广东凯盾新材料有限公司
Guangdong Kaidun New Material Co., LTD

KAI DUN
凯盾

广东凯盾新材料有限公司

新型碳化纤维防火材料的应用及产品推介

Application and product promotion of new carbon fiber fireproof materials

- 手机：186-0157-8985 181-4496-2927
- 固话：0757-87785772
- 官网：http://www.kdppta.com
- 地址：广东省佛山市三水区云东海街道科庆路1号21栋
- Mobile phone：86+186-0157-8985 86+181-4496-2927
- Landline：0757-87785772
- Official Website：http://www.kdppta.com
- Address: No. 1, Keqing Road, Building 21, Yundonghai Sub-district, Sanshui District, Fan City, Guangdong Province

目录

C O N T E N T

01

凯盾新材公司简介

Introduction to Kaidun New Materials Company

PART ONE

01 凯盾新材公司简介

Introduction to Kaidun New Materials Company

广东凯盾新材料有限公司
Guangdong Kaidun New Material Co., LTD

KAI DUN 凯盾

广东凯盾新材料有限公司是从事研发、生产、销售高性能纤维材料纺织品的科技型企业。拥有江苏工厂和广东工厂两个生产基地，运营总部设在广东佛山。江苏基地（凯盾新材金湖有限公司）拥有一万两千多平方米的生产车间、五条针刺机生产线，广东基地（广东凯盾新材料有限公司）拥有一栋四千平方米综合办公楼和一万平方米生产车间、三条针刺机生产线、多台织布机、多台切丝机、分线机、分切机等。

公司的核心业务是主要基于芳纶、聚酰亚胺、聚丙烯腈预氧化纤维、超高分子量聚乙烯、玄武岩等特种高性能纤维材料开发纺织或无纺制品。产品类型包括无纺布、毛毡、机织布、针织布、UD布、含基布等方面，加工工艺涵盖背胶、涂银、铝箔、橡胶等方面。产品适用于防火、隔热(保温)、密封、耐候、增强、防割、防穿刺等各领域，应用于防护、航空、航天、航海、汽车、光伏、高铁、消防、电器、化工、炼钢、热电、纺织、塑胶等各生产行业。

公司在全国有超过100家长期合作伙伴，下游产品远销海外。同时凯盾实业还是行业内少有的具备自行研发、定制生产、自行设计能力的企业。

凯盾实业勇于承担社会责任。近年来，凯盾实业一直致力于各种新型阻燃材料产品的研发及产品化项目，努力为国家高新材料突破外国封锁做出贡献。同时，大力发展智能制造等高新技术，推动制造行业从“中国制造”迈向“中国创造”。

Guangdong Kaidun New Material Co., Ltd. is a high-tech enterprise engaged in the research and development production, and sales of high-performance fiber material textiles. It has two production bases in Jiangsu and Guangdong, and the operation headquarters is located in Fosh, Guangdong. The Jiangsu base (Kaidun New Material Jinhu Co., Ltd.) has more than 12,000 square meters of workshop and five needle-punching machine production lines, and the Guangdong base (Guangdong Kaidun New Material Co., Ltd.) has a 4000-square-meter comprehensive office building and a 10,000-square-meter production workshop, three needle-punching machine production lines, a of looms, cutters, dividers, and cutters, etc.

The company's core business is mainly based on the development of textiles or non-wo products using special high-performance fiber materials such as aramid, PI fiber, pre-oxidized acrylic fiber, ultra-high molecular weight polyethylene, and bas. Product types include non-woven fabrics, felts, woven fabrics, knitted fabrics, UD fabrics, and substrates, and the processing technology covers back coating, silver, aluminum foil, rubber, etc. Products are suitable for various fields such as fire prevention, heat insulation (insulation), sealing, weather resistance, reinforcement, anti-cutting anti-piercing, etc., and are used in various production industries such as protection, aviation, aerospace, maritime, automobiles, photovoltaic,-speed rail, fire protection, electrical appliances, chemical industry, steelmaking, thermoelectric, textiles, and plastics.

The company has more than 100 longterm partners across the country, and downstream products are exported overseas. At the same time, Kaidun Industry is also one of the few enterprises in the industry that has the ability independently research and develop, customize production, and design by itself.

Kaidun Industry is willing to take on social responsibility. In recent years, Kaidun Industry has committed to the research and development and productization projects of various new flame-retardant material products, striving to contribute to the breakthrough of foreign blockades in the country's materials. At the same time, it has vigorously developed high-tech such as intelligent manufacturing, and promoted the manufacturing industry from "Made in China" to "Created in China.

01 凯盾新材公司简介 Introduction to Kaidun New Materials Company

广东凯盾新材料有限公司
Guangdong Kaidun New Material Co., LTD

KAI DUN 凯盾

芳纶长丝布织造
Fabric weaving of aramid filament

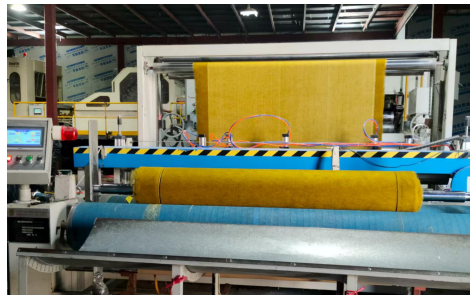
支持定制
幅宽：1-1.5m
纤度：200-3000D
Support customization
Width: 1-1.5m
Denier: 200-3000D

预氧丝无纺布织造
Pre-oxygen spunbond fabric weaving

支持定制
幅宽：1-2.4m
克重：800-2000g
厚度：1-15mm
Support customization
Width: 1-2.4m
Weight: 800-2000g
Thickness: 1-15mm

芳纶无纺布织造
Fabrication of aramid nonwoven fabric

支持定制
幅宽：1-2.4m
克重：100-800g
厚度：1-6mm
Support customization
Width: 1-2.4m
Weight: 100-800g
Thickness: 1-6mm



