The Changing Structure of the Korean Textile and Clothing Industry and Policy Tasks

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1. Introduction

The Korean textile and clothing industry has fallen into a positioning trap without any obvious strengths over the checks of advanced countries such as Japan, the United States and Germany and catch-up developing countries such as China and India.

The domestic production base has shrunk as companies expand overseas investment to improve price competitiveness through cost reductions while neglecting facility investment for the production of new products and expansion of new facilities.

In addition, the Korean textile and clothing industry has not only declined in terms of profitability but also in terms of productivity due to a lack of technological innovation capability, a lack of high value-added products and a reorganization of the industrial structure centered on small companies with low productivity and low profitability.

With the advent of the 4th Industrial Revolution, advanced countries are using 4th Industrial Revolution technologies and smart factories to increase the productivity and efficiency of logistics and distribution, but the Korean textile and clothing industry has utilized these technologies at negligible levels.

The government has continued to support the development of high value-added and high performance technical textiles to upgrade the industrial structure, but technical textiles have not grown into export industries and still demonstrate high import dependence.

In this regard, this study will identify policy tasks that will enable the Korean textile and clothing industry to escape from the positioning trap between advanced and developing countries and to develop into a growing industry by developing a high value-added market currently occupied by advanced countries.

Table 1. Korean Textile and Clothing Production

Unit: KRW billion, percent

	Production			Annual average growth rate		Structural change		
	2006	2011	2018	2006 to 2011	2011 to 2018	2006	2011	2018
Chemical fibers	3,464	5,884	4,458	11.2	-3.9	10.6	12.5	11.3
Spun yarns	2,000	2,995	2,397	8.4	-3.1	6.1	6.4	6.1
Fabrics	7,479	11,329	8,398	8.7	-4.2	22.9	24.1	21.3
Dyeing and Finishing	3,575	4,380	3,782	4.1	-2.1	10.9	9.3	9.6
Clothing	13,126	18,444	15,598	7.0	-2.4	40.2	39.2	39.6
Other made-up textiles	3,044	4,061	4,759	5.9	2.3	9.3	8.6	12.1
Total	32,687	47,081	39,393	7.6	-2.5	100.0	100.0	100.0

Source: Korea National Statistical Office, Mining and Industry Survey Report.

2. The State of the Korean Textile and Clothing Industry

(1) The Production and the Value-added Rate of Korean Textiles and Clothing

□ Production

The Korean textile and clothing industry faces many difficulties, from shrinking domestic demand and sluggish exports due to the overall downturn in the global economy to an accelerated Chinese pursuit and fierce competition with Taiwan.

Production by volume declined by an average of 3.6 percent per annum from 2011 to 2019. Annual production drops grew from 1.7 percent in 2017 to 4.2 percent in 2018 and further to 6.9 percent in 2019. In 2019, the production of chemical fibers plummeted by 11.3 percent while clothing and fabrics production decreased by 7.1 percent and 5.7 percent, respectively. In the case of textiles, knitted fabrics and spun yarn production plunged, by 6.1 percent and 5.8 percent, respectively. Other made-up textiles declined at a lesser rate of 0.9 percent.

Production value, which has increased on the back of diversification and the high value-added of products since the mid-2000s, has entered a decline phase due to sluggish exports and shrinking domestic demand amid a global economic contraction and domestic economic slowdown since 2011.

The value of production declined by an average of 2.5 percent per annum, from 47 trillion KRW in 2011 to 39 trillion KRW in 2018.

In examining production by sector from 2011 to 2018, the production of fabrics and chemical fibers decreased while other made-up textiles increased. Fabrics decreased by an average of 4.2 percent per annum owing to weakening price competitiveness versus Chinese products and intensifying competition

with Taiwanese products. In particular, fabric production slowed significantly on account of the accelerated erosion of imported products into the domestic market amid continued sluggish exports. The production of chemical fibers declined by an average of 3.9 percent per annum owing to a drop in product prices that followed falling international oil prices and intensifying global competition. Spun yarns decreased by an average of 3.1 percent per annum due to the influence of the transfer of production facilities overseas in the cotton industry. The dyeing and finishing industry shrunk by an average of 2.1 percent per annum due to the slowdown in fabrics production in the demand sector. On the other hand, other made-up textiles increased by an average of 2.3 percent per annum, mainly in bedding products, interior products, cleaning products and marine products. In the case of clothing, knitted clothing declined significantly by an average of 10.2 percent per annum, while sewing clothing decreased only by an average of 1.7 percent per annum. In the case of the fabrics, tire cord fabrics sunk by an average of 15.9 percent per annum, while coated and nonwoven fabrics increased slightly, by an average of 0.7 percent and 0.1 percent per annum, respectively. In the case of other made-up textiles, consumer textile products posted modest growth of 3.7 percent per annum while industrial textile products averaged growth at a slightly lower rate of 1.7 percent per annum over the same period.

