
**Woqin Trade Makes the World a Better Place**

沃勤贸易，让世界更美好

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公司简介

河北沃勤贸易有限公司是一家专业的气凝胶保温材料出口企业，总部位于河北省石家庄市。我们专注于为石油天然气、建筑和工业领域全球客户提供高性能、节能的保温解决方案。

我们的使命是提供创新、环保的产品，帮助客户降低能耗、提升安全。



CN Watching

# About Us
# 关于我们

Company Profile Hebei Woqin Trading Co., Ltd. is a professional exporter of advanced aerogel insulation materials. Located in Shijiazhuang, Hebei Province, we focus on providing high-performance, energy-saving solutions for global customers in oil & gas, construction, and industrial sectors。

Our mission is to deliver innovative, eco-friendly products that reduce energy consumption and enhance safety。

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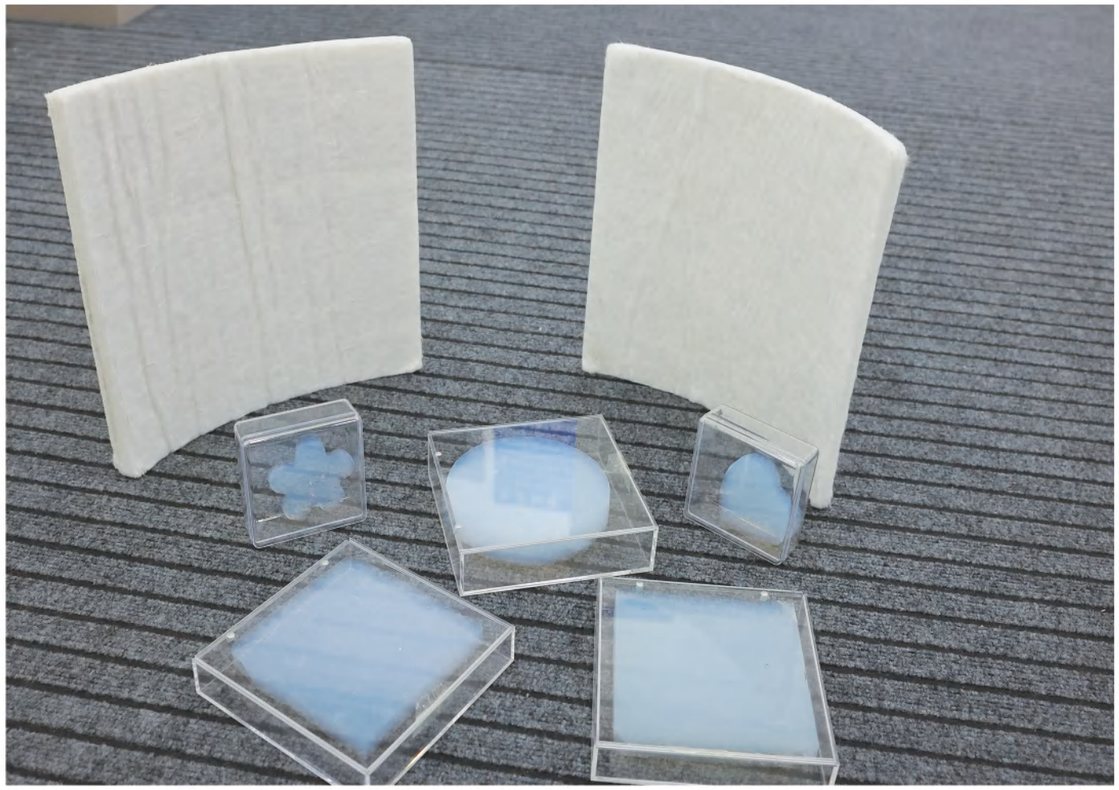

# Overview of aerogel
# 气凝胶概述

Silicon dioxide is the main substance that makes up our world today, and it is ubiquitous in various forms. The material value gap varies greatly from integrated circuits to glass curtain walls with different structures. The project we are showing today is a kind of porous silica: aerogel. It is a three-dimensional network pore structure formed by the accumulation of silica colloidal particles in space. It is the lightest solid in the world and has the lowest solid thermal conductivity. It is a super insulating material and adsorbent material.

二氧化硅是构成我们今天世界的主要物质，它无处不在形态各异从集成电路到玻璃幕墙不同结构的材料价值差距有着天壤之别。今天我们展示的项目就是一种多孔结构的二氧化硅：气凝胶。它是由二氧化硅胶体颗粒在空间堆积成立体网状的孔隙结构是世界上最轻的固体拥有最低的固态导热系数是一种超级绝热材料和吸附材料。



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# Introduction to aerogel
# 气凝胶简介

Aerogel, also known as dry gel in English, is a gel obtained by chemical solution reaction, forming sol, and then gel. It is a porous material (close to air density) filled with gas in a spatial network structure after removing most of the solvents in the gel. Aerogel is a solid material form, super light, is the lightest solid material known at present, also known as "solidified smoke", "blue smoke". Aerogel is the only choice in some scenarios where the requirements for weight and insulation are very strict.

