

~ Fried food of the world ~

15 Commonly Eaten Fried Foods of the World

Perfect Oil Guide
[Food Edition]



15 Fried Foods of the World

With a booming diet industry and an increasingly health conscious population, talking about oil has become a bit of a taboo in recent years, but it is still one of the three essential nutritional elements, next to sugars and proteins.

There are a myriad of vegetable oils, each with their own special uses. For example, linseed oil and perilla oil can be used raw as dressings, while canola oil and sesame oil, with their high heat resistance, can be used as frying oil.

As for animal products, beef tallow and lard are examples that, due to their rich taste when cooked, are preferred for use as frying oils.

Foods cooked with oil are an important part of every culture, in every region. Especially popular are easy-to-eat, no-fuss fried foods.

| | | | |
|---|---|---|--|
|  | Fried Chicken A4 USA |  | Falafel A12 Middle Eastern countries / Egypt |
|  | Fish and Chips A5 UK |  | Potato Cakes A13 Australia |
|  | Corn Dog A6 USA |  | Poutine A14 Canada |
|  | Curry Bread A7 Japan |  | Taquito A15 Mexico |
|  | Schnitzel A8 Germany / Austria |  | Yu Lin Chi A16 China |
|  | Arancini A9 Italy |  | Tempura A17 Japan |
|  | Coxinha A10 Brazil |  | Doughnuts / Donuts A18 USA |
|  | Empanada A11 Spain, Portugal / North America / South America / the Philippines / the Middle East / etc. | | |



Fried Chicken

American fried chicken has its roots in the Southern soul food culture of African-Americans. The combination of a Scottish chicken-frying method with the spices and seasonings of West Africa gave birth to this uniquely American food.

USA



Fried chicken grew from a popular Southern African-American meal to be popular among white Southern communities. However, it was not until the mid-20th century, with the growth of fast food chains that it became a nationally popular food. As those chains moved overseas, fried chicken's popularity went global. Japan, which already had a popular type of fried chicken called 'karaage', took American fried chicken under its wing, especially on

the island of Okinawa, and it is now eaten at celebrations and around Christmas time. Traditionally, American fried chicken is made with drumsticks coated in a flour-based batter and mixed with seasonings and spices. Traditionally frying takes 10 to 15 minutes in a deep pot heated to 320 to 340°F (160 to 170°C), but nowadays, it can be cooked at home in 3cm of salad oil or at restaurants in pressure cookers.

Column

At a fried food manufacturing site, because fried chicken production does not use bread crumbs, less oil was being absorbed by the product, which resulted in the oil being changed less often than on other production lines. This led to a faster deterioration of oil quality. Due to their dissatisfaction with AV test strips in determining oil quality, we introduced them to the DOM-24. Being designed for use at high temperatures and producing faster results than the test strips, the DOM-24 provided an easy to use, non-consumable test method that kept their costs down. Now, they will never miss a drop in oil quality again.

Fish and Chips

Fried white fish, typically cod, served with fries - it sounds so simple but the average English consumer will tell you that it all comes down to the elusive balance of the crunchy, yet fluffy mild - tasting batter for this soul food.

UK



To make the batter, flour and baking soda are mixed-not with water-but with beer! This gives the batter a unique texture and light brown color. The beer used in the batter must be cold. The type of beer used, whether it be an ale, a stout, a lager, or a bitter, differs between locations.

Recently, vegetable oils like peanut oil have been gaining some usage in the process, but cooks focused on flavor still prefer to use the traditional beef tallow or lard.

Column

Consider the example of a fish and chip shop, with 30 years' experience operating in a fish market, who were changing their oil once every two days, no matter what. A popular store to eat at they required four fryers, meaning they were using large amounts of costly oil. The DOM-24 now helps them better manage their oil quality, with easily viewable, numerical results. Not only has it lowered their costs, but it has also reduced their environmental impact.

*AV: Acid Value TPM: Total Polar Materials POV: Peroxide Value

Corn Dog

Invented during the 1940s in Texas, this street food is made by skewering a hot dog and frying it in cornmeal batter. Corn dogs are the perfect snack for eating on the go. Available fried-fresh at festival stalls and at gas stations as well as in the frozen section of most supermarkets.

USA



To make the batter, mix cornmeal, all-purpose flour, baking powder, salt, and sugar with milk and egg and then rest it in a refrigerator for about an hour. A hot dog is skewered, coated in flour, and then dipped in the cooled batter before being fried at 355°F (180°C) in vegetable oil for 3 to 4 minutes.

In Japan, where cornmeal is fairly uncommon, they developed the 'American Dog,' which is instead made with plain flour. Corn dogs are growing in popularity all over the world.

Column

At a factory producing packaged foods, part-time employees were in charge of oil testing using AV test strips, but said they found determining the value from the color to be difficult. When the factory moved locations, which resulted in a restricting of the production line and some new staff, the company switched from the test strips to the DOM-24. Easily usable with little training, the DOM-24 gives the company the peace of mind that comes with consistent readings, no matter who was in charge, and the transition to the new oil testing system went smoothly.

Curry Bread

Curry filled delicatessen bread, or 'curry bread' first appeared during the Showa-Era in Tokyo, around the late 1920s. Several stores, all still in operation, claim to be the original inventor of this delight. Curry bread has enjoyed a long popularity.

Japan



It is often believed that the idea for curry bread originated from the Russian piroshky but true Russian piroshky are typically filled prior to being baked in an oven to expand. Many fried foods resemble fried dumplings, so it is said that the type of piroshky popular in Japan may have been developed based on curry bread.

Curry bread is still only found commercially in Japan, but it has recently seen a boom in popularity amongst tourists, with many of them attempting to recreate the experience after they return home. Maybe one day soon you will find some delicious curry bread near you.

Column

In Japan, the oil used to fry breads must be changed once the AV exceeds 2.5, as set by government regulation. In one particular large-scale bakery, policy dictates the AV is to be taken during the production process and if the value exceeds 2.0, the oil is changed before the next batch comes in. Using oil test strips, they found, was too subjective and could not be done as often as they would have liked. The DOM-24 allows them to easily check between each batch by providing a simple numerical reading, keeping them in control of the process.

*In Japan, manufacturers of boxed lunches (bento boxes) and other prepared foods are required to change oil with an AV greater than 2.5 in accordance with the government's sanitation code.
*AV: Acid Value TPM: Total Polar Materials POV: Peroxide Value

Schnitzel

Schnitzel is a popular menu item not only in Germany and Austria, as you may expect, but also in countries such as Israel.

This dish is so popular in Austria that it is even available in specialty fast-food restaurants!

Germany / Austria



Firstly, a thick slice of meat is thinned out with a meat tenderizer. Then it is coated with flour and an egg glaze before being dipped in a mixture of freshly ground black pepper and bread crumbs.

Next, the schnitzel is placed in a skillet with a generous amount of oil and grilled in a way that resembles frying. Lard or butter are recommended for best results.

This traditional dish is said to have come to Vienna from Italy in the 16th Century.

Column

In some restaurants, the need for an oil change is determined with visual checks. The decision making process will vary greatly depending on the experience of the employee in charge.

With the DOM-24, you can turn your most experienced chef's decisions into a number value and create a standard. Maintaining a consistently high oil quality will give your dishes the edge.

Arancini

Of course, Italy – a country known for its food – has a home-grown variety of street food. On the island of Sicily, in the town of Palermo, arancini, whose name literally means 'little orange', is the king of street food.

Italy



Sicilian arancini are known for their conical shape and although they are snack-sized, they have a full-bodied texture that'll leave you full after only a few bites. Arancini are filled with a risotto that can be made with tomato sauce, mince meat, cheese, green peas and many more ingredients, all fried together in a bread crumb casing.



Column

A fried chicken factory would measure their soybean oil's quality with AV test strips and then run the results through a reader to produce an AV value. Oil changes would happen under this system about once per week, once they got an AV above 2.5. The fryers are run 3 times per day and tested after the day's final production run. With four fryers, testing with the strips was getting expensive. With the DOM-24, no matter how many fryers you have, you can easily check the AV value without using hundreds of expensive AV test strips.

*AV--Acid Value TPM--Total Polar Materials POV--Peroxide Value

Coxinha

This is a Brazilian street food made by frying chicken breast that has been wrapped in dough and then covered in bread crumbs.

With its pleasing texture and appealing shape, this is eaten as an easy and light meal.

Brazil



Sometimes coxinha are referred to as 'Brazilian-style croquettes', but they do not actually use any potatoes.

While their shape may resemble a large tear or a baby chick, it is actually supposed to resemble a chicken drumstick.

Chicken breast, flavored with salt and pepper, is boiled until it is ready to melt-in-your-mouth. Flour is added to the boiled water to make the batter.

After being left to cool in a refrigerator for one hour, the chicken is wrapped in the batter, which is then coated in an egg glaze and bread crumbs. Finally, it is fried in vegetable oil at 355°F (180°C) until it turns a rich golden brown color.

Column

At a food production location in Japan with a fried food production line they use vegetable oil to fry things such as croquettes, fried katsu, and fried chicken. With a variety of products and three production runs each day, they were testing the oil after each run with oil quality test strips. With three fryers, it meant they were using nine whole test strips each day, so they were looking for a new, more cost-effective method. With the DOM-24 they can keep the running costs and time spent to a minimum no matter how many times they test and safely control the quality of their oil.

Empañada

Coming from the word in Spanish/Portuguese meaning 'to wrap', the empañada is not only a must-have at celebrations, but also popular as an appetizer, for breakfast, or eating on the side of the road. Beloved all over the world, you are never far from a freshly fried empañada.

Spain, Portugal, North America, South America, the Philippines, the Middle East, etc.



Popular with tuna in Spain, beef in Argentina, and spinach in Arab nations, there are not only many regional variations but just many variations in general, including cheese, cream, and sweet potatoes. You can basically wrap whatever you want in the thick dough of an empañada. Even the filling method varies by region, from places where the dough is stretched, filled and then cut into smaller pieces and regions where balls of dough are

filled one by one.