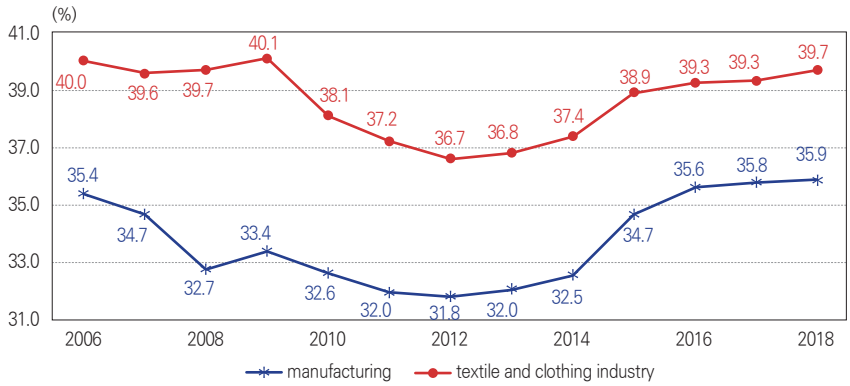
□ Value-added Rate

The Korean textile and clothing industry is a high value-added industry that creates added value through high functionality and performance in textiles and fashion design.

The value-added rate in the Korean textile and clothing industry rose by three percentage points from 36.7 percent in 2012 to 39.7 percent in 2018, thanks to the upgrading of the industrial structure centered on high-function textiles, high-performance technical textiles and fashionable clothing. The latter figure is 3.8 percent points higher than the average of 35.9 percent in the manufacturing as a whole.

In examining value-added rates by sector in 2018, dyeing and finishing and clothing posted high rates while chemical fibers and spun yarns were much lower. Dyeing and finishing showed a very high level of 47.9 percent, based on high-sensitivity dyeing and high-function finishing. Clothing also recorded a high level of 46.7 percent based on fashion design. On the other hand, chemical fibers and spun yarns posted lower figures of 27.9 and 31.4 percent, respectively. Because of the characteristics of the equipment industry, in particular, cotton spun yarns recorded a very low level of 22.8 percent. In the case of fabrics, wool fabrics demonstrated a relatively high level of 40.6 percent, while knitted fabrics and man-made filament fabrics were lower, at levels of 27.6 percent and 32.2 percent, respectively. In the case of other made-up textiles, household tex-

Figure 1. Value-added Rate of the Korean Textile and Clothing Industry



Source: Korea National Statistical Office, Mining and Industry Survey Report.
Note: The value-added rate = value-added/production.

tile products showed a high level of 39.3 percent, mainly in embroidery and bedding products, while industrial textile products showed a low level of 32.2 percent, mainly in tarpaulin products, fabric bags and carpets.

(2) Korean Textile and Clothing Trade

□ Trade Balance

The Korean textile and clothing trade deficit has been expanding since 2016 due to a continued increase in imports. The trade deficit ballooned after first turning to a deficit of 700 million USD in 2016, reaching 4.2 billion USD in 2019.

In examining trade balances by sector, clothing and other made-up textiles recorded a deficit, while fabrics recorded a surplus. First of all, Korea has long had a deficit in the clothing trade. The clothing deficit continued to expand due to the increase in reverse imports of Korean companies' overseas production, which was valued at nine billion USD in 2019. Other made-up textiles also posted deficits as imports have grown since 2014, recording a deficit of 600 million USD in 2019. On the other hand, fabrics recorded a large surplus of 4.8 billion USD in 2019, but have been on a steady decline since peaking at 9.1 billion USD in 1997.

□ Exports

Korean textile and clothing exports have increased mainly in ASEAN developing countries since 2009, but since 2014 exports slipped into a downward trend due to the slowdown in the global economy and the accelerated catch-up of China. Export growth decreased by an average of 4.2 percent per annum, from 11.6 billion USD in 2014 to 13 billion USD in 2019.

