

PLM FILTER SOLUTION GROUP

GLASS FIBER ***FILTER MATERIAL***



Glass Fiber Filter Material

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Glass Fiber Filter Material

Glass fiber filter material refers to filter materials made from glass fiber, used for purifying fine particles in the air or filtering impurities in liquids such as water and oil. Common glass fiber filter materials include glass fiber primary, medium, and high-efficiency filter paper, glass fiber woven filter fabric, glass fiber non-woven fabric, and glass wool. They are widely used in dust removal systems, HVAC systems, and oil-gas separation fields.



Raw Materials for Glass Fiber Filter Material

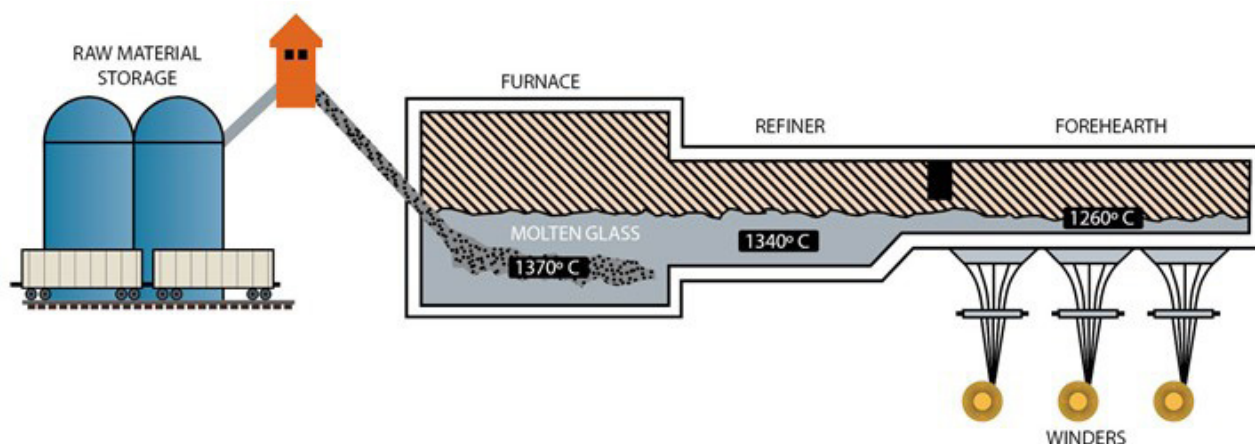
Glass fiber is made from quartz sand, limestone, dolomite, paraffin, and is combined with soda ash and boric acid through melting and spinning. Its main components are silicon dioxide and certain metal oxides. Based on composition and performance, glass fiber can be classified into four categories: non-alkali, medium acid, high alkali, and special types. Based on form, it can be divided into continuous glass fiber, chopped glass fiber, and glass wool. Glass fiber features flame retardancy, corrosion resistance, heat resistance, low hygroscopicity, low elongation at break, high tensile strength, brittleness and fragility, good thermal insulation and chemical stability, and excellent electrical insulation.



Production Process and Flow – Pool Furnace Drawing Method

Talc and limestone are ground into powder and blended together in a certain ratio. Using natural gas and oxygen as chemical raw materials and electrical energy as the power source, they are burned in a kiln with the combustion temperature controlled between 1000 °C and 1600 °C. During the combustion process, the mixed powder of talc and limestone melts into a liquid. The liquid flows through a platinum-rhodium precious metal alloy (85:15) porous bushing and is drawn at high speed into glass filaments. These filaments are then condensed with water to form glass fiber, which is coated with a chemical sizing agent on the surface, dried, and packaged for shipment. The drawing machine is a key piece of equipment in the glass fiber forming process. Its function is to rapidly stretch the glass liquid flowing from the bushing and wind it in a certain direction to form. The performance and precision of the drawing machine directly affect the quality of the fiber.

Note: In addition to directly making fibers from molten glass, it is also possible to first make the molten glass into glass balls or rods with a diameter of 20 mm, and then remelt them using various methods to produce extremely fine fibers with diameters ranging from 3 to 80 μm .



Glass Fiber Type I

Glass fiber can be divided into three types based on length: long fiber, short fiber, and glass fiber bulked yarn.



Long Glass Fiber

Long glass fiber refers to glass fiber with a length ranging from tens of meters to several kilometers, usually existing in the form of fiber bundles or fiber tapes.



Short Glass Fiber

Short glass fiber refers to glass fiber with a length ranging from a few meters to a few centimeters.