气凝胶英文名Aerogel，又称为干凝胶，是经过化学溶液反应，形成溶胶，再凝胶化获得的凝胶，是除去凝胶中的大部分溶剂，获得的一种空间网状结构中充满气体，外表呈固体状密度极低的（接近空气密度）多孔材料。气凝胶是一种固体物质形态，超级轻，是目前已知最轻的固体材料，也被称为“凝固的烟”、“蓝烟”。在一些对重量要求苛刻同时对绝热要求极高的场景，气凝胶是唯一选择。

# Characteristics of aerogel
# 气凝胶特性

1. The porosity is very high, up to 99.8%;
2. Nano scale pores (20-100nm) and three-dimensional nano skeleton particles (2-5nm);
3. High specific surface area, up to 1000 ㎡/g;
4. Low density, can be as low as 0.003g/cm ³;
5. The unique structure of aerogel determines its extremely low thermal conductivity, which can be as low as 0.012W/(m · K) at room temperature

1、孔隙率很高，可高达99.8%；
2、纳米级别孔洞(20～100nm)和三维纳米骨架颗粒(2～5nm)；
3、高比表面积，可达1000㎡/g；
4、低密度，可低至0.003g/cm³；
5、气凝胶独特的结构决定了其具有极低的热导率，常温下可以低至0.012W/(m·K)

# Types of aerogels
# 气凝胶种类

## Aerogel felt 气凝胶毡

### Product Introduction产品介绍

Aerogel felt is a kind of flexible thermal insulation material, which is made of silica aerogel as the main material and compounded in reinforced fibers, such as glass fiber and preoxidized fiber, through special process.

气凝胶毡是把二氧化硅气凝胶为主体材料，并复合于增强性纤维中，如玻璃纤维、预氧化纤维，通过特殊工艺合成的柔性保温材料。

### Product Features产品特点

Aerogel felt has the characteristics of softness, easy cutting, low density, inorganic fire prevention, overall hydrophobic, green and environmental protection, which can replace the traditional flexible insulation materials with poor environmental protection and insulation performance, such as glass fiber products, asbestos insulation felt, silicate fiber products, etc.

气凝胶毡具有柔软、易裁剪、密度小、无机防火、整体疏水、绿色环保等特性，其可替代玻璃纤维制品、石棉保温毡、硅酸盐纤维制品等不环保、保温性能差的传统柔性保温材料。

### Product advantages 产品优点

1. Excellent insulation effect
2. Reduce the thickness of the insulation layer
3. Hydrophobicity and Fireproof
4. Convenient construction
5. Save transportation costs

1.优异的隔热效果
2.减少保温层厚度
3.憎水性和防火性
4.施工方便
5.节省运输费用



### Physical property 物理性能

Thickness: 3-30mm
Width: Approximately 1.5 meters
Density: 160-240kg/m $^3$
Applicable temperature: -200 ℃~1000 ℃ (depending on the specific product)
Hydrophobicity: There are two types: hydrophilic and hydrophobic (depending on the specific product)
Thermal conductivity: 0.02~0.1W/(m · k) (depending on the specific product)

厚度：3-30mm
宽度：1.5米左右
密度：160～240kg/m$^3$
适用温度：-200℃~1000℃ (与具体产品相关)
疏水性：有亲水型和疏水型两种 (与具体产品相关)
导热系数：0.02~0.1W/(m·k) (与具体产品相关)

### Packaging form 包装形式

Roll shaped

卷状

Block-shaped

块状

### Application scope 应用范围

Air gel felt is mainly used for thermal insulation of industrial pipelines, storage tanks, industrial furnace bodies, power plants, life saving cabins, warship bulkheads, motor cars, directly buried pipelines, injection molding machines, removable insulation sleeves, high-temperature steam pipelines for heavy oil exploitation, transportation, household appliances, steel, non-ferrous metals, glass and other fields.

气凝胶毡主要用于工业管道、储罐，工业炉体，电厂，救生舱，军舰舱壁，动车，直埋管道，注塑机，可拆卸式保温套，稠油开采高温蒸汽管道，交通运输，家用电器，钢铁，有色金属，玻璃等领域的保温隔热。

# Types of aerogels
# 气凝胶种类

## Aerogel block 气凝胶块

### Product Introduction 产品介绍

Aerogel block is a typical nano porous material, which is a highly dis persed three-dimensional porous solid material with gas as the dispersion medium. Its pore size ranges from 1-100nm, with a porosity of 80% -99.8%, mostly semi transparent, and extremely light in weight. It is also known as "solid smoke" or "frozen smoke".

