

Digital Salt Meter

ES-421 Cat. No. 4210

Fast
Easy
Reliable

The ES-421 Digital Salt Meter utilizes the electric conductivity method and require no reagentsolutions.

Reduce costs and minimize risk by managing salt concentrations. With a compact and simple-to-use design, you'll want to always keep it close at hand.

Improved efficiency is guaranteed when used together with conventional titration methods. 84% of customers who evaluated the instrument have purchased.

Experience the convenience for yourself.



A restaurant chain

As the number of locations increase, customer complaints about inconsistent food quality also increased. **We have started checking the concentrations of salt in our soups and sauces** at the central kitchen before they are shipped out to other locations. At each restaurant, soups and sauces are checked periodically as they simmer. **We no longer receive the same type of customer complaints.**

A bakery

Salt is an important ingredient in baking bread. **We are monitoring the salinity of bread dough to be around 1-2%.** It is impossible to tell whether or not the salt was added to the dough from the appearance. Ever since we implemented the ES-421 in our production line, we have not forgotten to add salt. We can prevent substandard products from reaching to customers by salt testing.

A pickles manufacturer

We are using the ES-421 to measure pickles after the curing salt is washed off. The instrument is convenient and easy to use. Pickles are minced and diluted with water to a 10% concentration, and then measured with the ES-421. We also use a hand-held refractometer to measure the salinity of the brine for our salt-packed products. This is even more convenient because dilution is unnecessary. Both the salt meter and refractometer play important roles in the production for different purposes.

A fresh cut fruit processor

We use **2% saline solutions** with a small amount of ascorbic acid **to prevent discoloration of fruits.** Especially apples turn brown quickly. Monitoring the salt concentration is critical for us.



ES-421

Testimonials by Our Users Worldwide

A deli food supplier

A grocery store that carries our products came to our facility for inspection, and we were told to thoroughly monitor the amount of salt that goes into the food. **After evaluating several different salt meters including ones with a probe, we decided on the ES-421.** We used to rely on taste tests, but now we measure with the salt meter immediately after salt is added. We send the test data to the grocery store.

A restaurant

We list the salt content and calories of our food items on our menu. **We are monitoring the salt content of food in the kitchen** to make sure that readings stay close to the specified salt content.

A canned food manufacturing plant

We are using the ES-421 to **measure the brine for canned tuna.** It is easy to use and completely washable under the faucet. We liked it so much that we purchased a second unit.

A cold cut meat manufacturer

We use the ES-421 to **measure the salt concentration of ham and deli salads.** We love the unit and feel that the unit will soon pay for itself.

FAQ

Q How is the unit calibrated?

A Press the ZERO button while the sensor is empty and completely clean. No chemical is necessary. Perform this zero-setting daily. When measurement values seem to be off, calibrate the unit with a standard saline solution. Contact ATAGO for purchase.

Q Can tap water be used for sample dilution?

A Always use distilled water whenever possible. If tap water is used, make sure that the water reads "0 (zero)" in advance.

Q Do other electrolytes besides salt affect the readings?

A The amount of other electrolytes found in food is negligible, usually less than 1%.

Q Does the Mohr method and ES-421 Digital Salt Meter uses the same measurement principles?

A The Mohr method, also known as a silver nitrate titration method, utilizes the characteristic of silver nitrate that reacts with chloride ions to measure the salinity %. The ES-421 Digital Salt Meter employs the electric conductivity method. Both methods measure the salinity but operate on different measurement principles. However, by creating a conversion table between the two testing methods, correlation between the set of results can be seen.

Q Can the instrument measure the non-sodium total dissolved solids?

A Non-sodium total dissolved solids = Brix - (salinity % × 1.18). A refractometer with the Brix scale is required. The salinity % is multiplied by 1.18 to be converted into a Brix value.

NaCl Solution (for calibration)

Part#	Part name	NaCl concentration	Contents
RE-120250	NaCl Solution 2.50% AB250 for PAL-ES2, ES3 calibration	2.50 ± 0.05% (g/100g)	Approx. 5ml
RE-120284	NaCl Solution 2.84% AB284 for ES-421 calibration	2.84 ± 0.05% (g/100g)	Approx. 5ml



Specifications

	ES - 421
Cat#	4210
Measurement method	Conductivity method
Measurement range	0.00 to 10.0% (g/100g)
Resolution	0.01% for salt concentration of 0.00 to 2.99% 0.1% for salt concentration of 3.0 to 10.0%
Measurement accuracy	Displayed value ±0.05% (for salt concentration of 0.00 to 1.00%) Relative precision ±less than 5% (for salt concentration of 1.00 to 10.0%)
Temperature compensation	10 to 40°C
Ambient temperature	10 to 40°C
Power supply	006P dry battery (9V)
International protection class	
Dimensions and weight	17(W)×9(D)×4(H)cm, 300g

The ES-421 Digital Salt Meter is designed and manufactured in Japan.