聚酰亚胺无纺布织造
Fabrication of polyimide non-woven fabric

支持定制
幅宽：1-1.5m
克重：100-1000g
厚度：1-8mm
Support customization
Width: 1-1.5m
Weight: 100-1000g
Thickness: 1-8mm

超高分子量聚乙烯防刺毡织造
Ultra-high molecular weight polyethylene stab-resistant fabric weaving

支持定制
幅宽：1.5m
Support customization
Width: 1.5m

02

预氧丝阻燃防火机理

Pre-oxygenation flame retardant mechanism

PART TWO

02 预氧丝阻燃防火机理

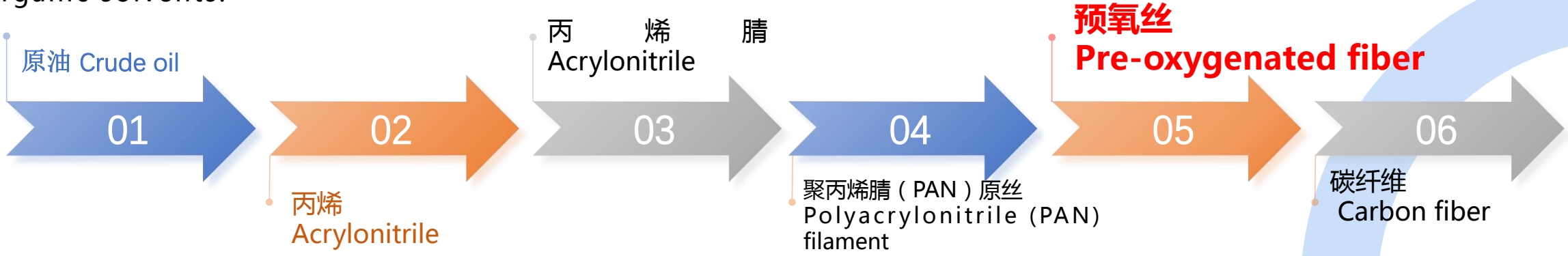
Pre-oxygenation flame retardant mechanism

广东凯盾新材料有限公司
Guangdong Kaidun New Material Co., LTD

KAI DUN 凯盾

预氧丝，全称为预氧化聚丙烯腈纤维，是聚丙烯腈（PAN）原丝在200-300℃的空气中经过预氧化处理而形成的一种耐高温、难燃的特种纤维材料，在300℃下长期稳定，瞬间可承受1000℃以上火焰。这一制备过程构成了碳纤维生产的核心前置工序。从分子结构层面分析，预氧化过程的本质是PAN线性大分子链在热和氧的作用下，发生环化、脱氢和氧化等一系列复杂的化学交联反应，逐步形成更为稳定的梯形结构。这种结构转变赋予了预氧丝区别于原丝和碳纤维的独特性能特征，使其成为一种性能独特的高技术纤维材料。**化学性能稳定，耐酸、碱及多种有机溶剂腐蚀。**

Pre-oxidized fiber, also known as pre-oxidized polyacrylonitrile fiber, is a special fiber material formed by pre-oxidation treatment of polyacrylonitrile (PAN) original fiber in air at 200-300℃. It is a high-temperature resistant and flame-retardant special fiber material that remains stable at 300℃ for a long time and can withstand flames above 1000℃ instantaneously. This preparation process constitutes the core pre-process of carbon fiber production. From the molecular structure level, the essence of the pre-oxidation process is that the linear macromolecular chains of PAN undergo a series of complex chemical crosslinking reactions such as cyclization, dehydrogenation, and oxidation under the action of heat and oxygen, gradually forming a more stable ladder-like structure. This structural transformation endows pre-oxidized fiber with unique performance characteristics different from those of the original fiber and carbon fiber, making it a high-tech fiber material with unique properties. It has stable chemical properties, resistant to corrosion by acids, alkalis, and various organic solvents.



02 预氧丝阻燃防火机理

Pre-oxygenation flame retardant mechanism

预氧丝的制备工艺参数控制极为精密，包括升温速率、温度场均匀性、张力控制和停留时间等都对最终产品的性能有着决定性影响。适当的工艺条件能够促进分子结构的规整转变，避免纤维过度收缩或产生缺陷，从而获得性能优异的预氧丝产品。这种精确控制的制造过程使得预氧丝在继承PAN原丝良好纺丝性能的基础上，获得了显著提升的热稳定性和机械性能。**具有良好的可加工性，可制成短纤、纱线、织物、毡等多种形态。**

在材料特性方面，预氧丝表现出多重优异性能。**其极限氧指数（LOI）通常高达35-45%，属于难燃材料范畴，遇火不熔融、不软化收缩、无熔滴，仅会发生碳化，避免二次伤害。**同时，预氧丝还具有良好的热稳定性，能够在200-300℃环境下长期保持性能稳定，瞬时耐温更高。在电学性能方面，预氧丝开始展现出一定的导电性，体积电阻率介于PAN原丝和碳纤维之间。这些特性共同构成了预氧丝作为独立材料应用的基础。

The preparation process parameters of pre-oxidized fiber are precisely controlled, including the heating rate, temperature field uniformity, tension control, and residence time, all of which have a decisive impact on the performance of the final product. Appropriate process conditions can promote the orderly transformation of molecular structure, avoid excessive shrinkage or defects in fibers, and thus obtain excellent pre-oxidized fiber products. This precisely controlled manufacturing process enables the pre-oxidized fiber to inherit the good spinning performance of PAN original fiber and to obtain significantly improved thermal stability and mechanical properties. With good processability, it can be made into short fibers, yarns, fabrics, felts and other forms.