气凝胶块是一种典型的纳米多孔材料，由胶体粒子或高分子相互聚集而成，以气体作为分散介质的高分散三维多孔固体材料。其孔隙尺寸在1-100nm范围，孔隙率在80%-99.8%，多呈半透明状，质量极轻，也被称为“固态烟”或“冷冻烟雾”。

### Product Features 产品特点

Aerogel blocks have extremely low density, excellent thermal insulation, good thermal stability, super hydrophobic, low sound speed, unique optical and diverse electrical properties, and multiple production methods.

气凝胶块具备极低密度、卓越隔热、良好的热稳定性、超强疏水、低声速、独特光学及多样电学特性，且制作方法多元。

### Physical property 物理性能

Porosity: 80%~99.8%
Density: 0.003-0.5g/cm $^3$
Large specific surface area: can reach several hundred or even thousands of square meters per gram
Thermal conductivity: 0.01~0.03W/(m · k)

孔隙率：80%~99.8%
密度：0.003～0.5g/cm$^3$
比表面积大：可高达几百甚至上千平方米每克
导热系数：0.01~0.03W/(m·k)





### Preparation Method 制备方法

Preparation of wet gel: usually, the sol gel method is used. First, the precursor, surfactant and catalyst are dispersed in the solvent. Through hydrolysis and polycondensation, the sol is formed, and then the wet gel with a certain spatial structure is generated.
Drying: mainly includes supercritical drying method, subcritical drying method, atmospheric pressure drying method, freeze-drying method, etc. Due to equipment and cost considerations, atmospheric pressure drying method is often used.

湿凝胶的制备：通常采用溶胶-凝胶法，先将前躯体与表面活化剂、催化剂分散在溶剂中，通过水解、缩聚反应，形成溶胶，进而生成具有一定空间结构的湿凝胶。
干燥：主要包括超临界干燥法、亚临界干燥法、常压干燥法和冷冻干燥法等，出于设备和成本考虑，常采用常压干燥法。

### Application scope 应用范围

Aerospace: Manufacturing insulation materials, heat-resistant tiles, etc. for spacecraft
Industry: Used for insulation and heat preservation of high-temperature equipment and pipelines, which can effectively reduce heat loss and improve energy utilization efficiency
Architecture: It can be combined with ordinary glass to create a new type of building material with insulation, fire resistance, flame retardancy, sound insulation, light transmission and other properties
New energy: can be used for hydrogen storage and can also serve as insulation material for thermal runaway of ternary batteries
。

航空航天：制造航天器的隔热材料、防热瓦等
工业：用于高温设备、管道的保温隔热，能有效减少热量散失，提高能源利用效率
建筑：可与普通玻璃结合，制成具有绝热、防火阻燃、隔音、透光等性能的新型建筑材料
新能源：可用于储氢，还能作为三元电池热失控隔热材料。

# Types of aerogels
# 气凝胶种类

## Aerogel powder 气凝胶粉

### Product Introduction 产品介绍

Aerogel powder is an ultra light and high-performance powder material with nano porous network structure.

气凝胶粉是一种具有纳米级多孔网状结构的超轻、高性能粉末材料。

### Product Features 产品特点

Aerogel powder has the characteristics of ultra clear density, excellent heat insulation, high porosity and large specific surface area, good chemical stability, unique optical performance, excellent acoustic performance, waterproof and hydrophobic.

气凝胶粉具有超清密度、优异隔热、高孔隙率与大比表面积、良好的化学稳定性、独特的光学性能、出色的声学性能和防水疏水等特性。

### Preparation Method 制备方法

The sol gel method is used to mix the silicon source, solvent, catalyst, etc. to form a solvent, which is then hydrolyzed and polycondensationed to form a wet gel; Then the solvent in the wet gel is removed by supercritical drying, subcritical drying, atmospheric drying or freeze drying, and finally the aerogel powder is obtained. Among them, the atmospheric pressure drying method has lower costs and is suitable for large-scale production.

