

Introduction of Junma Sealing Inc.

Junma Sealing

➤ Oct 4, 2023

Chengdu Junma Sealing Technology Inc.

成都俊马密封科技股份有限公司

INTEGRITY BUILDS QUALITY INNOVATION LEADS THE FUTURE

诚信铸就品质 创新引领未来

成都俊马密封科技股份有限公司
CHENGDU JUNMA SEALING TECHNOLOGY CO.,LTD.

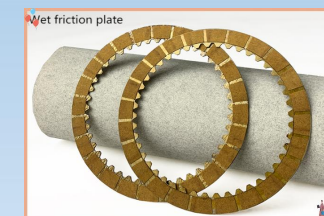
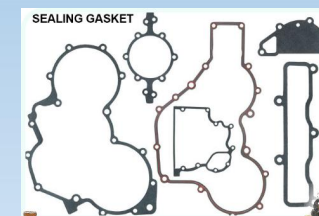
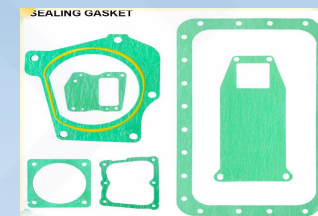
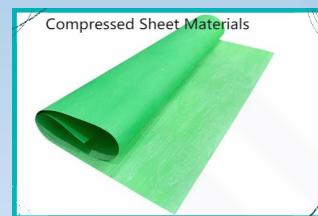
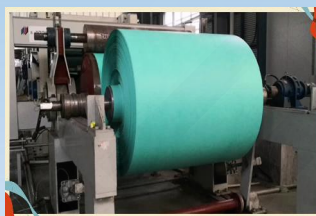
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- 01 公司简介Company Profile
- 02 技术研发Technical R&D
- 03 产品与市场Product and Marketing
- 04 未来规划Future Plans

PART ONE This is Junma



- Junma is a private enterprise established in 1997.
- Consist of 2 production plants – one for manufacture of BA materials and one for production of Compressed sheet materials.
- **Production capacity:** Beater Addition materials: 20 tons/day; Compressed Sheet Materials: 6 tons/day; Cork materials: 1 ton/day; Stamping gaskets: 300000 pieces/day.
- **Product Types:** Non-metallic gaskets, Metal coated gaskets, Cork gaskets, Composite gaskets, Graphite gaskets, Wet paper-based friction materials, Valve body partition gasket, Beater Addition Materials, Compressed Sheet Materials and Cork Rubber Materials
- **Key Customers:** Mercury Marine, Cummins, John Deere, BYD, LONCIN, Zongshen, Allison Transmisson, Kohler, Mtd, TTI etc.
- **Quality Certifications:** IATF 16949, ISO9001, ISO45001, ISO14001, Rohs, Reach.



01

Company History

Company Introduction

COMPANY
INTRODUCTION



Honors and Qualifications

Company Introduction

Honors



Junma has been awarded the titles of China High tech Enterprise, Sichuan Provincial Enterprise Technology Center, Vice President Unit of China Sealing Materials Association, and Research and Development Center for High Temperature Resistant Materials in the Nuclear Industry.

CERTIFICATIONS



Beater Addition Materials Production Line

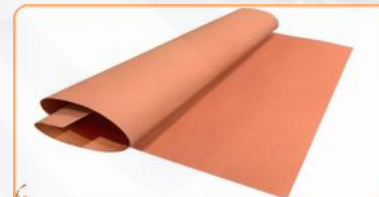
Sheet Materials Production Line



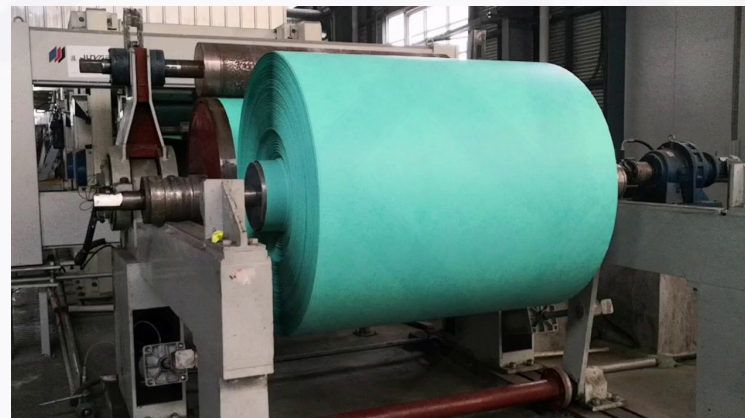
Coil Materials Production Line



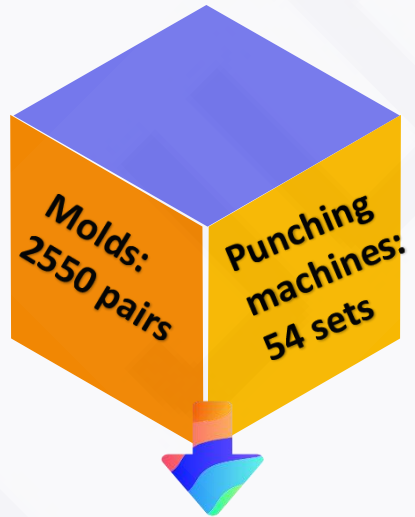
- ✦ Daily production capacity of materials: 20 tons;
- ✦ Production thickness: thinnest 0.15mm, thickest 2.0mm;
- ✦ Material tolerance: ± 0.04 mm;



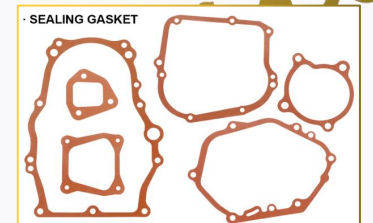
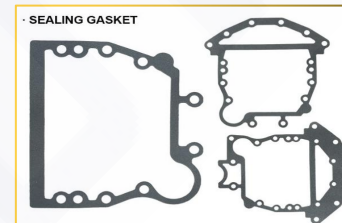
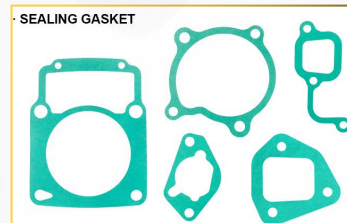
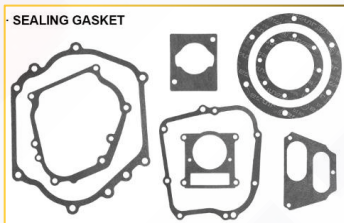
Material production line



Stamping Gasket production line



Daily production capacity of gaskets:
300000 pieces



R&D laboratory has over 80 sets of testing equipment: equipped with analysis and processing software for testing physical properties, chemical composition, property reliability, and ageing durability of sealing materials.



Oil seal tester



Nitrogen sealability tester



Salt Spray Test Chamber



Heat aging test chamber



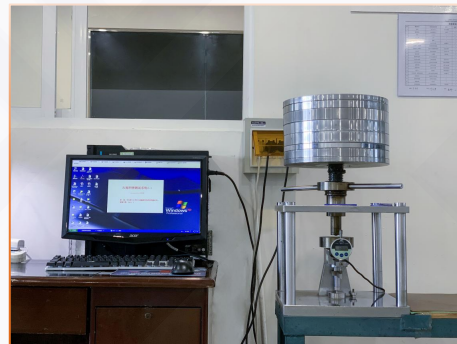
Thermal shock chamber



Resistance Tester



Tensile Tester



Compression rate tester



High temperature compression tester



3d scanner

PART TWO

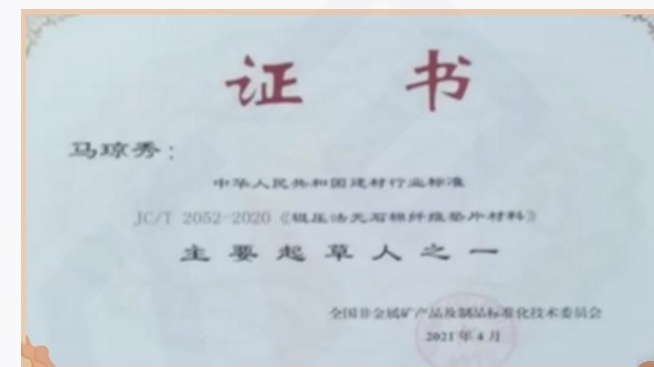
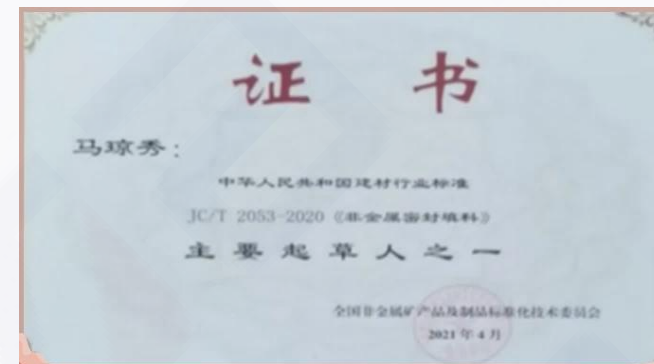
Technical R&D