In terms of material properties, pre-oxidized fibers exhibit multiple excellent properties. Its limiting oxygen index (LOI) is usually as high as 35-45%, which belongs to the category of flame retardant materials. It does not melt, soften and shrink when exposed to fire, and there is no dripping of molten, but only carbonization, avoiding secondary injury. At the same time, pre-oxidized fibers also have good thermal stability, which can maintain stable performance in a long-term 200-300℃ environment, with an instantaneous high temperature resistance. In terms of electrical properties, pre-oxidized fibers begin to show certain conductivity, with volume resistivity between PAN original fiber and carbon fiber. These properties together constitute the basis for the application of pre-oxidized fibers as an independent material.

03

从纤维到产品

From fiber to product

PART THREE

03 从纤维到产品 From fiber to product

广东凯盾新材料有限公司
Guangdong Kaidun New Material Co., LTD

形态类别 Morphological Category	具体形式 Specific form	特点与加工用途 Features and processing purposes
纤维与纱线 Fiber and yarn	短纤维、连续纱线 Short fibers; continuous yarn	可纺性原料，用于织布、混纺、填充。 Spinnable material, for weaving, blending, filling.
织物 Fabric	机织布、针织布、碳布 Woven fabric; knitted fabric; carbon fabric	直接用于防护服面料、隔热衬垫、复合材料基布。 Directly used for protective clothing fabric, heat insulation pad, composite base fabric.
非织造材料 Nonwoven material	针刺毡、预氧丝毡、碳纤维毡 Needle felt; pre-oxidized fiber felt; carbon fiber felt.	优良的隔热、吸音、过滤性能，用于保温、电池电极基材。 Excellent insulation, sound absorption, filtration performance, for thermal insulation, battery electrode base material.
密封与预制体 Seal and prefabricated body	盘根（密封填料）、针刺预制体 Anchor root (sealing packing), needle-punched preform	利用耐高温、耐腐蚀性，用于工业密封；作为碳/碳复合材料增强骨架。 For industrial sealing by using high-temperature resistance and corrosion resistance; as the reinforcing skeleton of carbon/carbon composites.




形态类别 Morphological Category	具体形式 Specific form	特点与加工用途 Features and processing purposes
纤维 Fiber	卷曲纤维 Curled fiber	连续长丝保持了良好的力学性能，拉伸强度可达300-500MPa，模量约为10-15GPa，同时具备柔韧性和可纺性，能够直接用于织造或作为增强材料。短切纤维则包括不同长度规格的产品，通常为3-12mm，适用于非织造工艺或作为复合材料填料。 The continuous filament maintains good mechanical properties, with a tensile strength of up to 300-500 MPa and a modulus of about 10-15 GPa, while also possessing flexibility and spinnability, allowing it to be directly used for weaving or as a reinforcing material. The staple fiber, on the other hand, includes products of different length specifications, typically ranging from 3 to 12 mm, suitable for non-woven processes or as fillers in composite materials.
	短切纤维 Short cut fiber	
纱线 Yarn	/	通过加捻等传统纺纱工艺制成，提高了纤维的集束性和加工性能，便于后续的织造工序。 It is made by traditional spinning process such as twisting, which improves the fiber's clustering and processing performance, and is convenient for the subsequent weaving process.
机织布 Woven fabric	平纹 Plain weave	平纹织物结构稳定，适用于防火服装的内层和密封材料 Plain weave fabric structure is stable, suitable for the inner layer of flame retardant clothing and sealing materials.
	斜纹 Herringbone	斜纹织物手感柔软，常用于防护服装的外层面料 Plain woven fabric has a soft hand feel and is often used as the outer fabric of protective clothing.
	人字纹 Herringbone pattern	缎纹织物表面光滑，适合高温过滤场景 Satin weave fabric has a smooth surface, suitable for high temperature filtration scenarios.
针织布 Knitted fabric	经编 Woven fabric	具有良好的伸长率和弹性，适用于需要较高形变能力的应用场景，如防护手套、头套等人体工程学要求较高的防护装备 With good elongation and elasticity, it is suitable for applications requiring higher deformation capability, such as protective gloves, headgear, and other personal protective equipment with ergonomic requirements.
	纬编 Warp knitting	
毛毡 Felt	短纤维梳理成网、针刺固结工艺 Short fiber web-forming, needling consolidation process	具有三维网络结构，是优质的高温隔热材料，使用温度可达300℃以上 There are three-dimensional network structures, which are high-quality high-temperature insulation materials, and the use temperature can reach above 300 ℃