采用溶胶-凝胶法，将硅源、溶剂、催化剂等混合形成溶剂，经过水解和缩聚反应生成湿凝胶；再通过超临界干燥、亚临界干燥、常压干燥或冷冻干燥等方法去除湿凝胶中的溶剂，最终得到气凝胶粉。其中，常压干燥法成本较低，适合大规模生产。





### Product advantages 产品优点

1. Energy saving and efficient: Excellent insulation performance significantly reduces energy consumption, with obvious advantages in the fields of energy and construction
2. Flexible design: It can be combined with various materials to meet the diverse design needs of different industries and products.
3. Safety and environmental protection: chemically stable, non-toxic and harmless, will not produce harmful substances, and is environmentally friendly
4. Strong durability: It has good chemical stability and physical properties, long service life, and reduces replacement and maintenance costs

1.节能高效：优异的隔热性能大幅降低能源消耗，在能源和建筑领域优势明显。
2.设计灵活：可与多种材料复合，满足不同行业和产品的多样化设计需求。
3.安全环保：化学性质稳定，无毒无害，不会产生有害物质，对环境友好。
4.耐用性强：具备良好的化学稳定性和物理性能，使用寿命长，减少更换和维护成本。

### Application scope 应用范围

Energy: Used for insulation and heat preservation of solar water heaters, insulated pipelines, industrial boilers, and heat exchangers
Architecture: As a building insulation material, it can be added to coatings, boards, and wall materials
Aerospace: Manufacturing insulation materials for spacecraft, satellite components, aerospace engine insulation components, etc
Transportation: Thermal insulation and sound insulation materials for vehicles such as cars and high-speed trains; Used in electric vehicle battery packs
Environmental protection field: used for sewage treatment and air purification

能源：用于太阳能热水器、保温管道、工业锅炉及热交换器的保温隔热。
建筑：作为建筑保温材料，可添加到涂料、板材、墙体材料中。
航空航天：制造航天器的隔热材料、卫星部件、航空发动机隔热部件等。
交通运输：汽车、高铁等交通工具的隔热、隔音材料；在电动汽车电池组中使用。
环保领域：用于污水处理和空气净化。

# Types of aerogels
# 气凝胶种类

## Aerogel coating 气凝胶涂料

### Product Introduction 产品介绍

Aerogel gel coating is made by high-speed dispersion process with aerogel as key functional filler, film forming resin, additives, solvents and other pigments and fillers.

气凝胶涂料，是以气凝胶为关键功能性填料，搭配成膜树脂、助剂、溶剂以及其他颜填料，经高速分散工艺制得。

### Product Features 产品特点

Aerogel coating has the characteristics of super strong heat insulation and heat preservation, light weight, environmental protection, fire resistance and flame retardancy, sound insulation and noise reduction, adsorption purification, good temperature resistance, etc.

气凝胶涂料具备超强隔热保温、轻质环保、防火阻燃、隔音降噪、吸附净化、耐温性好等特点。

### Application scope 应用范围

Architecture: Used for the interior and exterior walls of buildings, as well as for roofs, basements, and other areas; Industry: oil storage, pipelines, reaction vessels in the petrochemical industry, power generation equipment in the power industry, high-temperature furnaces in the metallurgical industry, etc; Aerospace: used for aircraft shells, engine components, etc; Transportation: Used for car engine compartments, high-speed rail cars, ships, etc

建筑：用于建筑内外墙，也适用于屋顶、地下室等部位;工业：石油化工的油储、管道、反应釜，电力行业的发电设备，冶金行业的高温炉等;航空航天：用于飞行器外壳、发动机部件等;交通运输：用于汽车发动舱、高铁车厢、船舶等。





### Product advantages 产品优点

Compared with traditional coatings and thermal insulation materials, aerogel coatings have significant advantages in thermal insulation, fire prevention, sound insulation and other properties, and are easy to construct, long in service life, and low in comprehensive cost.

相对于传统涂料和保温材料，气凝胶涂料在隔热、防火、隔音等性能上具有显著优势，且施工便捷、使用寿命长、综合成本低。

### Construction method 施工方法

It can be applied by spraying, rolling, scraping and other methods, with simple construction and the ability to adapt to surfaces of different shapes and materials.

可采用喷涂、滚涂、刮涂等方式，施工简便，能适应不同形状和材质的表面。

### Construction procedure 施工步骤

Before construction, the base layer should be cleaned to ensure that the surface is smooth, free of dust and oil stains; Then, according to the type and requirements of the coating, apply the primer, intermediate coat, and topcoat in sequence, paying attention to the drying time and thickness control of each coating.

施工前要先进行基层清理，确保表面平整、无灰尘、无油污；然后根据涂料类型和要求，依次进行底涂、中涂、面涂施工，注意每道涂层的干燥时间和厚度控制。

### Construction precautions 施工注意事项

The construction temperature environment should be between 5 ℃ and 35 ℃, and the relative humidity should not exceed 85%; Avoid construction in adverse weather conditions such as strong winds and rainy days; Pay attention to ventilation and wear protective equipment during the construction process.