Glass Fiber Expanded Yarn

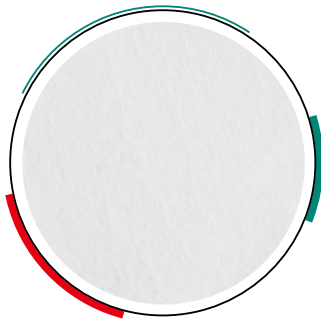
It is made by expanding continuous glass fiber yarn through a special high-pressure air device, combining the high strength of continuous long fibers and the fluffiness of short fibers. It is a type of glass fiber modified yarn that is high temperature resistant, corrosion resistant, and has low thermal conductivity, and low density.

Glass Fiber Type II

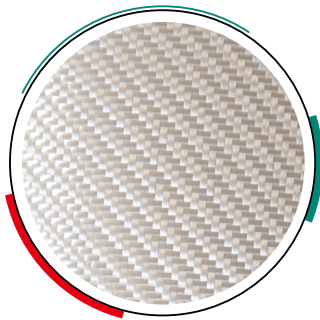
- Glass fiber is classified into non-alkali, medium alkali, and high alkali based on the content of alkali metal oxides.
- Alkali metal oxides generally refer to sodium oxide and potassium oxide, which are introduced from substances such as soda ash, mirabilite, and feldspar.
- In glass fiber filter materials, we typically use non-alkali and medium alkali glass fiber.

Type	Basic Information	Characteristics	Remarks
E-glass fiber	Non-alkali glass fiber refers to glass fiber with a low content of alkali metal oxides. The specific content of alkali metal oxides is regulated domestically to be no more than 0.5%, while internationally it is generally around 1%.	Advantages: High strength, strong electrical insulation, high temperature resistance; Disadvantages: Easily corroded by inorganic acids	--
C-glass fiber	Medium alkali glass fiber refers to glass fiber with an alkali metal oxide content between 8% and 12%.	Advantages: High temperature resistance, acid resistance, relatively low cost; Disadvantages: Poor electrical insulation, mechanical strength is 10%–20% lower than non-alkali glass fiber, poor water resistance	--
A-glass fiber	High alkali glass fiber refers to glass fiber with an alkali metal oxide content equal to or greater than 13%.	Poor strength, poor water resistance, good acid resistance	Usually not used for producing glass fiber

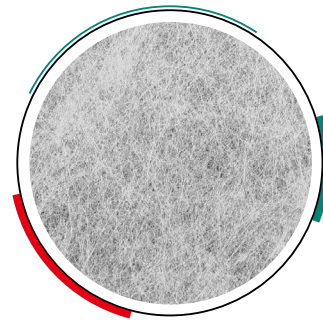
Types of Glass Fiber Filter Material



Glass Fiber Paper



Woven Glass Fiber Filter Fabric



Non-Woven Glass Fiber Filter Fabric

Special Performance Requirements

• Anti-Static

The classic characteristics of anti-static filter material should meet the technical requirements of charge density $< 7\mu\text{C}/1\text{ m}^2$, triboelectric potential $< 500\text{V}$, half-life $< 1\text{s}$, surface resistance $< 10^1\Omega$, volume resistance $< 10^9\Omega$

• Corrosion Resistant

The corrosion resistance of the filter material is indicated by the strength retention rate after the material is soaked in acidic or alkaline substances. The strength retention rate in both the warp and weft directions should be $\geq 95\%$.

• Hydrophobicity

The hydrophobic characteristics of hydrophobic filter materials are indicated by the water-shedding grade, which should be \geq Grade 4.

• Oil Repellent

The oil repellency grade of oil-repellent filter materials should be \geq Grade 3.

• Flame Retardancy

Flame-retardant filter materials should only smolder in flames without producing a flame. Upon removal from the flame, the smoldering should self-extinguish.

Filtration Grade of Glass Fiber Filter Paper

Among them, glass fiber filter paper is our main product, which can be divided into medium-efficiency, high-efficiency, and ultra-high-efficiency glass fiber filter paper based on filtration performance. Below is a comparison chart of filtration grades according to various national standards.

