC	Alveolab®
PROTOCOL	Compliant with standards AACC 54-30.02, ICC 121 and NF EN ISO 27971		●	●
	Compliant with standards ICC 188 (Adapted Hydration Kit) and UNI 10453		-	●
	Alveographic Analysis - standard protocol at constant hydration (50% b15)	Value P determination	●	●
		Value L anf G determination	●	●
		Value P/L determination	●	●
		Value W determination	●	●
		Value I.e. determination	●	●
	Alveographic Analysis - calculation of new Stress/strain parameters	Stress/strain	-	●
		1 st derivative	-	●
	Alveographic Analysis	Degradation protocol	●	●
		Relaxation protocol	-	●
		Hybrid protocol	-	●*
		Whole Wheat protocol	-	●*
	Measure of consistency during mixing		-	●
	Consistograph Analysis		-	●
	Alveographic Analysis - protocol at adapted hydration		-	●
	Creation of new specialized protocols (mixing speed, duration, etc.)		-	●
	Sample types	White Flour - Soft or Hard Wheat	●	●
		Whole Wheat Flour - Soft or Hard Wheat	-	●
		Durum Semolina	-	●

**Alveo-AH optional kit*

TEST	Cooling		Water (cryostat or tap)	Integrated Peltier effect
	Electric maximum consumption		1800W/h	2200W/h
	Calibration of the pump (92/60)		Manual	Automatic
	Mixing	Adding of water	Manual	Automatic
		Regulated water temperature	-	●
	Shaping of test dough pieces	Semi-automatic cutter	●	●
		Anti-adhesive resting plates	●	●
	Resting of test dough pieces	Resting chambers	2	3
	Positioning and squashing of test dough pieces		Manual	Automatic
	Blowing of test dough pieces	Type	Manual	Automatic
		Analysis zone with regulated temperature and humidity	-	●
		Bubble	From below	From above
	Average number of tests in 8 hours (1 operator)		12	20

SOFTWARE	Software	Multilingual	●	●
	Software - “Test”	Data acquisition in real time	-	●
		Automatic save and archive	●	●
		Comparison	●	●
		Automatic creation of certificate of analysis	●	●
	Software - “Tools”	Improver guide	-	●
		Help in managing blends	-	●
		Virtual store	-	●
		Record of past performance	-	●
		Control card for the equipment	-	●

ORDERING INFORMATION

The Alveograph® is delivered with a recording system miniPC (not furnished: keyboard, monitor, monitor connector cable, mouse) and it comes with two reference samples to calibrate the Alveograph®.

ACCESSORIES

FARINE-A	Calibration flour Sample A for performance checking
FARINE-B	Calibration flour Sample B for performance checking
PC0-10	Strong flour Ref. sample for Consistograph's performance checking (For Alveolab® Only)
PLB-1017	Adapted hydration kit

Flour Ref

SPECIFICATIONS

Size	**AlveoPC**	**Alveolab®**
	Without Burette: 550 mm x 820 mm x 500 mm (22 in x 33 in x 20 in) With Burette: 550 mm x 820 mm x 850 mm (22 in x 33 in x 34 in)	640 mm x 1010 mm x 860 mm (26 in x 40 in x 34 in)
Weight	70 kg	96 kg
Noise Level	< 70 dB	
Power	220/240 VAC - 50/60 Hz - 1.800 W	220/240 VAC - 50 /60 Hz - 2.200 W
Fuse	Mixer: 5x20 T 10 A 250 V Alveograph®: 5x20 T 2 A 250 V	Both Mixer and Alveograph®: 5x20 T 10 A 250 V
Reagents needed per test (not supplied)	Salted Water 2.5% Peanut or Mineral Oil as Described in the NF EN ISO 27971	
MiniPC specifications	Windows 10 IOT - AlveoPC software already installed	Windows 10 IOT - Alveolab® software already installed
Cooling System	Not integrated Chiller (recommended) or Water Supply System Cooling Circuit Water: Water Temperature 15°C to 20°C (59°F to 68°F) Recommended Capacity Flow Pressure: 3 Bars	Internal
Data Export to USB	Available	
Print Results	By Connecting an External Printer to the MiniPC	
Software Languages	Chinese, Czech, English, Spanish, French, Italian, Polish, Portuguese, Russian, Romanian, Turkish, Ukrainian, Hungarian, Greek, Bulgarian	
Environmental Considerations	Indoor Use	
	Storage Temperature: -25°C to +55°C (-13°F to +131°F)	
	Operating Temperature: 18°C to 22°C (64°F to 72°F)	
	Humidity: Usage RH between 50 and 80%	
	Power Voltage Variations: ± 10%	
Regulatory compliances	Degree of Pollution as per EN 61010: 2	
	Installation Category as per EN 61010: II (surge category)	

KPM ACADEMY

On-demand courses for the Alveograph® Series and many other KPM Analytics products can be found on our KPM Academy: www.kpmanalytics.com/kpm-academy

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