施工温度环境应在5℃-35℃之间，相对湿度不高于85%；避免在大风、雨天等恶劣天气下施工；施工过程中注意通风，佩戴防护用品。

# Installation Guide
# 安装指导

## 1.Preparation before construction 施工前准备

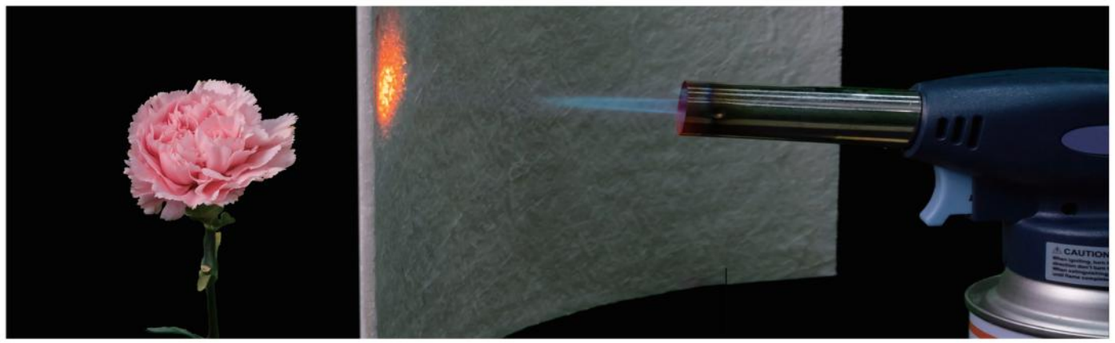
Material acceptance:
Check the specification, model, thickness and other parameters of the aerogel thermal insulation felt to ensure that it meets the design requirements. For example, high temperature pipes need to use products with corresponding high temperature resistance grades. Check the appearance for damage, cracks, and holes. The surface should be smooth and have a uniform color. If there are defects, they should be replaced in a timely manner. Sampling and testing key performance indicators such as thermal conductivity and hydrophobicity to ensure material quality meets standards.
Tool preparation:
Cutting tools: sharp art knives, professional cutting equipment, used for precise cutting of insulation felt. Fixed materials: stainless steel wire, galvanized iron wire, steel strip, etc., selected according to the diameter of the pipeline and working conditions to ensure firm and corrosion-resistant fixation. Sealing materials: sealing tape, silicone sealant, used for joint and interface sealing to prevent heat and moisture from penetrating. Measurement tools: tape measure, caliper, level, assist in accurately measuring pipeline dimensions, ensuring precise installation of insulation felt.
Pipeline pretreatment:
Thoroughly remove dirt, rust, and dust from the surface of the pipeline using methods such as sandblasting, wire brushing, and chemical cleaning. For pipelines with heavy oil stains, degrease them first and then polish them. Repair the surface protrusions and depressions of the pipeline to control the outer diameter deviation within the allowable range. Generally, the outer diameter deviation of industrial pipelines should not exceed ± 5mm to ensure a tight fit of the insulation felt.
材料验收：
核对气凝胶绝热毡的规格、型号、厚度等参数，确保其符合设计的要求，如高温管道需选用相应耐高温等级的产品。检查外观有无破损、裂缝、孔洞，表面应平整，色泽均匀，若有缺陷应及时更换。抽样检测导热系数、憎水性等关键性能指标，保证材料质量达标。
工具准备：
裁剪工具：锋利美工刀、专业切割设备，用于精确裁剪绝热毡。固定材料：不锈钢丝、镀锌铁丝、钢带等，依据管道直径与工况选择，确保固定牢固且耐腐蚀。密封材料：密封胶带、硅酮密封胶，用于接缝，接口密封，防止热量三十与水汽渗入。测量工具：卷尺、卡尺、水平仪，辅助精确测量管道尺寸，保障绝热毡铺设精准。
管道预处理：
彻底清除管道表面污垢、铁锈、灰尘，可采用喷砂、钢丝刷打磨、化学清洗等方法，油污重的管道先脱脂再打磨。修复管道表面凸起、凹陷，使其外径偏差控制在允许范围内，一般工业管道外径偏差不超过±5mm，保证绝热毡紧密贴合。



