



Filter Paper for Air Sampling

Glass Fiber, Ashless Cellulose, & Carbon Impregnated Filter Paper

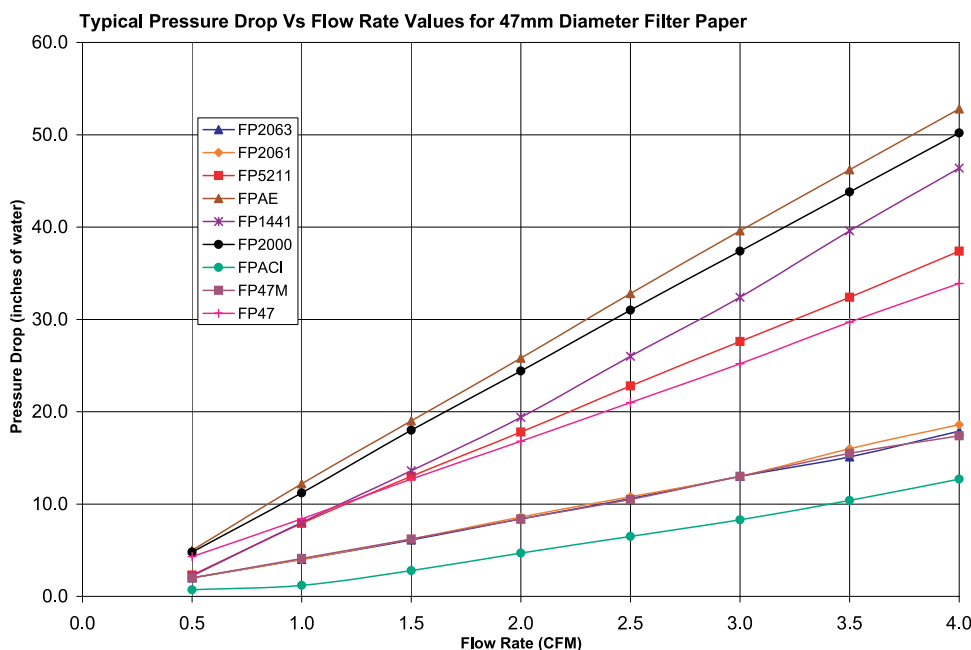
General Information: Environmental air sampling for particulate generally use two major types of filter paper collection media, Glass fiber and Cellulose. Carbon Impregnated filter paper is called out for in the determination of the presence of airborne Iodine.

Glass Fiber Filter Media

Glass fiber filter media is made from 100% micro-fine borosilicate glass fibers. Glass fiber filters are used where high flow rate and micron/sub-micron filtration is required. The filter media can be used for both liquid and air filtration. In the highest purity form, HI-Q offers a binderless "AE" grade glass filter media. With its' excellent purity, using the **FPAE-XX** series filter paper reduces the overall possibility of extractable organics commonly found in cellulose filter paper.

Where greater structural strength filter papers are needed (high pressure drop, vacuum applications), either a spun polyester backing is used, Type **FP5211**, or a minimal amount of acrylic resin binder is used, Type **FP2063** & **FP2061**, to keep up the integrity of the glass fibers during and after sampling/analysis. Some PM-10 sampling applications specifically call out for Whatman's "EPM-2000", HI-Q part number **FP2000**. FP2000 was developed and produced specially for use in high volume PM-10 air sampling equipment that collects atmospheric particulates and aerosols.

Properties of Glass Fiber Media: The borosilicate glass fibers are inert and resistant to all but strongly alkaline bases or acids such as hydrofluoric acid. The fibers are heat resistant and will only begin to soften at over 600°C. The borosilicate glass has a refractive index of 1.51, and when immersed in a solvent of a similar refractive index like benzene, the fibers will be transparent. Particles collected on the media then become easier to visibly identify.



Glass Fiber Filter Collection Media:

FP2063-XX

Hydrophobic, Glass Fiber Filter Paper with acrylic resin binder.

This hydrophobic, high purity filter media is recommended for use in general purpose, high and low volume air sampling applications for particulate collection. It is composed of 100% high quality borosilicate glass microfibers and an acrylic resin binder. Both the FP2063-XX & FP2061-XX filter paper grades are excellent for the removal of micron and sub-micron size particulate from ambient air and stack gases. Because glass fibers are brittle and do not naturally bind together, a small amount of acrylic resin binder (composition of which is described in CFR Title 21, Part 177.2260, Filters, Resin Bonded. ASTM Spec) is used to retain the filter paper integrity during air sampling and routine handling. The total borosilicate glass microfiber composition found in the FP2063-XX & FP2061-XX filter media contains less than 5% acrylic resin binder. DOP Collection Efficiency 97%.

