

Application Quick Guide

For the MyBrix Pocket Refractometer



METTLER TOLEDO



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Introduction

Made for use in the lab and on-the-go and designed with a full Brix range (0–95 °Brix) along with 10 integrated sugar-related scales, the MyBrix pocket refractometer works perfectly for measuring almost any sample in the food and beverage industry.

Ideal for determining the optimal harvesting time of fruits and vegetables (such as grapes, berries and tomatoes), performing incoming goods inspection, or process and quality control in juice, wine, soft drinks and food manufacturing. The MyBrix refractometer is the perfect solution for food and beverage producers who need a simple and affordable pocket refractometer.



Food

Brix measurements for incoming goods and during food manufacturing in order to guarantee a constant taste.

Samples: Sauce, soup, seasoning, jam, jellies, honey, syrup, corn syrup, oil, fat, fondants, chocolate, confectionary



Beverage

Brix measurements for incoming goods, processing, and quality control in juice, wine and soft drink production.

Samples: fruit juices, soft drinks, carbonated drinks, coffee, soy milk, beer, wine



Fruits and Vegetables (Agriculture)

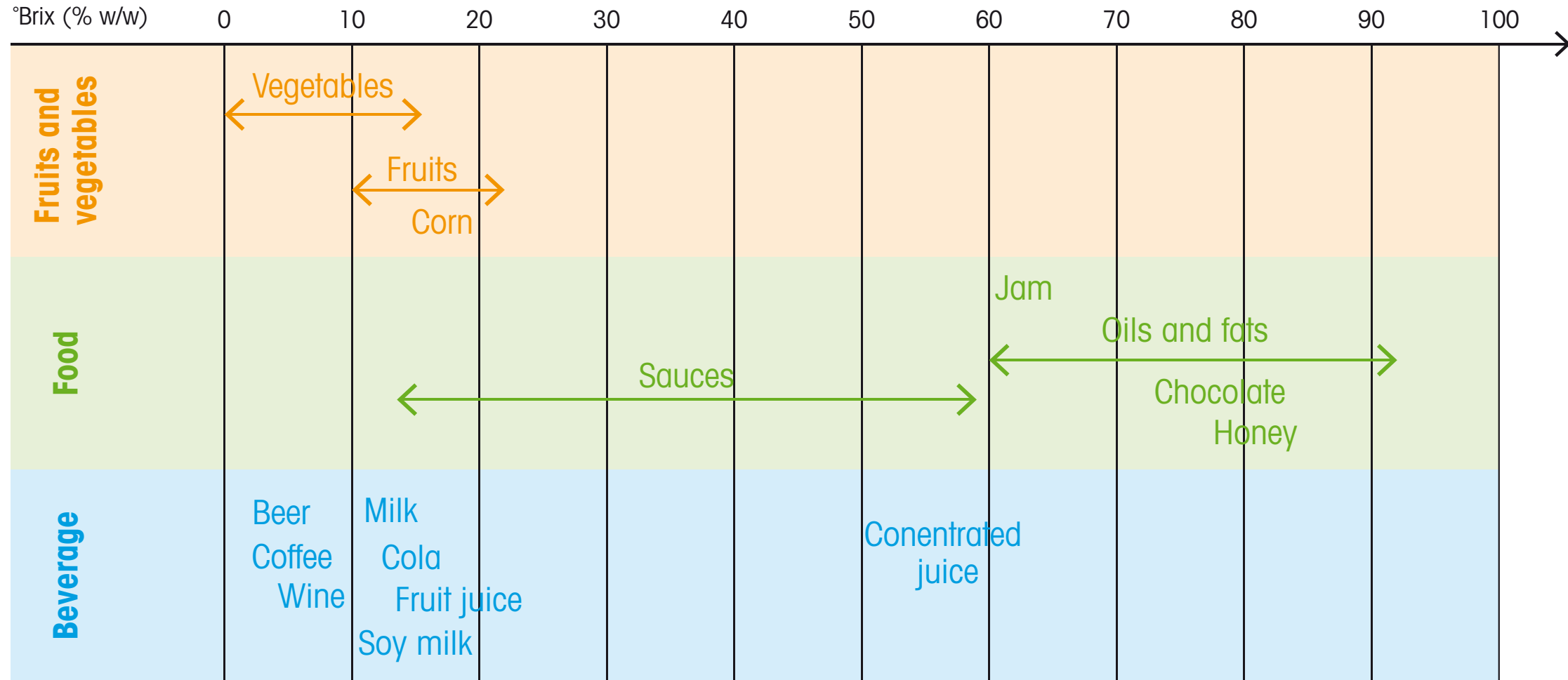
Brix measurements to determine the optimal harvesting time.