In examining exports by sector over the period from 2014 to 2019, all sectors decreased, especially in fabrics, which posted the largest decline, dropping by an average of 5.8 percent

Table 2. Korean Textile and Clothing Exports

Unit: million USD, percent

	Exports			Annual average growth rate		Structural change		
	2009	2014	2019	2009 to 2014	2014 to 2019	2009	2014	2019
Man-made fibers	1,738	2,698	2,632	9.2	-0.5	14.9	16.8	20.3
Man-made staple fibers	793	1,413	1,300	12.2	-1.7	6.8	8.8	10.0
Man-made filament yarns	945	1,285	1,331	6.3	0.7	8.1	8.0	10.3
Spun yarns	1,334	1,889	1,606	7.2	-3.2	11.4	11.7	12.4
Fabrics	7,173	9,371	6,946	5.5	-5.8	61.4	58.2	53.6
Natural fiber fabrics	519	551	369	1.2	-7.7	4.4	3.4	2.8
Man-made filament fabrics	1,595	2,305	1,670	7.6	-6.2	13.6	14.3	12.9
Man-made staple fiber fabrics	235	394	355	10.9	-2.1	2.0	2.4	2.7
Knitted fabrics	3,158	3,931	2,714	4.5	-7.1	27.0	24.4	20.9
Other fabrics	1,666	2,190	1,838	5.6	-3.5	14.3	13.6	14.2
Clothing	1,381	2,228	1,919	10.0	-2.9	11.8	13.8	14.8
Other made-up textiles	1,122	1,328	1,251	3.4	-1.2	9.6	8.3	9.7
Total	11,685	16,096	12,960	6.6	-4.2	100.0	100.0	100.0

Source: Korea International Trade Association, Korea Trade Statistics.

per annum due to intensifying competition with Taiwan and the accelerating catch-up of China. In particular, the decline of fabric exports can be attributed to the reduction of fabric imports (procurement) to Korea by Korean clothing producers that moved production bases abroad. Clothing and other made-up textiles fell by an average of 2.9 percent and 1.2 percent per annum, respectively, due to faltering consumer sentiment following the global economic slowdown. In particular, exports of other made-up textiles also decreased mainly in interior products and carpets despite increases in bedding, cables and ropes.

In examining exports by destination, the largest textile and clothing export market for Korean goods in 2019 was Vietnam. Exports to Vietnam continued to increase as Korean clothing producers based in Vietnam increased fabrics imports (procurement) from Korea. As a result, Vietnam's share of Korean textile and clothing exports rose from 2.4 percent in 2000 to 17 percent in 2014, and further yet to 22.3 percent in 2019. The conclusion of the Korea-USA free trade agreement had only a modest effect ton exports to the United States. The share of exports to the U.S. grew from 8.4 percent in 2011 to 22.3 percent in 2019. Exports to the EU were also only affected by the Korea-EU FTA in 2011. The EU's share climbed from eight percent in 2009 to 9.9 percent in 2019. On the other hand, exports to China declined significantly owing to China's reduced import demand for textile materials because of sluggish clothing exports and the import substitution of textile materials, cou-

Table 3. Korean Textile and Clothing Export Share by Leading Destination

Unit: billion USD, percent

	2000	2009	2014	2017	2018	2019	Annual average growth rate		
							2000 to 2009	2009 to 2014	2014 to 2019
Vietnam	2.4	11.3	17.0	21.7	22.0	22.3	12.7	15.8	1.0
China	14.1	19.7	15.9	14.3	13.6	12.8	−1.6	2.1	−8.2
USA	19.4	9.5	9.1	9.3	10.2	11.0	−12.4	5.7	−0.5
Indonesia	4.2	7.5	8.3	8.0	7.6	7.0	1.1	9.0	−7.5
Japan	8.1	5.5	5.6	5.6	5.8	6.2	−9.2	7.3	−2.5
Turkey	1.0	1.6	1.9	2.7	2.9	3.5	−0.5	10.9	8.4
ASEAN	10.6	24.7	32.6	36.8	36.6	36.2	4.2	12.7	−2.2
EU	9.3	8.0	9.7	9.8	10.4	9.9	−6.7	10.8	−3.9
Total	100.0 (18.78)	100.0 (11.69)	100.0 (16.10)	100.0 (13.74)	100.0 (14.08)	100.0 (12.96)	−5.1	6.6	−4.2

Source: Korea International Trade Association, Korea Trade Statistics.
Note: Figures in ( ) are export values (billion USD).

pled with expanded production capacity. As a result, the share of Korean exports to China fell sharply from 22.2 percent in 2006, its peak, to 12.8 percent in 2019.

