Main Office
HS HYOSUNG ADVANCED MATERIALS Corporation
119 Mapodae-ro, Mapo-gu, Seoul, Korea
T. 82-2-707-6114
www.hshyosungadvancedmaterials.com

HS HYOSUNG Advanced R&D Center for Tech and Innovation (HARTI)
HS HYOSUNG R&D Center (HQ)
74 Simindaero, Dongan-gu, Anyang-si, Gyeonggi-do, Korea
T. 82-31-428-1000

ARAMID R&D Center
30, Napdo-ro, Nam-gu, Ulsan, Korea
T. 82-52-278-7632

ECF
ELEMENTAL CHLORINE FREE

This eco-friendly paper is made from pulp bleached by chlorinated compounds like ClO_2 rather than elemental chlorine, so less dioxin is generated to reduce environmental impact.

30%
RECYCLED MATERIAL

This eco-friendly paper contains 30% regenerated pulp made from recycled paper.

Revised date : March, 1, 2026

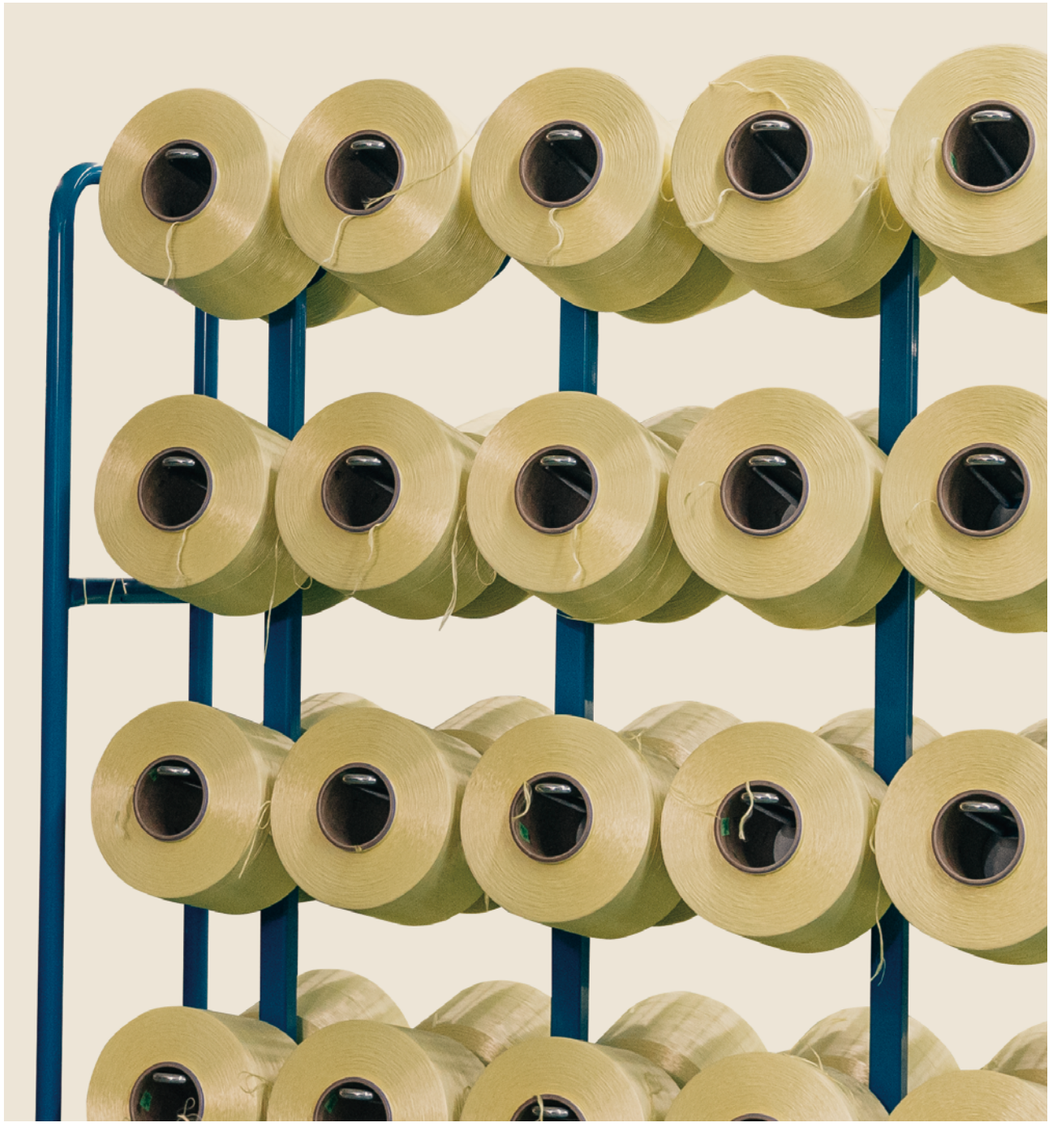
HS HYOSUNG ADVANCED MATERIALS

ALKEX®

Aramid Fiber

ALKEX®

HS HYOSUNG ADVANCED MATERIALS
Aramid Fiber



CONTENTS

4 HS HYOSUNG Group Story

5 HS HYOSUNG ADVANCED MATERIALS Story

6 HS HYOSUNG's Aramid ALKEX®

8 Why HS HYOSUNG ALKEX®

9 Applications Overview

10 Protection

12 Fiber Optic Cable

14 MRG

15 Staple Fiber / Spun Yarn

16 Specification

18 ESG Story

20 Global Networks







Creating Value Together

HS HYOSUNG's Leading Star, Value Tree

HS HYOSUNG's symbol, 'MASTERIA,' is an inspired fusion of 'MATERIA,' Latin for origin and tree (or forest), and 'ASTER,' the goddess of the stars. It further resonates with the multifaceted meanings of 'MASTER' and 'MATERIAL.' This emblem draws its inspiration from 'Hyosung' - the 'Leading Star' that guides us at the break of dawn - and the 'Value Tree,' which symbolizes a diverse array of values nurtured through tenacious vitality and enduring growth. MASTERIA reflects our vision to steer the world and our lives towards a more valuable and meaningful direction.

Discover New Safety, New Comfort

Global Market No.1

PET Tire cord
Seatbelt Yarns
Airbag Fabrics

The future of industry growing based on advanced materials