Samples: Grapes, fruit, vegetables



Brix Values

Overview samples and their expected Brix values.



Non-Alcoholic Beverages



Soft drinks and carbonated beverages

Pocket refractometers are used for incoming goods inspection of concentrated syrups and quick checks during the production process.

Applications:

- Sugar content (Brix) in syrups/concentrate (Concentrated syrup is first produced and later mixed with treated water at the filling point. This process is commonly used in the production of soft drinks)
- Sugar content (Brix / HFCS) of sweetener: High Fructose Corn Syrup (HFCS) is used to replace sucrose in the food and beverage industry. HFCS 55% is most commonly used for soft drinks production
- Sugar content (Brix / HFCS) in end products

Note: Carbonated beverages need to be degassed before measurement.

Tip: There is a high potential to offer MyBrix in combination with other density meters and refractometers.



Fruit juices

The pocket refractometers are used for incoming goods inspection of fruit, quick checks during the production process, as well as final quality control of juice or juice concentrates.

Applications:

- Sugar content (Brix) of fruits (incoming goods control)
- Sugar content (Brix) in juices
- Sugar content (Brix) in juice concentrates



Coffee and tea

Measurements of Brix and/or solids content (TDS) with pocket refractometers are used to control tea and coffee extraction (during or after the extractor to detect variations in coffee/tea concentrations).

Applications:

- Objective tests of coffee and tea extracts by refractive index (Brix)
- R&D to optimize coffee and tea extraction (coffee/tea producers and machine manufacturers)



Alcoholic Beverages



Wine

One of the most important parameters in wine production is the sugar content of the grapes. Accurately determining this value is crucial to define the harvesting time. Most wine producers use pocket refractometers to directly determine the grape ripeness in the vineyards.

Applications:

- Check ripeness of grapes before harvest by refractive index (Brix)
- Sugar content (Brix, °Baumé, Oechsle (German / Swiss) or KMW (Babo)) of grape juice and grape must

Tip: During the fermentation process, winemakers typically measure density or specific gravity (SG) over time. A portable density meter is perfectly suited for this.



Beer

In breweries, pocket refractometers are often used to measure the sugar content of wort prior to fermentation for beer consistency and to obtain an estimate of the final alcohol content.

Applications:

- Wort monitoring (Specific Gravity / Plato) of unfermented wort

Tip: Monitoring of the fermentation process (as well as wort monitoring) are mainly performed via density. There is a high potential to offer the MyBrix refractometer in combination with the portable density meter Density2Go.



Ready Meals



Sauces, pastes and seasoning liquids

Refractometers are used for Brix measurement of soy sauce, ketchup, barbecue sauce and many other sauces and

seasonings to ensure a constant taste, and to safely preserve and extend their shelf life.

Applications:

- Sugar content (Brix) of jams, honey, syrup (final products)
- Sugar content (Brix) of seasoning sauces, mustard and mayonnaise (final products)
- Sugar content (Brix / HFCS) of sweetener: High Fructose Corn Syrup (HFCS) with fructose level HFCS 42% is often used for processed foods



Canned vegetables and fish

Applications:

- Saline concentration used for vegetables, olives, and fish by refractive index (fresh solutions)



Agriculture and Bulk Foods



Fruits and vegetables

Brix measurement is carried out on almost all types of fruits such as apples, oranges, pears, grapes, melons, grapefruit, etc. to check the ripeness before harvesting, processing or selling.

Applications:

- Check ripeness of fruits and vegetables by refractive index (Brix)
 - outdoors before harvest at the farming sites
 - for incoming goods control at processing industries (e.g. fruit juice producers)
 - at fruit and vegetable markets or supermarkets
 - at restaurant or shops



Tomato industry

The pocket refractometers are used for checking the ripeness of the tomato before harvesting, incoming goods inspection at production sites, quick checks during the production process, as well as final quality control of tomato mashes or concentrates.

