KINGFA
金发生物



ECOPOND®

KINGFA BIOMATERIAL BROCHURE

For Our Home and Next Generation

ABOUT KINGFA BIOMATERIAL

A core business segment of Kingfa Group.The world's leading sales of bioplastics



Zhuhai Kingfa Biomaterial Co., Ltd.

▲**Founded in 2009.** Specializes in the R&D, production and sales of bioplastics

▲**Annual production capacity:**

·**Bio-Polyester:** 270,000 MT (PBAT/PBS/PBSeT/PBT/PBST, etc.)

·**PLA:** 30,000 MT

·**Bioplastics Compound:** 200,000 MT

·**Halogen-free flame retardants**: 1,000MT

▲**Patent: 200+**



Liaoning Kingfa Biomaterial Co., Ltd.

▲**Founded in 2022.** Specializes in the R&D, production and sales of bio-based monomers and fine chemicals

▲**Annual production capacity:**

·Bio-SA: 50,000 MT

·Bio-BDO: 10,000 MT

·Halogen-free flame retardants : 5,000MT

R&D power

Relying on Kingfa headquarters R & D research platform and Kingfa Biomaterial R & D and innovation platform, The company has built a high-level R&D team of bio-based polyester and biodegradable polyester, and has leading industrial innovation capabilities from small-scale test-pilot-industrialization-complete equipment development to application.

The R & D team has more than 100 people, including 30 PhDs, 40+ Master' s, 6 Principal engineers and more than 20 senior engineers.

Sustainability

The company possesses a professional carbon footprint management team, coupled with over three decades of data accumulation in the polymer materials industry. We not only offer raw material carbon reduction solutions but also provide a comprehensive lifecycle assessment program.

Certifications

Kingfa Biomaterial has achieved ISO9001/ISO14001 certification; It is the first in China to obtain the certification of the European Union, USA and other international authoritative institutions; The company's products have been certified by international authoritative organizations such as Din Certco, TUV Austria, BPI, ABA, JBPA, etc., and it is one of the enterprises with the most certifications and the most complete in China.

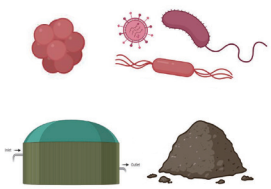




INTEGRATED SUPPLY CHAIN

Expand from biodegradable materials to bio-based materials

Reducing "white pollution"



Biodegradable materials

- ▲Molecular structure manipulation technology
- ▲Aging - degradation controllable technology
- ▲Lightweight Long-lasting Edge Sealing Technology
- ▲Short-cycle rapid prototyping technology

Reducing "carbon emissions"



Bio-based plastics

- ▲High efficiency material utilization technology
- ▲Synthetic biology technology
- ▲Refined green production technology