Adding salt, a little dry yeast, and sugar to flour to make the dough, which is then kneaded in lukewarm water and finished off with a little olive oil. The dough is ready once it feels elastic. Recently it has become more common for health-conscious families to cook them on cold pie sheets in an oven, but a golden brown, freshly fried empañada remains tempting for many people.

Column

A large-scale bread manufacturer checks the AV and POV of their oil using test strips one time per day. The AV limit is set to 2.5 and their POV to 25, but operationally, they change the oil once they get an AV reading approaching 1.0. On the other hand, in the same company's testing room, they are using the titration method to test AV and POV and a digital meter to test TPM. They test AV and TPM once per week, but because measuring POV takes time and the reagent is hazardous, they only test POV once per month. Since DOM-24 can measure AV and TPM on one machine, it is recommended for companies who want logical and timely QA procedures.

*AV--Acid Value TPM--Total Polar Materials POV--Peroxide Value

Falafel

Falafel has its origins in the Middle East. Reconstituted garbanzo beans and fava beans are ground up, mixed with herbs and spices and fried into little balls. In the Middle East, the most common oils used for frying are corn and sunflower oils.

Middle Eastern countries / Egypt



It is common to eat falafel wrapped with vegetables in pita bread and covered with tahini, also known as sesame paste, or with hummus, a thick garbanzo bean paste.

Falafel is growing in popularity in the Western world as a health food due to its 100% vegetable make-up, low-calorie count, and high levels of protein. It has even recently been found in an increasing number of stores in Japan. Now, falafel is

truly a global street food. The mixture of ingredients used to make falafel varies a little by region, depending on popular ingredients in the area. For example in Egypt falafel are made only with fava beans, while in Israel they are made only with garbanzo beans.

Column

In a factory in the United States that fries garbanzo beans and peanuts a standard value for oil changes was set at the same time they began educating their line managers on the benefits of oil quality management. After adopting the TPM and AV standards from Europe and Asia to manage their oil, they are currently using their DOM-24 on two of their production lines.

Potato Cakes

Potato cakes can be found all over Australia. Commonly seen as a side-dish to fish and chips, a potato cake is a flat, round snack made from a slice of potato that has been battered and deep-fried. Depending on the region they can be quite thick or even be made with mashed potatoes.

Australia



Potato cakes made from whole potato slices are also called potato scallops.

After the skin is peeled, the potato is cut into 0.2in slices, dipped in a liquid batter and then fried until golden brown in canola oil at approximately 345°F to 355°F (175°C to 180°C).

Potato cakes can be cooked at home in a skillet filled with approximately 0.4in of oil. They are so simple, as long as potatoes are available to you, potato cakes can be made anywhere.

Column

At a factory that manufactures potato chips, they were using oil test strips to measure the POV and titration to measure the AV, but they began investigating ways to better control their oil's quality by measuring TPM. This method can comprehensively determine the POV, caused by oxidation, and AV, caused by an increase in the free fatty acids from the potato's moisture content. With the DOM-24, they can check the TPM with just the push of a button.

*AV--Acid Value TPM--Total Polar Materials POV--Peroxide Value

Poutine

People who think of fries as a side dish are, one by one, raising the white flag in Canada. Poutine is the nobility of the fried potato world. It is so delicious that you might even call it a form of modern art.

Canada



Poutine is made with fresh French fries covered in melted cheese and fresh, hot gravy. Go on, eat your fill of this dish from Quebec. It will be hot – so don't forget the fork!

If you happen to come across some poutine in Canada – forget about calories for a bit – and be ready to eat until you can't move.



Column

In a French-Italian fusion restaurant, the oil used for their unmissable French fries was being changed once every three days. The restaurant's policy dictated that the oil must have a TPM value below 11%. Without a proper way to test the value, though, they were disposing of oil that was technically still usable.

Now, by measuring with the DOM-24, they can get a more accurate grasp of when oil needs changing, improve food safety and lower their costs while at the same time reducing their environmental impact.

Taquito

Taquito literally means 'little taco' in Spanish. Taquitos are made by wrapping filling in a tortilla, a staple in Mexican cooking, and crisp-frying to perfection.

Mexico



You can find taquitos all over Mexico; they are easy to make and even easier to eat. That simplicity, combined with their adorable appearance, makes them an essential item for any large party. Despite their appearance, they can be more filling than you might expect, so be careful not to eat too many. Depending on your preferences, you can cover your taquitos with guacamole, salsa or sour cream.

As a light meal they can be filled with fried chicken mince, taco filling or even apple, if you want to make a sweet treat.

Taquitos are usually fried in corn oil.

Just like Japanese sushi rolls, they can be made thin or thick and have hundreds of variations, depending on your chosen on filling.

Column

A frozen food company, who had been using reagents to test the AV of their oil, learned that they have been labeled a possible cancer cause and quickly discontinued using them. The company tried to use oil test strips instead but found that determining the result based on the color reduced their confidence.

They are currently testing the DOM-24 as it does not use any harmful reagents and gives results as an easily readable numerical value.

*AV--Acid Value TPM--Total Polar Materials POV--Peroxide Value

Yu Lin Chi

In Japan, this is known as a fried chicken dish with a strong onion flavor. The vital ingredient in this dish is the sauce – made from a blend of shredded onion, ginger, garlic, soy sauce, vinegar, sesame oil, and sugar.

China



Chicken thigh or breast is marinated in Shaoxing rice wine and lightly fried. Next they are lifted out with a slotted spoon and placed in a ladle where hot oil is poured over the meat until the skin is crispy. This process double fries the meat. Once done, the crispy meat is cut into bite-sized pieces and served on a plate covered in the delicious sauce. Best

results occur when a basic mix of lard and sesame oil is used for frying.

Watching the meat being fried using the slotted spoon and ladle is one of the highlights of Chinese cooking.

Column

A popular karaage restaurant measures the AV value using oil test strips. In order to use these strips, the oil must be placed on tongs and cooled. Once cool, the test strips are immersed in the oil for 30 seconds before the color change occurs. Unable to get accurate readings at temperatures above 212°F (100°C), the strips being used also cannot be put directly into the fryer, even at low temperatures, due to being coated in a reagent. With the DOM-24, they can check the oil quality in as many fryers as they want, as many times as they want, without having to worry about temperature or reagents.

*Government hygiene regulation in Japan stipulates that manufacturers of pre-prepared lunches and other foods must change oils at AV values of above 2.5.

Tempura

Tempura is said to have come to Nagasaki, Japan around the same time as guns via Western European visitors in the 15th Century. In the early Edo Period (1603 - 1868), fish from the Tokyo Bay were fried and eaten as tempura from street stalls. Around this time, rapeseed oil production was increasing, so even common folk could enjoy tempura. Along with sushi and soba noodles, tempura became one of the main flavors of the period and even today is known world-wide as a Japanese food.

Japan



Tempura is unique in the world of fried foods as it boasts a crispy outer skin while the food on the inside is steamed. Fresh tempura made by a veteran cook with high-quality sesame oil is a delicacy, but tempura soba noodles, served in soba restaurants' signature soup, or mountains of homemade tempura fried in rapeseed oil are enough to get Japanese people's taste buds firing.



Column

The tempura manager at an udon restaurant chain had been using the tempura's color and the results of AV test strips to determine the timing of oil changes, but had been hearing more and more about numerically-based TPM measurement. With the DOM-24 they can see the TPM and AV and are looking into ways they can use the knowledge of their veteran chefs to improve their usage of the instrument.

*AV: Acid Value TPM: Total Polar Materials POV: Peroxide Value

Doughnuts / Donuts

The humble donut is popular all over the world. With the original recipe said to have come to the New World on the Mayflower, this sweet snack has a long history.

USA



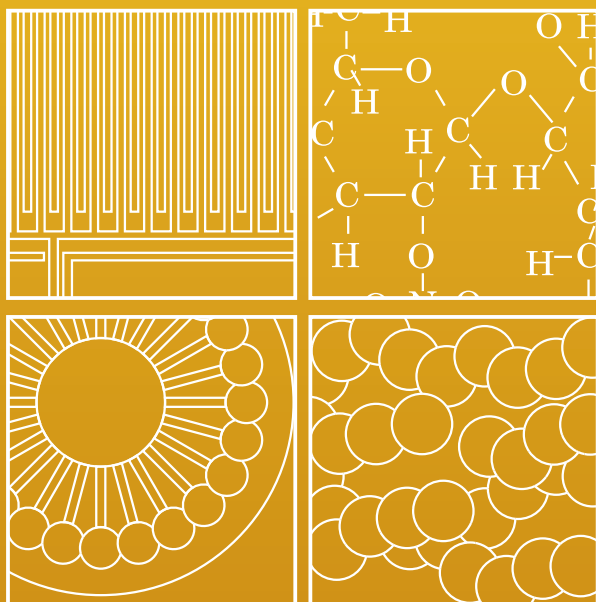
Donuts are well known for being nutrient-rich foods and in 2010 research showed that, when combined with coffee, they increased concentration and memory. Donuts are a casual breakfast in the USA, with donut stands found outside train stations each morning. In saying that, roughly 1/4 of a donuts weight comes from oil, so maintaining high quality oil is essential.



Column

At a donut chain, they had internally set oil-changing guidelines and periodically checked the oil quality using AV test kits. To use the kits, they had to wait until oil from the fryers cooled off, take and put it into the reagent test pack and wait about another minute for a reaction before making a color-based determination. Hot oil cannot be put into the test packets and because the packs are disposable, they are expensive to use. Using the DOM-24 the chain can check the quality of their oil, without waiting for it to cool down, just by pushing a button. No preparations, no reagents, and no on-going costs.

*AV--Acid Value TPM--Total Polar Materials POV--Peroxide Value



Perfect Oil Guide

[Food Edition]

To those looking for a safe,
easy and guaranteed way to maintain quality

Regularly consumed cooking oils come in a variety of types, including olive oils, vegetable oils, corn oils, perilla oils, cottonseed oils, and safflower oils.