## 2.Cutting of insulation felt 绝热毡裁剪

Size calculation:
Calculate the width of the insulation felt based on the formula C=π d (where d is the diameter of the pipeline), taking into account a 30-50mm overlap width on each side. The actual cutting width is the sum of the pipeline circumference and the width of the construction on both sides.
Crop operation:
Use cutting tools to calculate the cutting size in sequence. The cut should be neat and straight, avoiding jagged or skewed edges. For large-area cutting, templates can be used to assist in improving efficiency and accuracy.
尺寸计算：
根据管道周长公式C=πd（d为管道直径）算出绝热毡宽度，考虑每侧30-50mm搭接宽度，实际裁剪宽度为管道周长加两侧搭建宽度之和。
裁剪操作：
用裁剪工具依次计算裁剪尺寸，切口要整齐、笔直，避免锯齿状或歪斜，大面积裁剪可用模版辅助提升效率与精度。

# Installation Guide
# 安装指导



## 3.Laying and fixing 铺设与固定

Laying sequence:
The straight pipe section is laid section by section along the axial direction, and when there are branches or fittings, the main pipe is laid first and then the branch pipe is laid to ensure continuity and integrity. When laying, pay attention to the direction of the insulation felt fibers being perpendicular to the direction of the pipeline heat flow. If the heat flow of the hot water pipeline spreads outward, the fibers will surround the pipeline in a circular shape.
Fixed method:
Small diameter pipes (less than 100mm) are fixed with stainless steel wire or galvanized iron wire wrapped at a spacing of 150-200mm to ensure a tight and secure fit. Large diameter pipelines (greater than 100mm) should be initially fixed with steel strips at a spacing of 300-500mm, and then tightly wrapped with iron wire to avoid damaging the insulation felt during fixing. At bends, tees, and other pipe fittings, cut them into suitable curved sections and fix them with customized clamps or flexible sealing materials combined with iron wires. The curvature of the clamps should be adapted to the pipe fittings, and sealed with tape to prevent heat leakage.

铺设顺序：
直管段从一段沿轴向逐段铺设，有分支或管件时先主管后支管，确保连续性与完整性。铺设时注意绝热毡纤维方向与管道热流方向垂直，如热水管道热流向外扩散，纤维呈环形环绕管道。
固定方式：
小直径管道（小于100mm）用不锈钢丝或镀锌铁丝缠绕固定，缠绕间距150-200mm，保证紧贴不松动。大直径管道（大于100mm）先用钢带初步固定，间距300-500mm，再用铁丝加密缠绕，固定时避免勒坏绝热毡。弯头、三通等管件处，剪成合适弧形段，用定制卡箍或柔性密封材料配合铁丝固定，卡箍弧度需适配管件，垫密封胶带防止热量泄露。



## 4.Interface and seam treatment 接口与接缝处理

Interface sealing:
When installing in sections, align adjacent insulation felt interfaces and tightly wrap them with sealing tape along the interface, with a width of not less than 50mm. Silicone sealant can be applied to high-temperature and high-pressure pipelines to enhance sealing.
Seam treatment:
The longitudinal seams should be staggered by no less than 100mm to avoid heat conduction channels; Horizontal seams should be treated with sealing tape or adhesive, and the seam width can be filled with insulation material debris before sealing to ensure insulation effect.

接口密封：
分段安装时，相邻绝热毡接口对齐，用密封胶带沿接口紧密缠绕，宽度不小于50mm，高温高压管道可加涂硅酮密封胶增强密封。
接缝处理：
纵向接缝相互错开不小于100mm，避免热传导通道；横向接缝用密封胶带或胶处理，缝宽可先填绝热材料碎末再密封，确保隔热效果。

# Installation Guide
# 安装指导

## 5.Installation of protective layer 防护层安装

Selection of protective layer:
Generally, metal protective layers such as galvanized iron sheet and aluminum plate are selected for industrial environments, which have mechanical strength and corrosion resistance; Fireproof asbestos cloth, ceramic fiber cloth, etc. are used in places with fire prevention requirements (such as petrochemical pipelines).
Installation of protective layer:
Cut the protective layer material according to the size of the pipeline, and connect or rivet the metal protective layer with a tight and flat bite, with a riveting spacing of 100-150mm; Non metallic protective layers such as fire-resistant asbestos cloth should be wrapped with appropriate elasticity and fixed with iron wire or tape. After installation, check for looseness or damage and repair them in a timely manner.

