

PLM FILTER SOLUTION GROUP

PLM FILTER ADHESIVE



Filter Adhesive Catalogue

Contents

3 **Adhesive**

3 **Working Principle of Adhesives**

4 **Adhesion Theory**

5 **Adhesive Types**

Anaerobic Adhesive

Single-Component Thermosetting Adhesive

PU Adhesive

Two-Component Filter Adhesive

Hot Melt Adhesive

Special Adhesive for Rubber Gasket

Adhesive

Adhesives, also known as glues, binders, or bonding agents, are substances that can join two or more parts or materials together through adhesion and cohesion at the interface, commonly referred to as glue.

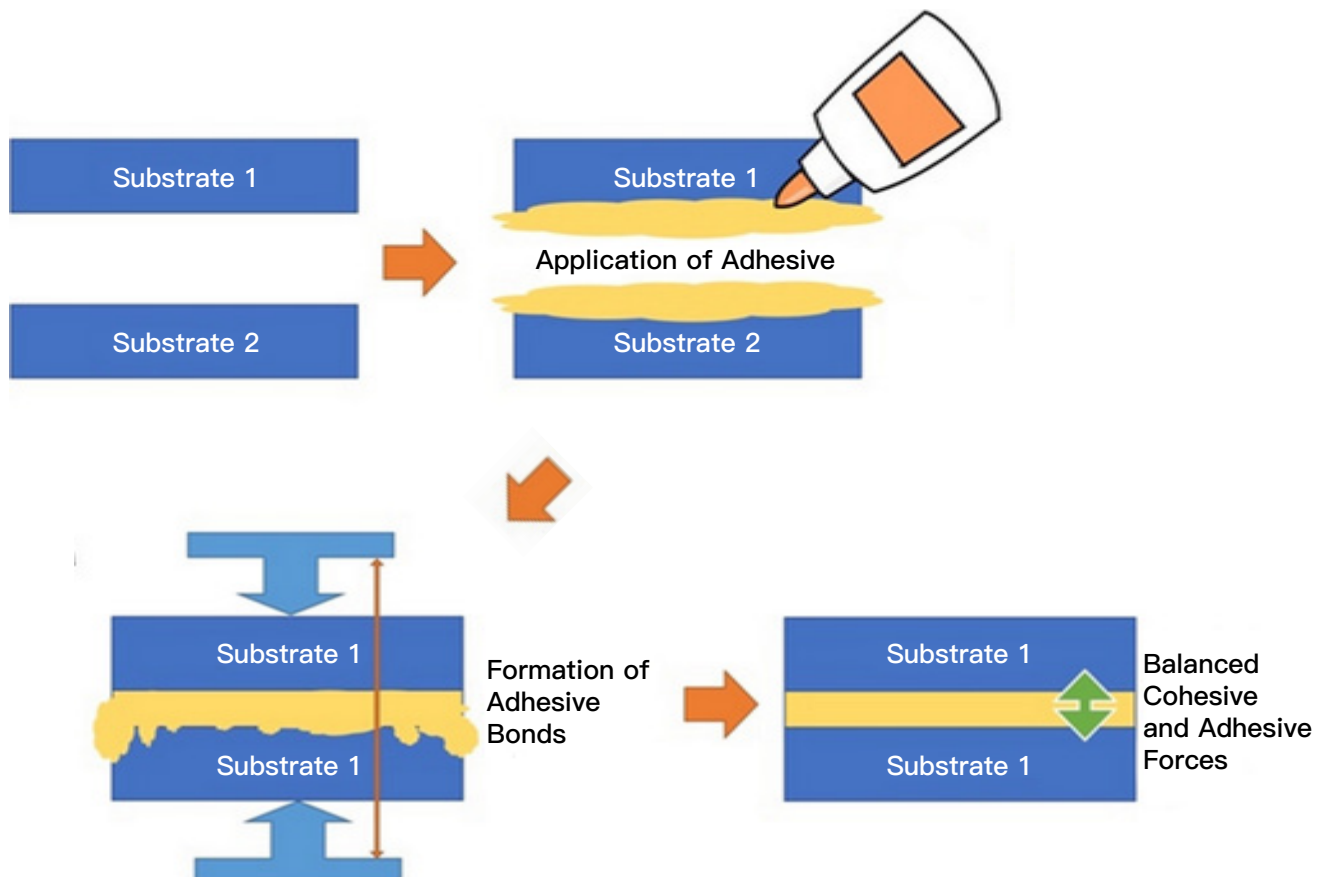
Working Principle of Adhesives

Adhesion

It refers to the state where two surfaces are held together by chemical forces, physical forces, or a combination of both.