形态类别 Morphological Category	具体形式 Specific form	特点与加工用途 Features and processing purposes
复合材料 composite material	预氧丝复合橡胶布 Pre-oxidized fiber composite rubber cloth	主要应用于高性能密封制品，如发动机垫片、油田防喷器等耐高温密封件。预氧丝与橡胶基体形成的牢固界面保证了复合材料在高温、高压条件下的密封可靠性。Mainly used in high-performance sealing products, such as engine gaskets, oilfield blowout preventers and other high-temperature sealing parts. The interface formed between the pre-oxidized fiber and the rubber matrix ensures the sealing reliability of the composite material under high temperature and high pressure conditions.
	预氧丝金属复合材料 Pre-oxygenated metal matrix composites	通过特殊工艺将预氧丝与低熔点金属复合，制备兼具金属导热性和预氧丝耐温性的功能材料，在热管理领域展现出应用潜力。By a special process, preoxidized fiber is compounded with low melting point metal to prepare functional materials with both metal thermal conductivity and preoxidized heat resistance, which shows application potential in the field of thermal management.
	预氧丝复合背胶无纺布 Pre-oxygenated filament composite non-woven fabric with adhesive backing	通过复合高温复合双面胶的形式，将无纺布一面具有方便粘贴的优点。By the form of composite high temperature composite double-sided adhesive, the non-woven fabric has the advantage of convenient pasting on one side.
	预氧丝复合铝箔无纺布 Pre-oxygen fiber composite aluminum foil non-woven fabric	铝箔具有反射热辐射的性能，复合铝箔毛毡能用于消防面罩、防火帘等领域。Aluminum foil has the performance of reflecting thermal radiation, and composite aluminum foil felt can be used in fire masks, fireproof curtains and other fields.
	预氧丝复合硅胶布 Pre-oxygenated silk composite silicone fabric	预氧丝机织布作为基布，单面或双面复合硅胶层，兼具基布的高温尺寸稳定性和硅胶层的弹性、密封性，可加工成复杂形状。Pre-oxygen silk woven fabric as the base fabric, single or double-sided composite silicone layer, with the high-temperature dimensional stability of the base fabric and the elasticity and sealing properties of the silicone layer, can be processed into complex shapes.
	预氧丝复合气凝胶毡 Pre-oxygen fiber composite aerogel felt	具有低导热、轻质、柔韧且兼具良好力学强度，是新能源汽车动力电池包内理想的隔热防火材料，能有效延缓热蔓延。Low thermal conductivity, light weight, flexible and with good mechanical strength, it is an ideal thermal insulation and fireproof material inside the power battery pack of new energy, which can effectively delay the spread of heat.
	预氧丝复合芳纶面料 Pre-oxidized filament composite aramid fabric	芳纶纤维加入混纺弥补预氧丝脆性，提升面料强度和耐磨性，可制成有色面料。应用于高等级消防服、特种作战服、军警防护装备、高温工业围裙等对强度和耐用性要求极高的防护服装。The addition of aramid fiber in the blend compensates for the brittleness of the preoxidized silk, enhancing the strength and abras resistance of the fabric, which can be made into colored fabric. It is applied to high-grade firefighting clothing, special combat clothing, military and police protective equipment, high-temperature industrial aprons and other protective clothing with extremely high strength and durability requirements.
	预氧丝复合聚酰亚胺面料 Pre-oxidized fiber composite polyimide fabric	在保持高阻燃性的同时，赋予面料优异的耐高低温稳定性。用于航空航天器内饰、特种灭火服、极端环境（如深空、极地）防护装备、高温过滤等对耐温与阻燃有极端要求的领域。While maintaining high flame retardancy, the fabric is endowed with excellent high and low temperature stability. It is used in fields with extreme temperature and flame retancy requirements, such as aircraft interior, special firefighting clothing, extreme environment (such as deep space, polar regions) protective equipment, high temperature filtration, etc.

04

预氧丝产品应用

Application of pre-oxidized yarn products

PART FOUR

04 预氧丝产品应用

Application of pre-oxidized yarn products

广东凯盾新材料有限公司
Guangdong Kaidun New Material Co., LTD

KAI DUN 凯盾

建筑施工领域 Construction engineering field

01 外墙保温防火 External wall insulation and fireproofing

在建筑外墙保温系统中，可将预氧丝防火棉作为保温层的防火保护材料。将其填充在保温材料与外墙装饰层之间，当发生火灾时，能有效阻止火势蔓延，保护保温材料不被燃烧，提高建筑外墙的防火安全性。

In the building exterior wall insulation system, pre-oxygenated fiber fireproof cotton can be used as a fireproof protective material for the insulation layer.illing it between the insulation material and the exterior wall cladding layer, it can effectively prevent the spread of fire and protect the insulation material from burning when a fire occurs, improving the safety of the building exterior wall.

02 钢结构防火包裹 Steel structure fireproof wrapping

对于建筑中的钢结构部件，如钢梁、钢柱等，可使用预氧丝防火棉进行包裹。钢结构在高温下强度会迅速下降，预氧丝防火棉具有良好的隔热性能，能降低钢结构在火灾中的温度上升速度，延长钢结构的耐火时间，为人员疏散和消防救援争取更多时间。在工业厂房和大型商业建筑中，常采用这种方式对钢结构进行防火保护。

For steel structural components in buildings, such as steel beams, steel columns, etc., they can be wrapped with pre-oxygen fiber fireproof cotton The strength of steel structure will rapidly decrease at high temperatures. Pre-oxygen fiber fireproof cotton has good thermal insulation performance, which can reduce the temperature rise speed of steel in a fire, extend the fire resistance time of steel structure, and win more time for evacuation and fire rescue. In industrial plants and large commercial buildings, this method is often used provide fire protection for steel structures.

03 防火隔断 Fire prevention partition

在建筑内部，可利用预氧丝防火棉制作防火隔断。将其安装在需要防火分隔的区域，如楼梯间、电梯井、电缆井等与相邻区域之间，能有效阻止火势和烟雾的扩散，起到隔离火源的作用，保障建筑内人员的生命安全和财产安全。

Inside the building, fireproof partitions can be made of pre-oxygen fiber fireproof cotton. When installed between areas that need to be separated by, such as stairwells, elevator shafts, and cable shafts, and adjacent areas, it can effectively prevent the spread of fire and smoke, play the role of isol the fire source, and ensure the safety of life and property of the personnel inside the building.

04 管道防火保护 Pipeline fire protection

建筑内的各种管道，如通风管道、电缆管道等，在穿越防火墙或防火分区时，可在管道周围填充预氧丝防火棉，对管道进行防火保护，防止火灾通过管道蔓延。

The various pipes in the building, such as ventilation pipes, cable pipes, etc., can be filled with pre-oxygenated fiber fireproof cotton around pipes when crossing the firewall or fire compartment, to provide fire protection for the pipes and prevent the fire from spreading through the pipes.

