cytiva

Honey laboratory filtration applications

Honey laboratory filtration applications

Honey has a long and rich history with accounts showing humans foraging for it over 8000 years ago. In addition to its consumption, recent focus has been placed on the medicinal benefit of honey.

Commercial honey production involves a number of analytical processes to confirm the quality, presence or absence of certain elements, and the lack of adulteration. Preparatory clarification and filtration is an important step so as not to damage equipment and affect results.

Analytical methods and recommended filters are based on those created by the International Honey Commission (IHC) and the Food and Agriculture Organization of the United Nations (FAO) Codex Alimentarius.

This brochure highlights the key analytical applications used throughout the honey production process, as well as recommendations of Whatman™ filters that would work best for each application.

Key laboratory filtration application index

Key application	Small	Medium	Large	Collect	Prepare	Analyze	Incubate	Raw honey	Processed honey	NIR	UV-Vis	HPLC	GC	IC	AAS
				C	P	A	I								
	Industry			LF workflow				Raw ingredient		Analytical systems					
General clarification				C	P	A									
Hydroxymethylfurfural (HMF) tests					P	A									
Sugar testing by ion chromatography						A									

NIR = Near infrared spectroscopy
UV-Vis = Ultraviolet–visible spectroscopy
HPLC = High-performance liquid chromatography
GC = Gas chromatography
IC = Ion chromatography
AAS = Atomic absorption spectroscopy

General clarification

Honey is required to be filtered prior to various analytical tests to reduce the amount of pollen and other impurities, so as not to damage equipment and affect results.

Honey is commonly heated prior to filtration to decrease viscosity and improve flow rate.

Cytiva offers a range of filter papers and devices for sample preparation of honey.

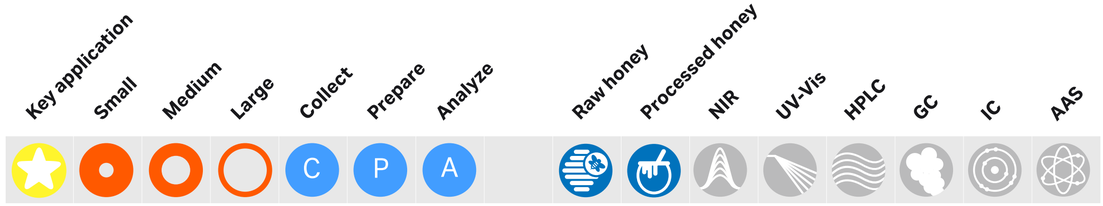
Filter papers

Whatman™ Grade 1 filter papers offer medium retention and flow rate, and are recommended for a large range of laboratory applications.

They are recommended for general sample preparation of honey prior analytical tests. Filter papers are available in a variety of diameters and pre-folded options.

Ordering information

Description	Quantity	Product code
Grade 1, 110 mm	100	1001-110



Syringe filter devices

Passing a viscous sample of honey through a syringe and filtration device is an alternative method of clarification when a shorter preparation time is important.

Whatman GD/X™ syringe filters include a specifically designed prefilter for filtering high particulate samples.

- Allows filtration of viscous samples with less hand pressure and a high loading volume.
- Made of heat-resistant polypropylene for high temperature samples.

Ordering information

Description	Membrane	Quantity	Product code
Whatman GD/X™ device, 2 5 mm, 0.45 µm	Glass Prefilter, cellulose acetate	150	6809-9233

General clarification continued

All-in-one filter device

Whatman Autovial™ syringeless filters combine both a syringe and filter together as a preassembled single use device. They are convenient, easy to use devices with minimal clean up.

- Choice of filter media allows a large range of sample filtration options.
- Made of heat-resistant polypropylene for high temperature samples.
- Able to conveniently load and stand samples on the work bench.

Ordering information

Description	Membrane	Quantity	Product code
Autovial™ 12 device, 0.45 µm	Glass Prefilter, cellulose acetate	50	AV125UCA

Hydroxymethylfurfural (HMF) tests

Honey quality is very important for customers who expect it to be fresh and not stored for long amounts of time or excessively heat treated.

Hydroxymethylfurfural (HMF) is an organic compound present in honey that is naturally generated by the decomposition of fructose in acidic conditions.

Honey that has been stored for long periods of time and/or excessively heat treated will have elevated levels of HMF. Therefore, fresh and good quality honey has lower HMF levels.