Based on its excellent technology that enabled Korea's first production of Nylon tire cords (a key material for tire reinforcements) in 1968, HS HYOSUNG ADVANCED MATERIALS has produced high-intensity industrial yarns, textiles and steel wire materials for various industries such as automobile, civil engineering and agriculture.

HS HYOSUNG ADVANCED MATERIALS develops the best materials for essential industries encompassing automobile, defense, construction and logistics and even covering sports and leisure to enhance the quality of our lives. Our materials help create a safe and comfortable life with the high performance and quality.
On top of that, we aim to protect the environment and pursue a clean future by developing eco-friendly materials and implementing sustainable manufacturing processes.

HS HYOSUNG ADVANCED MATERIALS would like to go one step further by promising a coexistence of stakeholders, local and global communities and a value-driven development for a safe and comfortable life.
This is the way we seek for to create values beyond customer expectations.

ALKEX®

Tire reinforcement material used in more than 50% of passenger car tires worldwide



We maintain the No.1 position in terms of global market share with the integrated production and supply systems for tire reinforcements at the largest scale across the world.

Sustainable Technical Yarns with Versatile Uses



Utilizing the advanced technology with which the first airbag fabric in Korea was developed, the company produces and exports sustainable Technical yarns for versatile uses.

The World's First PET Automotive Carpet



Applauded for its best quality in Korea of commercial and automotive carpets, the company has succeeded to mass-produce the world's first polyester automotive carpet.

High-Performance New Material - TANSOME®



TANSOME® is a material used for automobiles increasingly becoming lighter. Recognized for its excellent strength and stability, it is now widely utilized in the eco-friendly energy industry.