Cohesion

It refers to the state where particles within a single substance are held together by primary valence forces (including ionic bonds, covalent bonds, coordination bonds, metallic bonds, etc.) and secondary valence forces (including van der Waals forces, hydrogen bonds).



Adhesion Theory

Adhesive bonding between polymers, between polymers and non-metals or metals, between metals and metals, and between metals and non-metals all involve the issue of interface bonding between polymer matrices and different materials. Bonding is the result of interactions after contact between different material interfaces. Therefore, the role of the interface layer is a fundamental issue in the study of adhesive science. Factors such as the interfacial tension between the adherend and the adhesive, surface free energy, properties of functional groups, and interfacial reactions all affect adhesive bonding. Adhesive bonding is a highly comprehensive technology with complex influencing factors, and existing adhesive bonding theories explain its principles from specific perspectives, so there is no comprehensive and unique theory.

Adsorption Theory (Main Theory)

The theory posits that the primary source of adhesive strength is the molecular forces within the bonding system, namely van der Waals forces and hydrogen bonding forces. Process: The first stage involves the diffusion of liquid adhesive molecules to the surface of the adherend through Brownian motion, bringing the polar groups or segments of the two interfaces closer together. In this process, increasing the temperature, applying contact pressure, and reducing the adhesive viscosity all contribute to the enhancement of Brownian motion. The second stage is the generation of adhesive forces. When the distance between the adhesive and the adhered molecules reaches 5–10Å, an attractive force is generated between the interface molecules, further shortening the distance to a state of maximum stability.

Note: 'Å', pronounced 'Ångström', is a unit of length used in particle physics. The Ångström is a common unit of measurement for the wavelength of light and the diameter of molecules, symbol: 'Å'. The correct pronunciation of Å is 'oh', 'angstrom'.



Theory of Chemical Bond Formation/Chemisorption

The chemical bond theory suggests that, in addition to intermolecular forces, chemical bonds sometimes form between the molecules of the adhesive and the adherend. For example, studies on the adhesive interface between vulcanized rubber and copper-plated metal, the role of coupling agents in adhesion, and the adhesive interface between isocyanates and metal or rubber, all demonstrate the formation of chemical bonds. The strength of chemical bonds is much higher than that of van der Waals forces. The formation of chemical bonds can not only improve adhesion strength but also overcome the drawback of joint failure due to desorption. However, the formation of chemical bonds is not universal. Certain conditions must be met to form chemical bonds, so it is impossible for all contact points between the adhesive and the adherend to form chemical bonds. Moreover, the number of chemical bonds per unit adhesive interface is much smaller than the number of intermolecular forces, so the adhesive strength derived from intermolecular forces cannot be ignored.



Mechanical Force Theory

From a physical chemistry perspective, mechanical action is not a factor in generating adhesive strength, but rather a method to enhance the bonding effect. The adhesive penetrates into the gaps or uneven areas on the surface of the adherend, and after curing, it generates interlocking forces in the interface region. These situations are similar to the joining of nails and wood or the action of tree roots embedding into soil. The essence of mechanical connection force is frictional force. When bonding porous materials, paper, fabrics, etc., mechanical bonding strength is important, but for some solid and smooth surfaces, this effect is not significant.



Diffusion Theory

When two polymers are compatible, they exhibit mutual diffusion due to molecular Brownian motion or segmental movement when they are in close contact. This diffusion occurs across the interface of the adhesive and the adherend, leading to the disappearance of the interface and the formation of a transition zone. The diffusion theory cannot explain the bonding of polymer materials with metals, glass, or other hard substrates because polymers find it difficult to diffuse into such materials.



Adhesive Types

Our company provides adhesives for automotive air filters and HEPA air filters, including anaerobic adhesives, single-component thermosetting adhesives, PU adhesives, two-component filter adhesives, hot melt adhesives, and special adhesive for rubber gasket. The product range is complete and suitable for various complex working conditions of customers.



Anaerobic Adhesive

Anaerobic adhesive is a single-component adhesive used for sealing, locking, fastening, and anti-loosening. It cures in an environment isolated from air (oxygen) and in contact with metal ions. It is widely used in machinery, automotive, aerospace, electronics, and other fields, for thread locking, sealing pipes, securing bearings, and flange sealing. The characteristic of anaerobic adhesive is that it remains liquid when exposed to air. Once air is excluded and it comes into contact with metal ions (such as on surfaces of metals like iron and copper), it undergoes a polymerization reaction, curing rapidly to form a high-strength bond or sealing effect. This characteristic makes anaerobic adhesive very suitable for application in gaps, threads, or joint surfaces between metal components.