□ Imports

Korean textile and clothing imports, which had jumped owing to the increase in the re-impor-

Table 4. Korean Textile and Clothing Imports

Unit: million USD, percent

	Imports			Annual average growth rate		Structural change		
	2009	2014	2019	2009 to 2014	2014 to 2019	2009	2014	2019
Man-made fibers	733	1,461	1,372	14.8	−1.3	10.1	10.1	8.0
Man-made staple fibers	211	223	195	1.2	−2.7	2.9	1.6	1.1
Man-made filament yarns	522	1,238	1,177	18.9	−1.0	7.2	8.6	6.9
Spun Yarns	2,023	2,790	2,370	6.6	−3.2	27.8	19.4	13.8
Fabrics	1,389	2,131	2,143	8.9	0.1	19.1	14.8	12.5
Natural fiber fabrics	441	557	445	4.8	−4.4	6.1	3.9	2.6
Man-made filament fabrics	133	218	185	10.4	−3.3	1.8	1.5	1.1
Man-made staple fiber fabrics	154	205	211	5.9	0.6	2.1	1.4	1.2
Knitted fabrics	80	141	131	11.8	−1.4	1.1	1.0	0.8
Other fabrics	581	1,010	1,171	11.7	3.0	8.0	7.0	6.8
Clothing	3,323	8,381	10,890	20.3	5.4	45.7	58.2	63.6
Other made-up textiles	737	1,333	1,847	12.6	6.7	10.1	9.3	10.8
Total	7,265	14,396	17,129	14.7	3.5	100.0	100.0	100.0

Source: Korea International Trade Association, Korea Trade Statistics.

tation of products produced by Korean manufacturers relocating their production bases to developing countries in Asia, including China and Vietnam, has remained the low increase since 2014 due to the global economic slowdown and falling consumer sentiment following the slowdown in the domestic economy.

Imports increased by an average of 3.5 percent per annum from 2014 to 2019 period, reaching 11.7 billion USD in 2019.

In examining imports by sector from 2014 to 2019, clothing and other made-up textiles recorded steady growth, while spun yarns and chemical fibers exhibited decline and fabrics only slightly increased. Other made-up textiles recorded a relatively high growth rate of 6.7 percent per annum on average, mainly in interior products, linen, string, rope and fishing net. As a result, the share of other made-up textiles among Korean textile and clothing imports rose from 9.3 percent in 2014 to 10.8 percent in 2019. Clothing is driving the increase in imports of total textiles and clothing, along with high imports from ASEAN countries. As a result, the share of clothing rose from 25.9 percent in 2000 to 45.7 percent in 2009 and to 63.6 percent in 2019. On the other hand, spun yarn imports were sluggish, owing to a slowdown in import demand due to a decrease in the production of fabrics and knitted clothing. As a result, the share of spun yarns rose from 25.9 percent in 2000 to 45.7 percent in 2009 and further to 63.6 percent in 2019. Fabrics increased only relatively low due to the import substitution of high value-added products by improving the quality level of Korean products. As a result, the share of fabrics fell from 31.7 percent in 2000 to 19.1 percent in 2009, and further to 12.5 percent in 2019.

In examining imports by leading supplier over the 2000 to 19 period, Imports has recorded a high increase rate from ASEAN countries, including Vietnam, mainly for mid. low-priced products, and from the EU, mainly for high-end products, while it has only increased from China. Imports from ASEAN countries had a very high growth rate of 14.9 percent per annum on average. As a result, the share of ASEAN countries in Korean textile and clothing imports rose from 9.7 percent in 2000 to 15.6 percent in 2009, and further to 38.0 percent in 2019. In particular, imports from Vietnam recorded a very high growth rate of 24.1 percent per annum on average although he is Korea's second-largest Import partners after China. As a result, the share of Vietnam rose from 1.6 percent in 2000 to 7.2 percent in 2009, and further to 26.3 percent in 2019. Imports from the EU recorded a relatively high growth rate of 6.3 percent per annum on average, mainly in luxury clothing and highly sensitive textiles. As a result, the EU's share of imports rose from 8.5 percent in 2014 to 9.6 percent in 2019. In particular, imports from Italy recorded a high annual growth rate of 13.3 percent per annum on average, increasing Italy's share of imports from 4.1 percent to 4.9 percent during the same