- ✦ Focusing on basic material scientific research. R&D team consists of over 20 technical personnel with Ph.D, master's, and bachelor's degrees;
- ✦ Has 21 invention patents, 30 new utility invention patents, and 2 scientific and Technological Achievement Awards;
- ✦ Member of the National Standards Committee of China, 4 R&D scientists are selected as member of National Standard Committee, participate in drafting over 20 national standards;
- ✦ Application engineers are expert in analyzing and resolving gasket sealing problems. Often participate in providing problem-solving training and gasket designs for customers.

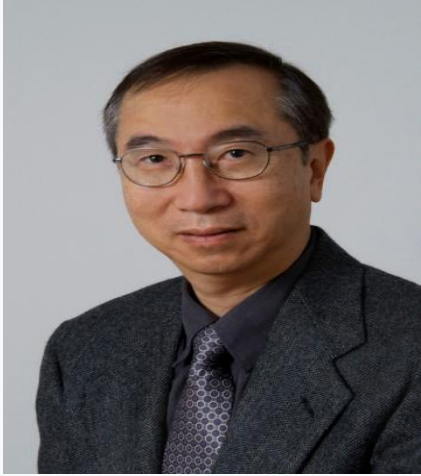


National Standards Participating in Compilation

Company Introduction



Chief Scientist



Dr. Kenneth K Ko

Dr. Ko is a world known expert in sealing technologies. He helps Junma in providing technical and theory guidance in constructions and applications of sealing materials.

Team introduction

🚩The R&D team focuses on basic science research of materials. Team members are consisting of professional from different disciplines, including polymer materials, rubber, mechanical engineering, etc;

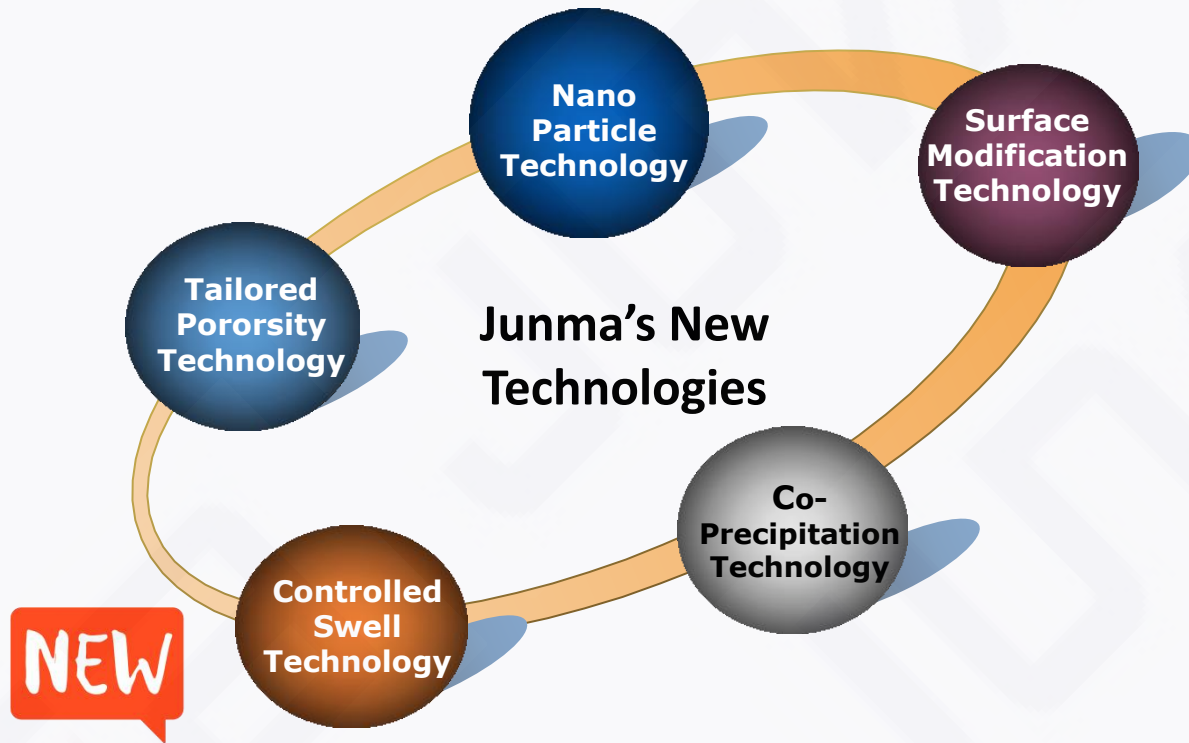
🚩The education background of the R&D team: 4 with doctoral degree, 4 with master's degree, and 12 with bachelor's degree.

🚩All key team members have in-depth knowlege in academic and industrial applications. especially in research and development of non-metallic sealing materials;

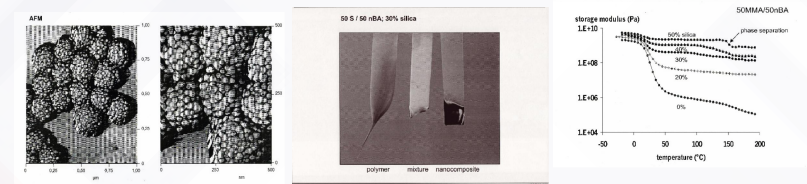
Name	Education	Position	Research Direction
Mr.SZ Liu	Bachelor	senior engineer	Polymer and rubber product sealing materials
Dr. HL Zhou	PhD	Professor	Processing and Application of Rubber Plastic Synthetic Fiber
Dr. SJ Xie	PhD	Professor	Mechanical Engineering Sealing Direction
Dr. YY Wu	PhD	Professor	Automation of papermaking process and production equipment

New Technologies Developed at Junma

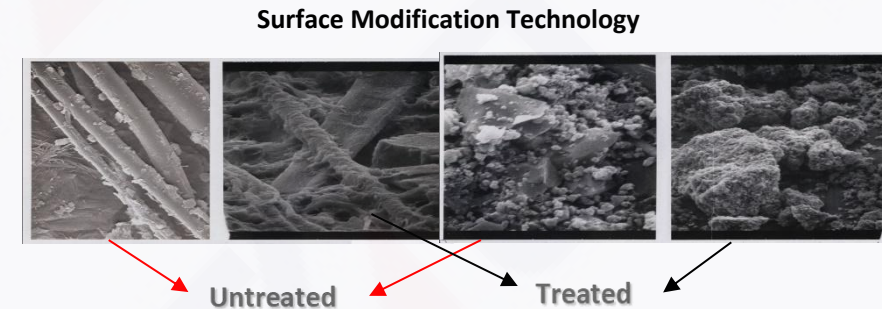
Company Introduction



New Technologies are developed to increase the compactness and interactions between components of the gasket structure – to improve the mechanical properties and sealability of the gasket material.

