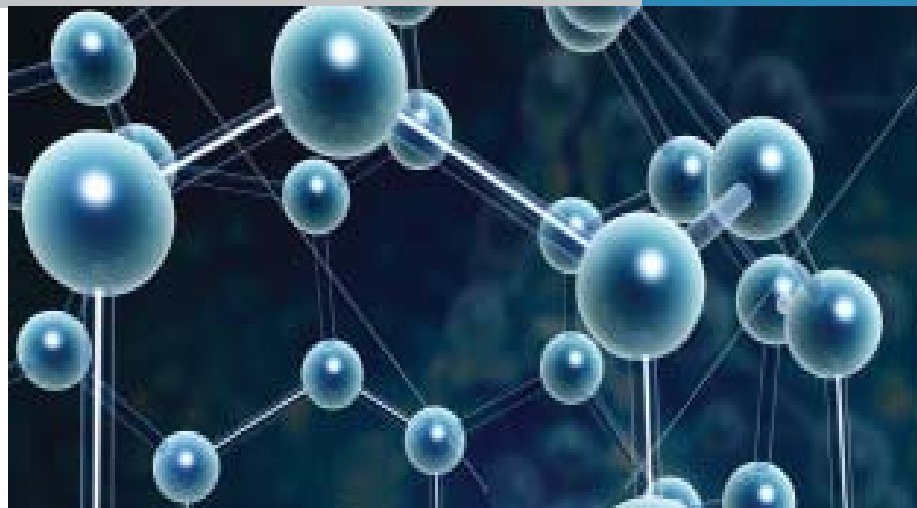


Thermo Scientific ChemComb® 3500 Speciation Collection Cartridge

The Thermo Scientific ChemComb 3500 Speciation Collection Cartridge provides users with a flexible system for the collection of gases and particulate matter for laboratory analysis. Various inlet sizes, flow rates and collection materials are available for user-customizable configurations.



Key Features / Benefits

- Field-proven sampling system characterized by Harvard and UMEG
- Configurations for collecting inorganic and organic gases and particles
- Compact, flexible design facilitates transport and handling, sample integrity
- Honeycomb materials partition gases and particles, scrub ozone and acid gases; PUF/XAD unit for organic gases
- Inlets for PM-2.5, PM-10, PM-1

Proven Performance

The Thermo Scientific ChemComb 3500 Speciation Sampling Cartridge provides a flexible means of sampling particulate matter (PM) and gases from ambient air for analysis in a laboratory. The unit was developed by the Harvard School of Public Health, and its performance has been characterized and documented in a number of peer-reviewed publications.

Flexible Configurations

The sampling device is made up of a single cartridge that contains a well-characterized inlet with a PM-2.5 or PM-10 impactor, up to two honeycomb denuders for the removal or collection of selected gases, and a four-stage 47 mm diameter filter pack for the collection of particle-related components. PM-2.5 inlets are available for flow rates of 10 and 16.7 l/min, and a PM-10 inlet for 10 l/min.

The honeycomb denuders are used in systems operated at 10 l/min. Systems can also be configured without honeycomb denuders to operate as a multistage filter pack for PM-2.5 or PM-10.

Advanced Hardware Options

A version designed for collecting organic species adds the capability of sampling on polyurethane foam (PUF) and/or XAD after the filter pack.

The collector can be installed in a number of sampling systems, including the Thermo Scientific Partisol Speciation Sampler and original Partisol Air Sampler, as well as simple constant-flow pumping systems.

ChemComb 3500 Speciation Collection Cartridge

System Overview

The ChemComb Speciation Sampling Cartridge is composed of the following main sections:

- A PM-2.5 or PM-10 inlet/impactor, available in 10 and 16.7 l/min configurations for PM-2.5, and for a 10 l/min flow rate for PM-10. These inlets are either clear anodized or have a PTFE (Teflon® material) coating over a clear anodized surface. The PTFE coating is used in most applications, and minimizes losses of HNO₃ and NH₃. Clear anodized inlets are available for the collection of organic and elemental carbon on quartz fiber filters to avoid possible interferences from inlet surface coatings.
- A denuder section, which can be empty if no gas stripping or collection is desired. This part of the sampling module can accommodate up to two honeycomb denuders.
- A 4-stage filter pack section, which can house between one and four 47 mm diameter filters in separate levels. All components of the filter pack are made of Teflon material to minimize interactions with the collection hardware. At the exit of the filter pack section is a 1/4 inch diameter quick-connect fitting for easy integration with a variety of sampling platforms.

The cartridge's glass honeycomb denuders have the following features:

- Patented by Harvard University with exclusive rights held by Thermo Fisher Scientific.
- Length of 38 mm and diameter of 47 mm.
- Each honeycomb denuder contains approximately 212 hexagonal flow channels that are approximately 2 mm on a side. The total internal surface area is approximately 310 cm².
- The honeycomb denuders are made completely of glass to avoid gas losses that can take place due to nitric acid and ammonia adsorption on the epoxy resin sometimes used in annular denuders. The use of the same material throughout the denuder avoids cracking that can otherwise occur in the face of large temperature changes.

- To optimize the denuder gas collection efficiency, ChemComb Cartridges containing honeycomb denuders should be operated at a 10 l/min flow rate and fitted with the corresponding inlet. In this configuration, a honeycomb denuder typically attains a collection efficiency of better than 98%.
- Each honeycomb denuder is provided with two caps for use in collector preparation and sample analysis in the laboratory.

Honeycomb Denuder Analysis

- The Harvard University-developed glass honeycomb denuders have a long history of use in a number of sampling applications. Numerous laboratories are well-practiced in the analytical procedures required for their evaluation.
- Step-by-step preparation and analytical procedures are provided by Thermo Fisher Scientific that are based upon the methodologies developed by Harvard University and Research Triangle Institute.
- Ion chromatography is most often used as the analytical method.

Physical Dimensions/Weight

- External diameter (not including clips): 2.95" (7.49 cm)
- External diameter (including clips): 3.81" (9.68 cm)
- Length (from inlet to end of 1/4" connector): 11.13" (28.27 cm)
- Weight (with empty denuder section): 2.7 lb (1.23 kg)
- Weight (fully equipped with 2 denuders): 3.2 lb (1.45 kg)

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