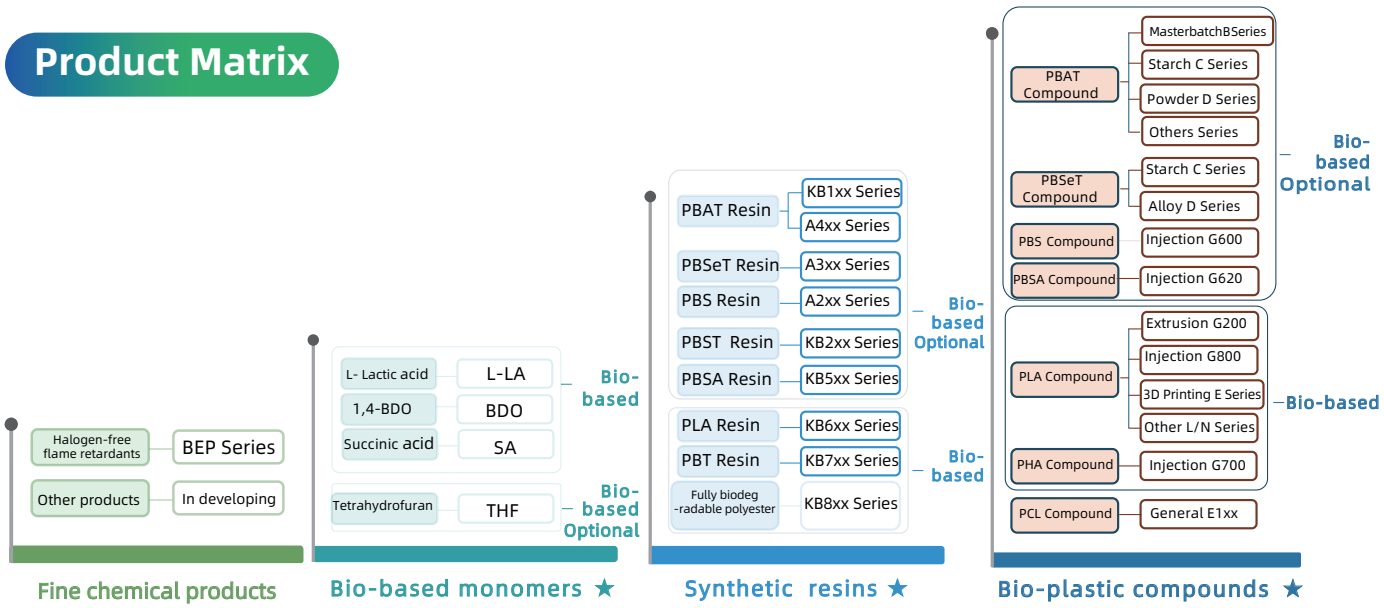
Reducing microplastic pollution



Sustainable Development

Extend from polyesters to upstream and downstream products

Product Matrix



TYPICAL APPLICATIONS FOR BIOPLASTICS

Flexible packaging applications

- Product packaging
- Industrial packaging
- Lifestyle packaging
- Logistics packaging



Other areas of applications

- 3D printing filaments
- Dining utensils
- Toys/ stationery
- Agriculture and forestry
- Home Appliances/ Automotives

















BIO-BASED MONOMERS & RESINS

Bio-based Monomers SA & BDO & THF

Product	Grade name
BIO-SA	SA100、SA200
BIO-BDO	KB-Bio530
BIO-THF	KB-THF100

Certifications

▲BETA laboratory detected **100%** biobased carbon content

▲Obtained USDA Biobased Certification from the US Department of Agriculture

▲Obtained German DIN Gepruft biobased certification

▲Obtained SGS carbon footprint certification

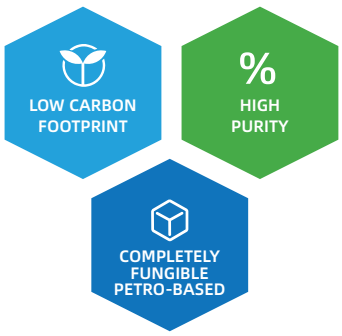
Applications

▲**Bio-based succinic acid (Bio-SA)** is an important basic raw material for the synthesis of a variety of organic substances and the manufacture of drugs, with a wide range of applications.
·**Food industry:** acidulants, neutralizers, flavorings, emulsifiers
·**Pharmaceutical industry:** eye drops, oral disinfectants, antibiotics, etc
·**Chemical industry:** biodegradable plastics, 1,4-butanediol, THF, etc

▲**Bio-based 1,4-butanediol (Bio-BDO)** is a bio-based product made from biomass.
·It is applied to degradable plastics, engineering plastics, spandex, polyurethane, etc., which can significantly improve the biocarbon content of downstream products.

▲**Bio-based tetrahydrofuran (Bio-THF)** is a completely bio-based product prepared from biomass, bio-BDO downstream product. It can be used to produce polyte tramethylene ether glycol (PTMEG), and can also be used as solvent, chemical and pharmaceutical intermediates.

