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Beverage resource guide for commercial testing laboratories

ThermoFisher SCIENTIFIC

Fast, efficient analysis

For all beverages, the compositional quality and safety must be monitored to help track contamination, adulteration, and product consistency, as well as to ensure regulatory compliance from raw ingredients (water, additives, and fruits) to the final product.

Thermo Fisher Scientific is a recognized leader in providing analytical solutions. From carbohydrates and sugar substitutes, to vitamins and additives, we are unique in our commitment to provide fast, accurate testing for all applications performed in commercial testing laboratories.

Compendiums included in this directory

Key to the instrumentation acronyms

Learn more

- Beverage Testing Learning Center
- Beverage testing instrumentation

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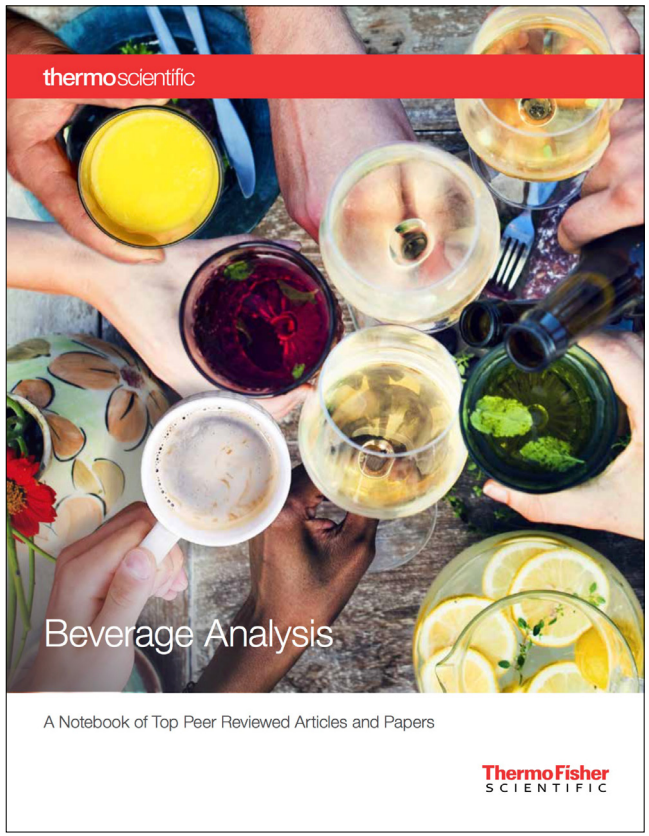
A key to the instrumentation acronyms

Acronym	Description
AA	Atomic Absorption Spectroscopy
GC-MS	Gas Chromatography with Single Quadrupole Mass Spectrometry Detection
GC-MS/MS	Gas Chromatography with Triple Quadrupole Mass Spectrometry Detection
HPAE-PAD	High Performance Anion Exchange with Pulsed Amperometry Detection
HPLC-CAD	High Performance Liquid Chromatography with Charged Aerosol Detection
HPLC-DAD	High Performance Liquid Chromatography with Diode Array Detection
HPLC-ECD	High Performance Liquid Chromatography with Electrochemical Detection
HPLC-Fluorescence	High Performance Liquid Chromatography with Fluorescence Detection
HPLC-UV	High Performance Liquid Chromatography with Ultraviolet Detection

Acronym	Description
IC-Suppressed Conductivity	Ion Chromatography with Suppressed Conductivity Detection
IC-UV	Ion Chromatography with Ultraviolet Detection
ICP-MS	Inductively Coupled Plasma Mass Spectrometry
ICP-OES	Inductively Coupled Plasma Optical Emission Spectrometry
Ion Exclusion-PAD	Ion Exclusion Chromatography with Pulsed Amperometry Detection
IRMS	Isotope Ratio Mass Spectrometry
LC-MS/MS	High Performance Liquid Chromatography with Triple Quadrupole Mass Spectrometry Detection
LC-HRAM	High Performance Liquid Chromatography with High Resolution Accurate Mass using Orbitrap Technology
UHPLC-MS/MS	Ultra High Performance Liquid Chromatography with Triple Quadrupole Mass Spectrometry Detection

Notebook of peer reviewed articles and papers



View the full compendium

Learn more: Beverage Testing Learning Center

Overview

The power of peer reviewed articles cannot be underestimated. Years of research within the beverage industry have led to the discovery of anti-oxidants in coffee and wine, the origin of raw ingredients when analyzing for beverage authenticity, and pesticides in fruit juices.