Use quality standards and indicators to deliver delicious and safe products to consumers.

Consistently stable production, sensible quality assurance, and maintaining the best standards and procedures are vital.

Cooking Oil and Quality

Oil and Refractive Index B 4

Oil and Deterioration B 8

Oil and Viscosity B 12

Product Information

Product Lineup B 16

Frying Oil Monitor
DOM-24 B 18

Refractometer
PAL-RI B 20
MASTER-RI B 21
RX-5000i-Plus B 22
DR-A1-Plus B 24
NAR-1T LIQUID B 25

Viscometer
VISCO™ B 26

Options B 28

User Testimonials B 30

All ATAGO products are designed and manufactured in Japan.

ATAGO CO., LTD.

<http://www.atago.net/> overseas@atago.net

Headquarters: The Front Tower Shiba Koen, 23rd Floor
2-6-3 Shiba-koen, Minato-ku, Tokyo 105-0011, Japan
TEL : 81-3-3431-1943 FAX : 81-3-3431-1945



HACCP GMP GLP

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

| | | |
|--|--------------------------------|------------------------------------|
| ATAGO U.S.A., Inc. | TEL : 1-425-637-2107 | customerservice@atago-usa.com |
| ATAGO INDIA Instruments Pvt.Ltd. | TEL : 91-22-28544915, 40713232 | customerservice@atago-india.com |
| ATAGO THAILAND Co.,Ltd. | TEL : 66-21948727-9 | customerservice@atago-thailand.com |
| ATAGO BRASIL Ltda. | TEL : 55 16 3913-8400 | customerservice@atago-brasil.com |
| ATAGO ITALIA S.r.l. | TEL : 39 02 36557267 | customerservice@atago-italia.com |
| ATAGO CHINA Guangzhou Co.,Ltd. | TEL : 86-20-38108256 | info@atago-china.com |
| ATAGO RUSSIA Ltd. | TEL : 7-812-777-96-96 | info@atago-russia.com |
| ATAGO NIGERIA Scientific Co.,Ltd. | TEL : 234-707-558-1552 | atagonigeria@atago.net |

* Specifications and appearance are subject to change without notice.

Copyright © 2017 ATAGO CO., LTD. All rights reserved. [ENV01] 17071000GR Printed in Japan



Oil and Refractive Index

Vegetable oils are, as the name implies, oils that come from various flora. Typically, these oils are squeezed or otherwise extracted from seeds or fruits. As the name of each oil varies with the extraction method and location, there are easily more oil types than raw materials.

Specifying Cooking Oil Types

Cooking Oil Quality & Refractive Index

As vegetable oils are meant for consumption, they have strict safety and quality guidelines. ATAGO manufactures instruments that can measure the property and quality of vegetable oil.

Using Refractive Index is one method used to determine the properties of vegetable oils. Since the properties and compositions vary, it is possible to determine the type of oil using Refractive index.

The instruments used to measure refractive index are known as 'refractometers'.

For high-precision readings, ATAGO has the RX Digital Bench-Top Refractometer series and analog Abbe Refractometers. For faster readings, we have the PAL pocket hand-held refractometer series and other hand-held units. ATAGO has a wide product range designed to meet all of our customers' needs.



| Oil Name | Specific Gravity 25/25°C | Refractive Index 25/25°C | Saponifica- tion value | Iodine value | Unsaponifiable Material % |
|---------------------------|--|---|---------------------------|-----------------|--|
| Consumable safflower oil | 0.919 to 0.924 | 1.473 to 1.476 | 186 to 194 | 136 to 148 | At or below 1.0 |
| Consumable grape oil | 0.918 to 0.923 | 1.472 to 1.476 | 188 to 194 | 128 to 150 | At or below 1.5 |
| Consumable soybean oil | 0.916 to 0.922 | 1.472 to 1.475 | 189 to 195 | 124 to 139 | At or below 1.0 |
| Consumable sunflower oil | 0.915 to 0.921 | 1.471 to 1.474 | 188 to 194 | 120 to 141 | At or below 1.5 |
| Consumable corn oil | 0.915 to 0.921 | 1.471 to 1.474 | 187 to 195 | 103 to 135 | At or below 2.0 |
| Consumable cottonseed oil | 0.916 to 0.922 | 1.469 to 1.472 | 190 to 197 | 102 to 120 | At or below 1.5 |
| Consumable sesame oil | 0.914 to 0.922 | 1.470 to 1.474 | 184 to 193 | 104 to 116 | At or below 2.5 Purified sesame oil is 2.0 |
| Consumable rapeseed oil | 0.907 to 0.919 | 1.469 to 1.474 | 169 to 193 | 94 to 126 | At or below 1.5 |
| Consumable rice oil | 0.915 to 0.921 | 1.469 to 1.472 | 180 to 195 | 92 to 115 | At or below 4.5 Salad oil is 3.5 |
| Consumable peanut oil | 0.910 to 0.916 | 1.468 to 1.471 | 188 to 196 | 86 to 103 | At or below 1.0 |
| Consumable olive oil | 0.907 to 0.913 | 1.466 to 1.469 | 184 to 196 | 75 to 94 | At or below 1.5 |
| Consumable palm oil | 0.897 to 0.905 Measurement Temperature 104°F (40°C) | 1.457 to 1.460 Measurement Temperature 104°F (40°C) | 190 to 209 | 50 to 55 | At or below 1.0 |
| Consumable coconut oil | 0.909 to 0.917 Rising Melting Point 68 to 82°F (20°C to 28°C) Measurement Temperature 104°F (40°C) | 1.448 to 1.450 | 248 to 264 | 7 to 11 | At or below 1.0 |

Chart : A look at the constant physical properties including the refractive index of different oils (Source : Japan Agricultural Standards)

Sesame Oil

Oil from sesame seeds

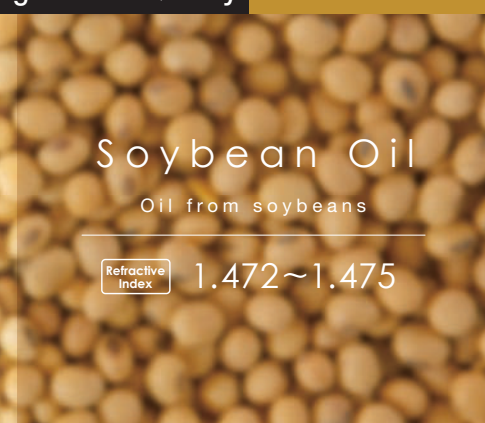
Refractive Index 1.470~1.474



Soybean Oil

Oil from soybeans

Refractive Index 1.472~1.475



Rapeseed Oil

Oil from rapeseeds

Refractive Index 1.469~1.474



Palm Oil

Oil from palm kernels

Refractive Index 1.457~1.460



Sunflower Oil

Oil from sunflower seeds

Refractive Index 1.471~1.474



Cottonseed Oil

Oil from cottonseed

Refractive Index 1.469~1.472



Olive Oil

Oil from olive pulp

Refractive Index 1.466~1.469



Peanut Oil

Oil from peanuts

Refractive Index 1.468~1.471



Grape Seed Oil

Oil from grape seeds

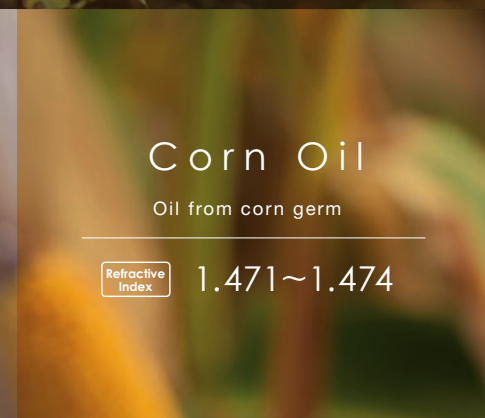
Refractive Index 1.472~1.476



Corn Oil

Oil from corn germ

Refractive Index 1.471~1.474



Oil and Deterioration



Frying oil deteriorates with exposure to air, light, heat, and water.

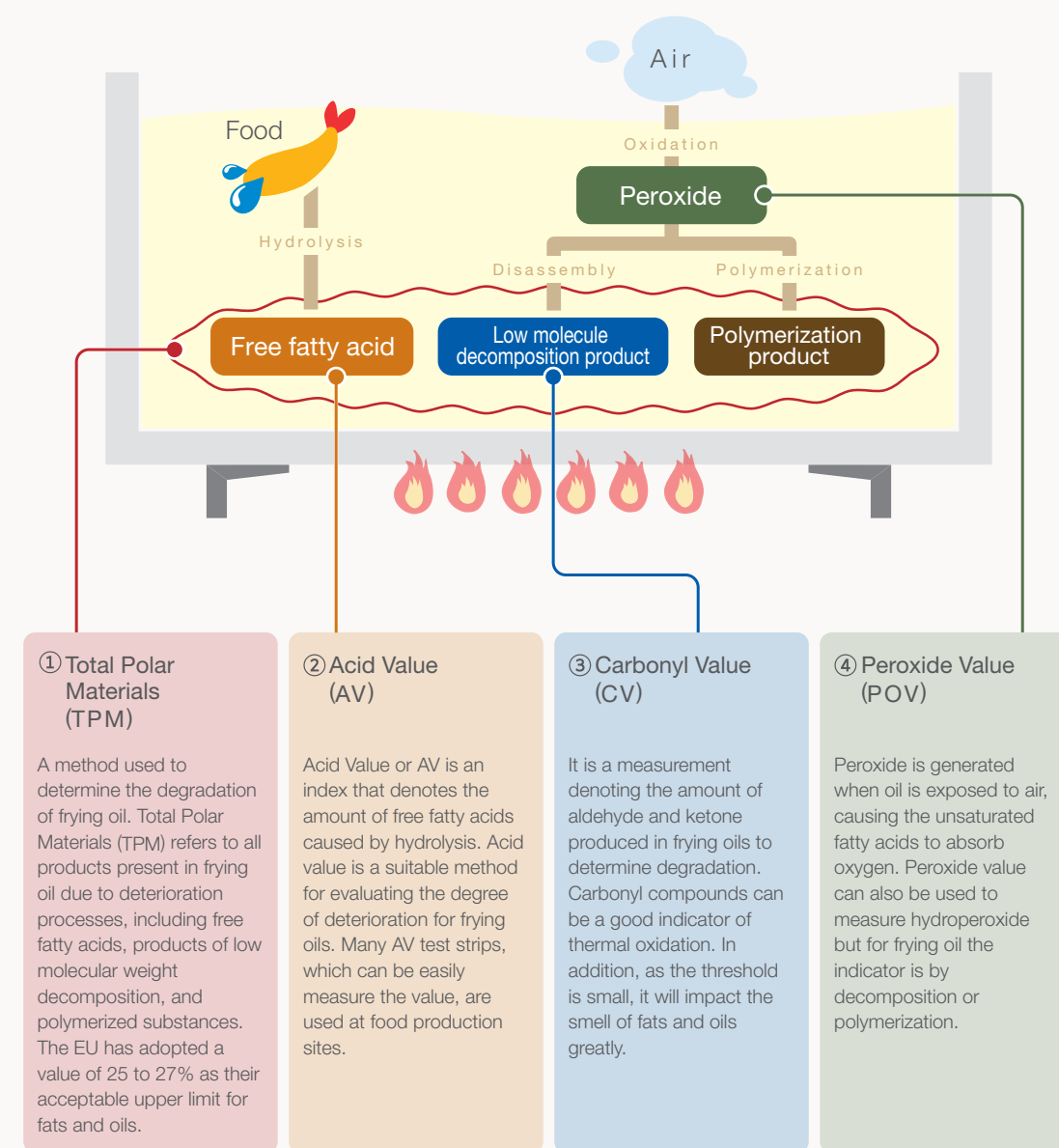
If an oil's quality deteriorates, it can bubble excessively, change color, emit an odor, or cause food to become greasy.