Product Advantages









USDA Biobased Certification



DIN-Geprueft Biobased Certification



carbon footprint certification

HALOGEN-FREE FLAME RETARDANT

Halogen-free Flame Retardants

BEP-900
Ultra-high heat stability HPPA, PA66

BEP-900G
Pelleted, heat-resisting PBT PA6, PA66, HPPA, PPE

BEP-9003
Ultrafine Powder Particle Size:D95 ≤ 10μ
Cable And Thin Film

BEP-9005
High Dispersity
Size: D95 ≤ 15μ
TPE, TPU

BEP-M220
PA,PBT-Specific

BEP-M320
PA-Specific
Low precipitation

BEP-M330
PA,PBT-Specific

BEP-Y100
High temperature and humidity without precipitation
PA6, PA66

High Dispersity | Non Precipitation | Halogen Free | Good Heat Stability | Excellent Flame Retardancy

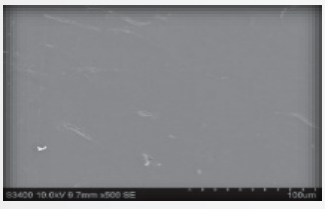
BEP-900 Versatile Halogen-Free Flame Retardant Solutions

- Compatible with PBT, PA, PPA, PPE, and other engineering plastics.
- High heat resistance
- Excellent flame retardancy

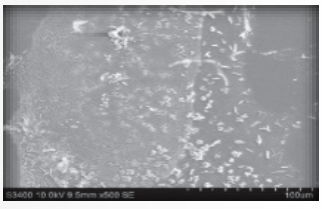


BEP-Y100 High Temperature And High Humidity Environment PA Halogen-Free Flame Retardant Solutions

Item	Unit	Test value
Phosphorus content	wt%	24.5-25.5
1%Themal weight loss	℃	≥350
Bulk density	g/cm³	0.4-0.7
Partical size (D50)	μm	30-50
Moisture	wt%	≤0.5



BEP-Y100



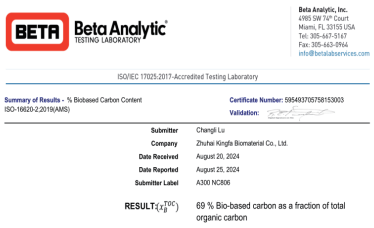
BEP+MPP

PRECIPITATION TEST (Temperature: 85°c/Humidity: 85%, 500h)

INNOVATIVE PRODUCTS AND APPLICATIONS

Bio-based resins

Material	Grade name	Monomers	Bio-based carbon content *
Bio-PBAT	KB100 NC806	PTA、AA、BDO	36%
Bio-PBSeT	A300 NC801CN	PTA、Se、BDO	37%
Bio-PBSeT	A300 NC806CN	PTA、Se、BDO	68%
Bio-PBST	KB220	PTA、SA、BDO	62%
Bio-PBS	A200	SA、BDO	98%
Bio-PBT	KB718	PTA、BDO	31%
Bio-PBXY	KB800	X、Y、BDO	98%


Beta Analytic
TESTING LABORATORY

Beta Analytic, Inc.
4985 SW 74th Court
Miami, FL 33155 USA
Tel: 305-667-5167
Fax: 305-663-0964
info@betalabservices.com

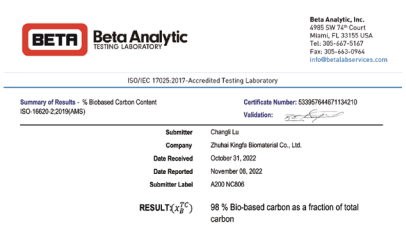
ISO/IEC 17025:2017-Accredited Testing Laboratory

Summary of Results - % Biobased Carbon Content ISO-16620-2:2019(AMS)

Certificate Number: 595493705758153003
Validation:

Submitter	Changli Lu
Company	Zhuhai Kingfa Biomaterial Co., Ltd.
Date Received	August 20, 2024
Date Reported	August 25, 2024
Submitter Label	A300 NC806