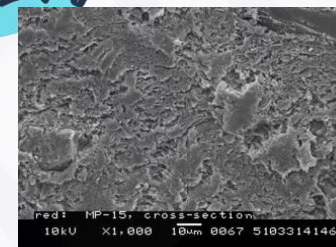


Co-Precipitation Technology



Nano Particle Technology

NEW

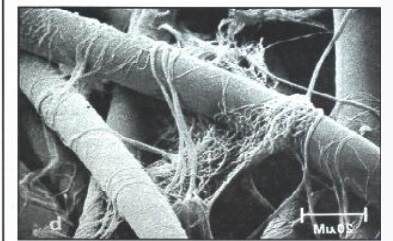
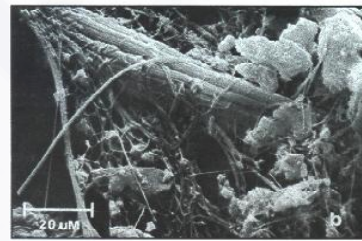
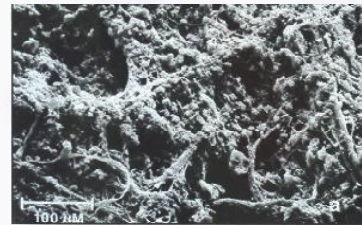
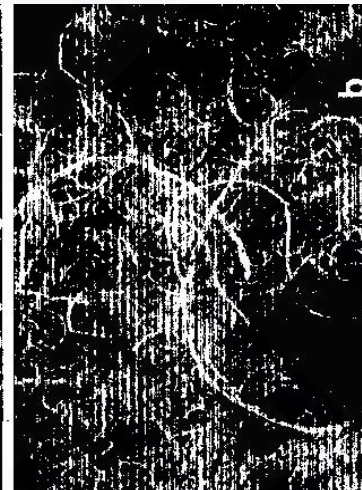
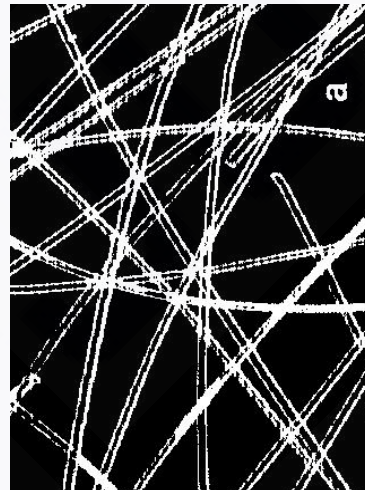
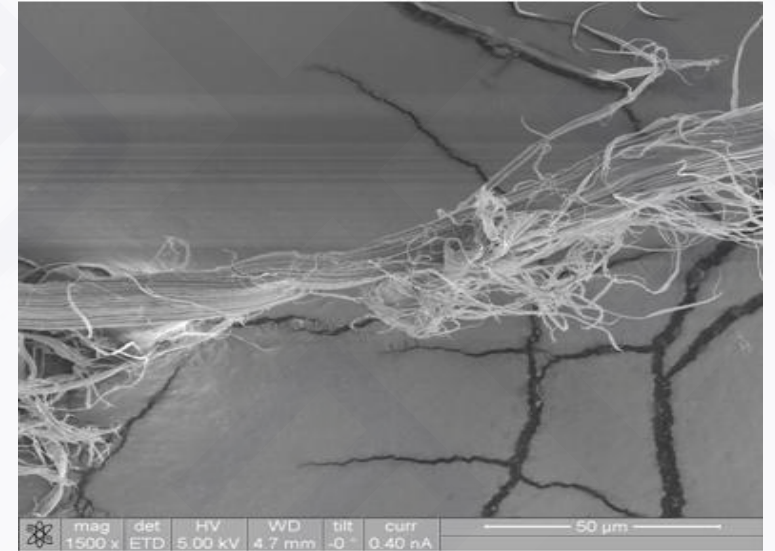
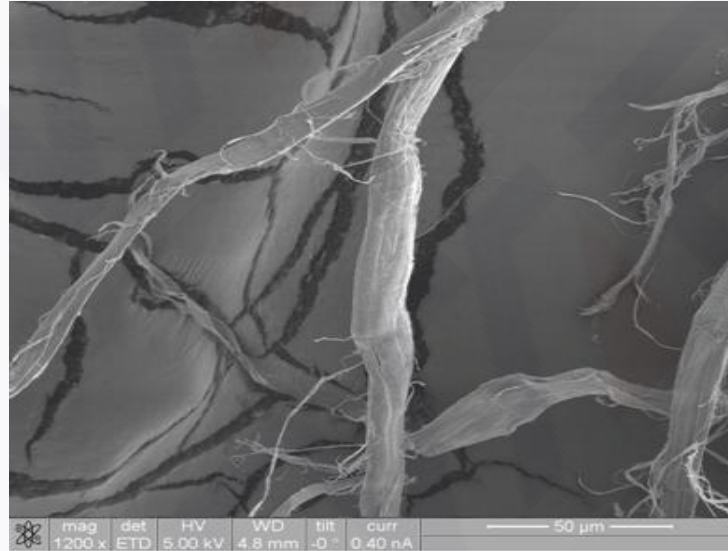


Junma's Nano Particle BA Products



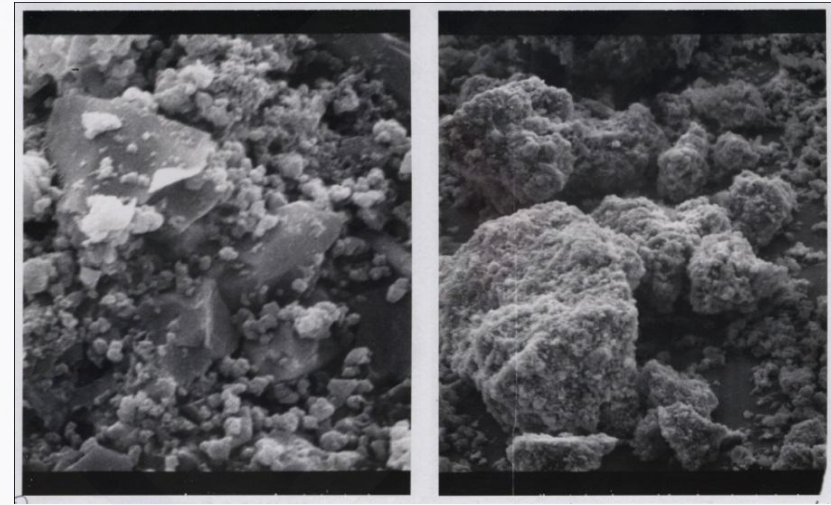
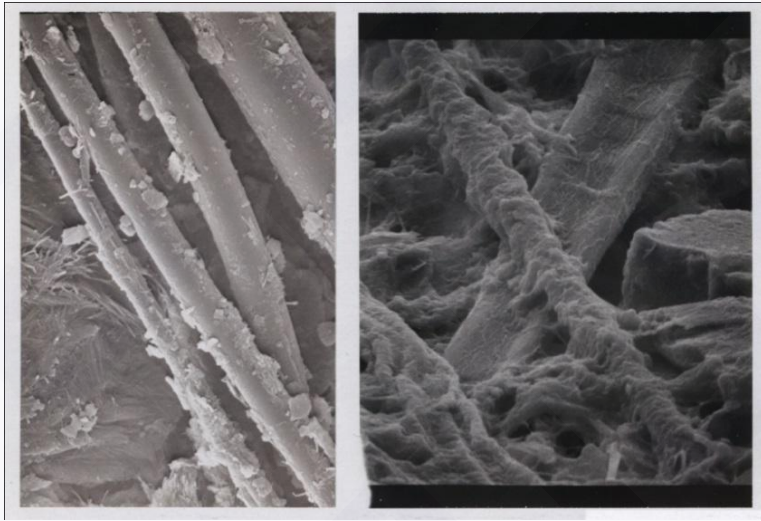
Ordinary Chinese BA Products

Fiber microfibrilization



Surface active technology

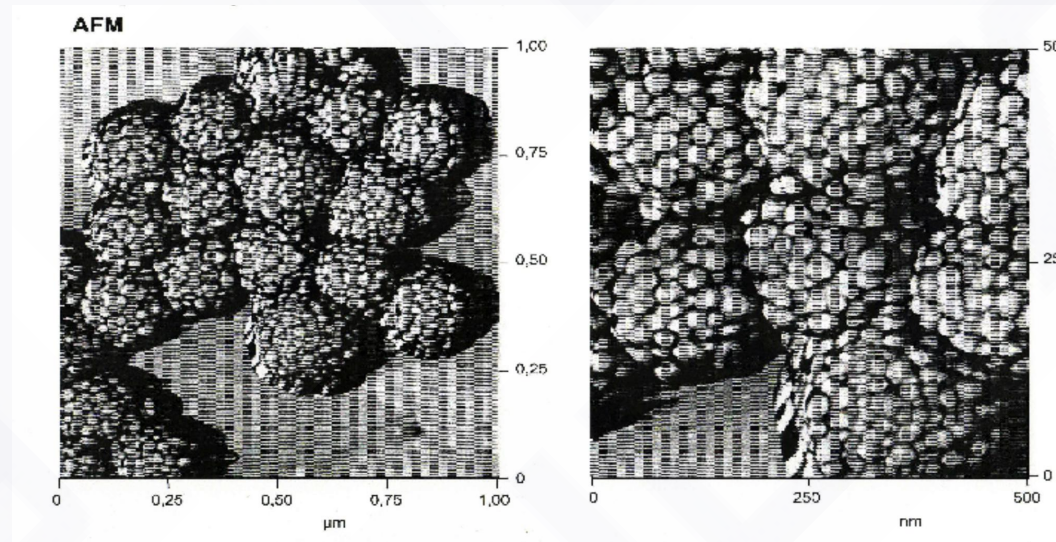
1. Disperse fibers and fillers evenly
 2. Uniformly cover the surface of fibers and fillers,
 3. After the slurry is dehydrated and formed, the various raw material components are tightly combined, and the gaps in the structure are even,
- So: the material produced not only has strong and superior physical properties, but also has good uniformity.