Depending on how it has deteriorated in quality, it may not just affect the taste but also be bad for consumer's health. It is vital the oil quality is maintained.

Identifying Deteriorated Cooking Oil

Types of deterioration

Determining oil deterioration at home can be done by color or smell, but in professional kitchens and production sites, the methods below are used.



Determining Deterioration

Dom-24 vs Test Strip vs Titration

DOM-24

- Measurement time is approximately 30 seconds
- Simple operation
- No reagent, no waste
- Anyone can read the digital display
- Wide temperature range of 32 to 491°F (0 to 225°C)
- Total Polar Materials (TPM) : Resolution 0.5%
- Acid Value (AV) : Resolution 0.1

The DOM-24 detects the electrical capacity and temperature with a sensor and computes the TPM as a correlation of both. It can also calculate the AV of both using the correlation between them and the TPM.

Test Strip

- ✗ Individual difference, subjective judgements
- ✗ Waste disposal is required
- ✗ Measurements at high temperature
- ✗ Reagents have a shelf-life
- ✗ Minimum Scale 0.5

Determines AV value using the color change of test strips, coated in a reagent, immersed in sample. Commonly sold and used as AV oil detection test strips that can be easily used at production facilities. These strips are a common method of testing oxidization of frying oils in Japan.

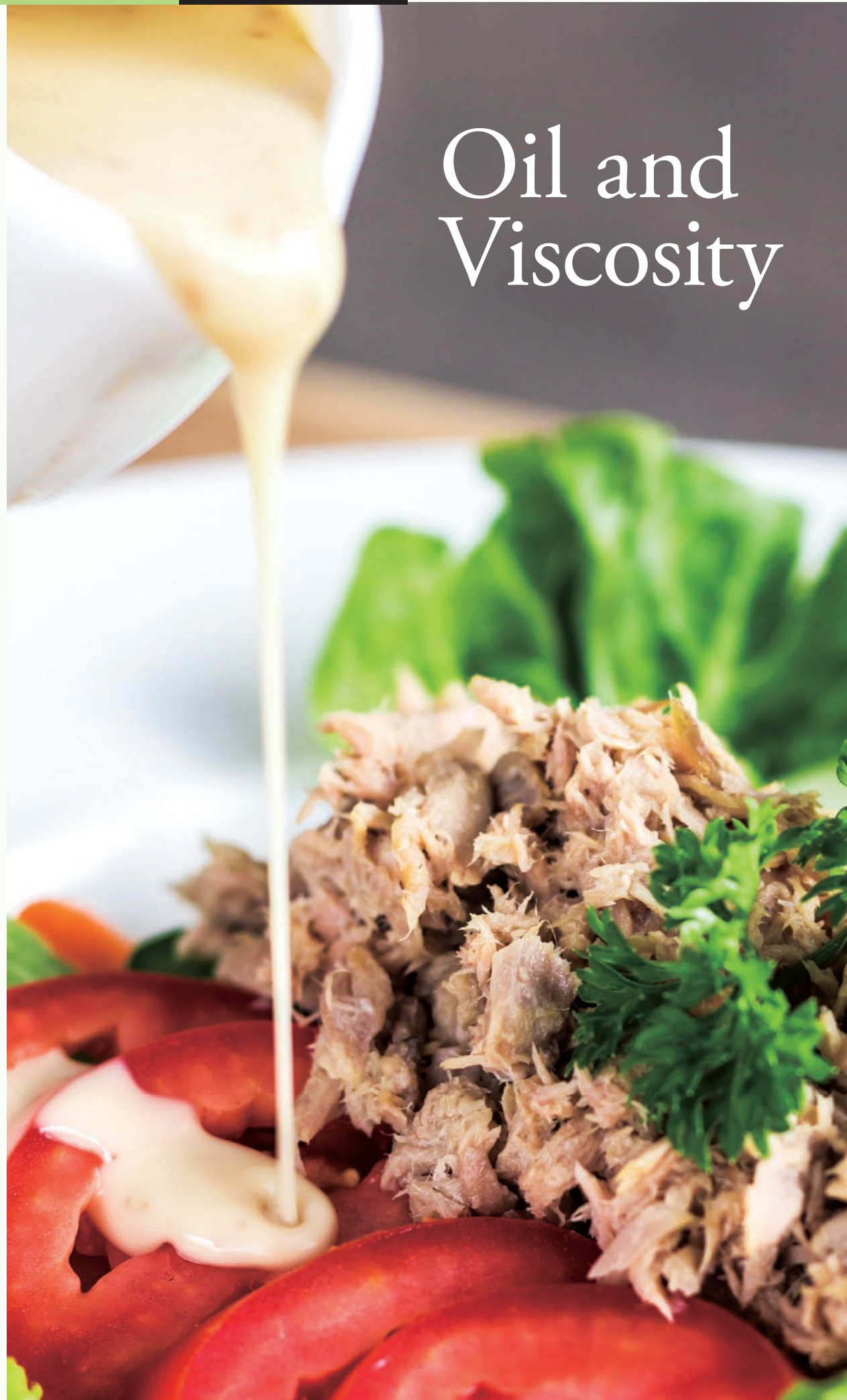
Titration

- ✗ Set-up and preparation take time
- ✗ Expense of using an external testing facility

In addition to titration using a starch indicator (the acetic acid-isooctane method), standard oil/fat testing methods include the iodine titration technique, which uses the principle of iodine being released from potassium iodide, and the Potentiometric titration method.

TPM = Total Polar Materials, AV = Acid Value

Oil and Viscosity



Viscosity is a number value that denotes a flowing body's internal friction. Consumable vegetable oils have a higher viscosity compared to water. Salad oil has a viscosity 50 to 100 times greater than water. When we combine the knowledge of an oil's viscosity with its refractive index and degradation (AV, TPM) we can assess its properties.

“Dressing” – A Processed Food Made With Familiar Vegetable Oil

Dressings are classified based on viscosity and oil content

The mayonnaise and dressings that consumers use every day are processed foods made using vegetable oils. Dressings are made with vegetable oils, vinegar, and/or juices mixed with table salt, sugar and other seasonings. The Japanese Agricultural Standards body has set standards for dressings and the oil content and viscosity is a part of that. The main qualities of dressing are as follows.

| Standard Name | Water Content | Oil Content | Viscosity |
|--|-----------------|---------------------|--------------------|
| Mayonnaise | At or below 30% | At or above 65% | At or above 30Pa·s |
| Creamy Salad Dressing | At or below 85% | Between 10% and 50% | At or above 30Pa·s |
| Semi-solid Dressings Other Than Mayonnaise and Creamy Salad Dressing | At or below 85% | At or above 10% | At or above 30Pa·s |
| Emulsified Dressing or Separated Dressing | At or below 85% | At or above 10% | Below 30Pa·s |

Chart : Taken from the Food and Agricultural Materials Inspection Center's Survey on the Japanese Agricultural Standards of Dressings

Determining Viscosity

Viscometers are the machines used to measure viscosity. There are several different kinds of viscometer, including u-tube viscometers, falling ball type viscometers, and rotational viscometers. The most common type of viscometer in use is the rotational viscometer. At ATAGO we have a simple to use, portable rotational-type digital viscosity meter called the VISCO™.



The Relationship Between Viscosity and Taste

Essential Salad Dressing

Without a certain level of viscosity when pouring a dressing on salad it will not remain on top of the vegetables and be difficult to coat the whole salad with. It is essential that the dressing has a viscosity that is suitable for the salad it is being used on.



Olive Oil, Loved the World Over

Olive oil has a higher viscosity compared to salad oil. For fried cooking, high viscosity generally makes it more likely the food produced will be greasy, so it is considered ill-suited to deep frying. However, high viscosity makes it difficult to heat the oil which means it will be used in salads or pastas. Incidentally, castor oil is said to be the vegetable oil with the highest viscosity.



Batter, The Lifeline of Fried Foods

Batter is, putting it simply, the substance that forms the coating on fried food, made from water, milk, egg and so on mixed with flour. When making batter at home, have you ever checked the thickness as you mix it by lifting it up into the air? That is a great way to check the viscosity. Pros look at the viscosity of the batter on two fronts; one, how it sticks to the food being fried and two, how it will fry. No matter how crispy or crunchy you want the texture of the final product to be, it all comes down to the viscosity of the batter.