Super Fiber ALKEX®

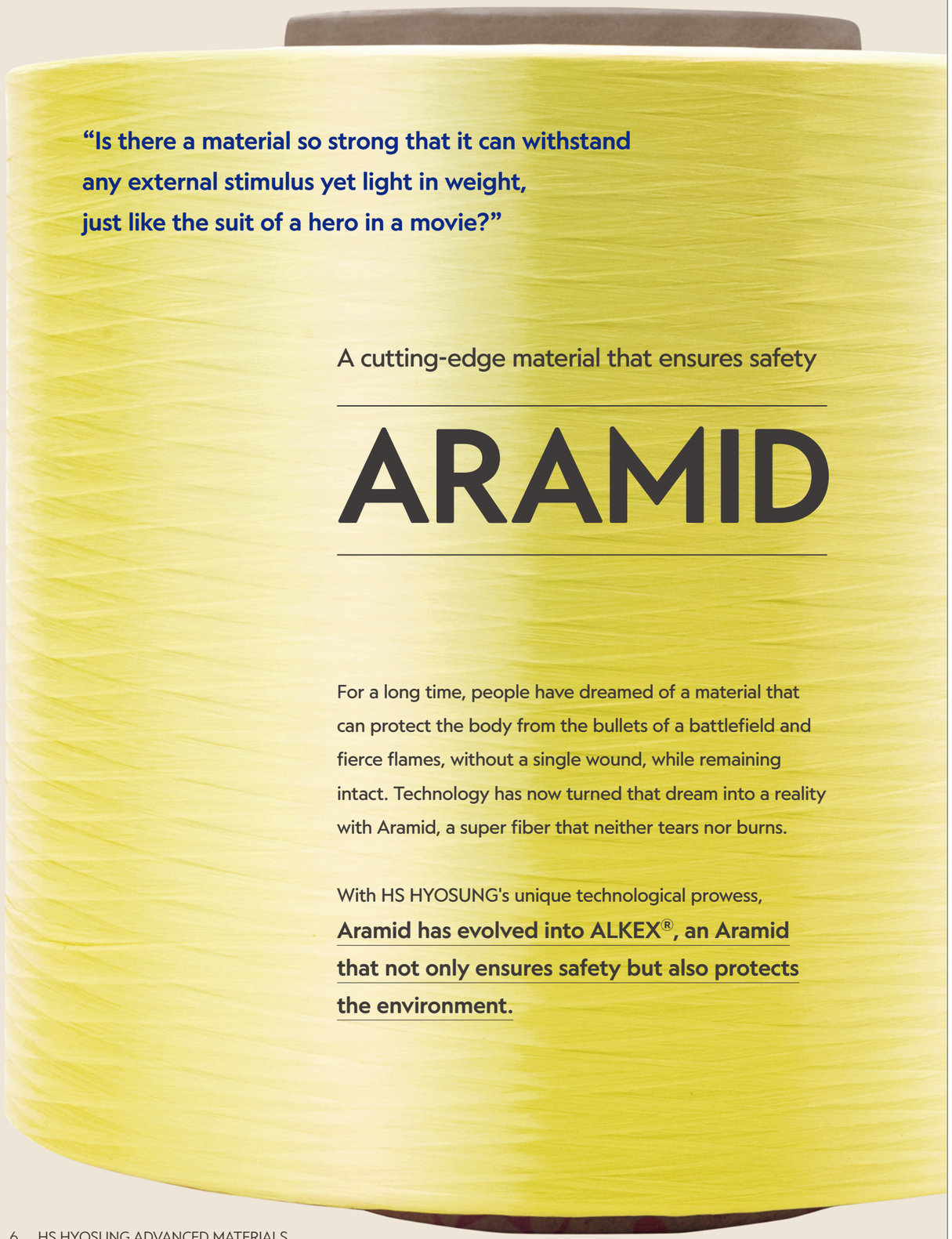


The Aramid yarn, developed with the company's own technology and commercialized successfully, is actively utilized for industrial uses including ballistic and automobiles.

The World's Largest Airbag Fabric Maker - GST



GST is the world's largest airbag producer with the biggest global market share and is also selected by globally renowned automakers such as Autoliv, ZF and Toyota.



"Is there a material so strong that it can withstand any external stimulus yet light in weight, just like the suit of a hero in a movie?"

A cutting-edge material that ensures safety

ARAMID

For a long time, people have dreamed of a material that can protect the body from the bullets of a battlefield and fierce flames, without a single wound, while remaining intact. Technology has now turned that dream into a reality with Aramid, a super fiber that neither tears nor burns.

With HS HYOSUNG's unique technological prowess, **Aramid has evolved into ALKEX®, an Aramid that not only ensures safety but also protects the environment.**

Premium Aramid Fiber Developed with HS HYOSUNG's Exclusive Technology

ALKEX®

ALKEX® is HS HYOSUNG ADVANCED MATERIALS' Aramid brand.
As a core material for future industries that prevent risks and enhance safety, it is recognized globally for its excellence, extending beyond the domestic market. Through proactive investment and securing production capacity, it is solidifying its position in the market.

Five times stronger than steel and overwhelmingly lightweight
High Strength

Does not melt or burn even in high temperatures of 500ºC
High Heat Resistance

Strong resistance and tolerance to various chemicals
Chemical Resistance

Does not easily break or stretch in any environment
High Tensile Strength

Absorbs large impacts and deflects small ones
High Elasticity

Maintains condition without damage even under repetitive loads or impacts
Fatigue Resistance

Why, ALKEX

The Ultimate Safety Solution



Quality and Price Competitiveness

With various international certifications such as ISO 9001, ISO 14001, IATF 16949, OEKO-TEX, HS HYOSUNG's competitiveness and quality are globally recognized.



Localization

Smooth communication through local subsidiary staff and prompt logistics support through local warehouses.



Diverse Portfolio

Specialized product lines applied to various uses.