Comparison of untreated and treated fiber surfaces

Organic and inorganic blend co flocculation

1. The traditional adhesive is a pure latex type rubber material
 2. Our company will fully mix the water-based dispersed colloidal inorganic binder with latex type rubber,
 3. Then, a "co flocculation" process is used to derive a co polymer mixture of organic and inorganic binders during the production of sealing materials,
- Therefore, the thermal decomposition resistance, creep resistance and aging resistance of organic rubber (latex) binder are improved.



Relationship Between Properties of Gasket Mat'l and Gasket Performance

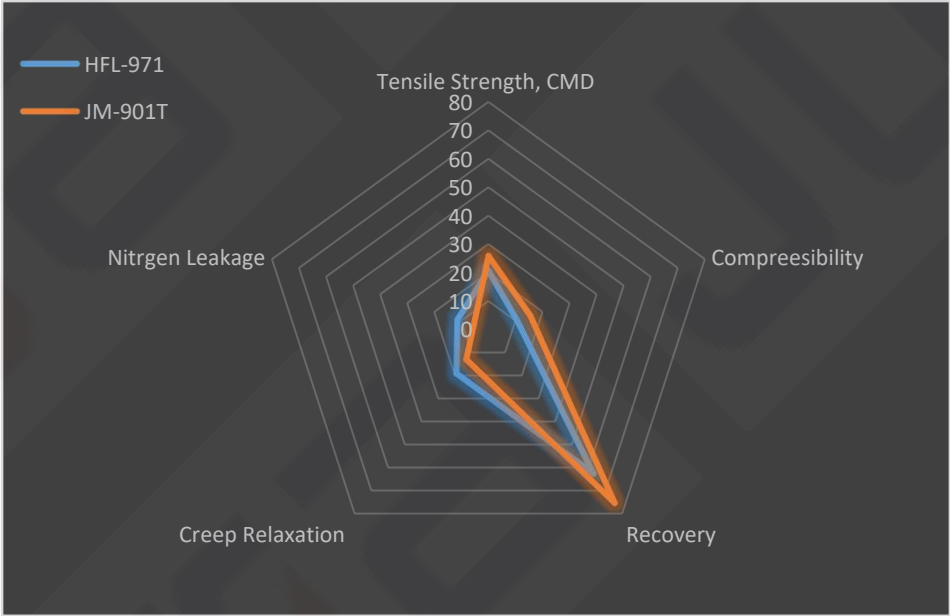
Company Introduction

NO.	Properties of Gasket Mat'l	Impact on performance of Gasket products
1	Density	Refers to the tightness of the material structure, directly affects the bulk leakage of the gasket.
2	Gauge	Affects compressibility, stress relaxation and crush resistance
3	Compressibility	Affects the conformability between the flange surface and the gasket (interface leakage). When the compression rate is too high, the crush resistance will be lower, and the stress relaxation will be greater.
4	Recovery	Affect the interface leakage. Especially when the application temperature increases, the flange surface may deform resulting in a fall in flange pressure. If the gasket material can rebound to maintain the conformability between the gasket and flange surface, the sealing function of the gasket can be maintained.
5	Tensile	No direct impact on sealing performance, but strength generally represents the toughness and fastness of the gasket material which indirectly affect the blow-out resistance of a gasket.
6	Creep Relaxation	When gasket material is working under pressure and temperature, the gasket structure can slowly creep to become thinner (stress relaxation). During application. A gasket material with great stress relaxation can affect the interface leakage (due to thinning), which is the main cause of the longevity of the gasket seal.
7	Crush Resistance	With the tightening of bolt torque, the pressure applied onto the gasket will increase. The gasket material must have the ability to withstand the torque flange pressure in order to avoid leakage caused by crushing of the gasket.
8	LOI	A Is a phenomenon of weight loss of gasket material under a certain temperature. The ignition-loss indirectly represents the temperature resistance of a sealing material at different temperatures.
9	Immersion Tests	Refers to changes of a gasket material after immersed in different liquids (lubricants, refrigeration fluids, water, etc.) under certain temperature time conditions.

Comparison of gasket material properties

Company Introduction

Test Items	Unit	Interface		Junma	
		HFL-971	HFL-972C	JM-901T	JM-901T
Tensile Strength, CMD 强度	MPa	22.61	23.97	25.45	26.55
Density 密度	g/cm3	1.5	1.52	1.53	1.52
Gauge 厚度	mm	0.79	0.82	0.84	0.46
Compresibility 压缩	%	12.45	11.5	9.1	8.21
Recovery 回弹	%	65.06	66.5	73.09	74.95
Immersion, IRM #903 Oil 浸#903 油					
Tensile after immersion 浸后强度	Mpa	19.7	22.57	23.29	24.92
Weight Increase 吸油增重	%	12.6	9.96	11.24	9.87
Thickness Increase 增厚	%	2.55	1.23	2.41	3.85
Immersion, #92 Fuel 浸#92 燃油					
Tensile after immersion 浸后强度	Mpa	14.14	19.61	19.12	20.4
Weight Increase 吸油增重	%	11.77	10.22	21.57	20.97
Thickness Increase 增厚	%	5.06	5.52	9.07	8.4
Creep Relaxation 应力松弛	%	18.9	16.54	15.2	14.6
Crush Resistance 抗压	Mpa	180	225	275	300
Nitrgen Leakage 氮气泄漏率	ML/h	11.33	10.02	6.34	5.54

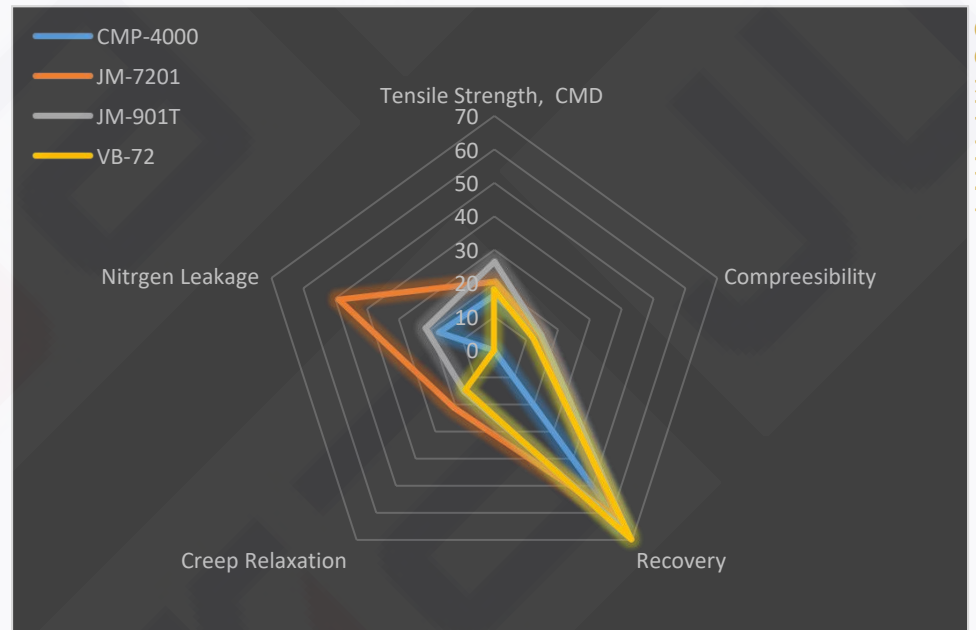


The material samples and parameters are from the market and are for reference only.