Viscosity List

| Sample Name (Measurement temp.) | Viscosity |
|---------------------------------|-----------|
| Salad oil (74.3°F/23.5°C) | 65mpa·s |
| Castor oil (68°F/20°C) | 1000mpa·s |
| Mayonnaise (73.4°F/23°C) | 8000mpa·s |

The viscosity readings are examples.

| Sample Name (Measurement temp.) | Viscosity |
|---------------------------------|-----------|
| Water (68°F/20°C) | 1mpa·s |
| Tonkatsu Sauce (75.2°F/24°C) | 640mpa·s |
| Honey (69.8°F/21°C) | 1300mpa·s |
| Jam (73.4°F/23°C) | 6000mpa·s |

Non-vegetable oil samples have been included as a reference.

Recently, vegetable oils have started to be used as a type of biofuel. Viscosity is used to determine biofuel suitability.

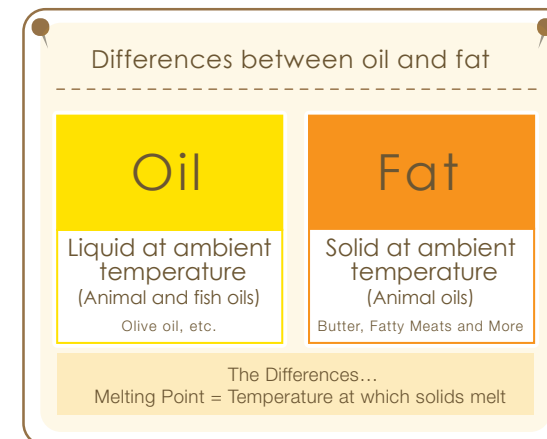
About Oils

About vegetable oils and animal oils

There are many types of vegetable oil and each has its own specialty. The heat-resistant canola and sesame oils are prized as cooking oils due to their light finish. Recently popular are oils like perilla oil and linseed oil, which have been found to have high Omega-3 content to improve brain function, and are used in raw meals as dressings. Olive oil, while weak to light exposure, has a high resistance to oxidation; the pure form is used in stir-fries, while extra virgin types are used in salads and marinades to make full use of the flavor. Animal oils and fats include things like tallow, lard, butter, and fish oils. Tallow and lard are well known for their uses in frying foods. You can get a richer flavor mixing in a little animal oil when using vegetable oils to fry.

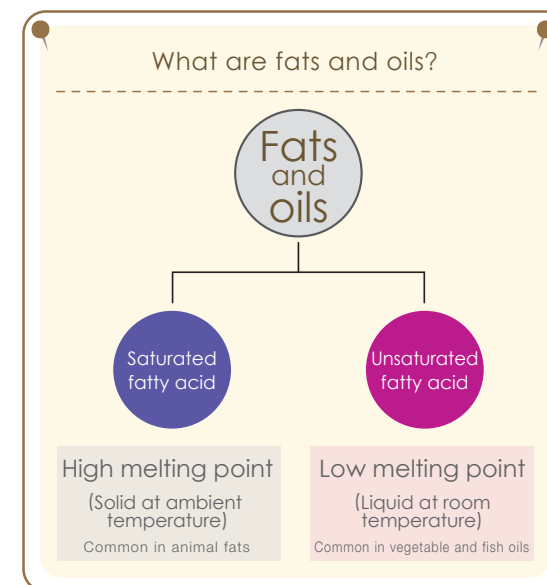
What is the difference between oil and fat?

What really is the difference between these two? Well, while oils are typically liquid at room temperature (for example, vegetable oils like olive and fish oil), fats are usually solid at room temperature, like butter or lard. Generally, fat has a higher concentration and a greasier image than oils do, don't you agree? The fundamental difference is that their melting point is different.



What are oils and fats?

Broadly, they are divided into two groups; saturated fatty acids common in animal oils and fats and unsaturated fatty acids common in vegetable and fish oils. Saturated fatty acids melt only at high temperatures and are usually solid at room temperature. On the other hand, unsaturated fatty acids melt at relatively lower temperatures and are liquid at room temperature. For example, unsaturated fatty acids can harden within the body, causing an increase in blood concentration and, if left unchecked, can cause hardening of the arteries. Further, fish oils are said to contain high levels of unsaturated fatty acids. Fatty tuna contains a lot of these which melt at a low temperature so even eaten raw in sushi, it will melt in your mouth.



Product Lineup

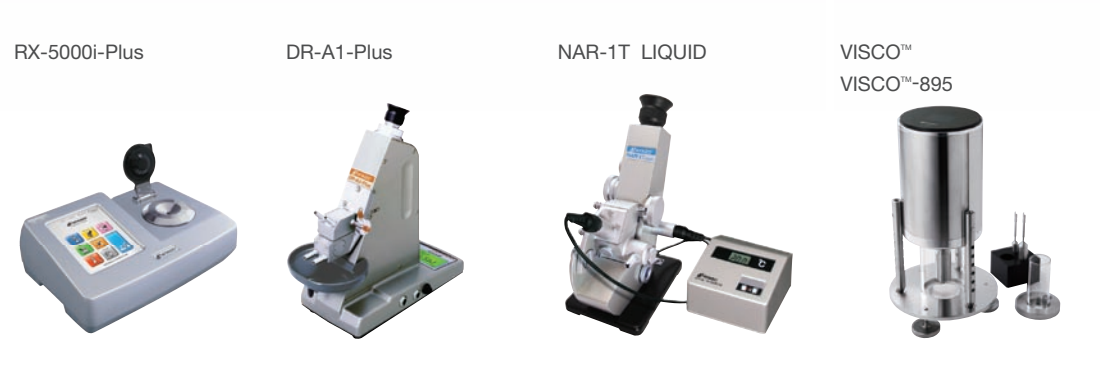
PRODUCTS

Frying Oil Monitor **Refractometer**



| | | | |
|-------------------|--|--|--|
| Cat.No. | 9341 | 3850 | 2612 |
| Measurement items | Total Polar Materials Acid Value Temperature (°F/°C) | Refractive index Temperature (°C) | Refractive index |
| Product details | You can measure the total polar materials (TPM) and acid value (AV). | Model with Refractive index scale. The Refractive index (resolution 0.0001) of the measurement will be displayed continuously like an electric news board. | Refractive index Hand-held Refractometers. |

Refractometer **Viscometer**



| | | | | |
|-------------------|--|---|---|--|
| Cat.No. | 3275 | 1311 | 1211 | 6800 6820 |
| Measurement items | Refractive index (nD) Brix 100 user scales Temperature (°C) | Refractive index (nD) Brix Temperature (°C) | Refractive index (nD) Brix Temperature (°C) | Viscosity (mPa·s/cP) Torque (%) Temperature (°F/°C) |
| Product details | A high-precision digital refractometer. Displays Brix to three places and Refractive index to five places. | Abbe refractometer with a digital display so there's no need to read a scale. | Standard-type Abbe refractometer (for liquids) | A viscosity meter that is portable and compact. The body, legs, and stage of the VISCO™-895 are made from light-weight aluminum. |

Frying Oil Monitor

DOM-24



Identifies the Best Time to Replace Oil

- Allows you to safely cook delicious fried foods
- Lower costs by using oil right up until it needs to be replaced
- Lowers oil usage and reduces waste

Measurement Items Total Polar Materials (TPM)
Acid Value(AV)

Measurement Range TPM : 0.5 to 40.0%
A V : 0.00 to 9.99

Temperature Range °C : 0 to 225°C
°F : 32 to 437°F

No preparation or set up required. Ready to read the moment it is immersed in frying oil.

- 1 Press and hold the START button for approximately 1 second.
- 2 Press the SW1 button to choose between measuring in AV or TPM scales.
- 3 Press the START button. The instrument will begin taking measurements. Insert the sensor into the oil, and stir the oil.
- 4 Measurement results (temperature and TPM) will be displayed once stability is reached (within approx. 30 sec).

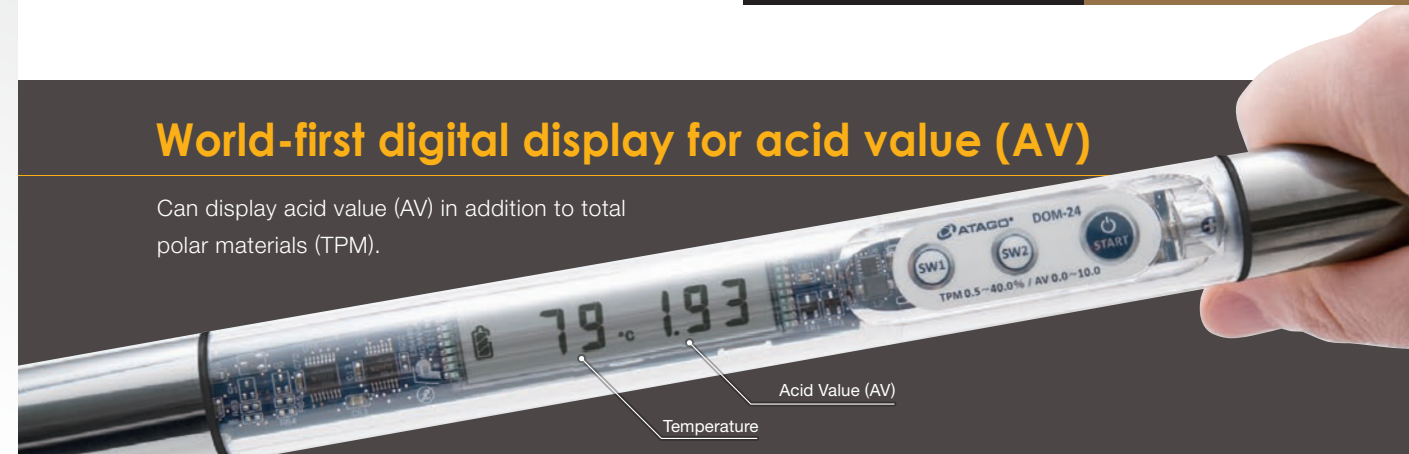
*TPM is active on startup

Specifications

| | | | |
|-------------------|--|--------------------------------|--|
| Cat.No. | 9341 | Measurement accuracy | TPM : ±2.0% (20 to 200°C / 68 to 392°F) AV : ±0.2 Temperature : ±1°C / ±2°F |
| Model name | DOM-24 | Temperature compensation range | 0 to 225°C / 32 to 437°F (accuracy guaranteed from 20 to 200°C / 68 to 392°F) |
| Measurement range | TPM : 0.5 to 40.0% AV : 0.00 to 9.99 Temperature (°C) : 0 to 225°C Temperature (°F) : 32 to 437°F | Power supply | Size AAA alkaline battery × 2 |
| Resolution | TPM : 0.5% AV : 0.01 Temperature : 1°C/1°F | International protection class | IP67 |
| | | Dimension and weight | 22(φ)×490(w)mm, 400g (Main unit only) |