RESULT(x_1^{TOC}) 69 % Bio-based carbon as a fraction of total organic carbon


Beta Analytic
TESTING LABORATORY

Beta Analytic, Inc.
4985 SW 74th Court
Miami, FL 33155 USA
Tel: 305-667-5167
Fax: 305-663-0964
info@betalabservices.com

ISO/IEC 17025:2017-Accredited Testing Laboratory

Summary of Results - % Biobased Carbon Content ISO-16620-2:2019(AMS)

Certificate Number: 533957644671134210
Validation:

Submitter	Changli Lu
Company	Zhuhai Kingfa Biomaterial Co., Ltd.
Date Received	October 31, 2022
Date Reported	November 08, 2022
Submitter Label	A200 NC806

RESULT(x_1^{TC}) 98 % Bio-based carbon as a fraction of total carbon





Paper coating biomaterial solutions



Main applications

▲Beverage cups (hot/cold), food containers (soups, ice cream, etc.)
▲Paper based flexible packaging
▲Hamburger paper, fast food cartons (fast food, airline catering, etc.)

Product advantages

▲Lower to 8gsm coating weight
▲Compatible with PE machine
▲ Biobased & Home compostable

Key performance

▲Bio-based Properties: **Up to 100%** bio-carbon content.
▲High Recyclability and Compostability (industrial/home compostable).
▲Food Contact Safety: Meets GB/T, EU, FDA standards.
▲Superior Processing: Stable molding, ultra-high coating speed.
▲Strong Adhesion: Delamination resistance, anti-blocking at low grammage.
▲Excellent sealing property: Efficient cup production.

Comparison of Different Paper coating Solutions

Items	PE	PLA	KF-E300
Mechanical property	Flexible	Brittle	Similar with LDPE，flexible
Sealing property	good	Not good	good
Sealing temperature（℃）	＞270	＞250	＞220
Coating speed（m/min）	200-500	60-90	110-200
Coating weight(g/m²)	8-15	26-30	8-18
Compatibility with PE machine	---	Not compatible	Compatible
Compost certificate	---	Industrial compost	Home compostable
Bio content	0%	90-100%	40%-100%
Adhesion with paper	strong	weak	strong
Sticky or not during shipping	Not sticky	sticky	not sticky
Cup forming speed and loss	Fast speed and low production loss	Comparatively slow speed and higher loss	Fast speed and low production loss

INNOVATIVE PRODUCTS AND APPLICATIONS

3D printing materials solutions





Product advantages:

▲Strong technological innovation
▲Comprehensive plastics product portfolio
▲Integrated technical solutions and design

Biomaterials

PLA series

KB600 series	N500 series	E800 series	E700 series	High speed printer Series	WPC series	Matte Series	Pearly white series
Excellent aging resistance and stability	Tailor materials to different printer types	Tougheness High transparency	Excellent toughness	Matching fast printer with speed ≥500MM/S	Wood-like appearance	Matte appearance frosted texture	High Gloss, High Brightness

Other materials

Kingfa Group has a full range of 3D printing material solutions, in addition to biomaterials, there are also engineering/special plastics series solutions (Speciality Engineering Plastics series, elastomer series, ABS series, PC series, PETG, PLA carbon fiber, etc.).

Biodegradable straw solutions

Biodegradable straw materials

- Applicate to straight and bend straw, colored/uncolored straws.
- Bio-based content range from 68-100%
  Compliant with biodegradability and food contact standards,

● Typical performance of straws

Property	General Grade	G200
Heat resistance (℃) with post-crystallization	≥75	≥80
Heat resistance (℃) without post-crystallization	≥50	≥60
Processing temperature (℃)	190	185
Shelf life	1 year	1 year
Low Extrusion die material accumulation	⋆	⋆ ⋆ ⋆
Low-defect	⋆	⋆ ⋆ ⋆
85 °C / 85 % RH accelerated aging (h)	≥24	≥24