防护层选型：
一般工业环境选镀锌铁皮、铝板等金属防护层，具有机械强度与耐腐蚀性；有防火要求场所（如石油化工管道）用防火石棉布、陶瓷纤维布等。
防护层安装：
按管道尺寸裁剪防护层材料，金属防护层用咬口连接或铆接，咬口紧密平整、铆接间距100-150mm；非金属防护层如防火石棉布采用缠绕方式，松紧适度并用铁丝或胶带固定，安装后检查有无松动、破损并及时修复。



## 6.Quality inspection and acceptance 质量检查与验收

Appearance inspection: check whether the air gel thermal insulation felt is laid smoothly and tightly, and whether there is hollowing, cracks and falling off; Whether the moisture-proof layer is damaged or wrinkled, and whether the sealing of the construction joints is intact; Whether the installation of the metal protective layer is firm, and whether there is any deformation, scratches, etc. on the surface.
Thickness measurement:Using tools such as calipers and ultrasonic thickness gauges, randomly select multiple measurement points at different parts of the pipeline to measure the total thickness of the insulation layer (including insulation felt, moisture-proof layer, and protective layer. If the designed total thickness is 50mm, the measured deviation should be within ± 5mm), ensuring that the design requirements are met and the insulation effect is guaranteed.
Adhesive strength test:Select a certain number of test points, test the adhesive strength between the aerogel insulation felt and the pipe surface by professional tensile test equipment according to the standard method. Generally, the adhesive strength of civil building pipe insulation is required to be no less than 0.1MPa. Industrial pipes have higher requirements according to the specific working conditions, such as the adhesive strength of chemical engineering pipes is not less than 0.2MPa. If it does not meet the standard, rework it in time.
Thermal performance testing:If conditions permit, use equipment such as heat flow meters and infrared thermal imagers to simulate actual working conditions and conduct thermal performance tests on the installed insulation pipelines. Compare the allowable heat loss values in the design, and if actual heat loss exceeds the standard, investigate and modify the quality and installation process of the insulation felt to ensure energy-saving and efficient pipeline operation.

外观检查：检查气凝胶绝热毡铺设是否平整、紧密，有无空鼓、裂缝、脱落现象；防潮层有无破损、褶皱，搭建缝密封是否完好；金属保护层安装是否牢固，表面有无变形、划伤等。
厚度测量：使用卡尺、超声波测厚仪等工具，在管道不同部位随机抽取多个测量点，测量保温层总厚度（含绝热毡、防潮层、保护层，如设计总厚度50mm，实测偏差应在±5mm范围内），确保满足设计要求，保证保温效果。
粘结强度测试：选取一定数量测试点，通过专业拉力测试设备，按照标准方法测试气凝胶绝热毡与管道表面粘结强度，一般民用建筑管道保温要求粘结强度不低于0.1MPa，工业管道依据具体工况有更高要求，如化工管道粘结强度不低于0.2MPa，若不达标及时返工。
热工性能检测：在条件允许下，使用热流计、红外热像仪等设备，模拟实际工况对已安装保温管道进行热工性能测试，对比设计允许的热损失值，如发现实际热损失超标，排查绝热毡质量、安装工艺等问题并整改，确保管道运行节能高效。

# Application area
# 应用领域

## Thermal insulation field
### 隔热保温领域

### 1.Industrial insulation 工业保温

It can be used for insulation of pipelines, storage tanks, and other equipment in industries such as petroleum, chemical, and power, effectively reducing heat loss and energy consumption. Compared with traditional thermal insulation materials, aerogel thermal insulation materials have thinner thickness, lighter weight and better thermal insulation effect.

可用于石油、化工、电力等行业的管道、储罐等设备的保温，能有效减少热量损失，降低能源消耗。与传统保温材料相比，气凝胶保温材料的厚度更薄，重量更轻 ，保温效果更好。

### 2.Building insulation 建筑保温

Adding aerogel to building walls, roofs and other structures can improve the thermal insulation performance of buildings, reduce the energy consumption of air conditioning and heating, and achieve energy conservation and emission reduction. At the same time, aerogel also has a good sound insulation effect, which can improve indoor comfort.

将气凝胶添加到建筑墙体、屋顶等结构中，可提高建筑物的隔热性能，降低空调和暖气的能耗，实现节能减排。同时，气凝胶还具有良好的隔音效果，能提高室内的舒适度。

### 3.Cold-chain transportation 冷链运输

Used for insulation of cold chain equipment such as refrigerated trucks and cold storage facilities, it helps to maintain a low-temperature environment and ensure the quality of perishable items such as food and medicine during transportation and storage.

用于冷藏车、冷库等冷链设备的保温，有助于保持低温环境，确保食品、药品等易腐物品在运输和储存过程中的质量。



## Aerospace field
### 航空航天领域

### 1.Aircraft insulation 飞行器隔热

Aerogel can be used as thermal insulation material for aircraft wings, fuselage and other parts, which can withstand extreme temperature changes and protect the internal structure and equipment of aircraft from high temperature. Its low-density characteristics can effectively reduce the weight of the aircraft, improve fuel efficiency and flight performance.