04 预氧丝产品应用

Application of pre-oxidized yarn products

广东凯盾新材料有限公司
Guangdong Kaidun New Material Co., LTD

KAI DUN 凯盾

个人防护领域 Personal protective equipment

在防火防护领域，预氧丝制品发挥着不可替代的作用。**防火服装是预氧丝最为传统的应用领域，包括消防服、工业防护服、军用防护装具等。**预氧丝织物在接触火焰时形成致密碳化层，有效阻隔热传导，为使用者提供宝贵的逃生时间。现代高性能防火服通常采用预氧丝与其他纤维（如阻燃粘胶、芳纶）的多层复合结构，兼顾防护性能与穿着舒适性。

防火毯、逃生绳等应急救援产品是预氧丝的另一重要应用。预氧丝防火毯极限氧指数高，不助燃，是家庭、工厂和公共场所必备的安全设施。预氧丝制品在这些应用中的卓越表现主要源于其本质难燃的特性和高温下的尺寸稳定性。

In the field of fire protection, pre-oxidized fiber products play an irreplaceable role. Fire-fighting clothing is the most traditional field of pre-oxidized fiber, including fire-fighting suits, industrial protective clothing, military protective equipment, etc. When exposed to flames, the pre-oxidized fabric forms a dense carbonized layer, effectively blocking heat transfer and providing valuable escape time for the user. Modern high-performance fire-fighting clothing often uses a multi-layer composite of pre-oxidized fiber and other fibers (such as flame-retardant viscose, aramid), balancing protection performance and wearing comfort.

Fire blankets escape ropes and other emergency rescue products are another important application of pre-oxidized fiber. The high oxygen index of pre-oxidized fiber fire blankets and their non-ammability make them essential safety facilities for families, factories and public places. The outstanding performance of pre-oxidized fiber products in these applications mainly comes from their inherent flame-ardant properties and dimensional stability at high temperatures.

防护服
Protective clothing

保温毯
Insulation blanket

逃生绳
Escape rope

密封条
Seal strip

04 预氧丝产品应用

Application of pre-oxidized yarn products

广东凯盾新材料有限公司
Guangdong Kaidun New Material Co., LTD

KAI DUN 凯盾

防火与隔热领域 Fireproofing and heat insulation fields

01

预氧丝针刺毡滤袋能够连续在200℃以上环境下工作，瞬时耐温可达260℃，且耐化学腐蚀性能良好，应用于燃煤锅炉、垃圾焚烧、水泥生产等行业的烟气净化系统。与传统涤纶滤料相比，预氧丝滤料在高温条件下使用寿命更长，过滤效率更稳定，且表面光滑，清灰性能优异。
The pre-oxidized filament needle felt filter bag can work continuously in an environment above 200℃, with an instantaneous temperature resistance of up 260℃, and has good chemical corrosion resistance, which is applied to the flue gas purification system in industries such as coal-fired boiler, waste incin, cement production, etc. Compared with traditional polyester filter material, the pre-oxidized filament filter material has a longer service life and more stable filtration efficiency under high temperature conditions and has a smooth surface and excellent dust removal performance.

02

建筑防火材料领域，预氧丝非织造布和毡制品**用于钢结构防火包覆、防火门窗密封条等**，在发生火灾时能有效延缓结构升温，为人员疏散和消防救援争取关键时间。
In the field of architectural fireproofing materials, pre-oxidized fiber non-woven fabric and felts are used for steel structure fireproofing, fireproof doors and windows sealing strips, etc., which can effectively delay the temperature rise of the structure in case of fire, and win the key time for evacuation and fire.

03

工业隔热方面，预氧丝毡、毯制品被用于**各种工业炉窑、高温管道和设备的保温隔热**。预氧丝材料在中低温区（200-600℃）的隔热性能尤为突出，导热系数低，热容量小，能够有效降低工业能耗。在航空航天领域，预氧丝复合材料用于热防护系统，保护结构不受气动热影响。这些应用充分利用了预氧丝轻质、耐温、低热导率的综合优势。
In industrial insulation, preoxidized fiber mats and blanket products are used for heat insulation of various industrial furnaces, high-temperature pipelines, and equipment The preoxidized fiber material is particularly outstanding in the insulation performance in the medium and low temperature range (200-600℃), with low thermal and small specific heat capacity, which can effectively reduce industrial energy consumption. In the aerospace field, preoxidized fiber composites are used in thermal protection systems to protect structures aerodynamic heat effects. These applications make full use of the comprehensive advantages of preoxidized fiber, such as light weight, high temperature resistance, and low thermal conductivity.

预氧丝防火棉

04 预氧丝产品应用

Application of pre-oxidized yarn products

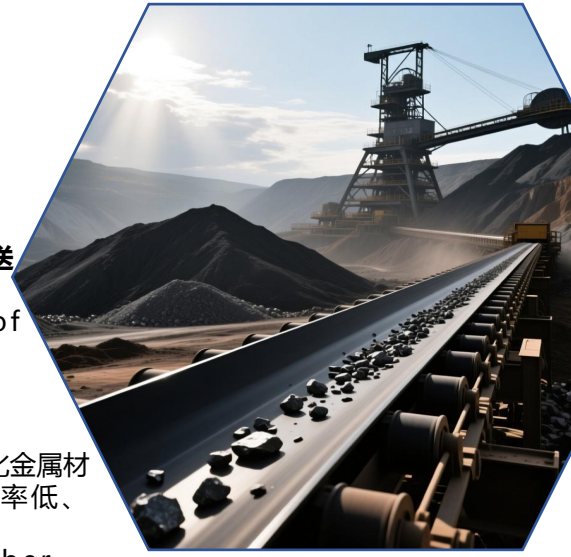
广东凯盾新材料有限公司
Guangdong Kaidun New Material Co., LTD

