Topilene®

HYOSUNG Polypropylene

HYOSUNG CORPORATION
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Topilene
HYOSUNG Random Copolymer **Polypropylene**
Impact Copolymer Small electric-appliances
Cap Pipe Speciality Film
Homopolymer
Medical

HYOSUNG

History of Hyosung

Hyosung has been the major driving force of the Korean economy for last half century. The history of Hyosung as a leader in a number of key industrial sectors in Korea is one of the most significant part of the path of Korea`s economic development.

1971 *Established R&D Center*

1989 *Entered the PP and propylene business*

1991 *Commenced production of the PP-Ⅰ process at the Yongyeon plant*

1996 *Commenced production of the PP-Ⅱ process at the Yongyeon plant*

2004 *Acquired PP/DH PU ISO 9001, ISO 14001 Certifications*

2006 *PP-R R200P won Korean World-class Product Award*

1957. Hyosung Corporation founded
1966. Established Tongyang Nylon Co., Ltd.
1968. Completed the Ulsan Plant
1971. Established R&D Center, a first in Korea
1972. Exported tire cords to Southeast Asian countries for the first time
1973. Established Tongyang Polyester Co., Ltd.
Established Tongyang Dyeing Co., Ltd.
1975. Acquired Hanyoung Industries Co., Ltd. (formerly Hyosung Heavy Industry)
1977. Established the heavy industry plant in Changwon
1979. Started producing PET bottle at the Eonyang Plant
1983. Developed a Microfiber that combines nylon and polyester
1986. Developed POWER-5800 for office computers
1989. Entered the PP and propylene business
Established Hyosung EBARA Co., Ltd.
1990. Entered the Spandex business

1991. Commenced production at the PDH plant
Commenced production of the PP-Ⅰ process at the Yongyeon plant
1992. Started producing Spandex at Anyang Plant
1995. Established PET bottle company in China, Established the Tile Carpet plant in Daejeon
1996. Commenced production of the PP-Ⅱ process, Established the Nylon Film plant in Daejeon
1998. Developed PP-R pipe grade(R200P), a first in Asia
T&C, trading company, life industry, and heavy industry all merged into Hyosung Co., Ltd.
Developed 800kV GIS, a first in Korea, and only the 3rd time globally
1999. Acquired Korean Trade(KT) Marks for the Hyosung Computer, Ultra High Voltage GIS(Gas Insulated Switchgear), and Polyester Fiber(Aerocool)
2000. Established the spandex plant in Gumi
2001. Adopted ERP, Established the spandex plant in China
Concluded a contract with Beijing Coca Cola for the long-term supply of PET bottles
2002. IV Bottle Grade was certified to comply with USP class Ⅵ
Took over the Tire Cord Plant of Michelin in Scotsville, U.S.A.
Aerocool was selected as one of the world's best products

2003. The Class Hyosung was established
Hyosung Spandex(Guangdong) Co., Ltd. was established in Guangdong Province, China
Hyosung Film(Jiaxing) Co., Ltd. was established in Zhejiang Province, China
2004. Acquired PP/DH PU ISO 9001, ISO 14001 Certifications
Work for the spandex Plant in Zhuhai, China completed
Expanded the Nylon Film facilities at the Gumi 1 factory
Work for the transformer Plant in Baoding, China completed
The Tire Cord Plant in Jiaxing, China completed
Signed a supply contract for 750kV switchgear with Northwest Street Power Grid Corp, China
2005. Work for the Nylon Film Plant in Jiaxing, China completed
2006. PP-R R200P won Korean World-class Product Award
Contracted with Goodyear for the long-term supply of tire cords and contracted to take over four factories around the world
Acquired an Agfa Photo production facility in Germany
Acquired the Nantong Hyosung Transformer Co., Ltd. in China
Acquired Dongguk Trade's Spandex factory in China

2007. Renewal of ISO 9001, ISO 14001 Certifications
Construction of the NF_3 Plant was completed
Built facility for anti-bacterial filled PET bottles
Built a #1 Solar Energy Power Plant
2008. Work for the Spandex Plant in Turkey completed
Work for the Spandex Tire Cord Plant in Vietnam completed
Expanded the Nantong Hyosung Transformer Co., Ltd. factory in China
2009. Construction of the Aramid Fiber Plant was completed
Construction of the TAC Film Plant was completed

Business of Hyosung

Hyosung has expanded its business sector into different fields based on solid experience in textile industrial and trade areas. Hyosung currently comprises 7 business groups(PG, Performance Group) of chemicals, fibers, industrial materials, power & industrial systems, construction, trade and information & communication with 23 affiliated business units(PU, Performance Unit).
As Hyosung's main products are semi-industrial materials required in the manufacture of finished consumer goods, Hyosung has pursued co-prosperity and built intimate relationships with its customers based on trust from the very early stages in its history. Now Hyosung is expanding its business not only into Asia but all around the world by its global network.

Chemicals PG
■PP/DH PU ■Packaging PU
■Film PU ■TPA PU ■Neochem PU

Industrial Materials PG
■Tire & Industrial Reinforcements PU
■Technical Yarn PU ■Interior PU

Textile PG
■Spandex PU ■Nylon Polyester Fiber PU
■Fabric / Dyeing PU

Construction PG
■Construction PU
■HEEC PU

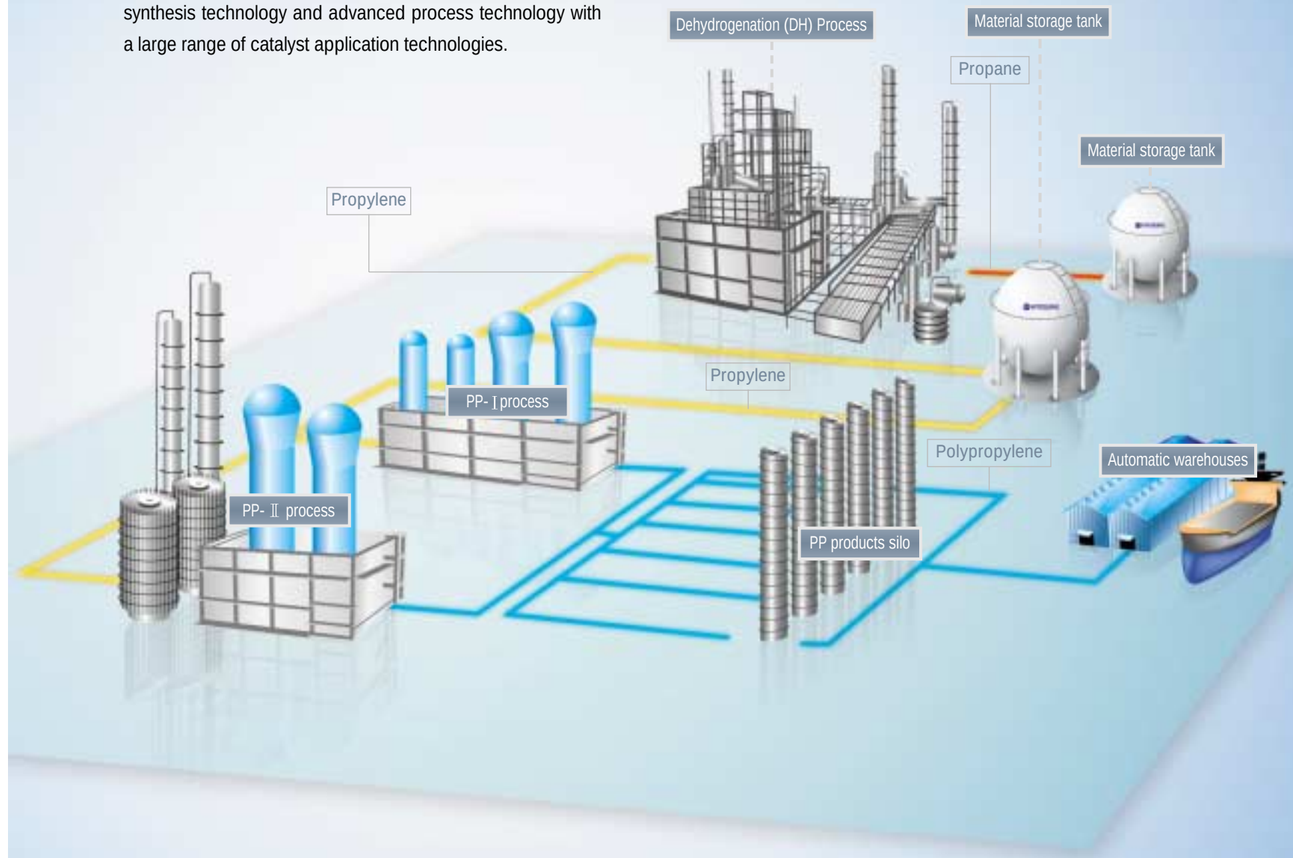
Power & Industrial Systems PG
■Power Systems PU ■Industrial Machinery PU
■Hyosung EBARA PU

Trading PG
■Steel & Metal Ⅰ, Ⅱ PU
■Chemical Products PU
■Trans-World PU

Information & Communication PG
■Nautilus Hyosung PU ■HIS PU
■Hyosung Capital PU

TOPILENE® Process

HYOSUNG has secured a solid supply chain from Propane to Polypropylene using the world's most advanced propylene manufacturing process, Propane Dehydrogenation Process. TOPILENE, a trade mark of Hyosung Polypropylene, is the binding product that merges the company's polymer synthesis technology and advanced process technology with a large range of catalyst application technologies.




■ Yongyeon Plant PP Process


■ Production R&D Center


■ Yongyeon plant Propylene Ball Tank


■ Yongyeon plant DH Process

Specialized Use

For Pipes

Property ASTM Method Unit	Melt Flow Index D1238 g/10min	Flexural Modulus D790 kg/cm²	IZOD Impact Strength (23℃) D256 kg · cm/cm	IZOD Impact Strength (-10℃) D256 kg · cm/cm	Application	Characteristics
R200P **R200P-####** (Color Grade)	0.25	8,500	N.B	4.5	Hot and cold water supplying pipe	Pressure resistance, High impact, Long term heat stability
HB240P	0.3	15,000	N.B	8	Sewage / Drainage Pipe	High stiffness, Long term heat stability
HB242P	0.3	18,000	N.B	8	Sewage / Drainage Pipe	Very high stiffness, Long term heat stability

For Medical applications

Property ASTM Method Unit	Melt Flow Index D1238 g/10min	Flexural Modulus D790 kg/cm²	IZOD Impact Strength (23℃) D256 kg · cm/cm	Application	Characteristics
R530A	2	9,500	8	IV Bottle	Transparency, USP Class VI, EP §3.1.6, FDA DMF 21499
R530	7	9,500	6	IV Bottle	Transparency, USP Class VI, SFDA, FDA DMF 21499
J700-1	11	19,500	4	Disposable syringe (Hub, Cap, Plunger)	High stiffness, High slip, Productivity, FDA DMF 21499
J800S	20	16,500	3	Disposable syringe (Hub, Cap, Plunger)	High stiffness, High slip, FDA DMF 21499
J801	25	18,000	3.5	Disposable syringe (Barrel), Transparent product	Transparency, High stiffness, USP class VI, FDA DMF 21499

The properties listed are highly dependent on the test specimen preparation followed ASTM D618 and testing protocols. A similar protocol may generate substantially different values. This information is furnished conditional upon the persons receiving the material making their own determinations as to its suitability for their own particular purpose only.

For Small electric-appliances

Property ASTM Method Unit	Melt Flow Index D1238 g/10min	Flexural Modulus D790 kg/cm²	IZOD Impact Strength (23℃) D256 kg · cm/cm	IZOD Impact Strength (-10℃) D256 kg · cm/cm	Application	Characteristics
HJ801R	11	22,000	3.5	-	Toaster, Coffee maker, Steam iron	High stiffness, Long term heat resistance, UL 746B
J801R	18	22,000	3.5	-	Toaster, Coffee maker, Steam iron	High stiffness, Long term heat resistance, UL 746B
HJ800R	18	17,500	8	4	Toaster, Coffee maker, Steam iron	High stiffness, Impact strength, Long term heat resistance, UL 746B

For Caps & Closures

Property ASTM Method Unit	Melt Flow Index D1238 g/10min	Flexural Modulus D790 kg/cm²	IZOD Impact Strength (23℃) D256 kg · cm/cm	IZOD Impact Strength (-10℃) D256 kg · cm/cm	Application	Characteristics
J301CP	1.8	16,500	7	-	PET bottle cap	Stiffness, Good processibility
HJ541CP	6.5	17,500	11	5.5	PET bottle cap	Stiffness, Good processibility, Impact strength

For Speciality films

Property ASTM Method Unit	Melt Flow Index D1238 g/10min	Flexural Modulus D790 kg/cm²	IZOD Impact Strength (23℃) D256 kg · cm/cm	IZOD Impact Strength (-10℃) D256 kg · cm/cm	Application	Characteristics
J240F	1.0	13,000	N.B	7	Protective IPP film	Low fisheye, Processability, High impact
J351F	2.6	14,000	10	3	Retort CPP film	Low fisheye, High impact
J440F	4.5	14,500	9	2.5	Protective CPP film	Low fisheye, Impact strength, Processability

The properties listed are highly dependent on the test specimen preparation followed ASTM D618 and testing protocols. A similar protocol may generate substantially different values. This information is furnished conditional upon the persons receiving the material making their own determinations as to its suitability for their own particular purpose only.

General Use

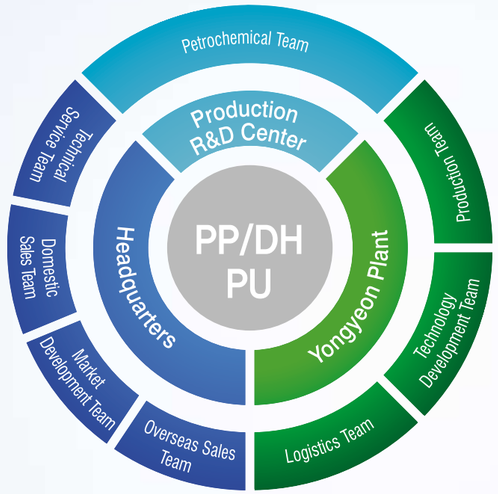
Impact Copolymer / Random Copolymer / Homopolymer

Property ASTM Method Unit	Melt Flow Index D1238 g/10min	Tensile Strength (at Yield) D638 kg/cm²	Flexural Modulus D790 kg/cm²	IZOD Impact Strength (23℃) (-10℃) D256 kg · cm/cm		Rockwell Hardness D785 R-scale	Heat Deflection Temperature D648 ℃	Application	Characteristics
Impact Copolymer									
HJ340	1.0	300	15,000	15	7	80	120	Sheet, Industrial appliances	High stiffness, High impact strength
J340	1.7	270	12,500	15	6.5	70	105	Crate, Container, Battery case, Toy	High impact strength, UL 94HB
J440	4	270	12,500	13	5.5	75	105	Crate, Container, Battery case, Toy	High impact strength, UL 94HB
J640	10	270	13,000	10	5	80	105	Battery case, Electric appliances, Home appliances, Parts of an automobile	Impact strength, Flowability, UL 94HB
J642	10	290	16,000	10	5	85	120	Home appliances, Electric appliances	Impact strength, High stiffness, UL 94HB
J640A	18	270	13,500	9.5	4.5	80	105	Large article - Industiral appliances, Home appliances, Electric appliances, Parts of an automobile	Impact strength, Flowability, UL 94HB
J740	25	270	13,500	8.5	4	80	110	Large article - Industiral appliances, Home appliances, Electric appliances, Parts of an automobile	Impact strength, Flowability, UL 94HB
J742	25	290	16,500	8	4.5	87	120	Large article - Industiral appliances, Home appliances, Electric appliances	Impact strength, Flowability, High stiffness, UL 94HB
J842	45	280	15,000	6.5	4	85	120	Very large article - Home appliances, Industrial appliances	High flowability, High stiffness, UL 94HB
J945	55	280	15,000	6	3.5	85	120	Very large article - Home appliances, Industrial appliances	High flowability, High stiffness, UL 94HB
Random Copolymer									
R301	1.5	320	12,000	10	-	80	100	Extrusion blow molding, Thermoforming sheet	High transparency, Stiffness, Stretchability
Homopolymer									
F501	3	360	16,000	4	-	95	105	Flat yarn, Bands, Ropes	Processibility
J700	11	370	17,000	3.5	-	95	110	General injection	Processibility, Stiffness, UL 94HB
J800	25	370	17,000	3	-	100	110	General injection	Processibility, Stiffness

The properties listed are highly dependent on the test specimen preparation followed ASTM D618 and testing protocols. A similar protocol may generate substantially different values. This information is furnished conditional upon the persons receiving the material making their own determinations as to its suitability for their own particular purpose only.

HYOSUNG POLYPROPYLENE

With the world's most advanced PP manufacturing technology along with the HYPOL process of Japan's MITSUI Petrochemical Co., Ltd. and the advanced UNIPOL Process technology of US-based Union Carbide, Hyosung has developed a manufacturing system that satisfies different customer needs and supplies the best products to each of our processing companies.



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