HACCP GMP GLP

ATAGO products comply with HACCP, GMP, and GLP standards.

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Specifications and appearance are subject to change without notice.

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Free Demo Available

The New Global Standard

ES-421 Digital Salt Meter

Why measure salt content?

Adding salt is one of the most critical processes in food manufacturing as it has a significant effect on the color, taste, and texture of food.

The ES-421 Digital Salt Meter is ideal for quick and easy salinity checks on the production floor.

Recently, in addition to use in the production area, many companies are validating the ES-421 as the preferred method in lab settings as well. Food scientists are choosing to limit the use of precipitation titration with harmful silver nitrate (Mohr's Method).

Because the ES-421 Digital Salt Meter is safe, fast, and simple.

Due to the difference in measurement principles, readings from the conductivity salt meter may not match up exactly with the readings by titration for certain samples. However, by creating a conversion table between the two testing methods, correlation between the set of results can be seen.

Unlike titration, no expensive and harmful chemical is involved in the measurement process.

ATAGO delivers the revolutionary salinity measurement

Why choose ATAGO?

- 1 Fast** - Results are displayed within 3 seconds.
- 2 Easy measurement** - Just press the START button.
- 3 Easy calibration**
 - Clean the sensor and press the ZERO button.
- 4 Digital display**
 - No more varied readings caused by user interpretation.
- 5 Automatic Temperature Compensation**
 - Reliable for any samples, hot or cold.

A frozen vegetable processor

The vegetables are blanched and flash frozen. **The salt content of the blanching water is important for maintaining the bright colors of vegetables.** If it's too low, the vegetables lose their colors, and if it's too high, they taste salty. The water is boiling all day long, and water and salt are added throughout the day. We did not realize how much the salinity changed until we started using the ES-421. Now we perform tests at fixed time intervals.



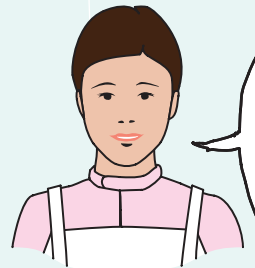
A condiment manufacturer

We are testing sauces and dressings for salt with the ES-421. The instrument is perfect for use at the production site because **it is compact and does not use harmful**



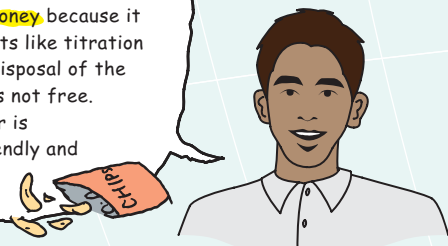
A cheese maker

We use the ES-421 to measure the salinity of salt water that we soak our cheese in. **The right concentration of salt is critical for the flavor of cheese.**