Comparison of gasket material properties

Company Introduction

Test Items	Unit	Interface		Junma	
		VB-72	CMP-4000	JM-7201	JM-901T
Tensile Strength, CMD 强度	MPa	18.21	16.28	17.42	26.38
Density 密度	g/cm3	1.52	1.49	1.46	1.53
Gauge 厚度	mm	0.54	0.79	0.8	0.75
Compreesibility 压缩	%	12.2	14.6	12.11	10.54
Recovery 回弹	%	69.3	64.5	61.2	66.41
Immersion, IRM #903 Oil 浸#903 油					
Tensile after immersion 浸后强度	Mpa	N/A	13.55	13.46	21.57
Weight Increase 吸油增重	%	12.5	10.69	12.4	14.87
Thickness Increase 增厚	%	2.86	0.64	1.5	3.42
Immersion, #92 Fuel 浸#92 燃油					
Tensile after immersion 浸后强度	Mpa	N/A	12.05	12.51	20.84
Weight Increase 吸油增重	%	11.88	9.87	12.58	13.9
Thickness Increase 增厚	%	5.77	1.27	3.03	8
Creep Relaxation 应力松弛	%	14.4	N/AR	21	15.2
Crush Resistance 抗压	Mpa	400	210	> 400	400
Nitrgen Leakage 氮气泄漏率	ML/h	N/A	17.25	48.8	21.45

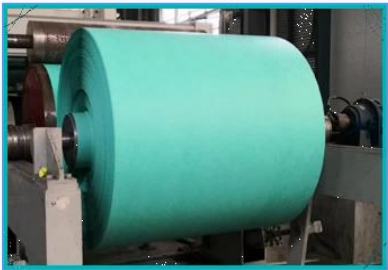


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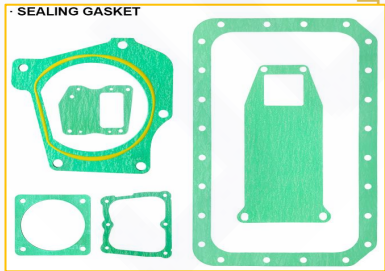
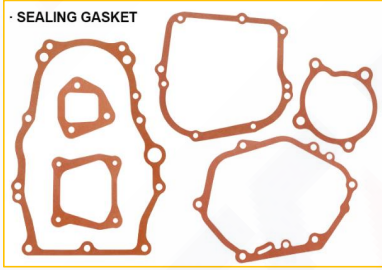
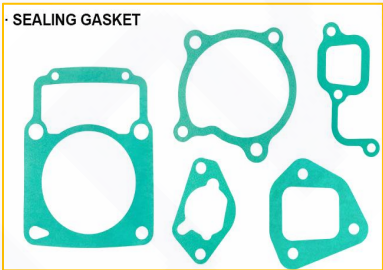
Product and Marketing

Areas Where Our Products Serve



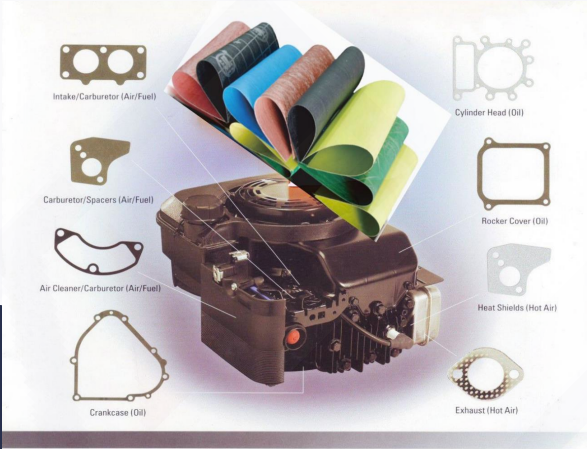


Beater Addition Materials



Compressed Sheet Materials

Schematic diagram of product application areas

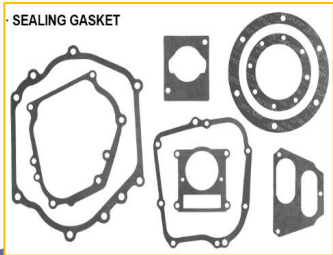
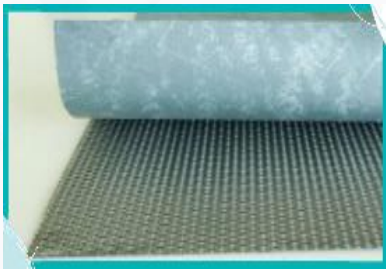


Cork Rubber Materials



Products

Laminated Materials



Beater Addition Materials

High Performance Material	JM-101A	Suitable for uneven flange surfaces. It is a sealing material with excellent anti brittleness, oil and corrosion resistance under high flange pressure, with a wide range of applications and a temperature of 200 ° C.	It is an excellent component of the oil, air, and lubricating oil sealing system
	JM-LH01	Has excellent wear resistance, compression resistance, creep resistance, oil resistance, and sealing performance. Can produce ultra-thin thickness (0.02mm), with an application temperature of 200-250 ° C.	Rotating system, transmission oil, air, coolant, fuel oil sealing system components
	JM-GW8020	It is a non asbestos material with good heat resistance, fire resistance, and low thermal conductivity. Specially designed for insulation applications in internal combustion engine exhaust systems. Has good physical properties such as compression resistance, oil resistance, and low creep. The upper limit application temperature is 850 ° C.	It is the preferred material for temperature resistance and thermal insulation applications in host equipment and after-sales markets
	JM-FB01	Specially designed for transmissions and similar applications, it has high tensile strength and compressive strength, and can withstand high internal pressure without the risk of cylinder damage. It can produce ultra-thin thickness (0.15mm) and is an excellent panel for metal composite materials. Application temperature 180 ° C.	Seals with high requirements such as transmissions and valves. Suitable for sealing system components of engine oil, air, coolant, fuel, and fuel oil, high-value type
	JM-303	Controllable swelling type product, with high compression resistance, good compression, and excellent oil sealing performance under low flange pressure, suitable for uneven flange surfaces, with application temperatures up to 300 ° C.	Cylinder head gasket, oil pan, low surface pressure sealing system components
	JM-7201	It is a high-performance microporous sealing material designed specifically for sealing applications in valve bodies and heavy-duty machinery. It is recommended for high-power compressors, general engines, diesel engines, and ships. Application temperature of 300 ° C.	Recommended for applications with high sealing requirements, such as compressors, engines, diesel engines, and ships.
General Material	JM-101	Nano porous products have excellent toughness, compression resistance, sealing performance, oil and corrosion resistance, and can be applied at temperatures up to 200 ° C.	Oil, air, coolant, fuel, universal
	JM-301	Controllable swelling type product, with high compression resistance, good compression, and excellent oil sealing performance under low flange pressure, suitable for uneven flange surfaces, with application temperatures up to 250 ° C.	Cylinder head gasket, oil pan, low surface pressure sealing system components
	JM-701	High compression rate, good sealing performance, superior performance of cork materials, but stronger and more resilient than cork materials, with better compression resistance and torque retention, making it the preferred product to replace cork materials.	Sealing systems with poor cylinder head gasket, oil pan, or flange flatness and low sealing pressure.
	JM-401A	Excellent performance in temperature resistance (350 ° C), oil resistance, compression resistance, and creep resistance, making it the preferred material for cylinder head gaskets, especially suitable for composite use with metal core plates	CHF cylinder head gasket
	JM-GR001	It has excellent thermal insulation and sound insulation properties, as well as oil resistance, pressure resistance, and sealing properties. It is a good universal insulation and sealing material, with an application temperature of 200 ° C.	Heat resistance, sound insulation, suitable for insulation applications in oil, air, and fuel oil sealing systems.
	JM-8013	A universal sealing material with high cost-effectiveness, with excellent pressure resistance, oil resistance, and sealing performance, and an application temperature of ≤ 200 ° C.	Engine oil, air, coolant, fuel, economy type
Economical Material	JM-8014	A high-performance sealing material. Widely applicable, it is a cost-effective product. Application temperature ≤ 200 ° C.	Engine oil, air, coolant, fuel, economy type
	JM-XX01	Excellent temperature resistance (300-350 ° C), oil resistance, compression resistance, and creep resistance, making it a highly cost-effective material for cylinder head gaskets	Cylinder head gasket, thermal insulation, sound insulation, oil, air, fuel oil sealing system components
	JM-8013A	A universal material with high cost-effectiveness, with excellent compression resistance, oil resistance, and sealing performance, and an application temperature of ≤ 200 ° C.	Engine oil, air, coolant, fuel, economy type