Applications:

- Check ripeness of tomatoes before harvest by refractive index (Brix)
- Sugar content (Brix) of tomato concentrates and derived products, like ketchup
- Brine concentration of canned tomatoes by refractive index (to safely preserve canned tomatoes)



Sweets and Sweeteners



Corn syrup (HFCS)

Sweetener made of corn starch (HFCS) is used to replace sucrose in the food and beverage industry. HFCS is available in three different fructose levels: HFCS 42%, 55% and 90%. Sugar syrup intended for sodas and similar products is sold by weight and sugar content. The exact determination of the Brix value is therefore important for cost and quality control in the beverage industry (soft drinks). HFCS 42% is mainly used for processed foods and breakfast cereals, whereas HFCS 55% is among the most commonly used sweeteners in the production of soft drinks.

In the USA, HFCS is among the sweeteners that replaced sucrose (table sugar) in the food industry.



Confectionery Industry

Concentration of sugar blends used as fillings for chocolates, boiled sweets and other confectionary products.

Applications:

- Sugar content (Brix) of sugar blends

Note: A rapid reading is often required in order to stop the cooking process at the correct stage. Pocket refractometers can be used in this process as long as they meet temperature specifications of the cooking temperature.

Tip: A further important application in the confectionery industry is the determination of the fat content of chocolate and cacao products via refractive index, which can be performed with the Excellence Refractometers. In addition, maintaining the instrument at a higher temperature may be required in order to keep high-concentration products in a liquid state. If so, a benchtop Refractometer with temperature control is needed.



Dairy



Milk and cheese

Pocket refractometers are used for quality control of incoming milk from different farmers (check for adulterations), the final milk product (to guarantee standardization) as well as during the production of cheese.

Applications:

- Quality control of milk, cream, fats and other raw ingredients
- The refractive index of milk and milk products
 - to check for adulterations (watering or skimming may decrease or increase the refractive index value respectively)
 - to estimate total solids
 - to define the price
 - to define fat content which is an important parameter during the standardization process in large bottling plants
- Check brine baths used to salt cheeses by refractive index

Tip: Both refractive index and density measurement can be used to check for milk adulterations.



Yoghurt and yoghurt drinks

Pocket refractometers are used for quality control of raw ingredients and final products

Applications:

- Quality control of raw ingredients (milk, fats) and finished products by refractive index
- Sugar content (Brix) of fruits ingredients (pulp, juices)

Tip: Perform quality control of added flavors with a density and refractometry multiparameter system.



Oils and Fats



Edible oils and fats

The varying composition of different oils and fats allows for them to be characterized by refractive index measurement. These measurements can thus also provide insight to their quality, as any change in their optimal composition will affect the refractive index. Moreover, the refractive index helps to differentiate between different fats, such as butter and margarine.

In the most common standards for edible oils and fats (e.g. AOAC) refractive index measurements at a specific temperature are defined, for which benchtop instruments with temperature control are required. However, often quick measurements in the field are performed with pocket refractometers, as well.

Applications:

- Measurement of oils and fats via refractive index
- Iodine Value by refractive index (empirical relation)

Tip: To measure edible oils and fats at a specific measuring temperature as defined e.g. by AOAC (20 °C / 40 °C), a benchtop Refractometer (temperature control) is needed.



Sample Preparation Hints and Tips



Carbonated beverages need to be degassed before the measurement.



Liquids with high sugar content may exhibit a density gradient and should therefore be gently stirred to be homogenized.



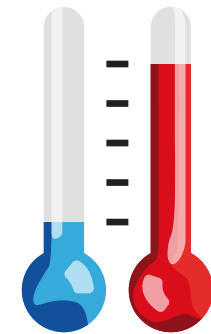
Juices (e.g. orange juice) need to be gently stirred to evenly distribute the pulp.



Berries, grapes and tomatoes need to be squeezed to apply only the "juice" on the prism.



Paste-like samples (e.g. tomato puree) need to be homogenized prior to measurements.



Ideally, the sample temperature does not deviate significantly from the instrument temperature.



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