KAI DUN 凯盾

密封与摩擦领域 Seal and friction area

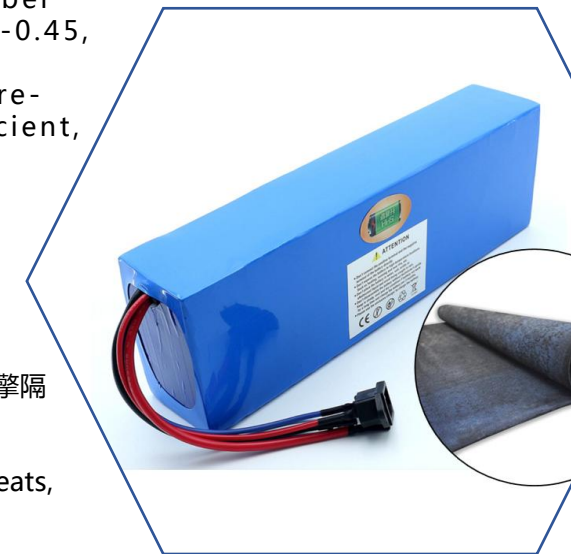
01 预氧丝增强橡胶密封件应用于汽车发动机、变速箱和排气系统，能够在持续高温环境下保持弹性和密封性能。
Pre-oxygenated fiber reinforced rubber seals are used in automotive engines, transmissions, and exhaust systems, maintaining elasticity and sealing performance in continuous high-temperature.

02 在石油化工领域，预氧丝编织填料用于泵、阀的密封，耐受腐蚀性介质和高温双重挑战。用于**耐高温输送带**，在煤矿井下使用具有阻燃效果。
In the petrochemical field, pre-oxygenated fiber woven filler is used for the sealing of pumps and valves, enduring the dual challenges of corrosive and high temperature. Used for high-temperature resistant conveyor belts, it has flame retardant effects when used in underground coal mines.



03 摩擦材料领域，预氧丝作为增强纤维用于制造**高性能刹车片**，摩擦系数稳定在0.35-0.45，耐磨性比金属材料提升40%以上，特别是适用于重型车辆和高温工况。预氧丝摩擦材料具有摩擦系数稳定、磨损率低、无热衰退和噪音低等优点。
In the field of friction materials, pre-oxidized fiber is used as a reinforcing fiber to manufacture high-performance brake pads, with the friction stable at 0.35-0.45, the wear resistance is more than 40% higher than that of metal materials, especially suitable for heavy vehicles and-temperature working conditions. Pre-oxidized fiber friction materials have the advantages of stable friction coefficient, low wear rate, no thermal decay and low noise.

04 新能源汽车安全防护方面，电池包隔热层使用预氧丝气凝胶，有效阻断电芯热失控蔓延，耐受瞬时1000℃高温。
In terms of safety protection of new energy vehicles, the battery pack insulation layer uses pre-oxygen fiber aerogel, which effectively blocks the spread of cell runaway and withstands instantaneous high temperature of 1000℃.



05 轨道交通与航空航天方面，预氧丝无纺布耐高温防火，发烟量低，质量轻，用于**汽车、高铁座椅防火层**，飞机引擎隔热罩。
In terms of rail transit and aerospace, the pre-oxidized filament non-woven fabric is heat-resistant and fireproof, with low smoke, light weight, and is used for the fireproof layer of car and high-speed train seats, and the heat insulation cover of aircraft engines.

04 预氧丝产品应用

Application of pre-oxidized yarn products

广东凯盾新材料有限公司
Guangdong Kaidun New Material Co., LTD

KAI DUN 凯盾

01

预氧丝机织布
Pre-oxidized filament woven fabric

特种防火帘、灭火毯、高温设备隔热罩、电芯防火间隔
Special fireproof curtain; fire blanket; high temperature equipment insulation cover; battery fireproof partition

02

预氧丝芳纶混纺机织布
Pre-oxidized filament aramid blended woven fabric

高等级消防服、特种作战服、军警防护装备、高温工业围裙等对强度和耐用性有高要求的防护装备。
High-grade firefighting suits, special operations clothing, military and police protective equipment, high-temperature industrial aprons, etc., protective equipment with high for strength and durability.

03

预氧丝腈纶混纺机织布
Pre-oxidized filament acrylic blended woven fabric

对成本敏感且非极端高温的一般阻燃工作服、内饰防火衬布、普通防火家纺用品等。
General flame retardant work clothes, interior fireproof lining fabric, ordinary fireproof home textiles, etc. for cost-sensitive and non-extreme temperature.

04

预氧丝聚酰亚胺混纺复合基布
Pre-oxidized PAN blended composite base fabric

航天航空领域中的飞行器内饰防火、隔热复合材料的增强基布；高温过滤、特种密封、电气绝缘等领域的复合材料基底。
The reinforcing base fabric for fireproof and heat insulation composites used in the interior of aircraft in aerospace field; composite base for high temperature filtration, special, electrical insulation and other fields.

04 预氧丝产品应用

Application of pre-oxidized yarn products

广东凯盾新材料有限公司
Guangdong Kaidun New Material Co., LTD

KAI DUN 凯盾

保温领域 Insulation field

墙体保温 Wall insulation

在建筑墙体施工过程中，可将预氧丝防火棉隔热保温棉填充在墙体内部空腔。比如在砖混结构或框架结构的非承重墙部分，将其铺设在墙体夹层中。由于该材料具有大量细小孔隙，能有效阻止热量的传导，就像给墙体穿上了一层“棉衣”，在冬季可以减少室内热量向室外散失，夏季则能阻挡室外热量传入室内，从而保持室内温度的稳定，降低空调等制冷制热设备的能耗。
对于既有建筑的节能改造，也可以将预氧丝防火棉隔热保温棉以粘贴或锚固的方式固定在墙体表面，形成外保温系统，提升墙体的保温隔热性能。
During the construction of building walls, pre-oxygenated fiber fireproof cotton insulation can be filled into the internal cavity of the wall. For example, in non-load-bearing walls of masonry or frame structures, it can be laid in the wall sandwich layer. Due to the large number of small pores in the material, it can effectively block the conduction of heat, just like putting a "cotton-padded jacket" on the wall. In winter, it can reduce the loss of indoor heat to the outside, and in summer, it can block the outdoor heat from entering the room, thus keeping the indoor temperature stable and reducing the energy consumption of refrigeration and heating equipment such as air conditioners.
For the energy-saving renovation of existing buildings, pre-oxygenated fiber fireproof cotton insulation can also be fixed to the wall surface by pasting or anchoring, forming an external insulation system to improve the insulation performance of the wall.