Compressed Sheet Materials

General Material	JM-7102	Universal roller sealing material products. Excellent and stable physical performance, with good fuel, lubricating oil, and sealing performance. Application temperature of 150 ° C.	Suitable for sealing components containing fuel, engine oil, and coolant
	JM-7103	Universal roller sealing material products. Good sealing performance for engine oil and fuel, with an application temperature of 200 ° C Specially recommended for pipeline sealing in the petrochemical industry.	Suitable for sealing components containing fuel, engine oil, and coolant. Recommended for sealing pipelines in the petrochemical industry.
	JM-7106	Specially designed for sealing applications in small engines (general engines), with excellent oil sealing and an application temperature of 250 ° C	Sealing system suitable for all small engines (general engines)
	JM-7107	Specially designed for the use of large general-purpose sealing gaskets, Des products have high strength, high temperature resistance (350 ° C), and excellent sealing properties	Sealing system suitable for all small engines (general engines), especially for environments with strict sealing conditions
	JM-7108	Specially developed for the sealing of agricultural equipment and machinery, it has comprehensive and high-quality physical properties, especially superior sealing, compression resistance, and corrosion resistance. The application temperature reaches 200 ° C.	Especially suitable for sealing agricultural machinery and equipment
High Performance Material	JM-7104	It is a roller sealing material required for high-performance applications. Has balanced physical properties and an application temperature of 350 ° C. Specially recommended for pipeline sealing in the petrochemical industry.	Suitable for sealing components containing fuel, engine oil, and coolant. Recommended for pipeline sealing in the petrochemical industry.
	JM-7105	It is a roller sealing material required for high-performance applications. Has balanced physical properties, excellent compression resistance, and good sealing performance for fuel and lubricating oil. Application temperature 400 ° C	Suitable for application components with high torque and high sealing requirements.
	JM-7110	It has excellent sealing performance, high compression resistance, and excellent compatibility with refrigerant refrigerant. Application temperature of 300 ° C.	Recommended for applications that require high sealing conditions, especially suitable for refrigeration and air conditioning equipment

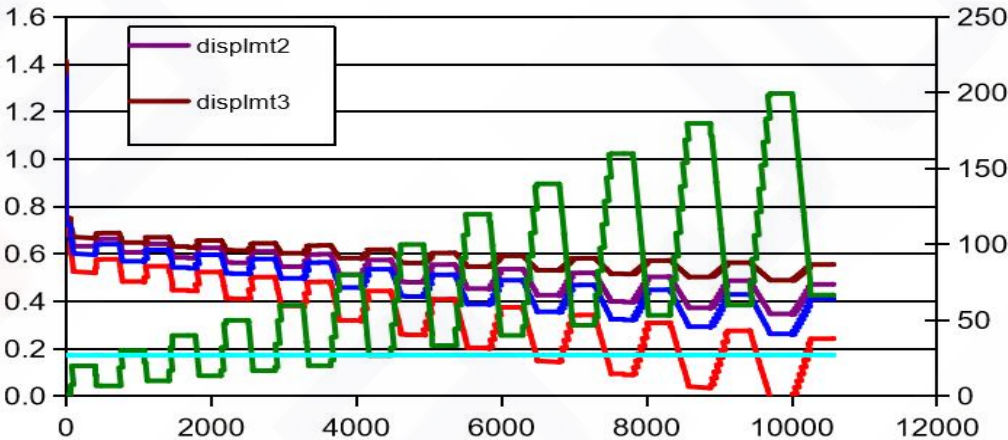
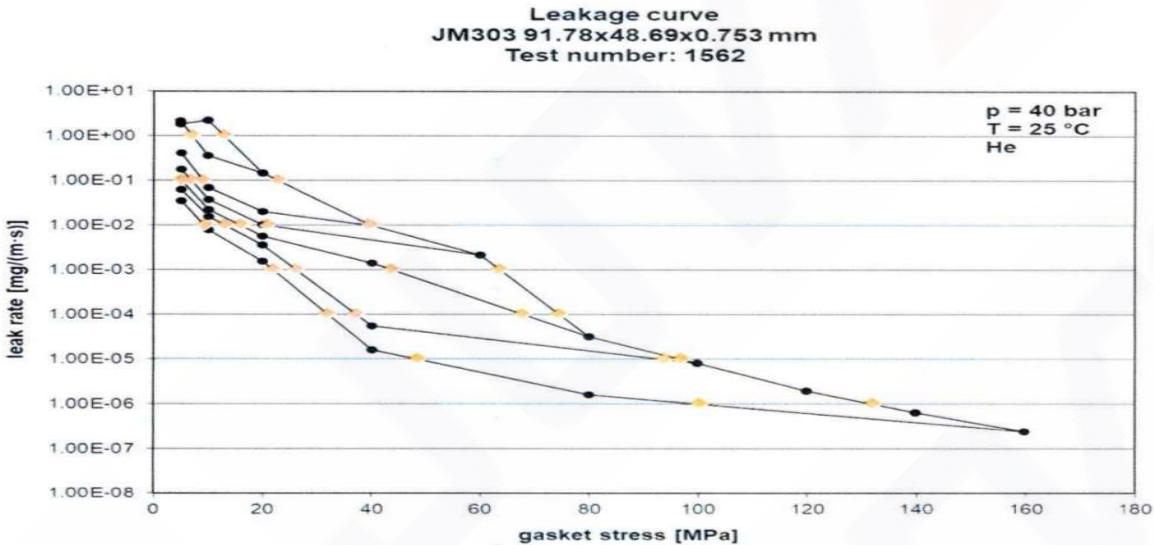
Features:

- Designed for Cylinder Head Facing Applications.
- Low Creep Relaxation.
- Excellent crush resistance (Peak operational temperature 450 C).
- Very good adhesion to metal cores.
- Cost Effective.
- Suitable for use in OEM and After Market Applications



Cummins approved materials: JM-303

Company Introduction



Engineering Standards

Name	GASKET,FIBER BASED SBR & NBR BINDER	Number	ES10461135
Identifier	MATERIAL SPECIFICATION (GASKET)	Engineering Standard Number	24236

Appendix A: Tables & Figures (Continued)

Table A2: Approved Sources & Gasket Material Designation

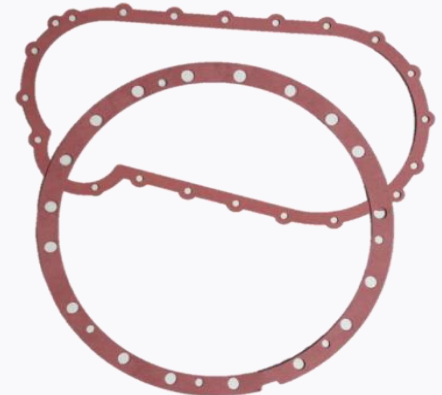
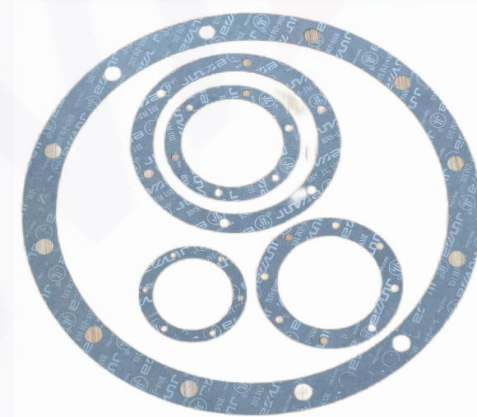
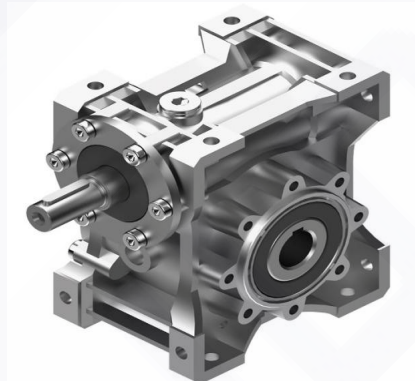
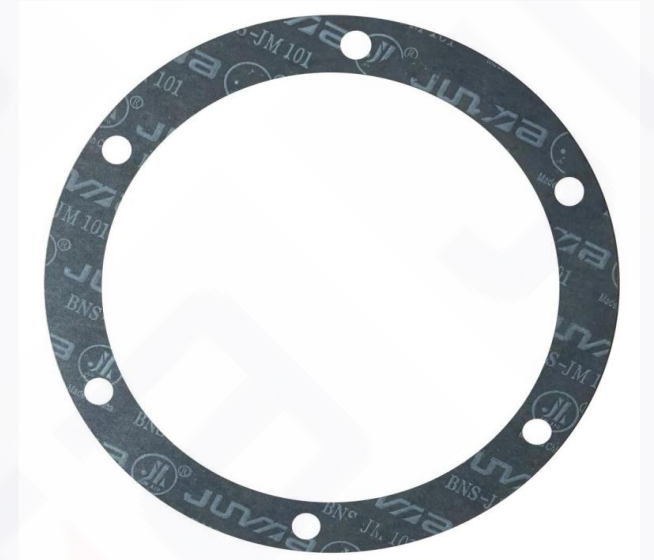
	Gasket Material Designation
	JM-303

