Sustainable Development and Technological Advancement of China's Chemical Fiber Industry

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Sustainable development

01

Promoting energy efficiency and low-carbon development

- Prioritized energy structure optimization and upgrading, as well as raising the proportion of secondary energy consumption.
- Encourages enterprises to purchase green electricity and increase the use of innovative energy sources like solar energy.
- Develop the carbon peaking roadmap, clarifies the industry's carbon reduction implementation approach.
- Increases research and development of green process technology and equipment, strengthens the transformation of clean production technology and the promotion of key energy-saving and emission reduction technologies.
- Encourages the development and use of green raw materials, catalysts, auxiliary materials, and additives, and leverages various technologies to realize the green production of the chemical fiber industry.
- Promotes the development and construction of green factories, green goods, green supply chains, and green parks in the industry.
- Carries forward the establishment of industry-leading demonstration enterprises in water and energy efficiency.
- Promoting industry-wide life cycle assessment, carbon footprint calculation, and social responsibility consciousness.

Sustainable development

02

Improving recycling level

- Advanced the optimization of the structure of recycled chemical fiber and the upgrading of enterprises.
- Realized the large-scale and low-cost production of chemical method-based recycled polyester through collaboration with international advanced enterprises and carrying out independent research and development, and promoted the development and industrialization of key technologies for recycled nylon, spandex, viscose, and high-performance fibers.
- Promoted key technological breakthroughs and industrial development in effectively utilizing waste textiles, accelerated the directional recycling of waste textiles, strengthened the recycling and reusing of waste school uniforms, police uniforms, work clothes and uniforms containing more polyester, and promoted the construction of laws, regulations, and standard systems related to the recycling and reusing of waste textiles in China.

Sustainable development

03 Promoting green fiber certification and platform system construction

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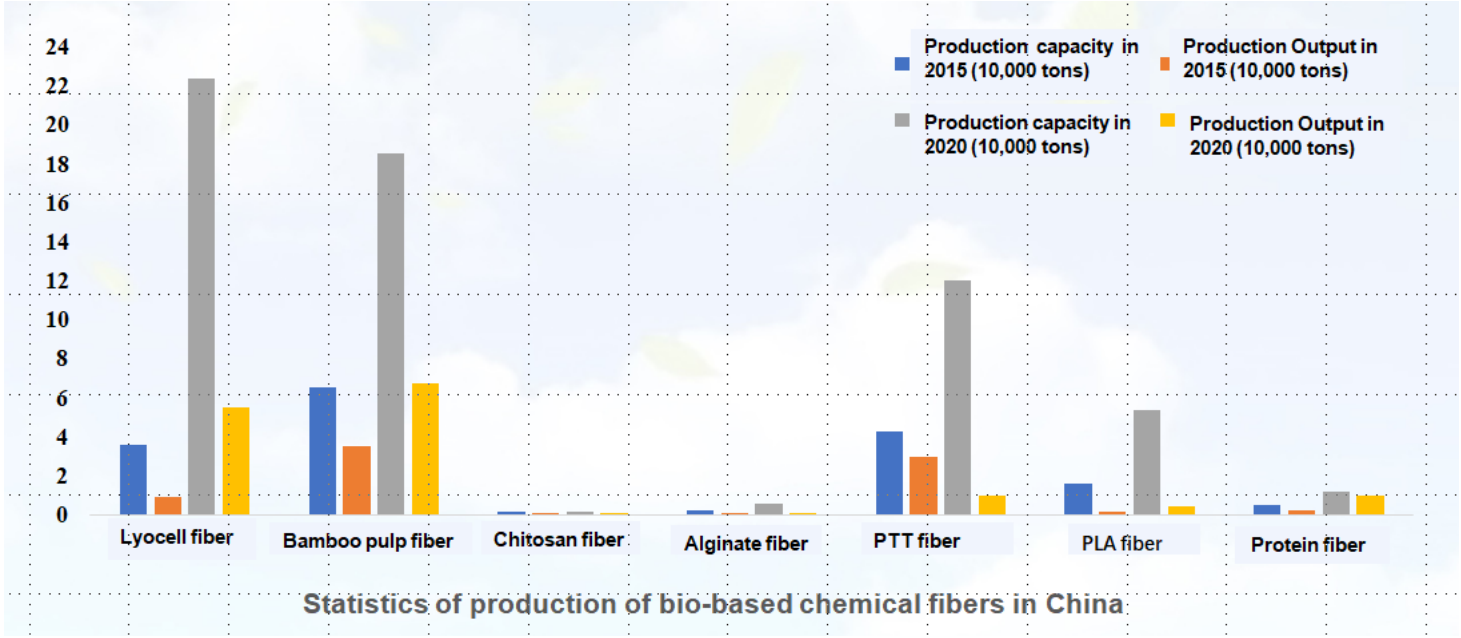
GREEN FIBER

- Created a number of green fiber manufacturers with clean production reaching the international advanced level by increasing the publicity and promotion of green fiber certification and guiding the green development of certified enterprises.
- Encouraged downstream enterprises in the industrial chain to participate in green fiber product certification, increased the influence of green fiber certification in the industry, and encouraged the development of green fiber industrial chain traceability and certification platforms.
- Encouraged the development of green standards and norms, formulated and improved industry-wide standard systems for green factories, green product evaluation, and green supply chains, and updated the checklist and limits concerning various hazardous substances.