2003
R&D started

2006
Anyang Research Center completed

2009
ALKEX® launched

2012
Spinning facility expansion

2015
National Institute of Justice (NIJ) ballistic certification acquired

2021
Additional facility expansion

ALKEX® began commercial production in 2009 and has continued to grow through proactive expansion of facilities and technology acquisition. Responding swiftly to the increasing global demand for Aramid fibers, we provide the highest quality products at reasonable prices, maintaining our position as a Global Aramid Provider.

Protecting Safety, Creating Innovation

ALKEX® : Protecting Safety, Creating Innovation

Ballistic

Various protective equipment such as ballistic vests, ballistic vehicles, and ballistic helmets

Fiber Optic Cable

Reinforcements for internet network or 4G/5G mobile communication fiber optic cables

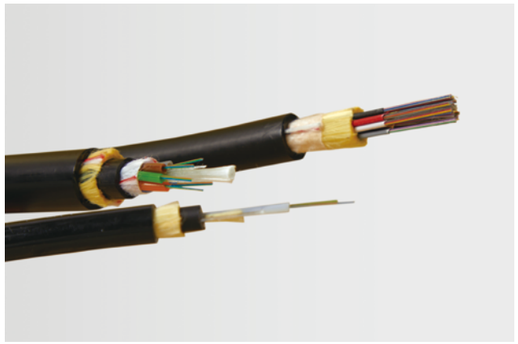
MRG

Electric vehicle battery cases and tire reinforcements

Staple/Spun Yarn

High-strength, chemical resistant polymer fibers









Protection

Stronger Protection, Lighter Weight,
Easier Use



HS HYOSUNG's aramid, ALKEX®, is a new material five times stronger than steel and can withstand temperatures up to 500°C.
By processing it into yarn or fiber forms, it is used to make lightweight bulletproof vests and helmets, enhancing safety
and comfort.

 # Five times stronger than steel

 # Withstands up to 500°C

 # Globally certified

Ballistic Vests & Helmets

Globally Recognized Safety

- In 2015, obtained ballistic standards certification from the US National Institute of Justice (NIJ) (Complies with NIJ 0101.06 Level IIIA, capable of defending against 9mm bullets and shrapnel)
- Conducted performance requests directly at the US ballistic testing institute (NTS), proving ballistic performance in various situations
- Used in police ballistic vests and helmets

Excellent comfort and usability

- Equipped with shrouds and side rails to attach night vision goggles and communication equipment for increased convenience
- More than 10% lighter than existing ballistic vests and helmets, ensuring mobility
- Implemented ergonomic patterns by 3D scanning head shapes

Ballistic Panels for Vehicles

- Used for protection in the financial sector, ballistic vehicles, and disaster evacuation facilities

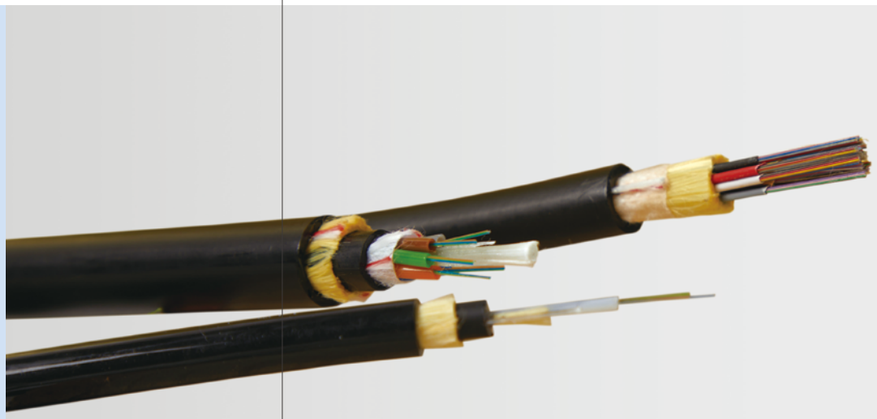
* Reduces the spread range of bullet fragments inside the vehicle to minimize secondary casualties

- Recyclable using thermoplastic resin
- Lightweight material allows for quick installation and removal



Fiber Optic Cable

With high strength and elasticity,
it withstands any environment
without breaking.



Another strength of ALKEX® is its excellent tensile strength and elasticity.
The reason why the optical fibers within Fiber Optic Cables, installed both inside and outside buildings or in the air, do not get damaged or stretched by various external environmental damages is thanks to HS HYOSUNG's Aramid, ALKEX®.

Improved Signal Transmission Quality

Global Demand Surge

Lightweight Fiber Optic Cables

Fiber Optic Cable Reinforcement

Weight Down, Safety Up

- Enhances the durability and safety of fiber optic cables with high tensile strength, heat resistance, chemical resistance, and non-conductivity.
- Lighter and thinner than traditional metal reinforcements, reducing the weight and outer diameter of fiber optic cables, advantageous for bending characteristics and installation.
- Suitable for indoor, outdoor underground installation, and high voltage cables in any environment.