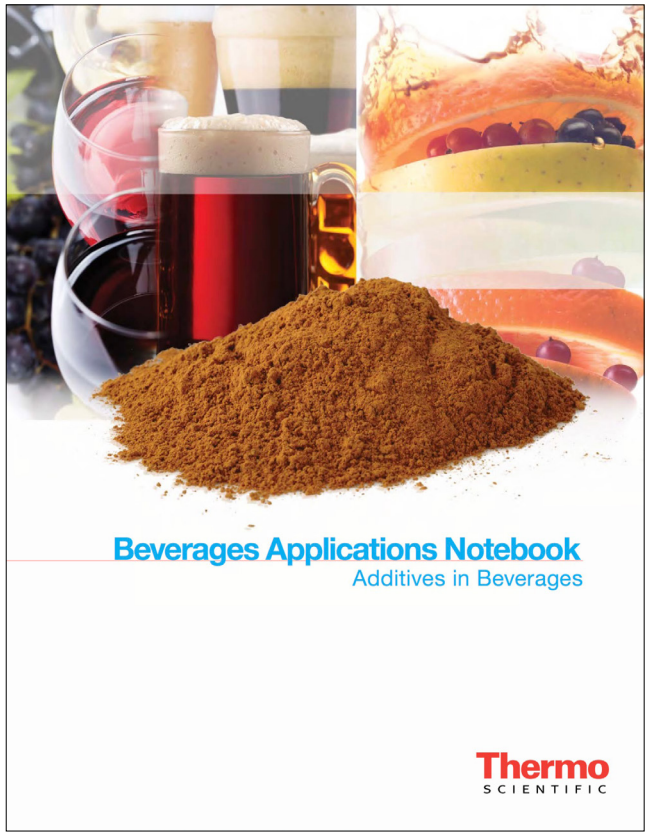
This comprehensive notebook represents a broad spectrum of publications that can be accessed easily online, specifically for the beverage industry. A collection of beverage analyses is presented, providing an insight into analytical chromatography research that is taking place today within the community. Techniques described include gas chromatography-mass spectrometry, liquid chromatography-mass spectrometry, ion chromatography, automated photometry, and trace elemental analyses.

Compendium contents

Analysis
Beer and cider
Bottled water and functional drinks
Coffee and cocoa
Fruit juice
Milk
Soft drinks
Spirits
Tea
Wine

Instrumentation type
Liquid Chromatography (LC)
Gas Chromatography (GC)
Ion Chromatography (IC)
Triple Quadrupole Mass Spectrometry (LC, GC and IC)
High Resolution Accurate Mass
ICP-OES, ICP-MS
Atomic Absorption
Isotope Ratio Mass Spectrometer
Automated Discrete Analyzers
Fourier Transform infrared spectroscopy
UV-Vis Spectroscopy

Additives in beverages



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Overview

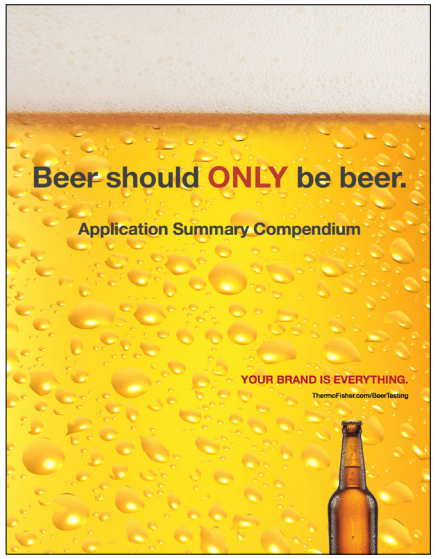
For all beverages, the compositional quality and safety must be monitored to help track contamination, adulteration, and product consistency, and to ensure regulatory compliance from raw ingredients (water, additives, and fruits) to the final product.

Compendium contents

Analysis	Instrumentation type
Benzoate	IC-Suppressed Conductivity
Dyes	HPLC-DAD
Mogroside V	HPLC-UV, HPLC-CAD
Steviol glycosides	HPLC-UV, HPLC-CAD
Sulfite	Ion Exclusion-PAD
Vitamins	UHPLC-MS/MS

Learn more: Beverage Testing Learning Center

Beer



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Overview

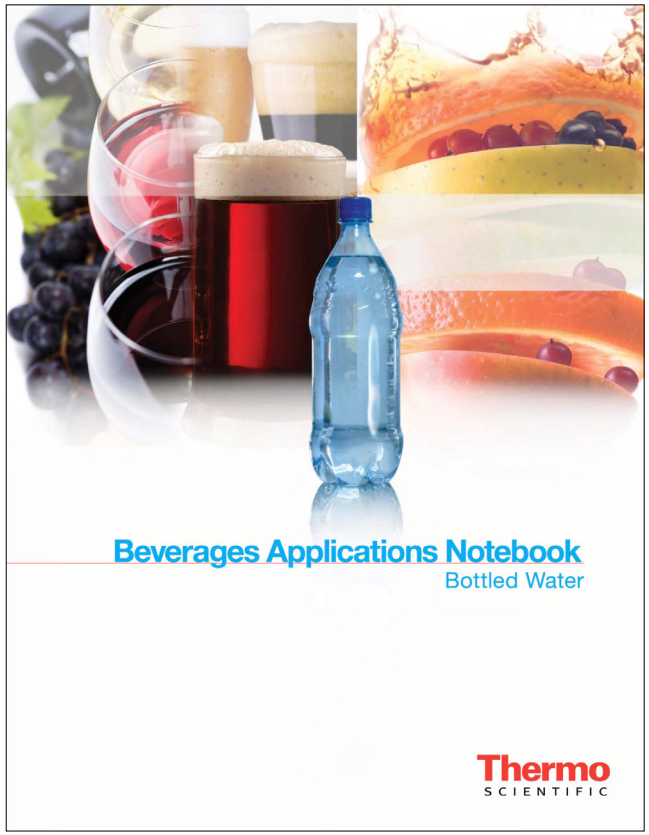
Beer is the most widely consumed alcoholic beverage in the world. Beer is typically brewed from four basic ingredients: water, a starch source, brewer's yeast, and a flavoring agent such as hops. Many varieties of beer result from differences in these ingredients, the additives used, and the brewing process. Thermo Scientific instruments help in monitoring the brewing process and also testing the quality, consistency, and purity of the final product.

Compendium contents

Analysis	Instrumentation type
IC analysis (anions, cations)	IC-Suppressed conductivity
Carbohydrates	HPAE-PAD
Organic acids	IC-Suppressed Conductivity
Acetaldehyde	Automated Discrete Photometry Analyzer
Beta-glucan	Automated Discrete Photometry Analyzer
Free Amino nitrogen	Automated Discrete Photometry Analyzer
Isohumulones (Iso-α-acids)	HPLC-UV
Sulfur dioxide	Automated Discrete Photometry Analyzer
Nitrosamines	GC-MS/MS
Chalconoids and bitter acids	HPLC-UV, HPLC-ECD
Multi-mycotoxin screening	LC-HRAM
Beer polyphenols, proanthocyanidins, and bitter acids	HPLC-UV, HPLC-ECD
Elemental contaminants	ICP-OES

Learn more: Beer Testing Learning Center

Bottled water



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Overview

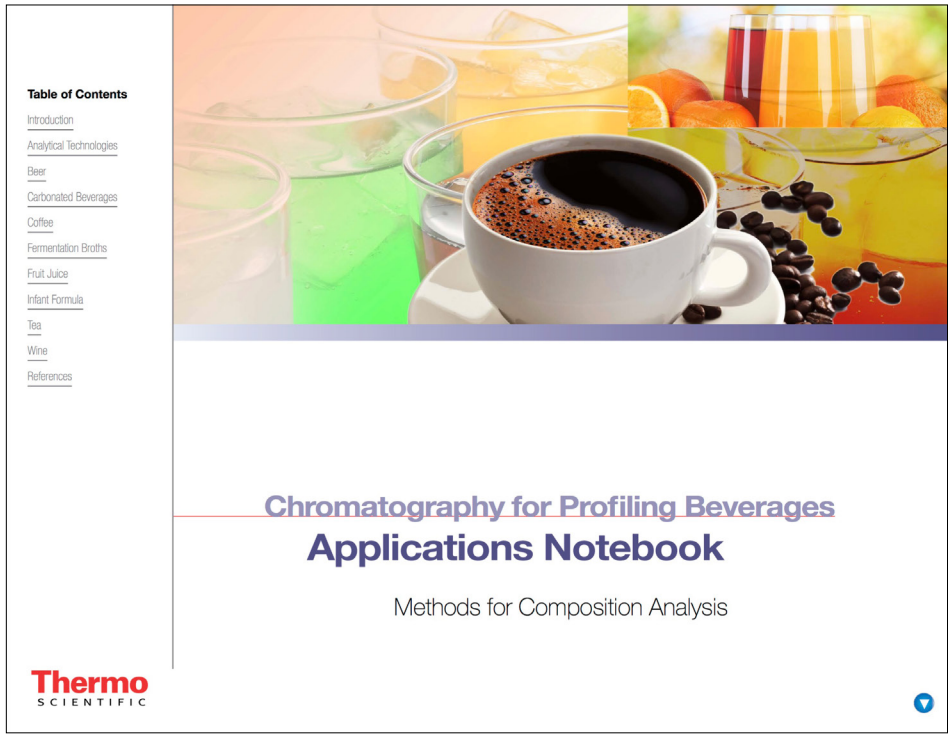
Clean, safe, without any contamination—that is what bottled water should be. We help manufacturers of bottled water, commercial testing labs, and regulatory agencies with our instruments to test for all this and more. Our instruments and solutions help in identifying disinfection by products, water contamination, electrolytes, and phthalates.

Compendium contents

Analysis	Instrumentation type
Oxyhalides and bromide	IC-Suppressed Conductivity
Chlorite, bromate, and chlorate	IC-Suppressed Conductivity
Phenols	HPLC-UV

Learn more: Bottled Water Testing Learning Center

Composition analysis



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Overview

The measurement of the different compounds found in a wide range of non-alcoholic and alcoholic drinks.

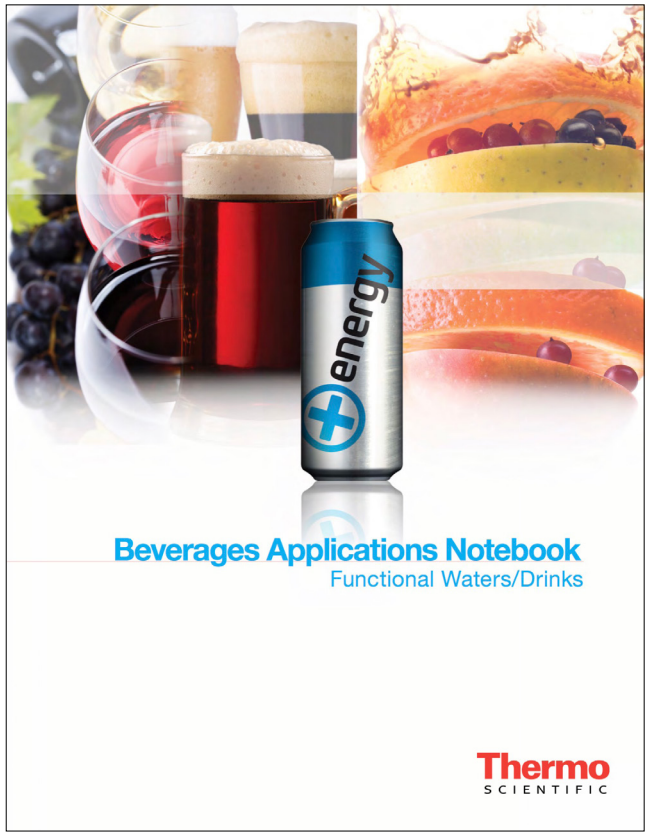
Included is an overview of instrumentation for the testing of beverages and a multitude of references from peer reviewed journals using our HPLC, ion chromatography, and sample preparation solutions.

Compendium contents

Analysis	Instrumentation type
Beer	HPAE-PAD, HPLC-UV, HPLC-ECD, IC-Suppressed Conductivity
Carbonated beverages	IC-Suppressed Conductivity
Coffee	HPAE-PAD, IC-Suppressed Conductivity, HPLC-UV
Fermentation broths	HPAE-PAD, IC-Suppressed Conductivity
Fruit juice	HPAE-PAD, IC-Suppressed Conductivity, HPLC-ECD
Infant formula	HPAE-PAD, IC-Suppressed Conductivity, HPLC-DAD
Tea	HPLC-UV, IC-Suppressed Conductivity
Wine	HPLC-UV, IC-Suppressed Conductivity, HPLC-ECD

Learn more: Beverage Testing Learning Center

Functional waters/drinks



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Overview

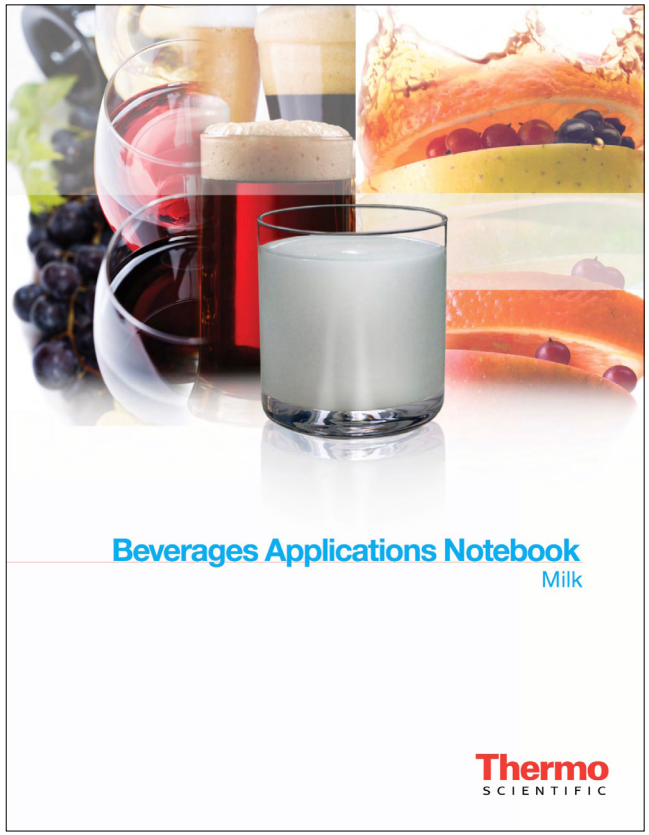
The beverage industry is growing each year with the introduction of new functional beverages, such as vitamin fortified water, energy drinks, anti-aging water, and sports drinks. With this growth come many more analytical challenges. Our instruments and applications help in overcoming these challenges.

Compendium contents

Analysis	Instrumentation type
Water and fat-soluble vitamins	HPLC-DAD
Glucosamine	HPAE-PAD
Vitamin B12	HPLC-UV

Learn more: Functional Beverage Testing Learning Center

Milk



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Learn more: Milk Testing Learning Center

Overview

People trust their milk to be safe, consistent, and unadulterated. Our instruments help in adhering to food label claims, product consistency, and purity, as well as identifying any contaminants and adulterants. Discover our solutions from carbohydrate analysis to vitamin D analysis to choline analysis in infant formula.

Compendium contents

Analysis	Instrumentation type
Choline	IC-Suppressed Conductivity
Fat extraction	Accelerated Solvent Extraction
Iodide	HPAE-PAD
Lactose	HPAE-PAD
Melamine	HPLC-UV, IC-UV
Nitrate/Nitrite	IC-Suppressed Conductivity
Sialic acids	HPAE-PAD, HPLC-Fluorescence

Wine

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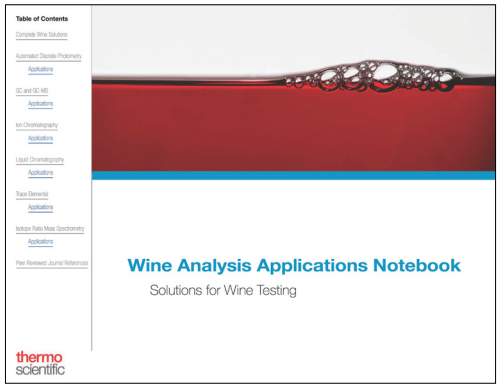

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Overview

People trust their wine to be exactly as they expect: unadulterated, safe, and consistent. Our customers know how long it takes to build a brand's reputation and how quickly one can disappear. So, they come to us and our widest instrumentation portfolio—ion, liquid, and gas chromatography, metal analysis, mass spectrometry, discrete analyzers, and data management—for accurate, reliable answers for their wine testing needs.

Compendium contents

Analysis	Instrumentation type
Catechins and phenolic acids	HPLC-UV
Pesticide residues	LC-MS/MS
Isotopes	GasBench II-IRMS
Phenolics, flavonoids	LC-HRAM
Iron, copper and zinc	AA
Nutrients and trace elements	ICP-OES
Impurities	GC-MS
Free sulfite	Automated Discrete Photometry Analyzer
Acetaldehyde	Automated Discrete Photometry Analyzer
Total acidity	Automated Discrete Photometry Analyzer
Glycerol	Automated Discrete Photometry Analyzer

Learn more: Wine Testing Learning Center

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Thermo Fisher Scientific is a recognized leader in providing analytical solutions. From carbohydrates and sugar substitutes, to vitamins and additives, we are unique in our commitment to provide fast, accurate testing and labeling information for all applications in this industry.

Find out more at **thermofisher.com/powerofpartnership**

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