Sustainable development

04 Laying the groundwork for the development of bio-based chemical fibers

- China's total output of bio-based chemical fibers has reach around 150,000 tons at the end of the 13th Five-Year Plan period in 2020, an increase of 87 percent over 2015 at the start of the 13th Five-Year Plan period.



Statistics of production of bio-based chemical fibers in China

Sustainable development

05

Works carried out in microplastic inhibition

The attempt to inhibit the release of fiber microplastics：

1. Apply a coating on the fabric
2. The use of laundry bags during washing
3. The addition of filtering devices outside the washing machine

Further works：

（1） Develop standards and methods for evaluating and detecting the release of fiber microplastics by clothes in the washing process

（2） Encourage washing machinery manufacturers to collaborate with scientific researchers to improve laundry equipment

（3） Advise fiber manufactures to take into account the wear resistance of fibers in producing fibers and increase their capacity to resist the formation of fiber microplastics during the washing process

（4） Encourage weaving and garment manufacturers to limit the amount of isolated fiber fragments left over throughout the manufacturing process

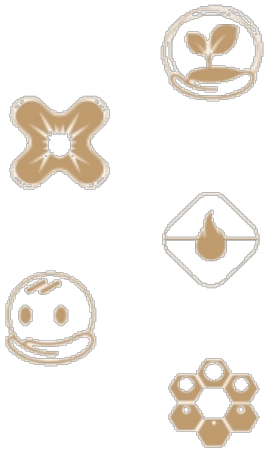
（5） Strengthen publicity to increase public consciousness about scientific laundry and the contamination about decreasing microplastic

Technology and Product Innovation

01

Ongoing advancement of China's functional fiber technology

- High-capacity, flexible, and efficient polyester and nylon preparation technologies that have generally advanced to the international advanced level have been widely adopted in China, and technologies including molecular structure design, copolymerization, blending and recombination have been further optimized, promoting the development of multi-functional, composite and modified fiber;
- The technology for preparing functional fibers such as ultra-fine, flame-retardant, antistatic, ultraviolet-resistant, antibacterial, phase change thermoregulated, and photochromic fibers has been further optimized, the range of differentiated and functional fiber products continues to grow, and the application fields have expanded.

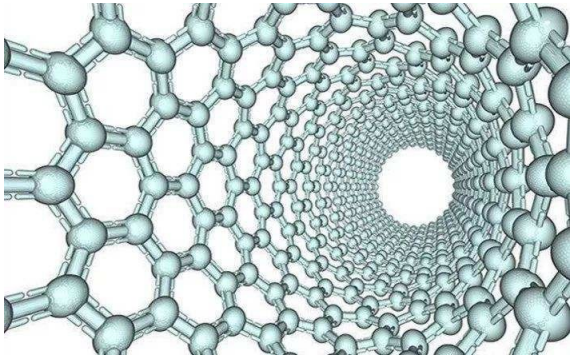


Technology and Product Innovation

02

Rapid evolution of advanced technologies on new fiber materials

- Smart fibers characterized by conduction, thermal storage and energy conversion, photochromism and thermochromism, sensing and response are being developed;
- Significant advances have been made in the macro quantitative preparation of nanofibers such as graphene, carbon nanotube, and microcrystalline cellulose fibers, the preparation of nanofibers by electrospinning, biochemical preparation of bacterial cellulose fibers, and the preparation of nanofibers by phase separation and centrifugal spinning in terms of safety protection, separation and filtration, and biomedicine;
- Biodegradable bio-based fibers such as polylactic acid, polyglycolic acid, and silk protein fibers, as well as fiber-based gel and fiber 3D printing, are finding new applications in medical fibers, implant materials, and synthetic devices.



The Evolution of Intelligent Manufacturing

- The application of automatic equipment has resulted in “machine replacing human”
- Intelligent workshops have been preliminarily built based on industrial Internet
- Information sharing has been preliminarily realized via coordination and interconnection between internal and external systems
- The intelligent warehousing system has led to “unmanned operation”
- Online detection and monitoring has led to “lean management”

THANK YOU