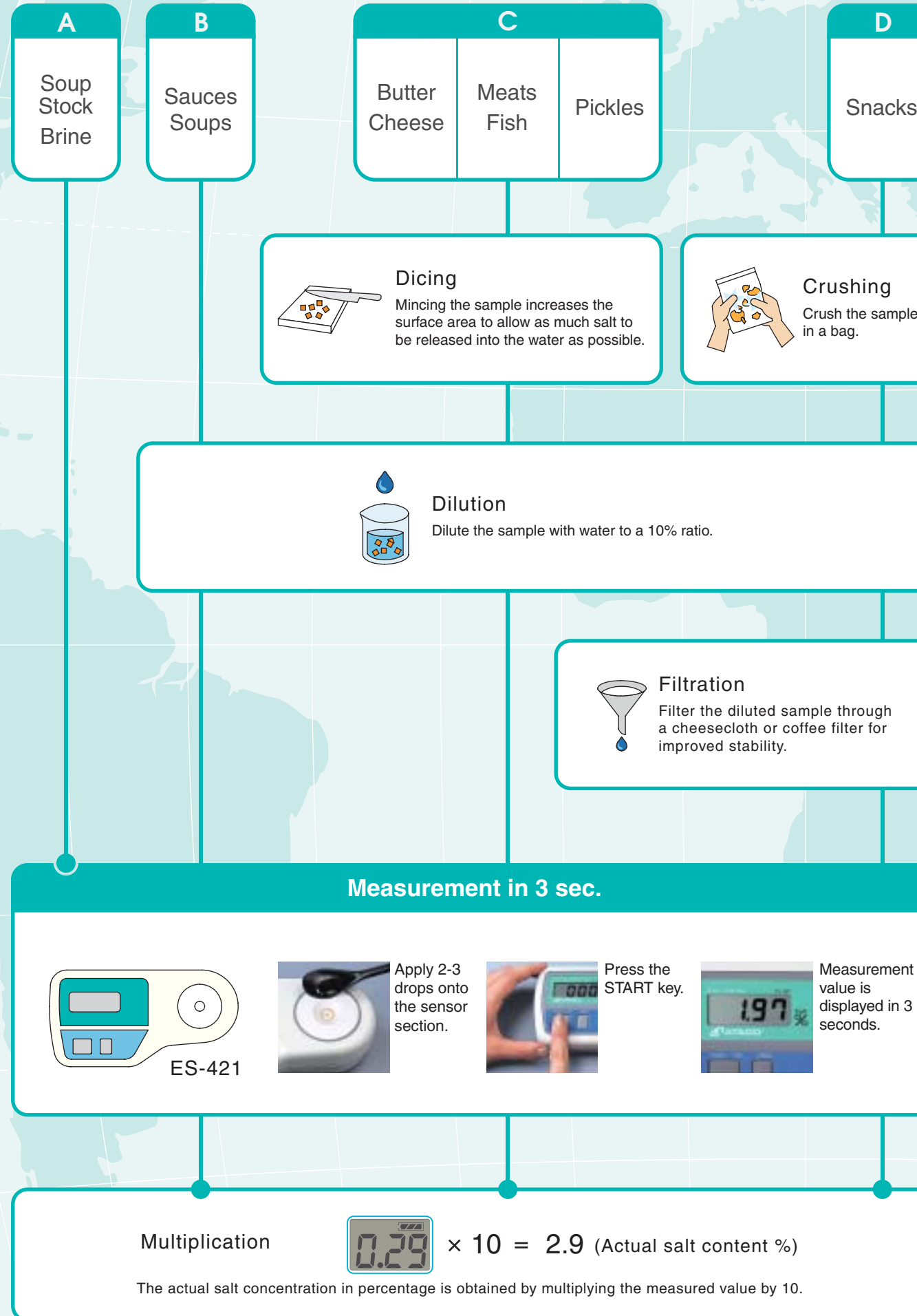


A potato chips manufacturer

Salt is sprinkled on fried potato slices from a machine, and the amount of salt dispensed is checked and adjusted at the beginning of a production lot. In the past, we had to take samples to the lab for testing, but now we can do it right at the production line. **The ES-421 saves us time and money** because it does not use reagents like titration systems. Even the disposal of the titrating reagents is not free. ATAGO's salt meter is environmentally friendly and economical.



How to Measure



Commonly Measured Food Samples

A

Sample	Value
Soup stock	0.9
Brine	1.0
Miso soup	1.0
Vegetable cooking water	1.0
Pasta cooking water	1.0
Soup stock	1.9
Brine	2.9
Ayran	4.9

If the sample is drinkable as is, no dilution is required.

B

Sample	Value
Gravy	0.8
White sauce	0.9
Demi-glace	1.1
Pasta sauce	1.2
Mayonnaise	1.6
Tomato puree	1.7
Dressing	1.7
Taco sauce	2.0
Steak sauce	2.0
Ketchup	3.0
Savory pancake sauce	4.5
BBQ sauce	4.8
Sushi vinegar	5.2
Noodle dipping sauce	5.8
Soy sauce dressing	6.1
Kimuchi paste	6.1
Yakitori sauce	6.5
Habanero sauce	6.8
Broad bean butter	7.0
Oyster sauce	9.4
Bean paste	11.0
Soy sauce	13.0
Fish sauce	21.0

C

Sample	Value
Soup base for hot pot	0.8
Minestrone soup	1.2
Potage	1.2
Noodle soup	1.4
Tom yam kung	1.5
Curry	1.6

If the solution tends to separate, collect from the middle layer that is homogenous. If the sample is oily, such as dressing, allow the oil in the liquid to float to the top, and then collect a sample from the layer underneath the oil, using a pipette, for improved repeatability.

D

Sample	Value
Butter	0.1
Mozzarella	0.7
Gouda	0.9
Emmental	1.1
Maribo	1.6
Brie	1.8
Gorgonzola	3.6

Dilute the sample with hot water to a 10% ratio. After the sample has melted, fat will float to the top. Collect the sample with a pipette from the layer underneath the fat. Note: Some water will evaporate, so the dilution ratio may not be accurate. Make sure any undissolved solids are liquefied as much as possible before measuring.

C

Sample	Value
Sausage	0.8
Ham	1.1
Salami	1.6
Bacon	1.7
Prosciutto	3.2

C

Sample	Value
Sardine	1.0
Tuna	1.1
Pickled octopus	1.3
Salmon	2.4
Salmon roe	2.8
Salted fish viscera	3.2
Salted cod roe	5.2
Anchovy	10.0

Dilute the minced sample with water and let it sit for about 3 minutes before measuring. Let it sit longer, for about 5 minutes, if the sample was diced in larger pieces.

C

Sample	Value
Pickle	1.7
Sauerkraut	2.1
Kimuchi	2.2
Olive	2.8
Pickled radish	3.6
Preserved vegetable	14.3

If the solution contains large pieces of sample, collect from the top layer with no undissolved solids.

D

Sample	Value
Chips	1.4
Crackers	2.3

Solid samples that crumble easily. Dilute the sample that contains oil and undissolved solids with water, filter out the solids, and measure.

Your sample is not listed? Contact ATAGO.



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