World-first digital display for acid value (AV)

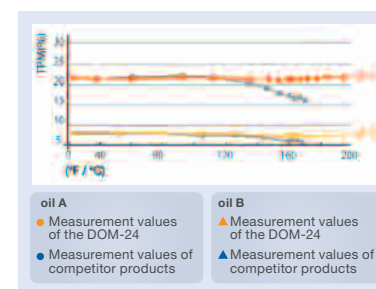
Can display acid value (AV) in addition to total polar materials (TPM).



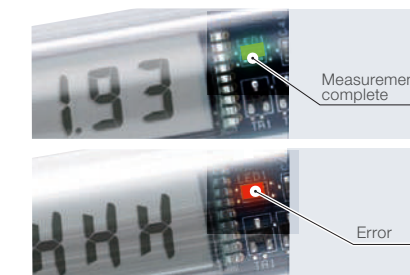
Can display deterioration as a numerical value so anybody can take a reading

Stable and reliable measurement values

The DOM-24 is equipped with automatic temperature compensation (ATC), making it capable of measurements at a wide temperature range of 0 to 225°C. The DOM-24 can provide stable and reliable measurement values, even at high-temperatures.



Easy confirmation with LED



Functional Use Beyond Simple Design

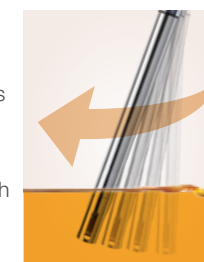
Avoiding burn injuries

To improve the safety of employees and contribute to the reduction in the risk of burns.



Can be used to stir the oil

Due to oil having layers, temperature and degradation levels may not be uniform throughout. Stirring the oil with the product can produce more consistent results.



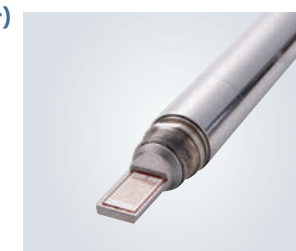
Sturdy construction with a protective cover



Shock-resistant & splash proof

Rated IP67 (Water resistant)

Designed to be used safely around water. Wash away stubborn oil stains with regular dish soap under running water. Instrument will survive accidentally being dropped in water.



Impact-resistant body

Confirmed to continue working even if dropped accidentally from waist height so you can relax and let all of your employees use it without worry.

Digital Hand-held "Pocket"
Dual Scale Refractometer PAL-RI

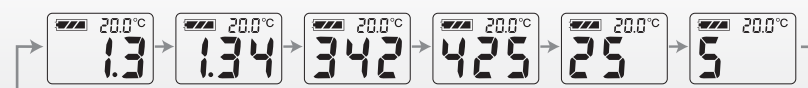
PAL-RI

Maintain Quality with
the Refractive Index

- Refractive index model of the PAL-Series
- Liquid measurement with Refractive index management



The Refractive Index (resolution 0.0001) of the measurement will be displayed continuously like an electric news board.

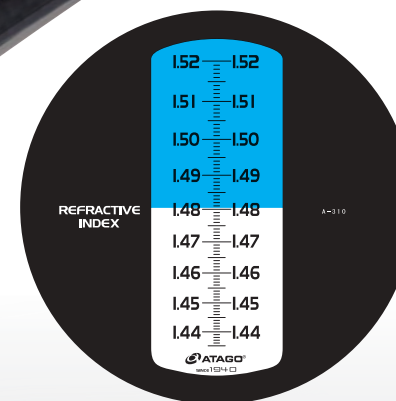


Hand-held Refractometer

MASTER-RI

Ultimate Functionality. Unsurpassed
Quality. Seamless Usability.

- Hand-held Refractometers
- Refractive index model of the MASTER-Series
- Easily read the Refractive index



Scale

Measurement Items Refractive index

Measurement Range Refractive index : 1.3306 to 1.5284

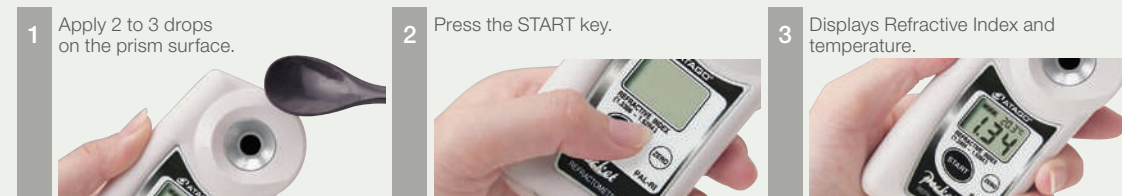
Measurement Accuracy Refractive index : ±0.0003 (water at 20°C)
Temperature ±1°C

Measurement Items Refractive index

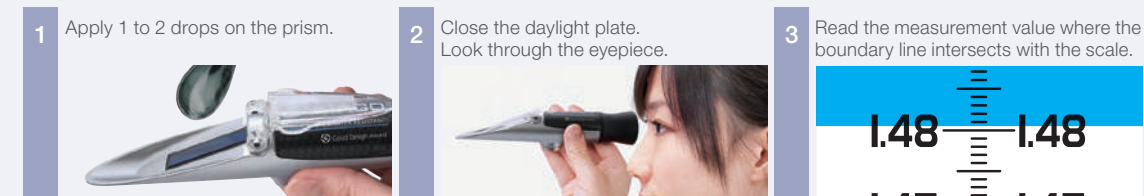
Measurement Range Refractive index : 1.435 to 1.520

Minimum Scale Refractive index : 0.001

Simply load the sample and push the button



Readings only require 2 to 3 drops of sample



Specifications

| | | | |
|-------------------|--|--------------------------------|--|
| Cat.No. | 3850 | Measurement accuracy | Refractive index : ±0.0003 (water at 20°C) Temperature : ±1°C |
| Model name | PAL-RI | Measurement temperature | 5 to 45°C |
| Measurement range | Refractive index : 1.3306 to 1.5284 Temperature : 5.0 to 45.0°C | Ambient temperature | 10 to 40°C |
| Resolution | Refractive index : 0.0001 Temperature : 0.1°C | Power supply | Size AAA alkaline battery × 2 |
| | | Battery life | Approx. 11,000 measurements |
| | | International protection class | IP65 Water resistant |
| | | Dimension and weight | 55(W) × 31(D) × 109(H)mm, 100g (Main unit only) |

Specifications

| | |
|----------------------|---|
| Cat.No. | 2612 |
| Model | MASTER-RI |
| Measurement range | Refractive index : 1.435 to 1.520 |
| Minimum scale | Refractive index : 0.001 |
| Dimension and weight | 32(W) × 34(D) × 168(H)mm, 130g (Main unit only) |

Digital Refractometer

RX-5000i-Plus

The Most Accurate Digital Refractometers in the World.

- ATAGO's flagship, most accurate and full range
- Experience the ease of touch-screen technology
- Programmable user scale



Measurement Items Refractive index(nD)
Brix

Measurement Range Refractive index(nD):
1.32422 to 1.58000
Brix : 0.000 to 100.000%

Output terminals Printer (for ATAGO digital printers)
Computer -USB

Specifications

| | | | |
|---------------------------------------|--|------------------------------------|---|
| Cat.No. | 3275 | Temperature control range | 5.00 to 75.00°C (No lower than 10°C below or higher than 55°C above the ambient temperature.) |
| Model name | RX-5000i-Plus | Environmental operating conditions | Temperature 5 to 40°C; Humidity 90%RH and below, Altitude 2,000m above sea level |
| Measurement system | Optical-refraction critical-angle detection system | Display method | 7.5-inch color LCD + touch screen |
| Measurement range | Refractive index (nD) : 1.32422 to 1.58000 Brix : 0.000 to 100.000% (Automatic Temperature Compensation) User scale : 100 | Output | Computer - USB, Printer and PC (via RS-232C) |
| Resolution | Refractive index (nD) : 0.00001 Brix : 0.001% Temperature : 0.01°C | Light source | LED (Approximating to D-Line wavelength) |
| Measurement accuracy (*repeatability) | Refractive index (nD) : ±0.00002 Brix : ±0.010% Temperature : ±0.5°C | Materials | Prism : Synthetic sapphire Sample stage : SUS316 |
| Mode | MODE-S,1, 2, 3, T | Power supply | AC100 to 240V 50/60Hz |
| | | Power consumption | 90VA |
| | | Dimension and weight | 370(W) ×260(D) × 140(H)mm, 6.6kg (Main unit only) |

*When measuring a standard sucrose solution of up to 50% Brix or standard refractive index solution in MODE-1 at 20°C

5 measurement modes so you can pick the best way to measure your sample

The measurement method, time taken, repetitions, and target temperature will vary with each mode

MODE-1

Displays the measurement value once the sample reaches the target temperature.

MODE-3

Provides an option to turn the thermo-module off. Without temperature control, the measurement value is displayed 4 seconds after the START key is pressed.