Table 5. Korean Textile and Clothing Import Share by Leading Supplier

Unit: billion USD, percent

	2000	2009	2014	2017	2018	2019	Annual average growth rate	
							2000 to 2014	2014 to 2019
China	42.1	55.2	44.5	40.7	38.6	38.2	8.6	0.4
Vietnam	1.6	7.2	18.7	23.7	26.0	26.3	29.2	10.8
Indonesia	4.4	4.6	5.2	5.3	5.3	5.0	9.6	2.6
Italy	6.4	4.4	4.1	4.8	4.8	4.9	4.8	7.1
Japan	11.4	5.9	3.7	3.4	3.1	3.1	−0.3	0.3
India	5.7	3.4	2.5	2.5	2.9	2.4	2.0	2.8
ASEAN	9.7	15.6	31.9	35.9	38.1	38.0	17.8	7.2
EU	11.9	9.7	8.5	9.3	9.4	9.6	5.6	6.3
Total	100.0 (4.79)	100.0 (7.27)	100.0 (14.40)	100.0 (15.19)	100.0 (17.14)	100.0 (17.13)	8.2	3.5

Source: Korea International Trade Association, Korea Trade Statistics.
Note: Figures in ( ) are import value (billion USD).

period. On the other hand, imports from China slowed significantly since 2007, due to weakening price competitiveness versus Asian rivals brought on by rapid wage increases. As a result, China's share fell from 62 percent in 2007 to 44.5 percent in 2014 before dropping to 38.2 percent in 2019. Nevertheless, China's share of imports remains the highest.

3. Development Constraints of the Korean Textile and Clothing Industry

□ Low Technological Competitiveness due to a Dearth of Technological Innovation Capability

The Korea textile and clothing industry lacks core technology and technological innovation capability. Technological development has not been achieved due to a lack of R&D investment.

The ratio of R&D investment to sales declined from 1.52 percent in 2017 to 1.41 percent in 2018. Moreover, the latter figure was only a third of the 4.2 percent figure in manufacturing overall. The number of researchers per 1,000 employees was 87 persons, which was only two-thirds the average of the entire manufacturing sector in 2018. Despite employing so few researchers, R&D expenditure per researcher was just 83.9 million KRW, which was only 38 percent of the average number in the overall manufacturing sector in 2018

Owing to this lack of technological innovation capacity, the level of technology in the Korean textile and clothing industrial is significantly lower than that of its competitors in Italy and Japan, for instance. Technology levels in Korea are two years ahead of China, but four to five years behind Japan. The technical levels of the Korea textile industry have

Table 6. Comparison of Technological Competitiveness between Korea, China and Japan in the Textile and Clothing Industry

	Technical fiber yarns	Yarns for clothing	Fabrics	Dyeing and finishing	Sewing	Nonwoven fabrics	Fiber reinforced composites	Total
China=100	100	115	110	120	105	110	115	110
Japan=100	67	85	87	77	90	85	70	78

Source: KIET.
Note: Figures show Korean technology levels when China and Japan are set at 100.

Table 7. SWOT Analysis of Korean Textile and Clothing Industry

Strengths	Weaknesses
- The world's fifth largest textile material supply base - A balanced industrial structure between streams - Accumulation of quality control and processing technology - Establishment of research infrastructure specialized for local producers - Industry turns out more than 5,000 new designers annually - Fast fashion available in Dongdaemun Fashion Market	- Absence of core source technology and insufficient R&D capability - High performance technical textile technology weak - Middle and downstream vulnerabilities in technical textiles - Rapid aging of core labor force - Absence of global brands and weakening brand power - Weak global marketing power
Opportunities	**Threats**
- Government policy to promote high-performance technical textiles - Domestic market expansion in China and weakened price competitiveness due to rising labor costs - Enhancement of national brand image and increased awareness of Made-In Korea products through Korean Wave and K-pop - Rapid response the 4th Industrial Revolution based on the world's best ICT technology	- Concerns of deteriorating profitability and weakening competitiveness due to increases in minimum wage and shorter working hours - Enhancement of industrial competitiveness through improvements to China's textile material technology and development of fashion clothing brands - Strengthening environmental regulations at home and abroad

stalled at just 78 percent of those of Japan, due to a lack of technology development of high-performance industrial textile materials and differentiated textile materials.