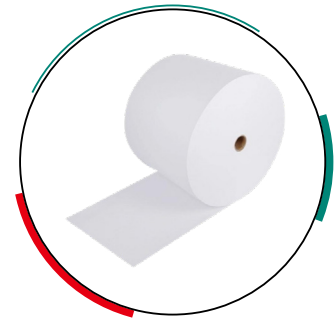
National Standard GB/T 14295	For General Ventilation								For Clean Rooms								
	Coarse Efficiency				Medium Efficiency		High-Medium Efficiency		Sub-High Efficiency				High Efficiency		Ultra-High Efficiency		
United States ASHRAE Standard	C1	C2/ C3/ C4	L5/ L6	L7/ L8	M9/ M10	M11/ M12	M13	M14	H15		H16		UH17/ UH18	UH19	UH20		
New European Standard	G1	G2	G3	G4	F5	F6	F7	F8	F9	H10	H11	H12	H13	H14	U15	U16	U17
Efficiency E (%)	65	80	90		60	80	90		85/95	99.5		99.5	99.995	99.9995/99.99995			
	Gravimetric Method				Colorimetric Method				MPPS Method (DOP Method)								

Application Range of Primary, Medium, and High Efficiency Glass Fiber Filter Paper

Applications	Filter Material Efficiency	Filter (Filter Element)	Filter Material Requirements
Class 100,000 and Class 10,000 clean rooms	HEPA	Partitioned or non-partitioned high-efficiency panel filter	100% testing of flame retardant materials, long lifespan
Class 100 clean room	HEPA or ULPA	Partitioned or non-partitioned high-efficiency or ultra-high-efficiency filter	100% testing
Electronic chip workshop	HEPA	Partitioned or non-partitioned high-efficiency filter	High-speed inflow, long lifespan
Class 10 and Class 1 Chip clean rooms	ULPA	Non-partitioned ultra-high-efficiency filter	Uniform, high-speed inflow, long lifespan
General clean room	F8, F9, H10	Partitioned or non-partitioned bag frame filter	Long-lasting, odorless
Advanced paint baking workshop	M6, F7	Bag frame filter	No fiber shedding, flame retardant
Synthetic fiber workshop	F8	Bag filter, simple filter	No fiber shedding
Class 300,000 pharmaceutical workshop	F8, F9, H10, H11	Bag frame filter, partitioned or non-partitioned frame filter	No Fibers, no dust, sterilized, no organic matter
Dairy workshop	M6, F7	Bag filter, roller filter	No active bacteria
Cigarette factory baking workshop	F8, F9	Bag filter, cartridge filter	Flame retardant, odor removal
Purification workbench air shower	HEPA	Partitioned or non-partitioned frame filter	Multi-directional blowing
Protective mask	HEPA	Non-partitioned filter, pleated tubular filter	Non-toxic, anti-fog (moisture-proof)
Luxury cars, aircraft cockpits	F8, F9, H10	Partitioned or non-partitioned bag filter, cartridge filter	Flame retardant, odorless
Air purifier	HEPA	Office, residential, automotive, commercial, etc., different forms	PM2.5 protection, odor protection, bacteria protection

Medium Efficiency Glass Fiber Filter Paper

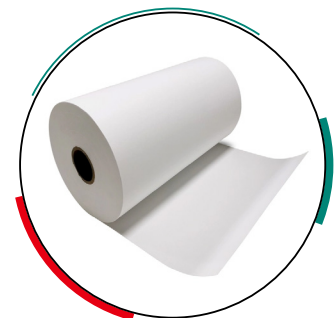
Medium-efficiency glass fiber filter paper is a filtration medium made from glass fiber materials, primarily used in air filtration systems to capture medium-sized particles in the air. It is commonly used in HVAC systems (heating, ventilation, and air conditioning systems), air purifiers, industrial dust removal equipment, and other applications requiring high air cleanliness. Medium-efficiency glass fiber filter paper plays a role in air filtration between primary and high-efficiency filtration, with a filtration efficiency generally ranging from 60% to 95%. It features high permeability, good filtration efficiency, high temperature and corrosion resistance, and a relatively long service life.



Code Number	Filtration Grade	Basic Weight g/m ²	Thickness mm	Air Resistance Pa	Filtration Efficiency %	MD Tension KN/M	CD Tension KN/M	Stiffness Mg	Water Resistance KPa	Fire Rating
LMW06F	F6	75±5	0.4±0.05	≤ 20	≥ 30	≥ 1.2	≥ 0.4	> 1000	> 2.5	–
LMW07F	F7	75±5	0.5±0.05	≤ 30	≥ 40	≥ 1.2	≥ 0.4	> 1000	> 3.0	–
LMW08F	F8	75±5	0.4±0.05	≤ 45	≥ 55	≥ 1.2	≥ 0.5	> 1000	> 3.0	–
LMW9FX	F9 (Livestock)	73±3	0.38±0.04	≤ 65	≥ 80	≥ 1.0	≥ 0.35	> 1000	> 3.5	F1
LMW09F	F9	75±5	0.40±0.05	≤ 70	≥ 75	≥ 1.2	≥ 0.4	> 1000	> 4.5	–