Offshore Plant and Rope Reinforcement

Sturdy in Any Environment, Any Impact

- Used in umbilical cables that securely fix marine plants and transmit necessary electrical signals to drilling equipment.
- Reinforces natural gas/oil pipes on land, protecting them from fire and external impacts.



MRG (Mechanical Rubber Goods)

Resistant to High Temperatures and Repeated Friction Without Deformation or Damage

The performance and safety of various industrial machines depend on how lightweight and sturdy their internal components are.

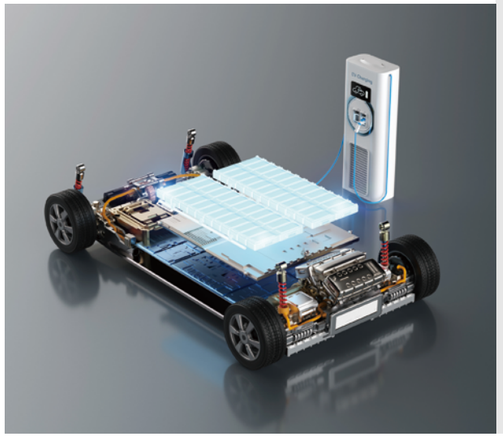
HS HYOSUNG manufactures various hoses/belts, electric vehicle battery cases,
and tire reinforcements using ALKEX® aramid, which has excellent fatigue resistance and heat resistance.

High Fatigue Resistance

Lightweight and Thin

Protection of High-Temperature Components





Hose, Belt

Strong Durability and Lightweight

- Prevent damage to the parts with excellent heat and fatigue resistance
- Used in various hoses in automobiles, lighter and thinner than traditional polyester reinforcements, reducing fuel consumption and emissions

Electric Vehicle Battery Cases and Tire Reinforcements

Further and Safer

- Used as a reinforcement for battery cases, reducing the weight burden of the vehicle body and increasing driving range
- Used as a reinforcement that solidifies the shape of the tire, enhancing driving safety

Staple Fiber / Spun Yarn

Protecting Workers' Safety and Increasing Work Efficiency with Fiber

Using Staple Fiber / Spun Yarn made by finely grinding ALKEX® aramid fibers, we manufacture aramid gloves and various protective clothing and equipment. Protects workers' safety from potential dangers during work processes or parts handling.

Safe Work Possible

The Strongest Softness



Overwhelming Defense with Softness

- Soft spun yarn, made by spinning finely cut fibers, is used to produce safety gloves.
- Prevents cuts from sharp objects during work processes, enhancing work safety

Yarn Specification

Properties

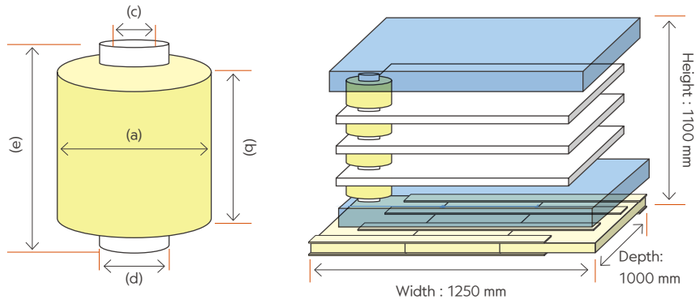
Flammability (LOI)	%	29
Hot air shirinkage (15 min. at 190℃)	%	0.1
Heat resistance (Residual strength after 48 h at 200℃)	%	90
Decomposition temperature	℃	>450
Coefficient of thermal expansion (Linear)	%10-6/K	-3.5
Density	g/cm3	1.44

- ISO 9001:2015, IATF 16949:2016, ISO 14001:2015 Certified
- ALKEX® is a HS HYOSUNG registered trademark.