FP2061-XX

Hydrophilic, Glass Fiber Filter Paper with acrylic resin binder.

This high purity filter paper has all the same properties of the type FP2063-XX, except that it is hydrophilic. Choose the paper best suited for your sampling application and particle identifying method. DOP Collection Efficiency 97%.

FPXM

Hydrophilic, Glass Fiber Filter Paper with acrylic resin binder.

This hydrophilic high purity filter media is recommended for use in general purpose, high and low volume air sampling applications for particulate collection. It is composed of 100% high quality borosilicate glass microfibers and an acrylic resin binder. This media is highly inert and resistant to chemical reaction. This filter paper is excellent for the removal of micron and sub-micron size particulate from ambient air and stack gases. Because glass fibers are brittle and do not naturally bind together, a small amount of acrylic resin binder (composition of which is described in CFR Title 21, Part 177.2260, Filters, Resin Bonded. ASTM Spec) is used to retain the filter paper integrity during air sampling and routine handling. The total borosilicate glass microfiber composition found in the FPXM filter media contains less than 5% acrylic resin binder. DOP Collection Efficiency of 98%.

FPX

Hydrophilic, Binderless, Glass Fiber Filter Paper.

This 100% high quality borosilicate glass micro fiber material demonstrates excellent fine particle retention and has a high retention efficiency for filtration of large volumes of air (High loading capacity). This binderless glass fiber filter possesses excellent purity. It is ideally suited for suspended solids analysis. Temperature usage up to 550°C. This media contains no acrylic binder. Low fiber shedding improves quality assurance of test results. DOP Collection Efficiency 99.98%, HEPA Quality.

Particle Retention: For air and gas filtration, collection of sub-micron (less than one micrometer in aerodynamic diameter) particles is sometimes required. In nuclear environmental air testing, the protocol is for sub-micron collection. Use of glass fiber media is therefore recommended. The test procedure for determining the effectiveness of particle retention is known as the DOP smoke test. In this test, DOP (dioctyl phthalate) is heated, the vaporized compound is dispersed into the air where it is cooled and condenses into mono-molecular particles of 0.3 micron size. By drawing these airborne particles through the filter media and measuring the amount of breakthrough particle, a retention efficiency is established (see ASTM method D-2986 for the complete procedure.) See tabular results in "Typical Performance Summary on Glass Fiber Filter Media" below.

Ashless Cellulose, & Carbon Impregnated Filter Paper

Ashless Cellulose Filter Paper such as the **Whatman 41** series is commonly used in quantitative analytical techniques such as gravimetric analysis. E.G.: To convert precipitate to a stable weighing form, a chemist may wish to ignite the filter paper containing collected precipitate in a pre-weighed crucible, thereby removing the filter paper with minimal and uniform residual "ash". Cellulose paper is also commonly used for smears or swipes. Cellulose paper is not recommended with pumps that can't overcome large pressure drops (e.g. battery operated centrifugal type) or, where required, to maintain a constant flow rate over the entire sampling period.

Typical Performance Summary on Glass Fiber Filter Media

Media Type	Pressure Drop @ 2 CFM	DOP Efficiency 0.3µm ASTM method D-2986	Binder	Efficiency (@ 4-8 PSI)	Thickness	Fiber Type
FP2063-47	8 inches H ₂ O	97%	Acrylic	High	0.016 inches	100% Borosilicate Glass Microfiber
FP2061-47	8 inches H ₂ O	97%	Acrylic	High	0.016 inches	100% Borosilicate Glass Microfiber
FP47M	8 inches H ₂ O	97-98%	Acrylic	High	0.020 inches	100% Borosilicate Glass Microfiber
FP47	17 inches H ₂ O	99.98%	None	Very High, HEPA Quality	0.017 inches	100% Borosilicate Glass Microfiber
FP5211-47	18 inches H ₂ O	99.99%	Acrylic	Very High, HEPA Quality	0.015 inches	100% Borosilicate Glass Microfiber
FPAE-47	26 inches H ₂ O	99.99%	None	Very High, HEPA Quality	0.020 inches	100% Borosilicate Glass Microfiber
FP2000-47	24 inches H ₂ O	99.99%	None	Very High, HEPA Quality	0.017 inches	100% Borosilicate Glass Microfiber

This data has been taken from production runs to show "Typical" properties. This is to be used as a guide and is not a specification sheet.