屋顶保温 Roof insulation

在屋顶的构造层中，比如在屋顶的防水层下方铺设预氧丝防火棉隔热保温棉。它可以有效减少太阳辐射热通过屋顶传入室内，在炎热的夏季，能显著降低室内温度，减少使用空调降温的时间和能耗。同时，在冬季也能起到一定的保温作用，防止室内热量从屋顶散失。
In the structural layer of the roof, such as below the waterproof layer of the roof, pre-oxygenated fiber fireproof cotton insulation is laid. It can effectively reduce the sun's radiant heat from entering the room through the roof, which can significantly reduce the room temperature in hot summer, reduce the time and energy consumption of using air conditioning for cooling. At the same time, it can also play a certain role in heat preservation in winter, preventing the indoor heat from dissipating from the roof.

保暖用品 Warm-keeping supplies

可以将预氧丝防火棉隔热保温棉填充到棉被、睡袋、保暖衣物等家用保暖用品中。其良好的隔热性能可以阻止人体热量散失，提供更持久的保暖效果。比如在制作冬季棉被时，加入一定厚度的预氧丝防火棉隔热保温棉，能让棉被更加温暖舒适。
Preoxidized silk fireproof cotton insulation can be filled into quilts, sleeping bags, and thermal clothing to provide home insulation. Its excellent insulation performance prevent the loss of body heat and provide more lasting warmth. For example, when making a winter quilt, adding a certain thickness of preoxidized silk fireproof cotton insulation can the quilt warmer and more comfortable.

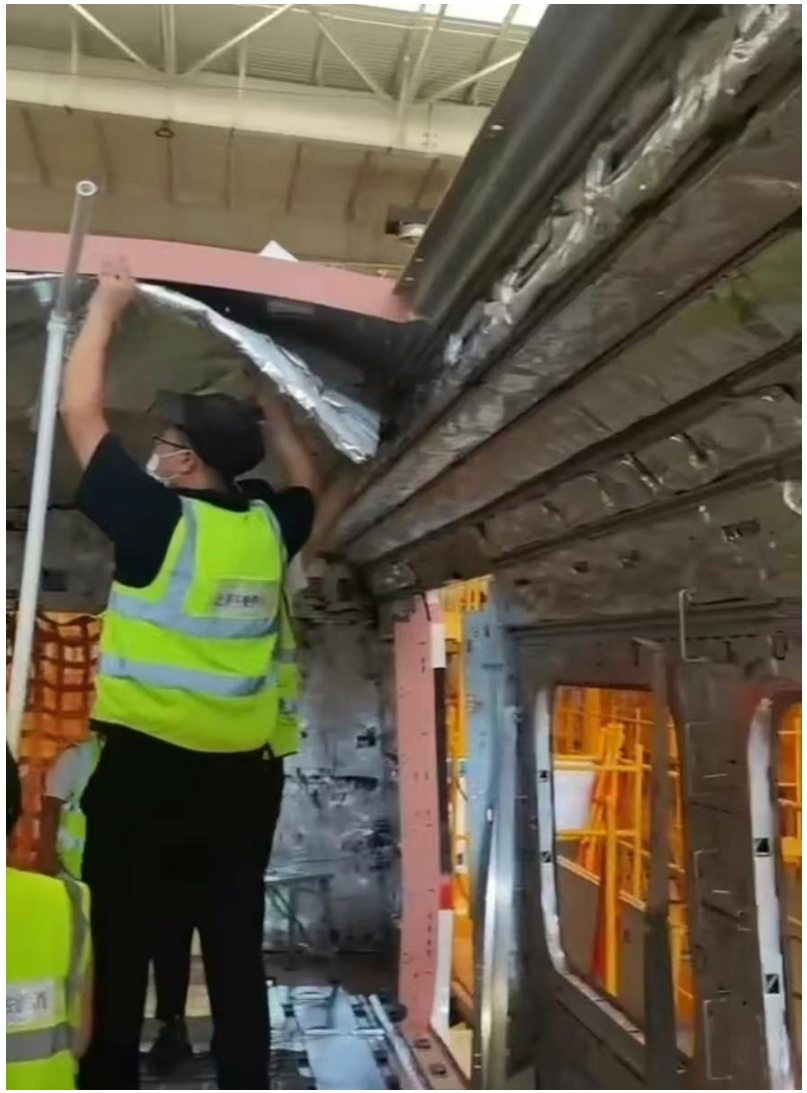
04 预氧丝产品应用

Application of pre-oxidized yarn products

广东凯盾新材料有限公司
Guangdong Kaidun New Material Co., LTD

KAI DUN 凯盾

隔音领域 Sound insulation field



01

防火棉应用于KTV音乐厅等娱乐场所
Fireproof cotton is applied to entertainment places such as KTV music halls.

KTV包间墙面，将预氧丝棉贴合墙体龙骨，外覆透声布艺软包，减少啸叫和邻包串音。吊顶，轻质铝箔复合预氧丝可抑制楼上脚步声。酒吧主厅，弧形吊顶内填充预氧丝棉，配合穿孔吸音板，将混响时间控制在0.8–1.2秒，既提升音乐清晰度又确保包间内的防火消防安全。

KTV private room wall, pre-oxygenated cotton wool is attached to the wall keel, and then covered with sound-permeable fabric pack to reduce howling and cross-talk between adjacent rooms. Ceiling, lightweight aluminum foil composite pre-oxygenated cotton can suppress the footsteps from the floor above. Main of the bar, arc-shaped ceiling is filled with pre-oxygenated cotton wool, combined with perforated sound-absorbing boards, to control the reverberation within 0.8–1.2 seconds, which not only improves the clarity of the music but also ensures the fire safety in the room.