Yarn Type			LOT	Linear Density		Filament Count	Oil Content	Elongation at break	Breaking Tenacity		Breaking Strength		Modulus	
	Den.	Dtex		Denier	Dtex	fila.	%	%	MPa	g/d	N	kgf	GPa	g/d
AF 1000 (Regular)	200	220	A021	202	224	134	2.0	2.8	2923	23.0	45	4.6	108	850
	400	440	A041	405	450	267	1.0	3.2			91	9.3	93	730
	1000	1100	A101	1010	1122	665	1.0	3.5			228	23.2	76	600
	1500	1670	A151	1520	1689	1000	1.0	3.7			343	35.0	70	550
	2250	2500	A221	2280	2533	1000	1.0	3.8			514	52.4	71	560
	3000	3300	A301	3040	3378	2000	1.0	3.9			686	69.9	73	580
AF 2000 (High Tenacity)	400	440	H041	405	450	267	1.0	3.5	3429	27.0	107	10.9	100	790
	600	660	H061	606	673	400	1.0	3.5			161	16.4	95	750
	840	930	H081	850	944	665	1.0	3.5			226	23.0	99	780
	1000	1100	H101	1010	1122	665	1.0	3.6			268	27.3	89	700
	1500	1670	H151	1520	1689	1000	1.0	3.7			402	41.0	85	670
AF 3000 (High Modulus)	1420	1580	M141	1415	1572	1000	1.0	2.7	2923	23.0	319	32.5	114	900
	2840	3160	M281	2830	3144	2000	1.0	2.7			637	65.0	108	850
	5680	6320	M561	5660	6289	4000	1.0	2.3	2860	22.5	1250	127.5	119	940
	7100	7900	M711	7115	7906	5000	1.0	2.4	2947	23.2	1617	165.0	120	945
	8520	9480	M851	8482	9424	6000	1.0	2.4	2922	23.0	1911	195.0	117	920
	14200	15800	M421	14255	15839	10000	1.0	2.5	2898	22.8	3185	325.0	112	880

*The physical properties listed in this brochure represent values for the reference only.