High-Efficiency & Ultra-High Efficiency glass fiber Filter Paper

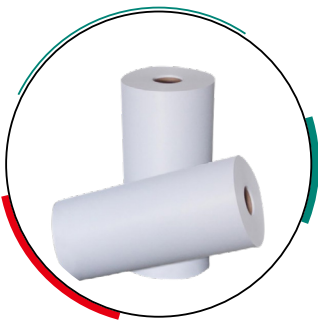
High-efficiency (HEPA) and ultra-high-efficiency (ULPA) glass fiber filter paper are advanced air filtration media made primarily from glass fiber, offering extremely high filtration efficiency. They are mainly used to purify very fine particles in the air, including bacteria, viruses, dust, and other tiny pollutants. They are widely used in places requiring ultra-clean air, such as electronics manufacturing, pharmaceuticals, food processing, laboratories, hospitals, and high-end air purification equipment.



Code Number	Filtration Grade	Basic Weight g/m ²	Thickness mm	Air Resistance Pa	Filtration Efficiency %	MD Tension KN/M	CD Tension KN/M	Stiffness Mg	Water Resistance KPa	Fire Rating
LMW10HX	H10 (Livestock)	73±3	0.38±0.04	≤ 95	≥ 92	≥ 1.0	≥ 0.3	> 1000	> 3.5	F1
LMW10H	H10	75±5	0.4±0.05	≤ 120	≥ 92	≥ 1.2	≥ 0.4	> 1000	> 5.0	–
LMW11H	H11	75±5	0.4±0.05	≤ 180	≥ 98	≥ 1.2	≥ 0.4	> 1000	> 6.0	–
LMW12H	H12	75±5	0.4±0.05	≤ 260	≥ 99.92	≥ 1.2	≥ 0.4	> 1000	> 6.0	–
LMW13H1	H13 (70 g)	70±3	0.35±0.05	≤ 300	≥ 99.95	≥ 1.2	≥ 0.4	> 800	> 5.0	–
LMW13H2	H13	75±5	0.40±0.05	≤ 300	≥ 99.95	≥ 1.2	≥ 0.4	> 1000	> 6.0	–
LMW13HQ	H13 (good water resistance)	75±5	0.40±0.05	≤ 300	≥ 99.95	≥ 1.2	≥ 0.4	> 1000	> 10.0	–
LMW13H2+	H13+	75±5	0.40±0.05	≤ 310	≥ 99.99	≥ 1.2	≥ 0.4	> 1000	> 4.0	–
LMW14H	H14	75±5	0.40±0.05	≤ 380	≥ 99.995	≥ 1.2	≥ 0.4	> 1000	> 6.0	–
LMW14HQ	H14 (good water resistance)	75±5	0.40±0.05	≤ 380	≥ 99.995	≥ 1.2	≥ 0.4	> 1000	> 10.0	–
LMW14H+	H14+	75±5	0.40±0.05	≤ 390	≥ 99.999	≥ 1.2	≥ 0.4	> 1000	> 4.0	–
LMW15U	U15	78±3	0.40±0.05	≤ 400	≥ 99.9995	≥ 1.2	≥ 0.4	> 1200	> 7.5	–

Glass Fiber Composite Material for Hydraulic Filters

Glass fiber composite materials for hydraulic filters are a type of filtration medium specifically used in hydraulic systems. They are made by combining glass fiber with other materials, offering high strength, high filtration efficiency, and good pressure and high-temperature resistance. This material is mainly used for hydraulic filters to filter impurities in hydraulic oil, ensuring the cleanliness and stable operation of the hydraulic system.



Code Number	Basic Weight g/m ²	Thickness mm	Air Permeability L/m ² /s	Max Pore μm	Mean Pore Size μm	Dry Burst Strength Kpa
LM-8001	140±10	0.7±0.1	30±10	≤ 12	≤ 9	> 300
LM-8003	140±10	0.7±0.1	70±10	≤ 23	≤ 16	> 300
LM-8005	140±10	0.7±0.1	100±20	≤ 28	≤ 20	> 350
LM-8010	140±10	0.7±0.1	180±30	≤ 40	≤ 35	> 180
LM-8015	140±10	0.65±0.1	300±50	≤ 45	≤ 40	> 350
LM-8020	140±10	0.7±0.1	350±50	≤ 50	≤ 40	> 200
LM-8030	140±10	0.6±0.1	500±50	≤ 55	≤ 45	> 350
LM-8040	140±10	0.55±0.1	650±50	≤ 70	< 60	> 250
LM-8050	140±10	0.7±0.1	800±50	≤ 80	< 70	> 350



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