HMF levels can be detected by HPLC with UV detection or by UV/Vis spectroscopy.

Whatman™ laboratory filters are used for these applications that are detailed by the International Honey Commissions (IHC) harmonized methods.

Pre-analysis filtration

Honey must be filtered to reduce the amount of pollen and other impurities so as not to damage equipment and affect results.

Whatman™ Grade 1 filter papers are recommended for a large range of laboratory applications, offering medium retention and flow rate.

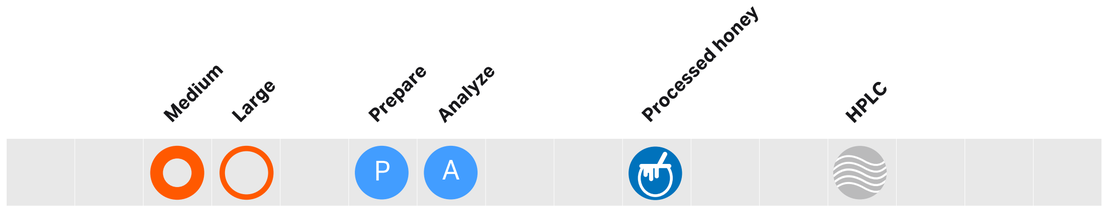
For more information view Honey Application: General Clarification, page 4.

Ordering information

Description	Membrane	Quantity	Product code
Grade 1, 110 mm	N/A	100	1001-110

Methods

IHC #	Hydroxymethylfurfural, 5.1, 5.2, 5.3



HPLC sample preparation

Prefiltering prior to HPLC analysis is an important step so as not to damage equipment and affect results.

The mobile phase consists of water/menthol, and cellulose acetate membranes are recommended.

Whatman GDX™ syringe filters include a specifically designed prefilter for filtering high particulate honey samples prior to HPLC.

Ordering information

Description	Membrane	Quantity	Product code
Whatman GD/X™ device, 25 mm	Glass Prefilter, cellulose acetate, 0.45 µm	150	6880-2504

Methods

IHC #	Hydroxymethylfurfural, 5.1

Sugar testing by ion chromatography

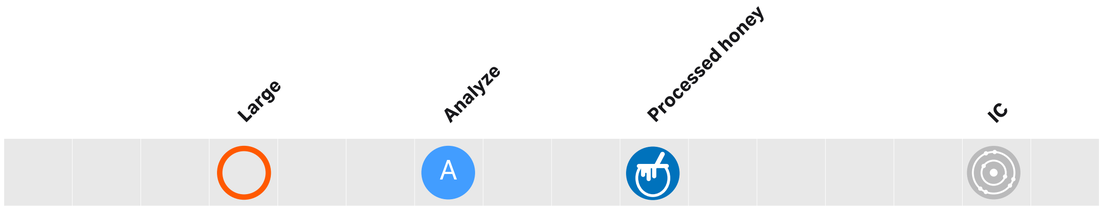
With growing global demand, honey has become the third most adulterated food globally.

Common adulteration methods include dilution and the addition of carbohydrate sugars, as well as the mislabeling of the geographic origin.

The concentrations and ratio of key carbohydrates (fructose, glucose, and sucrose) can be compared to existing spectra to determine if there are any adulteration issues.

The composition of the lower concentration carbohydrates can be used to indicate and the floral and geographic origin.

Ion chromatography (IC) can be used as one possible method to determine the concentration, ratio and spectrum of these sugar carbohydrates as per the International Honey Commission Methods.



Pre-analysis filtration

Sample filtration prior to IC analysis is an important step to prevent clogging columns and flow lines.

With very low levels of anion leaching, Whatman Anotop™ IC syringe filters are specially designed for the analytical prefiltering of clarified IC samples.

Ordering information

Description	Membrane	Quantity	Product code
Anotop™ 10 IC	Anopore™ membrane, 0.2 µm	100	6809-9233
Anotop™ 25 IC	Anopore™ membrane, 0.2 µm	200	6809-9244

Methods

IHC #	Sugars 7.4

Cytiva offers a range of high-quality Whatman™ filtration products for honey lab applications. Use this guide to find the recommended filters and devices for your applications.

cytiva.com

For local office contact information, visit cytiva.com/contact

CY29838-21Jun22-BR