Packaging Details

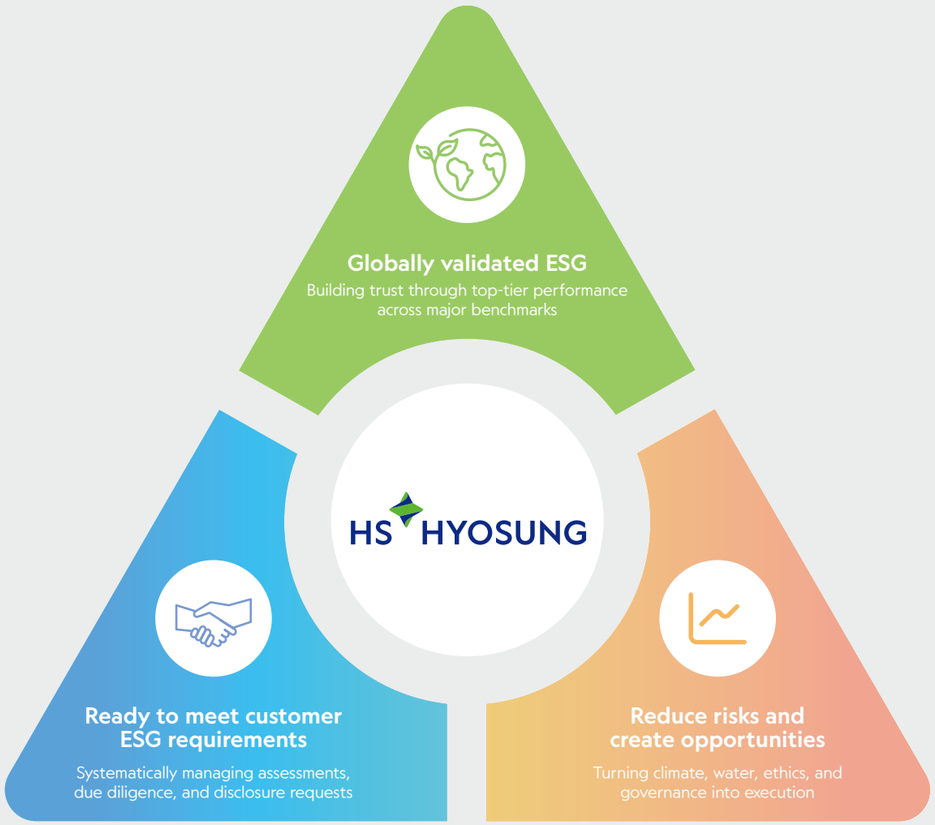


Type	Yarn LinearDensity		LOT	Bobbin Weight	Bobbin Diameter (a)	Bobbin Stroke (b)	Tube I.D (c)	Tube O.D (d)	Length (e)	Number of Bobbins	Net Weight	Yarn Length
				(kg)	(mm)	(mm)	(mm)	(mm)	(mm)	(EA)	(kg)	(m)
AF-1000	200Den	220dtex	A021	2	154	194	94	107	216	100	200	89209
	400Den	440dtex	A041	3.2	182	194	94	107	216	100	320	71261
	1000Den	1100dtex	A101	5	215	194	94	107	216	80	400	44654
				7	244	194	94	107	216	64	448	62476
				9	270	194	94	107	216	48	432	80298
	1500Den	1670dtex	A151	5	216	194	94	107	216	80	400	29705
				7	244	194	94	107	216	64	448	41547
	2250Den	2500dtex	A221	5	217	194	94	107	216	80	400	19837
	3000Den	3300dtex	A301	7	253	194	94	107	216	64	448	20824
AF-2000	400Den	440dtex	H041	2	160	194	94	107	216	100	200	44544
	600Den	660dtex	H061	3	194	194	94	107	216	100	300	44654
	840Den	930dtex	H081	5	210	194	94	107	216	80	400	53041
	1000Den	1100dtex	H101	5	215	194	94	107	216	80	400	44654
	1500Den	1670dtex	H151	5	216	194	94	107	216	80	400	29705
AF-3000	1420Den	1580dtex	M141	5.4	222	194	94	107	216	80	432	34524
	2840Den	3160dtex	M281	8	262	194	94	107	216	64	512	25275
	5680Den	6320dtex	M561	8.1	225	260	94	104	290	60	486	12600
	7100Den	7900dtex	M711	5.4	195	260	94	104	290	60	324	6700
				10.2	250	260	94	104	290	48	490	12670
	8520Den	9480dtex	M851	8.0	225	260	94	104	290	60	480	8300
	14200Den	15800dtex	M421	8.0	225	260	94	104	290	60	480	4970

* Tube : Cylindrical Paper Tube
* Alkex products which is over 3000 denier uses high-denier clamps
* Tesnile Test Method is based on ASTM D-7269 / Linear Density test method is based on ASTM D-1907, Option 6 (For the AF-3000 type, Option 5 is applied)"

Sustainability

We have been recognized by global rating agencies for our systematic management and transparent disclosure across the areas of Environmental, Social, and Governance. Going forward, we will continue to strengthen responsible ESG management through transparent communication and accountable practices.



EcoVadis

PLATINUM Top 1% ecovadis Sustainability Rating OCT 2025

Platinum 2024-2025
Two years in a row
Top 1% among ~150,000 companies

- Globally validated ESG credibility: EcoVadis global top-tier performance

Recognition Link

CDP
(Carbon Disclosure Project)
2025

CDP Discloser 2025

Climate Change **Leadership A-**
Water Security **Leadership A-**

- Demonstrating leadership in climate action and water stewardship through strategic execution.

MSCI
(Morgan Stanley Country Index)

MSCI

BBB 2024 - 2025

- Investor-oriented assessment of ESG risk and governance performance

Korea ESG Standards Institute (KCGS)

한국ESG기준원 Korea Institute of Corporate Governance and Sustainability

Overall A 2021-2025
5th years in a row

- Sustainability management performance assessed under Korea's leading ESG evaluation framework.

S&P Global CSA
(Corporate Sustainability Assessment)

S&P Global
Hs Hyosung Advanced Materials
Chemicals
Sustainability Yearbook Member

Sustainability Yearbook Member
2024~2025

- Sustainability management competitiveness validated by global benchmarks

Sustainalytics
2024 - 2025

SUSTAINALYTICS a Morningstar company

Risk Rating **Low**
Exposure **Low**
Management **Strong**

- Credibility assessment from an ESG risk perspective, informing the investment decisions of financial institutions and investors

Notes: Ratings and years are based on each evaluating organization's latest publicly disclosed criteria.