Application - Gearbox/Transmission Gasket:JM-101/JM-302

Company Introduction

Features:

- High value non-asbestos material with balanced applicational properties.
- NBR or SBR Binders that can provide excellent oil resistance
- Can provide good seal with low flange pressures.
- Cost Effective.
- Designed for use with Automobile engines, Motorcycles, Refrigerators, Small Engines, and Gardening equipment.

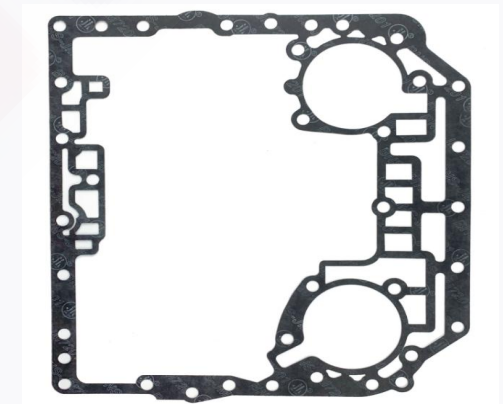
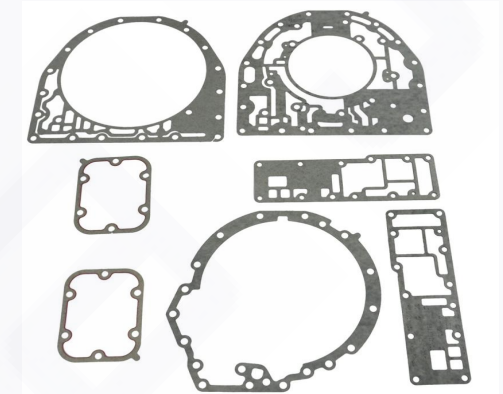
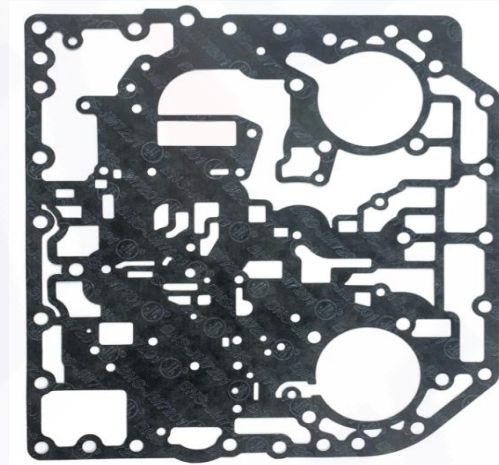


Application--Allison Transmission Gasket:JM-7201/JM-901T

Company Introduction

Brief Description:

- Value Grade non-asbestos gasket materials.
- Composed of fully cured nitril rubbers, Aramid fibers, and nano particle size inorganic fillers.
- Excellent mechanical properties with very good crush resistance and sealability.
- Excellent long-term performance: JM 7201 passed 2000 continuous alidation test.
- Recommend for use in heavy duty transmission, valve body, Refrigeration systems, and heavyduty diesel engines.



Application--Transmission valve body partition gasket:JM-FB01

Company Introduction

Transmission valve body partition gasket

Main customers include:
Changan Automobile Qingshan gearbox, Allison gearbox, etc.



Comparative Analysis of Materials Experiments between Junma's and Friendly Materials:

1. Oil immersion type: BOT-351-C4 transmission oil, 3363 transmission oil;
2. Test temperature condition: 140 °C × 2h, -40 °C × 1 hour;
3. Test frequency: 200 cycles, 600h;

Result: Junma's materials meet various harsh experimental environments.

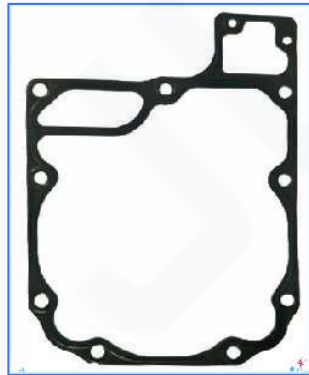
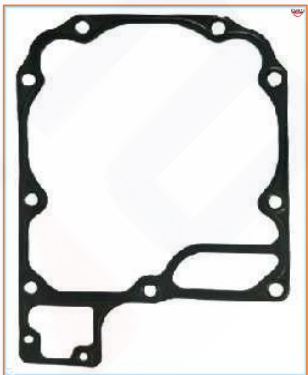


面料	生产工艺	浸BOT-351-C4变速箱油结果		浸3363变速箱油结果		结果分析
		A面	B面	A面	B面	
友商面料1	钢板涂胶粘接					整张脱落
友商面料2	钢板涂胶粘接					部分脱落
俊马FB01	纸张涂胶粘接					未脱落

Application - new energy vehicle compressors: Metal coating materials

Company Introduction

- ✔ Junma Company supplies sealing gaskets for BYD electric scroll compressors, accounting for 90% of the supply;
- ✔ Composite Sealing gaskets for BYD's entire series of new energy vehicles are produced by Junma Company.
- ✔ Junma received A+ report in annual evaluation of supplier performance.



NBR polymer metal coated gasket



Application-Small gasoline engine industry: JM-7201/901T/303/301/GR01/8013....

Company Introduction

✔Supply over 75% sealing gaskets for General power machinery products applications:

Small engines served include gasoline generators, lawn mowers, snow-plows, specialized and multi fuel power, small diesel engines, micro cultivators, micro water pumps, lawn machines, high-pressure cleaning machines, micro harvesters, etc.

JM products used in small engine applications include: JM-7201/901T/303/301/GR001/8013and others.



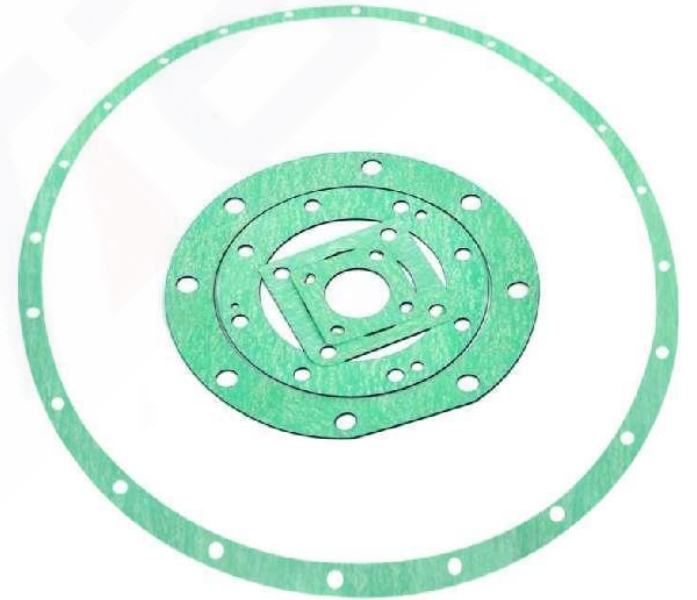
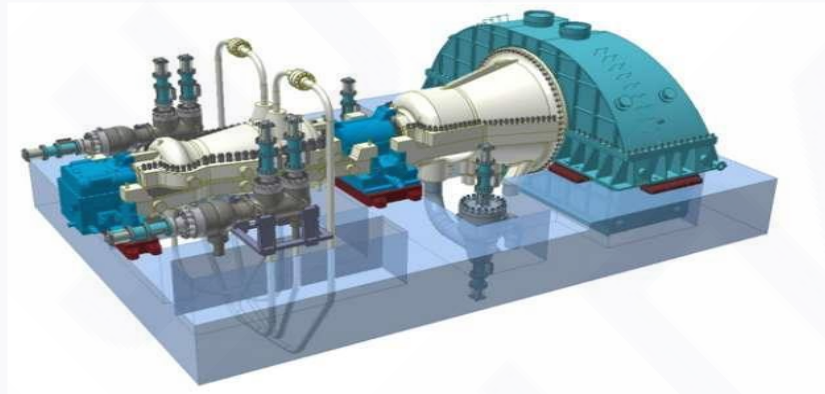
Application - Heavy duty gas turbine: JM-7105/7110