■ Excellent product performance

- Withstands 80°C heat and-16°C cold
- Good aging resistance
- Low warping
- Good heat resistance without post-crystallization

■ Good processing performance:

- 5-10°C lower extrusion
- Low extrusion die material accumulation
- Crystallization time halved

INNOVATIVE PRODUCTS AND APPLICATIONS

Bioplastic Food Packaging Solutions

Applications of Green Food Packaging



Puffed Food Packaging,
Snack Packaging



Daily Necessities Packaging,
Fruit/Vegetable Bags



Vacuum Packaging



Wet Wipe Packaging,
Medium-Barrier Liquid Packaging



Packaging for Dried Fruit,
Tea, Coffee, etc.



High-Barrier Liquid Packaging



Coffee Capsules



Coffee Bean Packaging,
Dog Food Packaging



Candy and Biscuit Packaging

Product Advantages:

▲High bio-based carbon content and biodegradable.

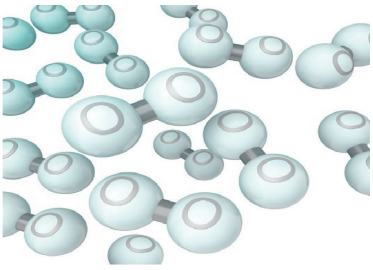
▲Home compostable options are available.

▲The moisture and oxygen barrier properties can be adjusted according to specific application requirements.

Coffe capsule biomaterial solutions



Locks in coffee flavor compounds



Resists moisture & Blocks oxygen

Product advantages

▲Home compostable or Industrial compostable available

▲Heat resistant: HDT up to 120℃

▲Toughness adjustable in wide range

▲High barrier

▲Short circle time

	Industrial compostable degradation		Home compostable degradation	
Grade Name	G600 C01(PBS)	G600 K02 (PBS)	G620 (PBSA)	G630 M01 (PHA)
Properties of the material	High stiffness	High toughness	High barrier, precise degradation cycle	High heat resistance, high barrier

INNOVATIVE PRODUCTS AND APPLICATIONS

High transparency self-adhesive cling film solutions

Key performance

Core performance	standard GB/T10457	Kingfa Biodegradable cling film	PE cling film
Thickness	/μm	10	10
Transmittance	≥85%	92	90
Haze	≤4%	0.9	1.2
Tensile strength (MD/TD)	≥10Mpa	44/15	23/13
Elongation at break (MD/TD)	≥100%	180/870	180/310
Right-angle tear strength (MD/TD)	≥40N/m	105/160	86/120
Gas permeability	$cm^3/(m^2*24h*0.1 MPa)$	O_2=64810 CO_2=59557	O_2=38162 CO_2=133752
Moisture permeability	$g/(m^2*24h)$	1032	25
Self-adhesive	≥0.5N/cm^2	0.9	0.7

Product advantages

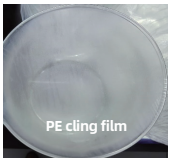

100% home compostable


High transparency


High and low temperature resistance, -20-85℃


Excellent self-adhesion





Excellent anti-fogging (25℃ water in 4℃ refrigerator for 10min)

High bio-based carbon content fruit bag solutions

Product advantages

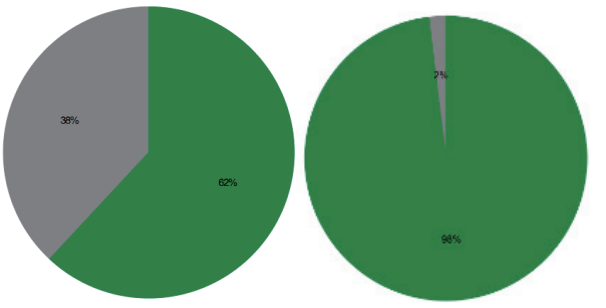
▲Bio-based： 20%-98% bio-based carbon content fruit and vegetable bag solutions