Detailed information regarding our ESG initiatives is available at

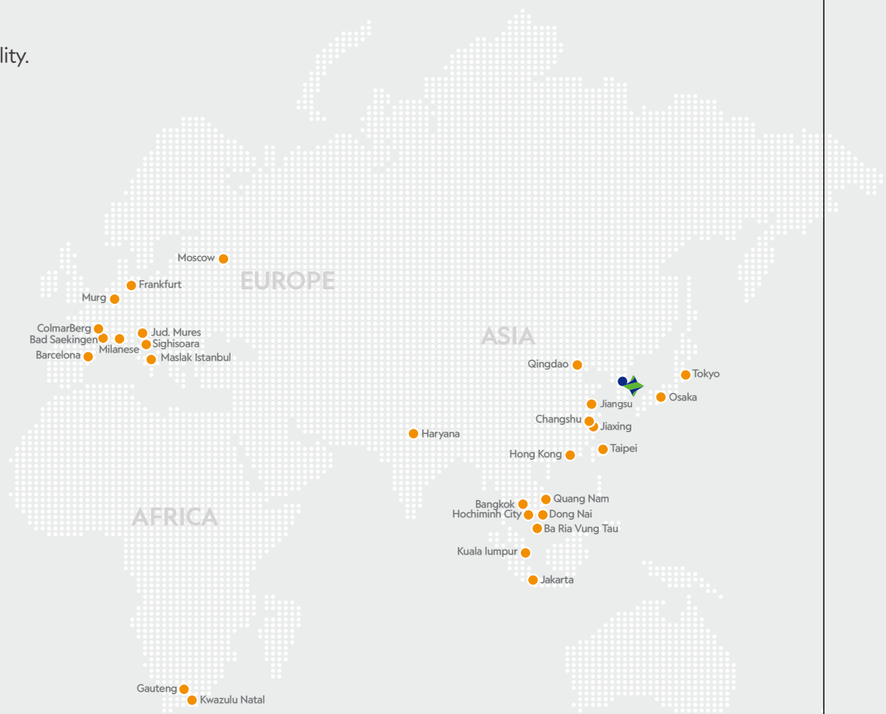
Global Networks

HS HYOSUNG builds a systematic global network,
aiming for value management through
unrivaled technology and excellent quality.

Global Locations

37 locations in 19 countries

Production Affiliate **17** | Trade Affiliate **13**
Logistics Affiliate **1** | Branch and Office **6**



Korean Locations

HQ 1 Plant 4 Institute 1



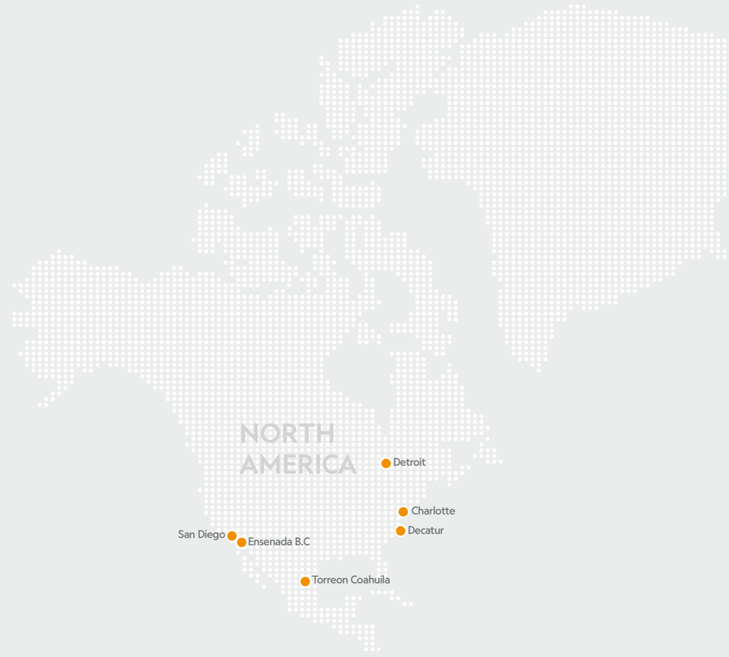
SEOUL
· Mapo

ANYANG
· Anyang plant
Roll carpet, Automotive carpet, Nylon BCF,
PET (Polyester) BCF

DAEJEON
· Daejeon plant
Tile carpet, PP BCF

ULSAN
· Steel Wire Technical Center
· Ulsan plant
Aramid, PET (Polyester) BCF

JEONJU
· Jeonju plant
Carbon fiber



ARAMID FIBER NETWORKS

Aramid Fiber production site

13 locations in 11 countries

1 HQ
· Korea

1 Plants
· Korea

10 Sales offices
· Korea · USA
· Italy · Germany
· Turkiye · Russia
· India · Brazil
· Taiwan · China

3 Warehouses
· Korea
· USA
· Luxembourg

Asia

17 locations in 10 countries

KOREA

CHINA
· Jiaxing · Qingdao · Jiangsu · Changshu

HONG KONG

VIETNAM
· Dong Nai · Quang Nam
· Ba Ria Vung Tau · Hochiminh City

JAPAN
· Tokyo · Osaka

INDIA
· Haryana

INDONESIA
· Jakarta

MALAYSIA
· Kuala lumpur

TAIWAN
· Taipei

THAILAND
· Bangkok

Europe & Africa

12 locations in 8 countries

GERMANY
· Murg · Bad Saekingen

LUXEMBOURG
· Colmar-Berg

ROMANIA
· Jud. Mures · Sighisoara

RUSSIA
· Moscow

ITALY
· Milanese

SPAIN
· Barcelona

TÜRKIYE
· Maslak Istanbul

SOUTH AFRICA
· Kwazulu Natal
· Gauteng

Americas

8 locations in 2 countries

USA
· Charlotte
· San Diego
· Decatur
· Detroit

MEXICO
· Torreon Coahuila
· Ensenada B.C