□ Limitation of High Value-added Clothing Market Development due to Inferiority in Design and Brand Power

Korean clothing companies have difficulties in pioneering high value-added markets due to inferior creative design development capabilities, an absence of global brands and weakening brand power.

Korean clothing companies have failed to grow into world-class global brands by settling for the domestic market and neglecting to enter the global market. As a result, Korean design and quality levels are 48 percent and 22 percent lower, respectively, than that in Italy.

□ Dimming Growth Potential due to Sluggish Facility Investment

In the Korean textile and clothing industry, the aging of production facilities has intensi-

fied and facility competitiveness has weakened because of sluggish facility investments, mainly in machinery and equipment.

Total facility investments amounted to 349 billion KRW in 2019, this is only 38 percent of the 909 billion KRW invested in 2015. In particular, investments in machinery and equipment were 8.5 billion won, or just 25 percent of the 28.1 billion KRW invested in 2015. In addition, investments in new product production and investment in response to export demand are critically insufficient.

According to the survey of the Korean textile and clothing industry, aged production facilities over 10 years old accounted for 64 percent of total production facilities.

□ Domestic and Global Market Encroachment due to the Accelerated Catch-up by China

The Korean textile and clothing industry finds itself in a nut-cracker as the technological gap with China rapidly narrows while the gap with advanced countries such as Japan, the United States and Germany grows.

China's textile and clothing industry, with improvements in product quality, is expected to rapidly catch up to Korea's textile and clothing industry.

In the 13th Five-Year Plan (which covers from 2016 to 20), China is actively promoting the strengthening of basic research by expanding R&D investment, the development of high-performance high-tech textiles, the high value-added of existing products, and its own brand development.

□ Fears of Worsening Business Management due to Deteriorating Working Environments Amid Low Profitability

Profitability in the Korean textile and clothing industry is not only steadily falling, but also significantly lower than the average for manufacturing. The ratio of operating profit to sales fell from 5.2 percent in 2010 to 4.3 percent in 2015, eventually plunging to just 3.3 percent in 2018, which is less than half of the average of 7.3 percent profit ratio for manufacturing as a whole.

The Korean textile and clothing industry is an industry highly dependent on labor that requires 9.4 workers to create one billion in added value, which is 1.7 times more than the average of 5.4 workers in the manufacturing sector.

As such, the textile and clothing industry, with its low profitability and labor-intensive business model is concerned that other business pressures such as weakening price competitiveness and deteriorating profitability will increase due to dramatic increases in the minimum wage in recent years.

□ The Erosion of the Domestic Market due to High Import Growth Without the Development of an Export Industry in Korean Technical Textiles

Despite support from the government, not

only has the Korean technical textiles industry failed to develop into an export industry due to a lack of competitiveness, it has ceded the domestic market to importers as well.

Exports of technical textiles only increased by an average of 2.5 percent annually, while imports increased by 6.2 percent per annum from 2010 to 2018.

In the case of the proportion of technical textiles in textile materials and products (excluding clothing), imports accounted for the largest share, at 46.2 percent, while exports made up just 28.3 percent of such products 2018.

In terms of the global market share of technical textiles, Korea occupies only three percent, which is lower than the 9.9 percent, 9.8 percent and four percent market share held by Germany, the United States and Japan, respectively.

The Korean technical textiles industry has the capability to develop and produce high-performance fiber yarns such as aramid fibers and carbon fibers, mainly in large enterprises, but in middle streams, such as technical woven and knitted fabrics, high-performance non-woven fabrics and blading products, it is very vulnerable.

In Korea, there are insufficient test inspection standards or certification systems to evaluate the reliability of high-performance textiles, such as high-performance super fibers, high-performance non-woven fabrics and reinforced composite materials.

Due to this, the industrial ecosystem for industrial fibers is cut off.