▲Transparency： Transparency > 90% and haze < 40%

▲Thin： The thickness is as low as 9μm, and the load bearing is not less than 3kg

▲Food contact safety：Passed EU 2011 and US FDA food contact certification

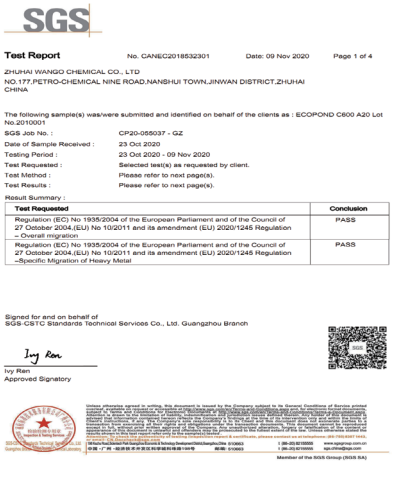




RESULT:(x_B^{TC}) 62 % Bio-based carbon

RESULT:(x_B^{TOC}) 98 % Bio-based carbon

BETA



SGS

Test Report No. CANEC2018532301 Date: 09 Nov 2020 Page 1 of 4

ZHUHAI WANGO CHEMICAL CO., LTD
NO.177,PETRO-CHEMICAL NINE ROAD,NANSHUI TOWN,JINWAN DISTRICT,ZHUHAI CHINA

The following sample(s) was/were submitted and identified on behalf of the clients as : ECOPOND C600 A20 Lot No.2010001

SGS Job No. :	CP20-058037 - GZ
Date of Sample Received :	23 Oct 2020
Testing Period :	23 Oct 2020 - 09 Nov 2020
Test Requested :	Selected test(s) as requested by client.
Test Method :	Please refer to next page(s).
Test Results :	Please refer to next page(s).

Result Summary :

Test Requested	Conclusion
Regulation (EC) No 1935/2004 of the European Parliament and of the Council of 27 October 2004,(EU) No 10/2011 and its amendment (EU) 2020/1245 Regulation – Overall migration	PASS
Regulation (EC) No 1935/2004 of the European Parliament and of the Council of 27 October 2004,(EU) No 10/2011 and its amendment (EU) 2020/1245 Regulation –Specific Migration of Heavy Metal	PASS

Signed for and on behalf of SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch

Ivy Ren
Approved Signatory

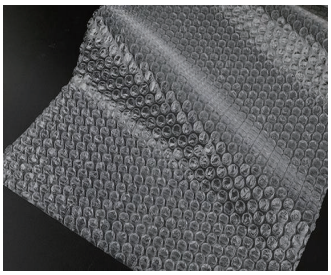
INNOVATIVE PRODUCTS AND APPLICATIONS

Biodegradable bubble wrap solution

Key performance

Items	unit	value
Density	g/cm3	1.33
Tensile Strength (MD/TD)	MPa	30/20
Elongation at Break (MD/TD)	%	200/600
Tear Strength (MD/TD)	mN	2400/1000
The strength of the dart impact	g	260
Shelf life	/	12-month cell retention≥80%
Production speed	/	Up to 9m/min
Process temperature	℃	140-150℃





Product advantages

·Rapid prototyping
·Leading production speed (9m/min)

·Performance remains excellent
·12-month cell retention≥80%

Biodegradable Solutions for the Agricultural Industry

Solutions for Compostable Agricultural Films

▲Biodegradable PBAT Resin (A400 MF Series) and PBAT Compound (D300 F Series), offering customized solutions tailored to different crops and regional climate requirements.

- Completely Degrades into Carbon Dioxide and Water
- Contains No PE (Polyethylene) Components
- Excellent Mechanical Properties
- Carbon Emission Reduction





Solutions for Compostable Slow-Release Fertilizer Coatings, Seedling Bags, and Seedling Trays, Degradable seedling paper, Tree protection net, Agricultural Clips.











COMPANY PROFILE OF KINGFA SCI. & TECH. CO., LTD.