MODE-T

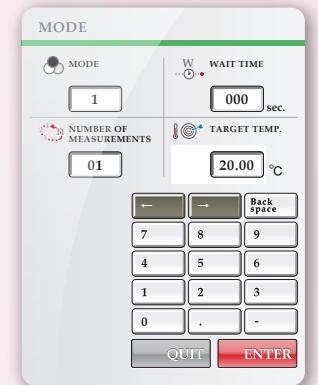
Equipped only on the RX-5000i-Plus, MODE-T is recommended for users who place importance on obtaining highly repeatable results (Brix 0.001%).

MODE-2

Measures Refractive Index and temperature at fixed intervals and displays the estimated measurement value at the target temperature.

MODE-S

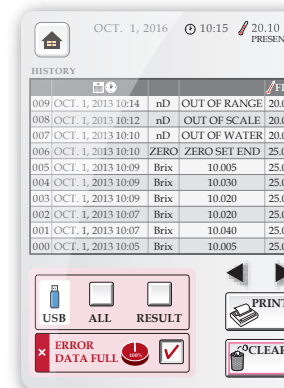
Displays the measurement value once a certain level of sample stability is achieved.



Measurement history

Recall the last 500 measurements

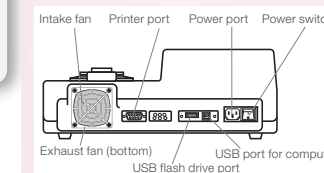
Exporting data to a USB drive or printer is only one touch away. The RX-i series is also equipped with a RS-232C port for direct computer connection.



FDA 21 CFR Part 11 Software

FDA 21 CFR Part 11 Software Included in Standard Delivery.

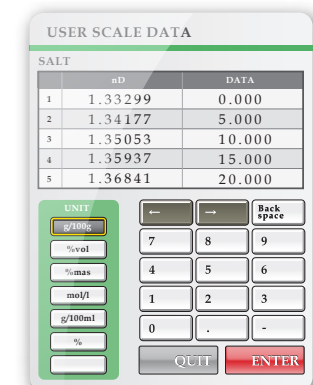
Cat.No.3167



User scales

Input original scales

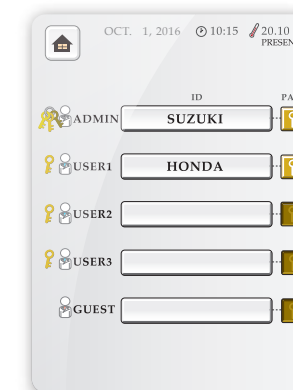
In addition to the refractive index (nD) and Brix scales, concentration scales for specific samples can be configured easily. Simply program corresponding refractive index values and concentration data points.



Security features help protect your device

4 security levels and ability to set up to 5 password-protected profiles

System-level function to limit usage combined with password protection gives you control over the device's security.



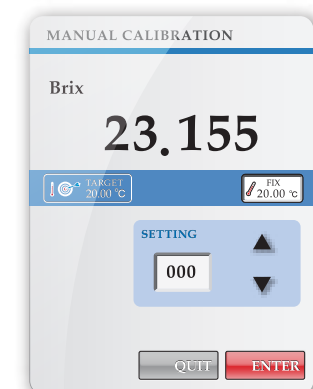
Calibration certificate

A calibration certificate can be ordered with each instrument for an additional charge. Please contact your ATAGO representative for further details.

When using multiple units...

Manual calibration

With the manual calibration feature, measurement values can be adjusted to be consistent with multiple units.



Abbe Refractometer

DR-A1-Plus

Abbe Refractometer

- Digital display
- Suitable with dark colored samples



Measurement Items Refractive index(nD)
Brix

Measurement Range Refractive index(nD) :
1.3000 to 1.7100
Brix : 0.0 to 100.0%

Measurement accuracy Refractive index :
±0.0002 (water at 20°C)
Brix : ±0.1%



Specifications

| | |
|-------------------------|---|
| Cat.No. | 1311 |
| Model name | DR-A1-Plus |
| Measurement range | Refractive index (nD) 1.3000 to 1.7100 Brix : 0.0 to 95.0% (ATC is executed at 5 within 50°C) |
| Resolution | Refractive index (nD) : 0.0001 Brix : 0.1% |
| Measurement accuracy | Refractive index (nD) : ±0.0002 Brix : ±0.1% |
| Measurement temperature | 5 to 50°C |
| Thermometer accuracy | ±0.2°C |
| Output | Printer DP-22C (Optional) PC (via RS-232C) |
| Ambient temperature | 5 to 40°C |
| Power supply | AC adapter (100 to 240V (50/60Hz) AC input) |
| Power consumption | 16VA |
| Dimensions and weight | 130(W) × 290(D) × 31(H)mm, 6.0kg (Main unit) 105(W) × 175(D) × 40(H)mm, 0.7kg (AC adapter) |

Abbe Refractometer

NAR-1T LIQUID

Original. Irreplaceable.
A True Classic.

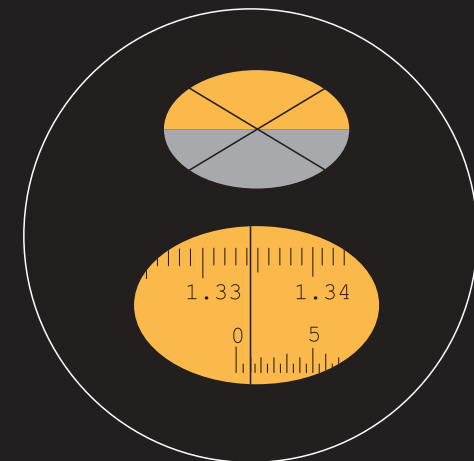
- Analog scale
- Reads the Refractive index and Brix of liquid samples



Measurement Items Refractive index(nD)
Brix

Measurement Range Refractive index(nD) :
1.3000 to 1.7100
Brix : 0.0 to 95.0%

Measurement accuracy Refractive index :
±0.0002 (water at 20°C)
Brix : ±0.1%



Specifications

| | |
|-------------------------|---|
| Cat.No. | 1211 |
| Model name | NAR-1T LIQUID |
| Measurement range | Refractive index (nD) : 1.3000 to 1.7100 Brix : 0.0 to 95.0% |
| Minimum scale | Refractive index (nD) : 0.001 Brix : 0.5% |
| Measurement accuracy | Refractive index (nD) : ±0.0002 Brix : ±0.1% |
| Measurement temperature | 5 to 50°C (Temperature range regulated by circulating constant temperature water bath.) |
| Thermometer accuracy | ±0.2°C |
| Ambient temperature | 5 to 40°C |
| Power supply | AC100 to 240V, 50/60Hz |
| Power consumption | 5VA |
| Dimensions and weight | 130(W) × 180(D) × 230(H)mm, 2.5kg (Main unit) 100(W) × 110(D) × 70(H)mm, 0.5kg (Thermometer) |



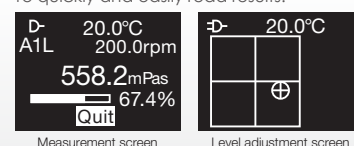
VISCO™

Introducing a New Type of Instrument. Taking You Beyond the Limits.

- Various selections of measurement
- Compact and easily carried with one hand
- Quick measurements anywhere



A fully digital display allows for anyone to quickly and easily read results.



| | | | |
|--|----------------|------------------------|------------------------------------|
| Measurement Range | Viscosity : A1 | 50 to 200,000mPa·s, | 50 to 200,000cP |
| | A2 | 100 to 600,000mPa·s, | 100 to 600,000cP |
| | A3 | 500 to 2,000,000mPa·s, | 500 to 2,000,000cP (1mPa·s=1cP) |
| Torque : 0.0 to 100.0% (recommended torque : 10.0 to 100.0%) | | | |

Measurement Items Viscosity (mPa·s/cP)
Torque (%)

Measurement Range

Specifications

| | | | | | |
|-------------------|-------------|--|--------------------------|---|------------------|
| Cat.No. | 6800 | 6820 | Measurement | Viscosity | ±1% (Full scale) |
| Model name | VISCO™ | VISCO™-895 <small>(Light-weight version with body, legs and stand made from aluminum.)</small> | Accuracy | Temperature | ±0.2°C |
| Measurement Range | Viscosity | A1 50 to 200,000mPa·s, 50 to 200,000cP A2 100 to 600,000mPa·s, 100 to 600,000cP A3 500 to 2,000,000mPa·s, 500 to 2,000,000cP (1mPa·s=1cP) | Speed | 0.5 to 250 rpm, Number of speeds : 20 | |
| | Torque | 0.0 to 100.0% (recommended torque : 10.0 to 100.0%) | Sample Temperature range | 10.0 to 40.0°C/50.0 to 104.0°F | |
| | Temperature | 10.0 to 40.0°C/50.0 to 104.0°F | Ambient Temperature | 10 to 40°C | |
| Resolution | Viscosity | less than 10,000mPa·s : 0.1mPa·s more than 10,000mPa·s : 1mPa·s | Computer Output | Output : USB - PC | |
| | Torque | 0.1% | Power supply | DC6V (AA alkaline batteries 1.5V×4) AC adapter : AC100 to 240V, 50/60Hz | |
| | Temperature | 0.1°C | Dimensions and Weight | 120 (W) × 120 (D) × 200.6 (H)mm(Main unit) 1.2kg (excluding batteries, spindles and temperature sensor) 0.5kg (Stand+screw) | |

No need to worry even with unstable oil samples

Using disposable containers eliminates the hassle of cleaning up after measurement.

Package A, which includes a specialized adapter for use with disposable containers such as paper cups, is available at ATAGO.

VISCO™ Package A Cat.No.6810

VISCO™-895 VISCO Package A Cat.No.6830

- VISCO™ (Main unit)
- Cup Adapter (with 100 cups*) RE-78141

*50 paper cups and 50 plastic cups are included.