Sealing Glue Model	Appearance	Cure Time	Storage Period	Content	Viscosity	Sealing Pressure	Working Temperature
LM1013	Red viscous liquid	30 min	6 months	750 mL	1000-5000 mPa·s (adjustable)	30 MPa	-55 °C to 165 °C

Single-Component Thermosetting Adhesive

A single-component thermosetting adhesive is an adhesive that undergoes a chemical reaction and cures under heating conditions, without the need to mix with other components. Unlike two-component adhesives, single-component adhesives are ready for use upon delivery, and users only need to heat them to a specific temperature to trigger the curing process. After curing, these adhesives typically exhibit good bonding strength, heat resistance, and chemical stability. This type of adhesive is mainly used in fields requiring high-strength and durable bonding, such as bonding electronic components, the automotive industry, aerospace, and the manufacture of filters. Due to its ease of operation, it is suitable for automated production lines and is widely used in various manufacturing industries.



Sealing Glue Model	The Tensile Shear Strength (Steel Bonded Steel)	Tensile Strength ¹	Aging Resistance of Engine Oil	Appearance	Density	Curing Conditions	Volatile Content	Viscosity
LM1712	Normal > 10 kg/cm ²	> 200 N	(135 °C × 192 h) without degumming.	homogeneous viscous liquid	1.5±0.2 g/cm ³	10–20 min (160 °C to 180 °C)	≥ 98%	3000–50000 mPa·s

¹ Peel strength of curved filter paper and metal parts when 5 pleats filter paper with 9.5 mm height and 22 mm width insert into 2.5 mm thick glue

PU Adhesive

PU adhesive is a synthetic adhesive with polyurethane resin as the main component, featuring excellent elasticity, wear resistance, chemical corrosion resistance, and high strength. It is widely used in fields such as construction, automotive, electronics, furniture, textiles, and footwear for bonding, sealing, and caulking between materials. PU adhesive can bond various materials, including metal, plastic, wood, glass, ceramic, and rubber.

PU adhesive plays an important role in various industries due to its versatility, high strength, and environmental performance, meeting the demand for high-performance adhesives in modern manufacturing and construction.



Specifications

PU Glue Type		LM1252	LM1255	LM1335	LM1408	LM1402	LM1508
Shore Hardness		22±5	50±5	22/50±5	80±5	22±5	85±5
Total Density (kg/m ³)		400+150	850+150	400/850+150	850+150	400+150	850+150
Tensile Strength (MPa)		P ≥ 0.8	P ≥ 0.8	P ≥ 0.8	P ≥ 1.2	P ≥ 1.2	P ≥ 1.2
Elongation (%)		≥ 180	≥ 180	≥ 180	≥ 120	≥ 280	≥ 120
Compression Permanent Deformation (%)		≤ 20	≤ 20	≤ 20	≤ 20	≤ 20	≤ 20
Falling Ball Resilience (%)		≥ 50	≥ 50	≥ 50	≥ 50	≥ 50	≥ 50
Mixed Mass Ratio=A:B		100:25	100:25	100:33	100:40	100:40	100:50
Liquid Color	A	Orange	Orange	Orange	Orange	Black	Black
	B	Khaki	Khaki	Khaki	Khaki	Khaki	Brown
Density (g/mL)	A	1.02±0.05	1.02±0.05	1.02±0.05	1.02±0.05	1.02±0.05	1.02±0.05
	B	1.22±0.05	1.22±0.05	1.22±0.05	1.22±0.05	1.22±0.05	1.22±0.05
Viscosity (MPa·s At 25 °C)	A	800–1000	800–1000	800–1000	800–1000	800–1000	800–1000
	B	170–250	170–250	170–250	170–250	170–250	200–250

Applications

Application	LM1408	LM1252	LM1255	LM1335	LM1402	LM1508
Commercial Vehicles	✓	✓		✓	✓	✓
Passenger Cars	✓	✓		✓	✓	✓
Construction Machinery	✓	✓	✓	✓	✓	✓
Vacuum Cleaner	✓		✓	✓	✓	✓
Air Compressors	✓	✓	✓	✓		✓
Industrial Filters	✓		✓	✓		✓
Industrial Dust Removal			✓			✓
Other Air Filters	✓	✓	✓	✓	✓	✓
Oil Filters						✓

Two-Component Filter Adhesive

Two-component filter adhesive is an industrial glue composed of two components, specifically used for manufacturing filter elements. It consists of Component A (usually resin) and Component B (curing agent), which need to be mixed in a certain ratio during use, and after a chemical reaction, it cures to form adhesive strength. Two-component adhesives are widely used in the manufacturing process of filter elements such as air filters, oil filters, and fuel filters, mainly for bonding filter materials and end caps, ensuring the filter element's structural stability, good sealing performance, high temperature resistance, and chemical corrosion resistance. The advantages of this adhesive include adjustable curing speed, high bonding strength, and good durability, making it suitable for use under different environmental conditions.