Founded in 1993, Kingfa Sci. & Tech. Co., Ltd. is an advanced material enterprise focusing on the R&D, production, sales and service of advanced high-performance chemical materials, and providing advanced material solutions for creating a safer, more comfortable and more convenient life. Kingfa is committed to solving the increasingly severe environmental problems, actively responding to the challenges brought about by the changes in the global environment, and promoting the continuous improve ment of the living environment through balanced economic, environmental and social practices to achieve sustainable develop ment and create a better life.

Headquartered in Guangzhou Science City, Kingfa operates 66 subsidiaries worldwide, with R&D and production bases estab lished in overseas regions such as South Asia, Southeast Asia, North America, and Europe. The company's core business revolves independently developed product with proprietary intellectual property rights, including nine major categories: modified plastics, eco-friendly high-performance recycled plastics, biodegradable plastics, specialty engineering plastics, high-performance fiber-reinforced composites, light hydrocarbon and hydrogen energy, polypropylene resin, styrene resins, medical and healthcare polymer materials.

Kingfa's products are widely used across industries including automotive, home appliances, electrical and electronics, consumer electronics, embodied intelligence, new energy, aerospace, high-end equipment manufacturing, sustainable packaging, and healthcare. The company has established strategic partnerships with numerous leading enterprises in China and around the world.

At present, Kingfa is one of the companies with the most comprehensive product portfolio in the global advanced chemical mate rials industry and the world's largest producer of modified plastics by production scale and product range. In fields such as biode gradable plastics, specialty engineering plastics, and high-performance fiber-reinforced composites, Kingfa's technology and product quality have reached the international advanced standards. Centered on advanced polymer materials, the company continues to expand across both upstream and downstream segments of the industrial chain, with its integrated industry ecosys tem creating increasingly strong synergies.

The company has evolved from a modified plastics manufacturer into a provider of integrated material solutions, while continu ously upgrading its product portfolio toward higher-end and higher value-added applications. Kingfa operates across four core business segments, namely modified plastics, advanced materials, green petrochemicals, and healthcare. Through sustained investment in technological innovation, supported by a global marketing and service network and a highly efficient operational system, the company continues to drive high-quality business growth.

Products are the cornerstone of market competitiveness. To sustain innovation, Kingfa adheres to the R&D philosophy of "inde pendent innovation, leading technology, and product superiority", relying on the support of National Recognized Enterprise Technology Center, National Engineering Laboratory, State Key Laboratory, and National Industrial Innovation Center, Kingfa has established the strategic "13551" R&D system, gradually forming a R&D platform driven by technology research, industry research, and product research.

In 2025, Kingfa invested RMB 2.761 billion in technology research and development, representing 4.22% of its sales revenue. The company adheres to the concept of "common endeavor, common growth, and common prosperity" and continues to innovate and improve the talent incentive mechanism to adapt to different stages of enterprise development. The value-sharing concept has attracted a large number of outstanding talents. At present, the R&D team consists of 260 Ph.D. holders and 1750 master's degree holders, and has independently trained 1 Member of Chinese Academy of Engineering, 1 Foreign Academician of the Russian Academy of Engineering and 6 experts with special allowance from the State Council.

Kingfa has filed 7621 domestic and foreign patents in total, including 5551 invention patents, 887 utility models, 37 appearance designs, 701 PCT patents and 445 foreign patents. The company has received four Second Prizes of the National Scientific and Technological Progress Award, 21 First Awards at the Provincial/Ministerial Level for Scientific and Technological Progress, and 22 China Patent Awards (Excellent Award).

Guided by the strategic principle of "Strengthen the Midstream, Reinforcing both ends, Innovation-driven, Leaping develop ment", Kingfa aims to build world-class R&D, marketing, manufacturing, and supply platforms. The company strives to become a global leader in advanced materials, supporting national strategic material needs and contributing to a sustainable future

ZHUHAI KINGFA BIOMATERIAL CO., LTD.

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