4. Policy Tasks for the Korean Textile and Clothing Industry

(1) Fostering Advanced Technical Textiles as a Next-generation Growth Engine and Export-oriented Industry

In the future, the Korean textile and clothing industry needs to promote advanced technical textiles capable of creating high value-added as a next-generation growth engine for sustainable growth. In particular, it is necessary to grow as an export-oriented industry as well as through import substitution by enhancing competitiveness through strengthening the industrial ecosystem of technical textiles.

First of all, it is necessary to strengthen industrial competitiveness by improving the technical level of high-performance fibers and the application of products such as carbon fibers, aramid fibers, PPS (polyphenylene sulfide) fibers and UHMWPE (ultra-high molecular weight polyethylene) fibers. In particular, in the case of carbon fiber, it is necessary to secure a competitive advantage with competing countries by developing original technology in high-performance fibers such as T-1000 ultra-high strength and high elastic carbon fiber, as the regular carbon fibers of the T-300 to 350 levels are facing intensifying competition and oversupply as Taiwan has secured a high level of competitiveness and production capacity in China is expanding.

It is necessary to develop advanced conver-

gence fibers to respond to changes in the industrial structure following the 4th Industrial Revolution. In particular, it will be necessary to develop lightweight, flame retardant and heat resistant textiles for future transportation equipment such as spacecraft and lightweight, rigid textiles for robots.

Fiber-reinforced composite materials should be strengthened by securing reliability with technology development support to reduce molding processing time and reduce molding costs. In particular, it is necessary to develop core technologies, such as design and simulation technologies for fiber-reinforced composite materials, high-speed molding technology, parts bonding technology, mold technology and recycling technology.

It is necessary to establish a reliability evaluation and certification system for reliability certification and create new demand for high-performance technical textiles. In Korea, there are no test inspection standards or certification systems to evaluate the reliability of high-performance fibers such as high-performance technical textiles, high-performance non-woven fabrics and lightweight fiber-reinforced composite materials.

It is necessary to build industrial ecosystems for advanced technical textiles with raw materials and yarns, intermediate materials (fabrics, non-woven fabrics, braiding), processing and composite materials, applied products (systems) and evaluation and certification. To this end, it is necessary to provide financial support for technological development and expansion of manufacturing facilities in intermediate technical textiles including technical fabrics, high-performance non-woven fabrics and braiding, which currently have a weak domestic production base. In particular, since it is necessary to develop technology in connection with demand industries such as automobiles, aircraft, civil engineering, and construction, it is necessary to build a shared growth model that includes cooperative technology development and joint marketing through strategic alliances with demand industries.

(2) High Value-added and Competitiveness of Textile Materials for Clothing

In the future, the Korean textile materials industry for clothing needs to establish a production system focused on high value-added and differentiated materials through technological innovation so as to maintain a competitive advantage with competitors such as China and Taiwan and prevent developing countries from catching up.

First of all, Korea needs to lead the high value-added of fabrics and pioneer the global market by fostering dyeing and finishing companies with planning and marketing capabilities.

In addition, it is necessary to realize high value-added and differentiation of textile materials for clothing by developing high-function yarn processing and dyeing and finishing technologies.

It is also imperative to strengthen government support for corporate participation in world-famous exhibitions such as the Unica Exhibition in Milan, the Première Vision in Paris and Fabric Start in Munich.

(3) Restructuring the Clothing Industry Centered on Premium Fashion Products

The Korean fashion industry needs to transform its industrial structure to one centered on high-end and differentiated (premium) fashion products to overcome fast followers such as China and to penetrate the high value-added product market currently occupied by advanced countries.

First of all, it is necessary to provide customized support for each stage of growth for promising designers. We need to find promising new designers with strong creativity and willingness to commercialize and provide all the support for new designers to start a brand. In particular, consulting should be provided to new designers, from start-up to the creation of marketing and financial plans. It is additionally necessary to promote the commercialization of promising new brand companies through customized consulting support for each brand, prototype production support and exhibition participation support. It is necessary to promote the globalization of mid-sized brand companies through support for participation in overseas collections and fashion shows, customized consulting support for entering the global market, and customized fashion material development consulting for each brand. It is necessary to support clothing companies to achieve marketing, logistics and distribution innovation using AI, VR (virtual reality), AR (augmented reality) and Big Data.

Finally, it is critical to establish a sustainable fashion ecosystem that can develop and produce eco-friendly and recycled textile materials and products that do not harm the environment.

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