02

防火棉应用于高铁地铁车厢隔音
Fireproof cotton is applied to the sound insulation of high-speed rail and subway carriages.

预氧丝贴附于车厢内侧钣金，首先通过其阻尼特性抑制钣金振动（减振环节），再以多孔结构吸收中高频反射杂音（吸音环节）。配合丁基胶止振板使用后，车门共振减少70%以上。在车厢意外起火时，防火棉能起到阻燃的作用。

The pre-oxygen silk is attached to the inner side of the car body panel, first suppressing the vibration of the panel through its damping characteristics (amping link), and then absorbing the reflected noise in the medium and high frequency bands through its porous structure (sound absorption link). When used with butyl rubber anti-vration pads, the resonance of the car door is reduced by more than 70%. In the event of an accidental fire in the car body, the fireproof cotton can as a flame retardant.

05

技术发展与产品定制

Technical development and product customization

PART FIVE

05 技术发展与产品定制

Technical development and product customization

广东凯盾新材料有限公司
Guangdong Kaidun New Material Co., LTD

技术发展趋势：Technological development trend:

性能精细化：针对不同应用（如防护 vs 电极），定制化调控预氧丝的孔隙结构、力学性能和表面活性。
可纺性提升：通过原丝和工艺优化，改善预氧丝纱线的柔韧性和强度，拓展高端织造应用。
绿色低碳工艺：优化预氧化能耗，提高生产效率，降低碳排放。

Performance refinement: Customized control of the pore structure, mechanical properties, and surface activity of the preoxidized fiber for different applications (e.g., protection vs electrode).
Enhanced spinnability: Improved flexibility and strength of the preoxidized fiber yarn through raw material and process optimization, expanding high-end weaving applications.
Green and low-carbon process: Optimized preoxidation energy consumption, increased production efficiency, and reduced carbon emissions.

支持定制： Support customization:

广东凯盾新材料有限公司是防火棉源头工厂，拥有自己的工厂车间和专业化生产线，生产多种高性能纤维产品。多种高性能纤维产品都可以根据客户要求进行定制。

公司生产的产品经过层层质检，质量放心值得信赖。生产的产品坚持高性能、高品质，产品质量得到行业内的认可和顾客们的好评。
Guangdong Kaidun New Material Co., Ltd. is a fireproof cotton original factory, with its own factory workshop and professional production line, a variety of high-performance fiber products. Multiple high-performance fiber products can be customized according to customer requirements.

The products produced by the company have passed many levels of inspection, with reliable quality and trust. The products produced adhere to high performance and high quality, and the product quality has been recognized by the industry and praised by customers.

市场驱动与前景：Market-driven and Prospects:

驱动力：
安全法规趋严：全球范围内对交通、建筑防火要求提升。
新能源爆发：储能电站对本质安全材料的迫切需求。
产业升级：高端制造对轻量化、耐高温复合材料的需要。
前景：预氧丝正从“中间品”走向“主角”，市场空间从传统保温向安全防护、新能源、航空航天等高端蓝海持续扩张。

Driving forces:
Strictening safety regulations: Enhanced requirements for traffic and building fire prevention worldwide.
New energy surge: Urgent demand for safe materials in energy storage stations.
Industry upgrade: High-end manufacturing's need for lightweight, high-temperature resistant composites.
Outlook: Prew yarn is transitioning from "intermediate product" to "protagonist," with the market space expanding from traditional insulation to high-end blue oceans such as safety protection new energy, and aerospace.

06

总　　结

S u m m a r i z e

PART SIX

本质阻燃 Intrinsic flame retardancy

预氧丝通过独特的梯形聚合物结构，实现了高LOI和不燃烧、不熔滴、不软化收缩特性，是其所有应用的基础。
The pre-oxidized yarn, with its unique trapezoidal polymer structure, has realized high LOI and the characteristics of non-burning, no, and no softening shrinkage, which is the basis for all its applications.

形态多样 Diverse morphology

柔软亲肤不扎手，易裁剪，易折叠。
从纱线、织物到毡、预制体，形态灵活，为跨领域应用提供可能。
Soft and skin-friendly, not prickly, easy to cut, easy to fold. From yarn, fabric to felt, preform, flexible in shape providing possibilities for cross-domain applications.

应用多样 Application diversity

核心应用围绕安全与高温两大主题，深度服务于个人防护、交通运输、工业密封和新能源等关键领域。
Core applications revolve around the two themes of safety and high temperature, deeply serving key fields such as personal protection, transportation, industrial sealing, and new energy.

未来可期 The future is promising

在技术突破和市场需求的双重推动下，预氧丝正从幕后走向台前，成为解决高端安全与材料难题的关键材料，国产化进程将为其发展注入强大动力。
Driven by technological breakthroughs and market demand, pre-oxidized yarns are stepping out from the sidelines and becoming key materials for solving high- safety and material issues. The process of domesticating them will inject strong momentum into their development.

广东凯盾新材料有限公司
Guangdong Kaidun New Material Co., LTD

KAI DUN
凯盾

广东凯盾新材料有限公司

感 谢 您 的 观 看

Thank you for watching

邓国超 凯盾新材
广东 佛山

扫一扫上面的二维码图案，加我为朋友。

- Mobile phone : 86+186-0157-8985　86+181-4496-2927
- Landline : 0757-87785772
- Official Website : http://www.kdppta.com
- Address: No. 1, Keqing Road, Building 21, Yundonghai Sub-district, Sanshui District, Fan City, Guangdong Province

扫描二维码 关注企业最新资讯