Specifications

Model		LM1541	LM1641	LM1645	LM1841
Tensile Strength (Steel-Steel) (MPa)		> 4.0	> 4.0	> 4.0	> 4.0
Tensile Shear Strength (Steel-Steel) (MPa)		> 3.0	> 3.0	> 3.0	> 3.0
Tensile Strength of Paper Filter Element (C0304) N		> 700	> 700	> 700	> 700
A:B		5:1	6:1	6:1	8:1
Liquid Color	A	White	White	White	White
	B	Brown	Brown	Brown	Brown
Volatile Content (%)	A	≥ 98	≥ 98	≥ 98	≥ 98
	B	≥ 98	≥ 98	≥ 98	≥ 98
Density (g/mL)	A	1.35±0.1	1.4±0.1	1.3±0.1	1.4±0.1
	B	1.22±0.05	1.22±0.05	1.22±0.05	1.22±0.05
Viscosity (mPa·s at 25 °C)	A	3000–6000	3000–6000	3000–6000	3000–6000
	B	200–250	200–250	200–250	200–250

Note: The above information is for reference only. For specific selections, please consult our sales staff.

Applications

Application	LM1541	LM1641	LM1645	LM1841
Hydraulic Oil Filters	✓			
Dust Filter Elements	✓	✓	✓	
Industrial Filters	✓	✓	✓	
Fuel Filters	✓		✓	
Air Filters	✓		✓	
Air Cleaners & Purifiers		✓	✓	
Viscosity (mPa·s at 25 °C)				✓

Hot Melt Adhesive

Hot melt adhesive is an adhesive that becomes liquid when heated and solidifies upon cooling. Its main component is synthetic resin, and when heated to a certain temperature, the hot melt adhesive becomes fluid and can be easily applied to various surfaces. When the adhesive cools to room temperature, it rapidly cures to form a strong bond. Hot melt adhesive is widely used in packaging, craft making, home repairs, automotive filters, and other fields. It is very convenient to use and offers flexible operation methods.



Automotive – Specifications

Code Number	Material	Melting Speed	High Temperature Resistance (°C)	Low Temperature Resistance (°C)	Viscosity	Softening Point (°C)	Recommended Working Temperature (°C)
LMHB150	EVA	5–8 seconds	80	–	5500–8500 cP (180 °C)	95±5	150–170
LMHP232	EVA	3–5 seconds	100±5	–	5500–8500 cP (180 °C)	110±5	160–180
LMHM180	PO	Moderate	100	-20	6000–10000 cP (180 °C)	110±10	110–120
LMHH190	PA	3–8 seconds	220–240	–	1600–3200 cP (210 °C)	175±5	180–200
LMFT412	PA	8–10 seconds	220–240	–	15000–20000 cP (200 °C)	120±5	180–200

Specifications for HEPA Air Filter (LMBX280)

Appearance	Density	Contents	odor	Melt Condition	Melt Speed
White particles	–	PO (Polyolefin)	Minimal Odor	Colorless and transparent	Medium speed

High Temperature Resistance	Low Temperature Resistant	Viscosity	Softening Point	Glue performance	Recommended Operating Temperature
> 70 °C	–	3000±500 cP (180 °C)	105±5 °C	Uniform & smooth	Box – 150 °C; Hose – 130 °C; Glue nozzle – 130 °C

Special Adhesive for Rubber Gasket

The special adhesive for rubber gasket is an industrial adhesive specifically used for bonding rubber gasket materials. This adhesive has properties tailored for rubber materials, providing good bonding strength and durability. It can effectively bond adhesive gaskets to other materials (such as metal, plastic, wood, etc.) firmly, while also possessing characteristics of shock resistance, wear resistance, high temperature resistance, and chemical corrosion resistance. This adhesive is widely used in the construction field and the automotive filter industry. Its usage is generally simple, allowing for quick curing and maintaining long-term stability.



Sealing Glue Model	LM1011	LM1012
Appearance	colorless transparent liquid	colorless transparent liquid
Cure Time	1 minute	10 seconds
Storage Period	12 months	6 months
Weight/Net Content	1000 g	750 mL
Viscosity	2–5 mPa·s	2–5 mPa·s
Tensile Shear Strength	≥ 10 MPa	≥ 10 MPa



**Design,
Supply & Support**

One Stop Solution to your Filters Production

PLM Filter Solution Group

A leading supplier of automotive filtration and clean air solutions.

ADD: East of Anping County, Hengshui City, Hebei Province, China. 053600

TEL: +86-15131850885

WhatsApp: +86-15131850885

E-MAIL: info@pmfiltersolution.com

WEB: www.pmfiltmaterial.com