气凝胶可以作为飞行器机翼、机身等部位的隔热材料，能够承受极端的温度变化，保护飞行器内部的结构和设备不受高温影响。其低密度特性还能有效减轻飞行器的重量，提高燃油效率和飞行性能。

### 2.Space exploration 太空探索

In space probes, satellites and other spacecraft, aerogels can be used for heat insulation, buffering and protection of sensitive equipment.
For example, NASA's Stardust probe uses aerogel to collect cometary dust, and the special structure of aerogel can capture dust particles without damaging them.

在太空探测器、卫星等航天器中，气凝胶可用于隔热、缓冲和保护敏感设备。
例如，美国国家航空航天局（NASA）的 “星尘” 号探测器就使用了气凝胶来收集彗星尘埃，气凝胶的特殊结构能够在不损坏尘埃颗粒的情况下将其捕获。

# Application area
# 应用领域

## Electronic and electrical field
### 电子电气领域

### 1.Battery insulation 电池隔热

Aerogel can be used as the thermal insulation material of lithium ion battery, which can effectively prevent the heat transfer generated during the charging and discharging process of the battery, prevent the battery from overheating, and improve the safety and stability of the battery.
At the same time, aerogel also has good insulation performance, which helps to avoid battery short circuit and other problems.

气凝胶可作为锂离子电池的隔热材料，能够有效阻止电池在充放电过程中产生的热量传递，防止电池过热，提高电池的安全性和稳定性。
同时，气凝胶还具有良好的绝缘性能，有助于避免电池短路等问题。

### 2.Electronic device heat dissipation 电子设备散热

Some high-performance electronic devices, such as computer chips, servers, etc., generate a large amount of heat during operation.
Aerogel can be used as a heat dissipation material to quickly dissipate heat, ensure the normal operation of electronic equipment, and improve its reliability and service life.

一些高性能电子设备，如计算机芯片、服务器等，在运行过程中会产生大量热量。
气凝胶可以作为散热材料，将热量快速散发出去，保证电子设备的正常运行，提高其可靠性和使用寿命。





## Environmental protection field
### 环境保护领域

### 1.Water purification 水体净化

Aerogel has a strong adsorption capacity for oil in water, and its porous structure can quickly absorb oil molecules to form a stable adsorption layer, so as to achieve oil-water separation.
In addition, the aerogel can also improve the adsorption performance of heavy metal ions through surface modification and other methods, effectively remove harmful heavy metal ions such as lead, mercury, cadmium, etc. in the water, so as to achieve the purpose of purifying water quality.

气凝胶对水中的油污具有很强的吸附能力，其多孔结构能够快速吸附油污分子，形成稳定的吸附层，从而实现油水分离。
此外，气凝胶还可以通过表面改性等方法，提高对重金属离子的吸附性能，有效去除水中的铅、汞、镉等有害重金属离子，达到净化水质的目的。

### 2.Air purification 空气净化

Aerogel can be loaded with activated carbon, photocatalyst and other functional materials for air purifier. While adsorbing harmful gases, it can also decompose some harmful gases into harmless substances through photocatalytic action, such as decomposing formaldehyde into carbon dioxide and water.

气凝胶可以负载活性炭、光催化剂等功能材料，用于空气净化器中。在吸附有害气体的同时，还能通过光催化作用将部分有害气体分解为无害物质，如将甲醛分解为二氧化碳和水。

# Cooperation commitment

Case Studies

· Saudi Arabia pipeline project: Reduced heat loss by 40%

· European passive house: Achieved ultra-thin wall insulation

· Indian refinery: Enhanced safety with fire-resistant aerogel

应用案例

· 沙特管道项目：热损失降低40%

· 欧洲被动房：实现超薄墙体保温

· 印度炼厂：提升防火安全

# 合作承诺



## Service Satisfaction Guarantee 服务满意保障

The company regularly follows up on customer needs to ensure that service quality meets customer expectations. The company's account manager will regularly communicate with clients to understand Customer needs and feedback, timely resolution of issues and improvement of services.

公司定期跟进客户需求，确保服务质量满足客户期望。公司的客户经理将定期与客户沟通，了解客户的需求和反馈，及时解决问题和改进服务。

## Service Support 服务支持

Pre sales professional consultation, precise recommendations; Follow up throughout the sales process and coordinate demand; Quick after-sales response and clarification of doubts.

售前专业咨询，精准推荐；售中全程跟进，协调需求；售后快速响应，解疑释惑。

## Cooperative innovation 合作创新

We are willing to work together to explore the application of new materials and technologies, and jointly promote customized products according to the market. We wish you a leading position.

愿携手探索新材、新技术应用，依市场共推定制产品，祝您领占先机。

**Woqin Trading is willing to work together with you to create excellent results and look forward to cooperation!**

沃勤贸易愿与您携手共进，共创佳绩，期待合作！