Company Introduction

Products are patented non-asbestos materials made by calendaring PROCESS

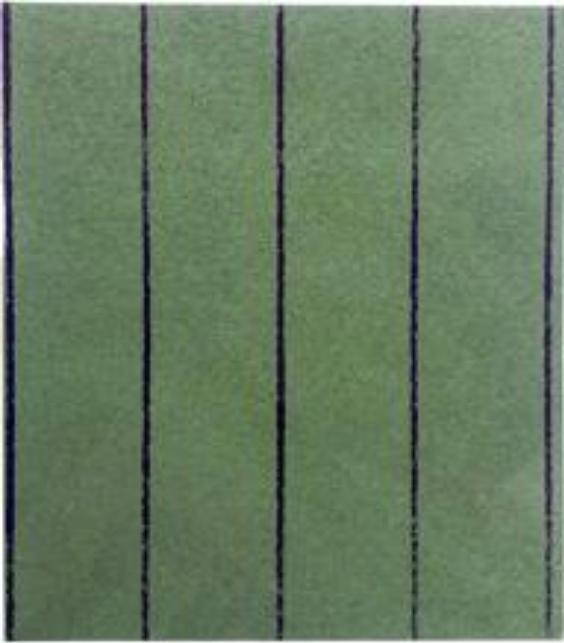
The product has good resistance to high temperature and high pressure:

- ✚ can withstand high temperature of 400 °C and high pressure of 20Mpa.
- ✚ Widely used in gas generators, industrial steam turbines, and nuclear industries.



Application - Heavy duty gas turbine: JM-GT09

Company Introduction



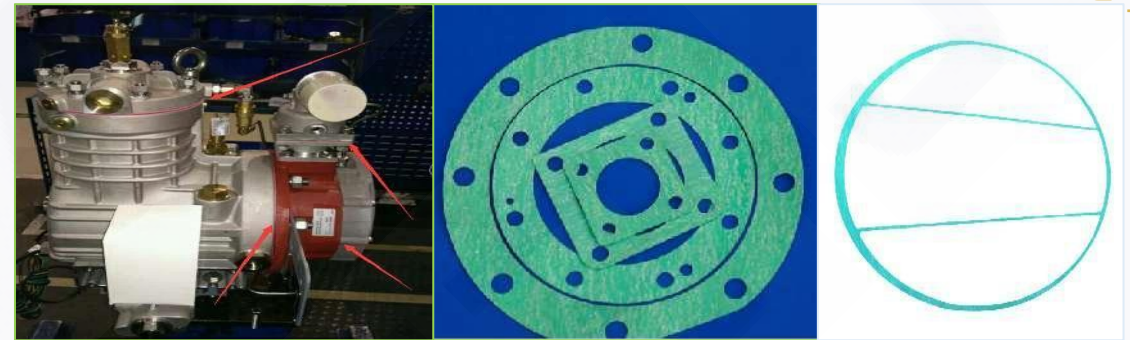
Friction plate 332800, suitable for gas turbine engines 722.6

Application - Air conditioning compressor: JM-7105

Company Introduction

- ▶ Good resistance to Freon coolants, acid and alkali solutions, does not dissolve, and not produce pollutants.
- ▶ Widely used in gas generators, industrial steam turbines, and nuclear industries.

High speed railway compressor gasket



Central air conditioning compressor gasket

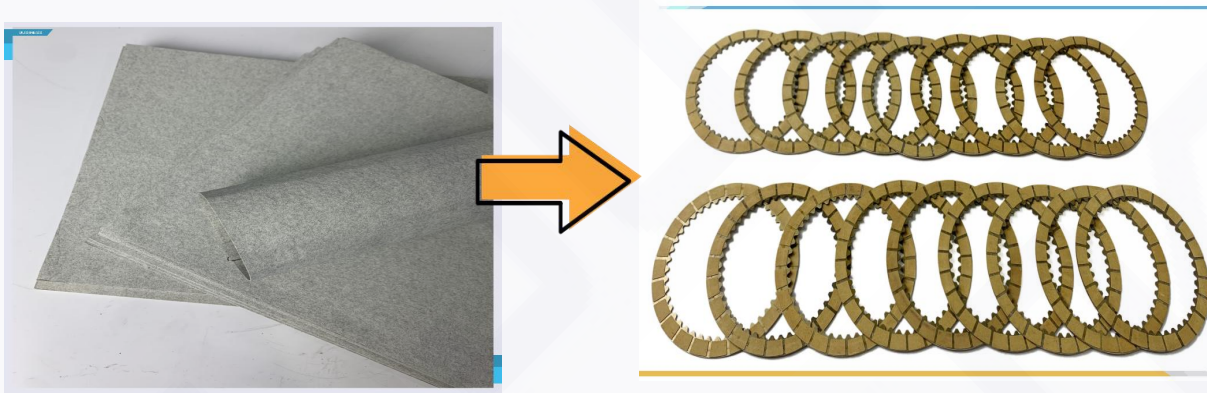


Refrigeration compressor gasket

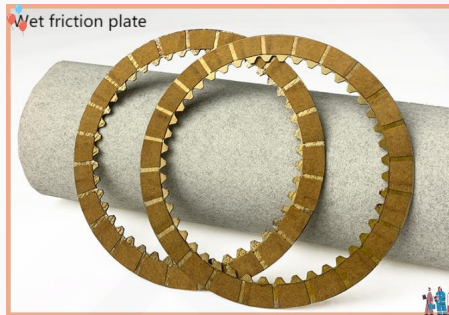


Application - Double wet clutch friction materials: JM-DCT-HP09

Company Introduction



Wet paper based friction discs

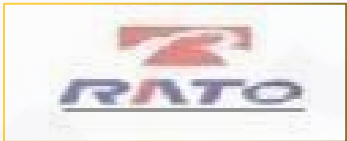


Characteristics of Wet Paper Based Friction Materials

- The size and uniformity of specific gravity (directly affecting friction performance)
 - High density - low dynamic friction coefficient
 - Low density - high wear
- Quantitative uniformity
- Pore distribution and uniformity
- The Roewe CVT180 friction pads produced through self-developed wet paper-based friction materials have gained successful market recognition.

Cooperative clients

Company Introduction



PART Four

Future Plans

1. Establish a national innovation base for wet paper based polymer composites;
2. Establish a new clean-room production line, ISO 5 level (1000000 level), for the production of transmission sealing products;
3. Design and established an automated production line for wet paper based friction discs;

Opportunity for Wet Friction Materials and Injection Plastic Materials

1. The base wet clutch friction material has a very broad market prospect, and there are currently few companies that can independently develop and produce such friction materials;
2. Junma has successfully developed base wet material production process with performance is equivalent to the level of international leading industry;
3. Developing plastic products for new energy vehicle interiors ,electronics and household appliances



An aerial photograph of a modern city skyline at dusk, featuring numerous skyscrapers and illuminated buildings. The image is overlaid with a semi-transparent blue filter. A large, white, sans-serif 'THANK YOU' text is centered across the upper half of the image. Below it, the company name and a welcome message are written in yellow.

THANK YOU

Chengdu Junma Sealing Technology Inc.

Welcom to Junma