Ultra-Low Adapter (ULA)- Sample Adapter for Low Viscosity Sample

A package that comes with Ultra Low Adapter (ULA) for measuring low viscosity sample and VISCO (Main unit) and VISCO™-895 (Main unit) is available.

VISCO™ Package B Cat.No.6811

VISCO™-895 VISCO Package B Cat.No.6831

- VISCO™ (Main unit)
- Ultra Low Adapter (RE-77120)

Measurement of low viscosity (1 to 2,000m·Pas) is possible.



One Hand. One Touch. One Button. VISCO™

Set-up ONE TOUCH™

VISCO is very easy to set-up. The spindle can be attached with just one touch — simply insert the spindle in the instrument. Absolutely no complicated set-up required.

Preparation ONE HAND™

Measurement preparation can easily be done with just one hand. Place the beaker underneath the pre-set area and place the instrument on the stand. No troublesome height adjustment necessary.

Measurement ONE BUTTON™

Operation requires only one dial button. All operations can be performed with the simple act of "sliding" or "pushing" the dial button. No more accidental operations due to pushing the wrong button.

Options

| Part No. | Part Name | Part No. | Part Name |
|--|---|-----------------|-----------|
| RE-79100 | Beaker | S (0.5oz/15mL) | |
| RE-79101 | | L (3.4oz/100mL) | |
| RE-78141 | Cup Adapter (with 100pcs) <small>* 50pcs of paper cups and 50pcs of plastic cups are included.</small> | | |
| RE-79102 | Paper Cup (3oz/90mL, 100pcs) | | |
| RE-79103 | Plastic Cup (3oz/90mL, 100pcs) | | |
| Ultra-Low Adapter (ULA) - Sample Adapter for Low Viscosity Sample | | | |
| RE-77120 | Ultra-Low Adapter (ULA)- Sample Adapter for Low Viscosity Sample Cylinder, Cylinder guide, Extension, UL Baseplate, Hook, Hook-holder, UL Spindle | | |
| RE-77107 | UL Spindle (Hook, Hook-holder) | | |
| RE-77121 | Cylinder (Cap, O-Ring) | | |
| Spindle | | | |
| RE-77104 | Spindle | A1 | |
| RE-77105 | | A2 | |
| RE-77106 | | A3 | |
| Standard Liquid | | | |
| RE-89010 | Standard Liquid (ULA) (NIPPON GREASE CO., LTD.) | JS2.5 | |
| RE-89011 | | JS5 | |
| RE-89012 | | JS10 | |
| RE-89013 | | JS20 | |
| RE-89014 | | JS50 | |
| RE-89016 | Standard Liquid (NIPPON GREASE CO., LTD.) | JS200 | |
| RE-89017 | | JS500 | |
| RE-89018 | | JS1000 | |
| RE-89019 | | JS2000 | |
| RE-89020 | | JS14000 | |
| RE-89021 | | JS52000 | |
| RE-89022 | | JS160000 | |
| Temperature sensor | | | |
| RE-75540 | Temperature sensor | | |

OPTIONS

DOM



● Strap (short)
Part No. RE-79430

PAL



● PAL-case
Part No. RE-39409



● PAL Silicone Cover
Part No. RE-39413



● Strap
Part No. RE-39410



● MAGIC™
Part No. RE-39446



● Small Volume Sample Adapter
Part No. RE-39412

MASTER

● MASTER Daylight plate



For metal body model



For plastic body model

For metal body model
Part No. RE-2315-60M

For plastic body model
Part No. RE-2315-61M

Small Volume Daylight plate

For metal body model
Part No. RE-2311-67M

For plastic body model
Part No. RE-2391-67M

RX

Please use when taking readings of volatile samples



● MAGIC™
Part No. RE-56180 MAGIC™ (Metal)



● MAGIC™
Part No. RE-56185 MAGIC™ (Plastic)

Digital Printers

| | Intended models | Power supply | Power consumption | Dimension and weight |
|---|-----------------|--------------|---|--|
| ● Thermal printers (thermal paper compatible) | | | | |
| DP-63 | Cat.No.3118 | RX-i series | AC adapter (Input voltage : AC100 to 240V) | 17×16×7cm, 580g (Main unit only) |
| DP-63(C) | Cat.No.3136 | DR-A1-Plus | | |
| ● Dot matrix printers (plain paper compatible) | | | | |
| DP-AD | Cat.No.3123 | RX-i series | AC adapter (Input voltage : AC100 to 240V) | 7VA 11×18×9cm, 470g (Main unit only) |

Sucrose Solutions (for Brix confirmation)

<Analog Hand-held, PAL, NAR, RX series (excluding RX-007α)>

| Part No. | Part name | Contents |
|-----------|-------------------------------|------------|
| RE-110010 | 10% Sucrose Solution (±0.03%) | Approx.5mL |
| RE-110020 | 20% Sucrose Solution (±0.03%) | Approx.5mL |
| RE-110030 | 30% Sucrose Solution (±0.03%) | Approx.5mL |
| RE-110040 | 40% Sucrose Solution (±0.04%) | Approx.5mL |
| RE-110050 | 50% Sucrose Solution (±0.05%) | Approx.5mL |
| RE-110060 | 60% Sucrose Solution (±0.05%) | Approx.5mL |

<High Accuracy (RX series)>

| Part No. | Part name | Contents |
|-----------|-------------------------------|------------|
| RE-111001 | 10% Sucrose Solution (±0.01%) | Approx.5mL |
| RE-112001 | 20% Sucrose Solution (±0.01%) | Approx.5mL |
| RE-113001 | 30% Sucrose Solution (±0.01%) | Approx.5mL |
| RE-114002 | 40% Sucrose Solution (±0.02%) | Approx.5mL |
| RE-115002 | 50% Sucrose Solution (±0.02%) | Approx.5mL |

<Low concentration (RX series)>

| Part No. | Part name | Contents |
|-----------|----------------------------------|------------|
| RE-110250 | 0.25% Sucrose Solution (±0.005%) | Approx.5mL |
| RE-110500 | 0.50% Sucrose Solution (±0.005%) | Approx.5mL |
| RE-111000 | 1.00% Sucrose Solution (±0.005%) | Approx.5mL |



* warranty period for these solutions is 6 weeks.

<Request Accuracy>

Custom concentrations are available upon request. Accuracy and prices will vary by concentration. Contact ATAGO for more details.

Test Pieces

| Part No. | Part name | Contents |
|----------|-------------------------|------------------------|
| RE-1195 | Test Piece A (nD 1.516) | with m-naphthalene 4mL |
| RE-1197 | Test Piece C (nD 1.620) | with m-naphthalene 4mL |

Standard Liquid

<DOM>

| Part No. | Part name |
|----------|------------------------|
| RE-99300 | DOM-24 Standard Liquid |

Package

VISCO™ Package A Cat.No.6810

- VISCO™ (Main unit)
- Cup Adapter (with 100 cups) RE-78141



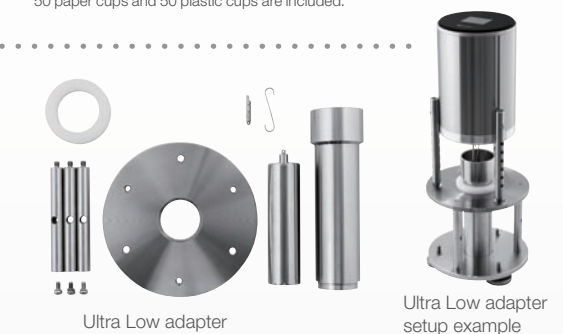
*50 paper cups and 50 plastic cups are included.

VISCO™-895 Package A Cat.No.6830

- VISCO™-895 VISCO Package A (Main unit)
- Cup Adapter (with 100 cups) RE-78141

VISCO™ Package B Cat.No.6811

- VISCO™ (Main unit) + standard accessories
- Ultra Low Adapter (RE-77120)



VISCO™-895 Package B Cat.No.6831

- VISCO™-895(Main unit) + standard accessories
- Ultra Low Adapter (RE-77120)

User Testimonials Testimonials from customers using our products

From Our Frying
Oil Monitor Users

DOM-24



George Chiala Farms, Inc.

At our company we roast diced garlic and thin-sliced onion in canola oil and sunflower oil.

We did a few trials where we sent out samples of our used oils to external labs for testing where they would test for the acid value and peroxide value. Including the time taken to send and test the sample, however, no trial came back with results in a timeframe we were satisfied with. Not to mention that the results that we got did not feel, to me, relevant to usage period or usage frequency of the oil. I was under the impression that the more you used the oil, the more it degraded which the results did not show.

When we tested the DOM-24, we got instant results and we could see the TPM and AV values going up as we continued to use the oil. We just set the upper limit on AV and TPM values to make sure we are not using bad oil. The DOM-24 is easy to use, gives results quickly, and gives us a good grasp on our oil quality. It meets all of our requirements.

Now we have the power to maintain a high oil quality in our process.

Testimonial from
a refractometer
customer

RX-5000α



Vegetable oil production company

When checking our vegetable oils (quality control), one unit we measure is Refractive Index (RI). In Japan, the standards for consumable vegetable oils are decided by Japan Agricultural Standards (JAS). For example, the RI at 77°F (25°C) for consumable rapeseed oil is set to 1.469 to 1474. At the testing room in our factory we measure the RI once manufacturing is complete and before it is poured into cans or PET bottles. Previously, we had been using an Abbe Refractometer connected to a constant temperature water bath set to 77°F (25°C) in order to take measurements, but we have switched over to using the automatic and digital RX-5000α. With that, once we put the oil on the prism and push a button, the measurements only take a few seconds to appear on the screen. Ours is connected to a printer too, so we can keep a record of the RI measurements.

The RX-5000α also has a Peltier sensor on the prism so we can set a target temperature of 77°F (25°C) and the instrument does the rest for us, no more need for a water bath. We have to use a refractometer in our business and with how convenient the RX-5000α is, we love using it.

We've also recently heard about ATAGO's VISCO unit. JAS does not have viscosity standards, but it would be useful information for QA purposes. We are planning on borrowing a demo unit soon.