Ordering Information (Filter Paper Packaged 100 pcs./box. Teflon Gaskets, 10/Package, Glassine Envelopes 100/Box)

Paper Type	47 mm Diameter	2 Inch Diameter	4 Inch Diameter	8" x 10" Rectangular Sheet
FP2063-XX	FP2063-47	FP2063-20	FP2063-102	FP2063-810
FP2061-XX	FP2061-47	FP2061-20	FP2061-102	FP2061-810
FPXM	FP47M	FP2.0M	FP4.0M	FP810M
FPX	FP47	FP2.0	FP102	FP810
FPAE-XX	FPAE-47	FPAE-20	FPAE-102	FPAE-810
FP2000-XX	N/A	N/A	N/A	FP2000-810
FP5211-XX	FP5211-47	FP5211-20	FP5211-102	FP5211-810
FP1441-XX	FP1441-47	FP1441-20	FP1441-102	FP1441-810
FPACI-XX	FPACI-47	FPACI-20	FPACI-102	FPACI-810

Note: HI-Q stocks many other punched filter paper sizes not shown in table above (i.e.: 21mm, 37mm, 50mm, 24" x 24".....). Call for additional custom sizes.

Accessory Type	47 mm Diameter	2 Inch Diameter	4 Inch Diameter	8" x 10" Rectangular Sheet
TEFLON-GSKT-XX	TEFLON-GSKT-47	TEFLON-GSKT-20	TEFLON-GSKT-102	N/A
Glassine-Envelopes	G-47MM	G-2-INCH	G-4-INCH	G-8X10

Glass Fiber Filter Collection Media:

FPAE-XX

Hydrophilic, Binderless, Glass Fiber Filter Paper.

This binderless, high efficiency (HEPA type), high purity, 100% high quality borosilicate glass micro fiber filter media is commonly used in the collection of alpha, beta, and gamma emitting particulate. Other common uses include gravimetric analysis of air pollutants and membrane prefilters. It is an excellent all around analytical grade filtration media for use in the removal of micron and submicron size particulates from both liquids and gases. Specifically designed for analytical applications. DOP Collection Efficiency 99.99%, HEPA Quality.

FP2000-XX

Binderless, Ultra-Pure, Glass Fiber (Whatman EPM-2000)

The EPM-2000 grade paper was developed and produced especially for use in high volume PM-10 air sampling equipment that collects atmospheric particulates and aerosols. It is manufactured from 100% pure borosilicate glass of special purity enabling detailed chemical analysis of trace pollutants to take place with the minimum of interference or background. EPM-2000 was selected by the EPA to be the standard filter for use in the nationwide network of Hi-Vol air samplers. 8" x 10" sheets are individually numbered to facilitate identification.

FP5211-XX

Hydrophilic, Laminated Glass Fiber Filter Paper with acrylic resin binder.

This hydrophilic, laminated glass fiber filter paper is a high efficiency multi-purpose filter medium with good heat resistance. It is particularly recommended for both gas and liquid filtration in medical and air monitoring applications. The base material consists of 100% high quality borosilicate glass microfibers with a 3-7% acrylic resin binder. The supporting scrim maintains the integrity of the glass fibers under flow stress compaction. The scrim can be applied to either side depending on the filter design. The scrim is bonded to the glass media using a polyester hot melt which has a melting point of 325° F. DOP Collection Efficiency 99.99%, HEPA Quality.

FP1441-XX

Whatman, Grade 41: 20-25µm.

The fastest ashless filter paper, recommended for analytical procedures involving coarse particles or gelatinous precipitates (i.e., iron or aluminum hydroxides). Also used in quantitative air pollution analysis. Cellulose paper is also commonly used for smears or swipes.

FPACI-XX

Carbon Impregnated Filter Media.

Carbon impregnated cotton fiber filter media contains 50-55% Carbon by weight. Basic Weight is 130 lbs./3000 ft². The paper is available in all standard die sizes and is generally used to qualitatively determine the presence of Iodine in a sampling environment. The paper resists most dilute acids (not suitable for warm alkaline solutions).

TEFLON-GSKT-XX

Teflon Support Gaskets.

Teflon Support Gaskets may be placed above and below the filter paper disc creating a protective barrier between the occasional sharp edges of filter paper holder support screens and retaining rings. The inner & outer diameters of the Teflon rings are punched to a specifically tight tolerance to minimize any flow disturbance and to maximize filter collection media face exposure. Punched Teflon thickness is 0.020.

Specialty Collection Media:

Accessories: