

Hanwha Newsletter

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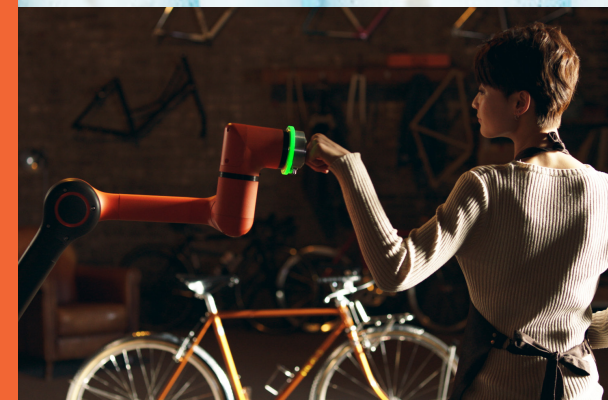
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No.5
in Net Income
(Unit: billion)



Defining the Next Generation Chemical Technology

Environmental Leadership

Developing Reliable Solutions with Eco-friendly Chemistry



The Hidden Dangers of Phthalate

Phthalates, mainly used as plasticizers, contain endocrine-disrupting chemicals that can change the hormone levels in people. Years of extensive studies reveal that they are toxic and extremely dangerous. So understandably, regulations on the use of phthalates worldwide are gradually being tightened, with production, sales and imports being banned across Europe since 2015.

Nevertheless, phthalates remain a vital component in many everyday products such as plastic bottles, cosmetics, toothpaste and hair sprays, making our exposure to them very difficult to avoid. However, Hanwha Total Petrochemical's R&D is taking steps to eliminate our reliance on phthalates with new eco-friendly catalysts.

Protecting People with "Phthalate-free" with Eco-friendly Polypropylene Catalyst

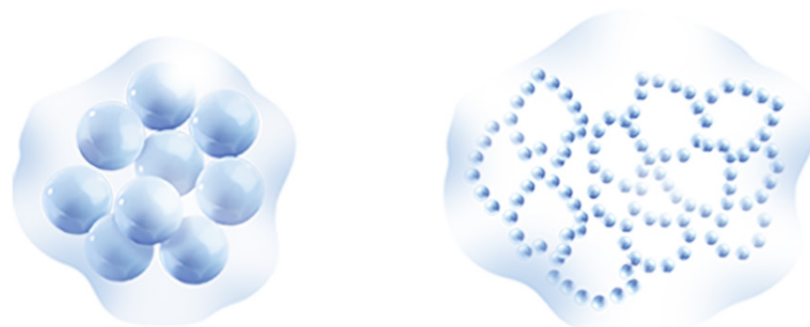
Roughly 50 million tons of Polypropylene (PP) are produced worldwide each year in the form of food containers, medical equipment, household appliances, and automobiles. Between 80-90% of the PP production process employs Ziegler-Natta catalysts, where phthalates are used as internal donors, the core component of the performance controller. This means that approximately 80 to 90% of the products we use every day can contain trace amounts of phthalate and thus the need for phthalate-free products are commensurately high.

Understanding the gravity of the situation, since 2009, the catalyst research team at Hanwha Total Petrochemical has been cultivating the next generation of eco-friendly PP catalysts. And in 2015, they made a breakthrough, successfully developing environmentally friendly PP catalysts by replacing phthalate with eco-friendly chemical compounds as internal electron donors.

The next-generation eco-friendly PP catalyst created by Hanwha's R&D team is completely phthalate-free and applies proprietary micropore carrier that boosts the activity and stereoregularity of the catalyst process. Moreover, PP products applied with the eco-friendly catalyst achieve the same levels of material property

machinability as those that use standard catalysts and thus, make them versatile enough to be used in almost any product.

Micropore Carrier



Micropore S/A : 141m²/g

Micropore S/A : 227m²/g

Low

Porosity

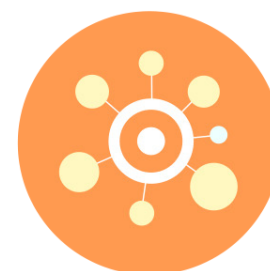
High

Large pore surface area per gram (high porosity)

Characteristics of Hanwha Total Petrochemical's Eco-friendly PP Catalyst



Phthalate 0%



High activity



High stereoregularity

The research by the Hanwha Total Petrochemical R&D team has been certified by world-renowned organizations. In 2014, Fraunhofer¹, Europe's largest applied science and technology research organization, officially certified that

PPs produced using this new eco-friendly catalyst do not contain phthalate. The team's PP catalyst earned the Good Laboratory Practice (GLP)² certification adopted by both the Organization for Economic Cooperation and Development (OECD) and the US Food and Drug Administration (FDA). And the European Union (EU), after having reviewed the results of the toxicity analyses including oral toxicity and mutability, also officially confirmed that the new eco-friendly catalysts were not harmful to humans.

¹ Fraunhofer-Gesellschaft: A leading government-funded research organization is the largest in Europe in applied research with 69 institutes and research facilities in Germany along (7 in the US). The organization focuses on applied research to commercialize technologies developed by universities and institutes.

² Good Laboratory Practice (GLP): Regulation on systemic control of research personnel, laboratory facilities and equipment, and test methods to ensure the reliability of safety evaluations and toxicity tests of medicines and cosmetics

Protecting the Environment with Eco-friendly Technologies

Hanwha is discovering solutions for many problems besides the endocrine-disrupting chemical like the phthalate that can harm the human body. It is also taking the lead in developing eco-friendly technologies that are environmentally-safe. Hanwha has succeeded in developing eco-friendly plasticizers, halogen-free compounds and solid hydrogen storage materials.

The research teams operating under Hanwha's petrochemical businesses are vigorously trying to solve environmental problems and developing eco-friendly technologies that can become the next generation of products for the petrochemical industry. In so doing, Hanwha stands at the forefront of petrochemical R&D and will continue to build on this position as an eco-friendly petrochemical industry leader.

Cases of successful development of eco-friendly technologies by Hanwha

· Eco-friendly Plasticizer

Hanwha Chemical has developed a non-phthalate-based eco-friendly plasticizer³ and is now preparing it for commercial production. However, the company's R&D continues its research on functional plasticizers that do not harm the environment and to develop new processes, improve stability, and machinability.



³ Plasticizer: Organic substances added to plastics and paints in order to make processing of materials easier at high temperatures

· Halogen-free Compound

Demand for eco-friendly electronic, automobile and construction products that do not contain halogen is increasing in all areas of the compound market. Hanwha Chemical produces an environmentally friendly, nonflammable⁴ compound which does not contain harmful substances like halogen⁵ elements, RoHS⁶, toxic metals, phthalates or VOCs⁷. They do, however, offer superb material property and economic feasibility.



⁴ Nonflammable: Characteristics of resistance to fire even when exposed to flammable situation

⁵ Halogen: A substance that is likely to cause human toxicity and endocrine problems due to elements such as fluorine, chlorine, and bromine.

⁶ RoHS (Restriction of the use of Hazardous Substances): Restriction on the use of hazardous substances like Hg, Pb, Cd, Cr6+, PBB, PBDE.

⁷ VOCs: Volatile Organic Compounds.

Quality Innovation Competitiveness Founded upon Innovation

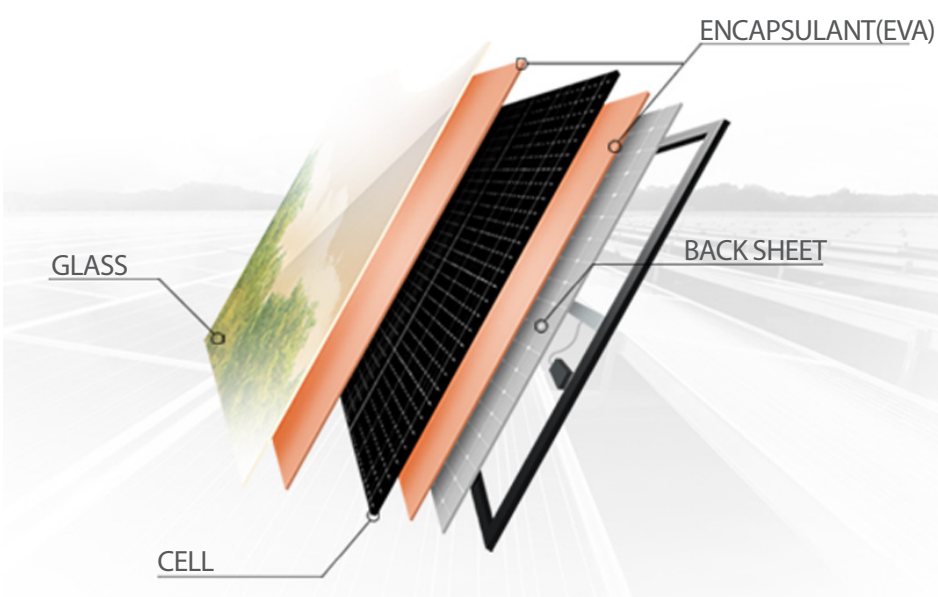


The World's Most Widely Used EVA Sheet for Solar Batteries is Made by Hanwha

Solar power is becoming more a promising environmentally-friendly source of energy, as cutting greenhouse gas has become the talk of the world. In 2016, the installed solar photovoltaics(PV) capacity reached 302 GW globally, a 32.7 percent growth year over year.

Solar PV panels collect sunlight and convert it into electricity or heat. The technology behind it involves the solar module whose structure is comprised of 5 layers. The first layer on the top is the glass layer and below it is the first of two encapsulant layers. The next and 3rd layer is the cell (battery) layer and then again an encapsulant layer. The last and 5th layer at the bottom is the backsheet. All combined the layers make up the solar module that can absorb sunlight. The encapsulant is the module's core material – it is a sheet that is only 0.5mm thin and it wraps around the cell. While deceptively thin, the encapsulant it is, however, critically needed to insulate the cells and protect them from moisture and external shock. One of the main components of encapsulants that has been widely used for the last 30 years has been ethylene vinyl acetate (EVA).

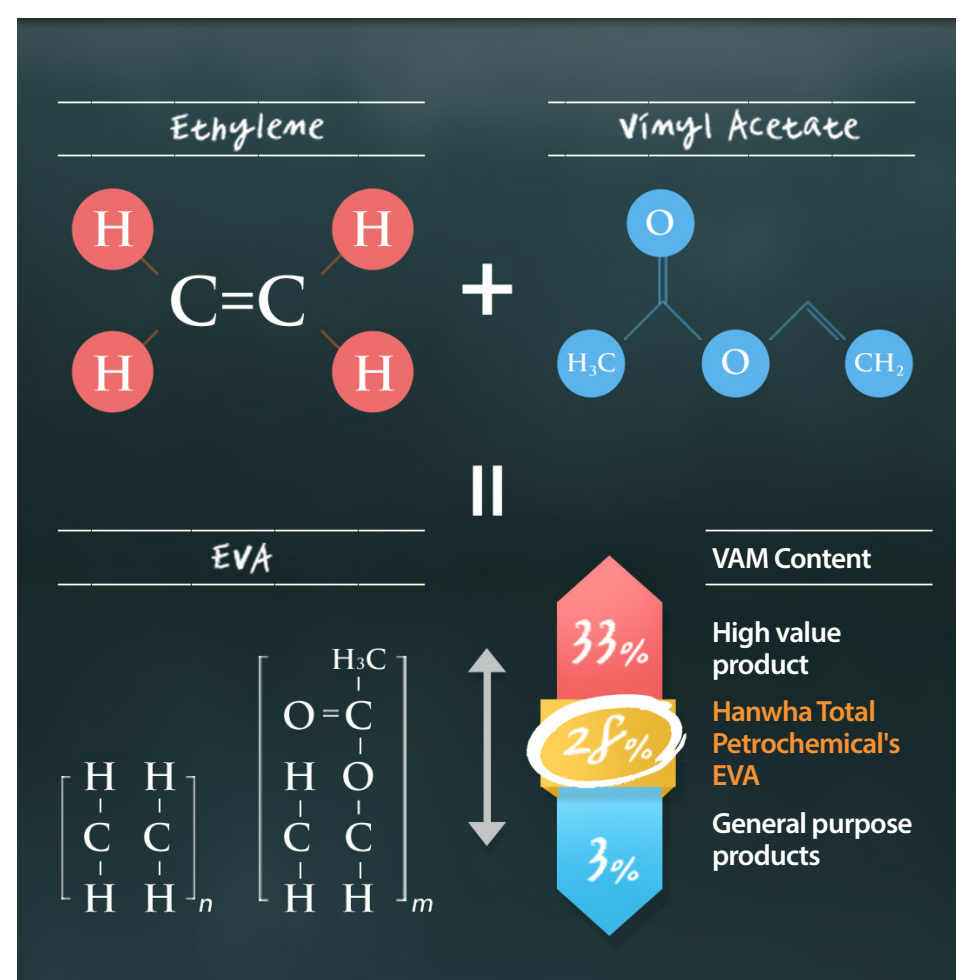
Hanwha Total Petrochemical has been leading the efforts to develop EVA and even adding value to it so that its products can be differentiated from competitive offerings. Hanwha's relentless R&D to innovate and raise the bar for quality has been met with great success. Hanwha Petrochemical is producing 240 thousand tons of EVA whose quality is unrivaled in the industry. The company's EVA has captured 35 percent of the lucrative global market – the largest share in the world.



Hanwha Succeeds in the Commercial Production of EVA with 28% VAM Content Using the World's First Tubular Process

To understand the success of Hanwha's EVA, we must first understand the product classifications and then the processes.

There are two different types of EVA cells, those classified as general purpose that use low Vinyl Acetate Monomer (VAM) content and those classified as premium that use high VAM cells. Solar cell encapsulants used in solar PV panels



contain high VAM counts and the higher the count, the better. Hanwha Total Petrochemical's high-value-added EVA registers approximately 28 percent VAM.

There are also two types of EVA production processes. One is the tubular reactor process and the other is the container-shaped autoclave process. Production of EVA requires an ultra-high temperature that is at least 446 degrees Fahrenheit and a reactor pressure of at least 2,500 bars. Small-scale pilot plants that can support these extreme operating conditions for the tubular process are very expensive to build. As a result, large-scale commercial plants struggle to get reliable data needed for pilot productions. This is why many EVA manufacturers opt for the autoclave process, which makes high-value EVA manufacturing easier, even though it is much less efficient than the tubular reactor process.

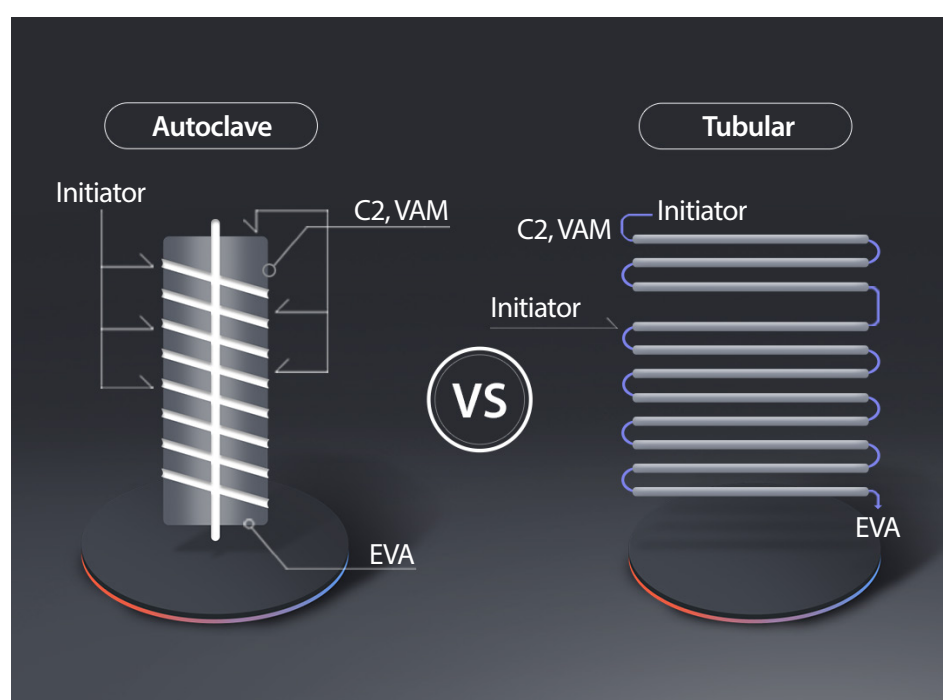
To develop EVA with higher VAM content, the R&D team at Hanwha Total Petrochemical took the unconventional approach by using the tubular process.

The R&D team of Hanwha Total Petrochemical applied its experience in fabricating high-quality low-density polyethylene (LDPE) and polymerization with the tubular process, they discovered a new formulation for polymerization. And as an alternative to building an actual pilot plant, the team created a program that could simulate and test the tubular process in a pilot plant.



Ji Yong Park, Manager of Hanwha Total Petrochemical

“The tubular process hardly allows any product development as the technology does not enable us to pre-evaluate the product through pilot plant nor prepare small samples for testing. In order to overcome this, our research team has succeeded in finding optimal polymerization conditions and developing them into production technology through minimum pilot production by running a self-developed simulator designed for process analysis and product design.”



Characteristics of Hanwha Total Petrochemical's EVA



High Transparency



High Purity



Low Shrinkage



30~40% increased productivity

After completing phased test productions, for the first time in the industry, Hanwha Total Petrochemical's R&D team succeeded in commercializing EVA for solar cells using the tubular process. Hanwha's EVA product has far denser molecular weight distribution and this means it has better transmittance than EVA's fabricated through the autoclave process. Hanwha's EVA boasts higher transparency, improved purity, and less shrinkage but at the same time, its productivity is 30 to 40 percent greater than the autoclave process. The breakthrough EVA with superior quality from the Hanwha R&D team has helped Hanwha secure a clear competitive advantage in the market.

Recently, in 2016, Hanwha Total Petrochemical's EVA won the title of World Class Product of Korea¹ and also awarded the IR52 Jang Yeong-sil Award². The product stood out amongst the other EVAs in the global market for its high-quality. The EVA from Hanwha represents the company's endless drive to innovate in the global petrochemical industry and its commitment to never stop improving quality to differentiate itself from competitors.

¹ **World Class Product of Korea (selected by the Ministry of Commerce, Industry and Energy)** The award is given to companies whose product(s) rank at least 5th or hold a minimum share of 5% of the global market and meet at least one of the following requirements:

- 1) global market exceeds \$50 million in size
- 2) annual revenue from exports exceeds \$5 million

² **IR52 Jang Yeong-sil Award (sponsored by Korea Industrial Technology Association)** Award for products that are successfully developed and commercialized through the application of new technology. The Award is also given to organizations that lead innovation in industrial technology.

Meet the Cobot HCR-5

A Reilable Robotic Co-worker



With the advent of the 4th Industrial Revolution, the manufacturing industry is facing a paradigm shift. In response to its ever-changing work environment, manufacturers are increasingly showing interest in robotics. Robots are central to the next generation process system that combines computers, artificial intelligence and information technology used in smart factories. And there are trends showing collaborative robots (also known as cobots) becoming the solution of choice for small batch manufacturers. Cobots have become popular because they are easier to operate with many of the same benefits as industrial robots but are less expensive to maintain.

Cobots are designed to interact directly and alongside humans. They perform simple, repetitive, and tedious tasks as well as any actions that involve potential exposure to contaminants or pose greater risk of injury. This allows human workers to focus more on tasks that require subjectivity, creativity or craft, in a safer collaborative environment.

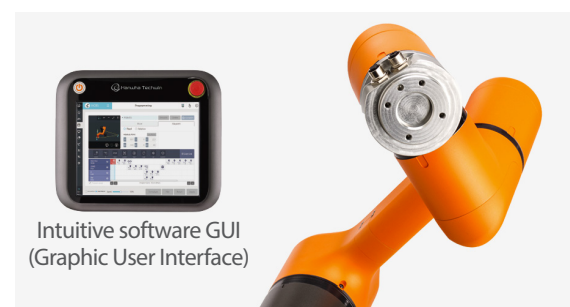
Hanwha Techwin's Cobot HCR-5 Creates Values for Businesses

Hanwha Techwin's HCR-5 brings the factory of the future to the present and transforms today's manufacturing environment with its simple user interface, installation flexibility, safety functions and other unique features.

The HCR-5 can be easily and quickly adopted by users to enhance their job so that productivity can increase. With flexible installation options, they can be placed not only where humans can operate but also where they can't, and this can lead to more efficient use of space that translates to greater profits. And the HCR-5 can do the work that's too dangerous, giving peace of mind to employees and employers alike. The applications for the HCR-5 are numerous but the bottom line is, they reduce costs while increasing productivity.

Hanwha Techwin's HCR-5 represents a foray into the robotics industry where the company can leverage its deep expertise in precision instrumentation and manufacturing. At the same time, the HCR-5 represents Hanwha Techwin's steadfast commitment to create quality products that help companies to ultimately help people with the products they produce.

Collaborative Robot	Industrial Robot
	
Key Benefits	
<ul style="list-style-type: none"> - Easy-to-install and operate - Easy to operate by unskilled workers 	<ul style="list-style-type: none"> - Fast work speed - Work that requires high skill /expertise
Key Proficiency	
<ul style="list-style-type: none"> - Monotonous and repetitive tasks - Simple assembly, pick & place 	<ul style="list-style-type: none"> - Technical and complex operations - Welding, painting, palletizing
Target Buyers	
<ul style="list-style-type: none"> - Small to medium size enterprises, Mid-scale enterprises manufacturing diverse products in small batches 	<ul style="list-style-type: none"> - Large enterprises mass-producing smaller variants of products at large-scale factories



Intuitive software GUI (Graphic User Interface)

Easy-to-Use

- HCR-5 is simple to install, program, and control. No special training or expertise is required.
- Its modular design lends itself to easy adjustments and repairs.



Two cobots can be used simultaneously and controlled with one controller

Mobile and Flexible

- The HCR-5 is lightweight and small (Weight: 20 kg, Reach: 915mm); therefore it is easy to relocate and placed in tight spaces.
- Its features and capabilities allow it adapt to different manufacturing processes without changing the existing production line.



Increases Worker Safety

- HCR-5 Safety protocols allow operators to work right next to them.
- It can be used to handle dangerous, monotonous, or repetitive tasks, so accidents can be reduced while efficiency can be increased.

Hanwha Chairman Meets Heritage Foundation Chief

This is an article published by The Korea Times, Korea's popular English language newspaper.



Hanwha Group Chairman Seung Youn Kim, left, talks with Edwin Feulner, president of the Heritage Foundation, during a meeting at The Plaza Seoul, Tuesday. Courtesy of Hanwha Group

Hanwha Group Chairman Seung Youn Kim met Edwin Feulner, president of the Heritage Foundation, to discuss various issues between Korea and the United States, Tuesday, according to the business group.

It was their second meeting in seven months after they met last October in Seoul to amply demonstrate their three decades of friendship.

The Heritage Foundation, based in Washington, D.C., is an influential conservative think tank that has been key to shaping American policies on politics, economy, foreign affairs and national security.

According to the nation's eighth-largest conglomerate, Kim and Feulner exchanged opinions on a range of topics, including bilateral economic issues, the security situation on the Korean Peninsula and in Northeast Asia and the Korean presidential election held on the same day.

"I hope that you will help us improve the Korea-U.S. alliance in the midst of rising Northeast Asian tensions," Kim was quoted as saying to Feulner during the meeting.

The American was also quoted as saying that U.S. President Donald Trump thinks highly of the bilateral ties and is working hard to upgrade them.

After co-founding the think tank in 1973, Feulner served as president from 1977 to 2013 and assumed office once again this month. Observers say Feulner highly respects Korea as demonstrated by his decades-long friendship with Kim.

He was close to Hanwha founder Kim Chong-hee, Chairman Kim's father.

Feulner is also seen as a close aide to Trump given that he served on the U.S. president's transition team. His influence on state affairs under the Trump administration is likely to increase.

In 2011, in recognition of Kim's contribution to non-governmental diplomacy between Seoul and Washington, the conservative think tank named one of its conference centers at its building the "Seung Youn Kim Conference Center."

Feulner, born in 1941 in Chicago, began his career as an analyst for the Center for Strategic and International Studies.

He earned a bachelor's degree in English from Colorado's Regis University in 1963. After receiving an MBA from the University of Pennsylvania's Wharton School of Business in 1964, Feulner attended Georgetown University and the London School of Economics as a fellow. He earned a Ph.D. from the University of Edinburgh. ■

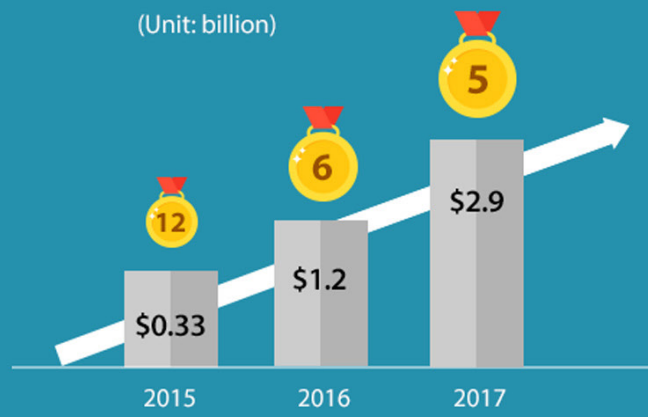
Hanwha's Business Growth : Behind the Number

Rise in Major Korean Corporate Rankings

No.5

in Net Income

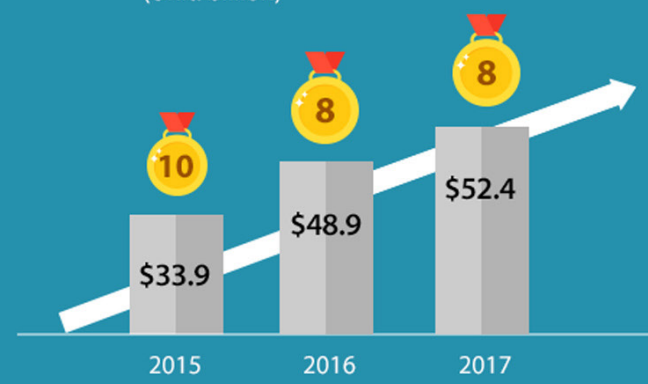
(Unit: billion)



No.8

in Total Assets¹

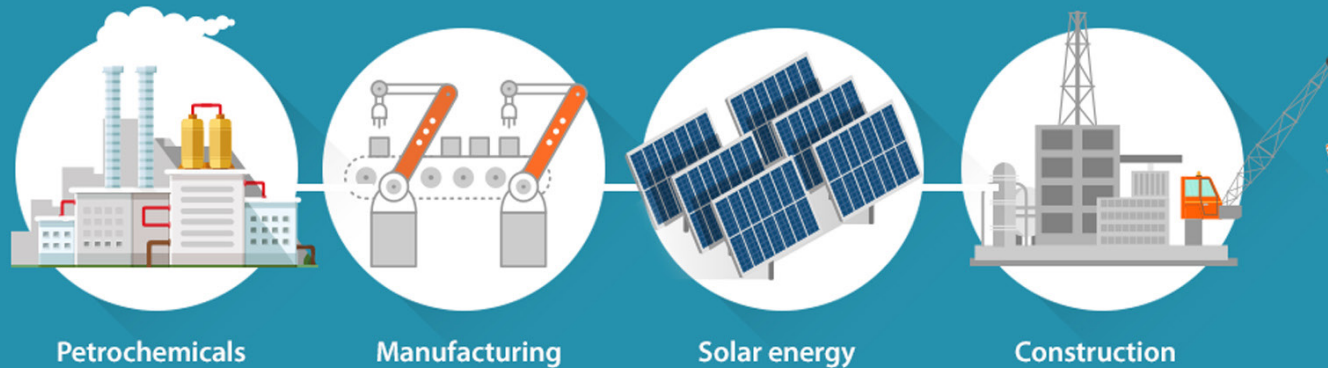
(Unit: billion)



¹ Currency is converted into US dollars using an exchange rate of USD 1 = KRW 1,118.80.

Total Assets are determined by calculating the sum of non-financial company's assets and the maximum value of a financial company's equity or capital stock.

Improved sales performance in major businesses contributed to income increase



249
Global Network
(As of March 2017)



Hanwha Q CELLS
Annual cell production capacity

6.8 GW

Global No.

1



Hanwha TOTAL Petrochemical
Annual EVA production capacity **630,000** tons



Hanwha Advanced Materials
GMT/LWRT global market share

70%

Total asset (\$82.2 billion)

₩100 trillion

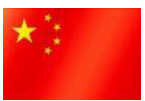
Hanwha Life

Total value of the New Bismaya City in Iraq

\$10 billion

Hanwha Engineering & Construction

Explore This Month's News of Hanwha and Its Affiliates, Taking the Initiative in All Corners of the World



China



Hanwha Group

Group Holds Opening Ceremony of Shanghai Integrated Office in China

Hanwha Group has been accelerating the pace of global management over the past years, operating in various industries across borders, including solar, chemical, materials, and finance. Shanghai has long been the strategic stronghold of the Group's global business with the highest number of affiliates being based in the city. The Group In this important market, the Group recognized the need to fully integrate the offices of the eight subsidiaries and representatives in the region, and after a year of preparation, the effort has finally born fruit.

On the 24th of April, the opening ceremony for the Group's Shanghai Integrated Office was held in Shanghai, China's economic hub. The office is based in the Puxi

region, west to the Huangpu River that cuts across through Shanghai. A total of 149 employees working for eight affiliate subsidiaries and representative offices, including those of Hanwha Chemical, Hanwha Q CELLS, Hanwha Techwin, Hanwha Foodist, Hanwha Corporation/Trade, Hanwha Advanced Materials, and Galleria Duty Free, are working at the New Caohejing International Business Center, occupying two floors 3,354m² in area.

The Shanghai Integrated Office not only signifies a physical integration of the office spaces of affiliates operating in eight different trades but also is expected to create synergy through inter-affiliate cooperation and collaboration in an extensive scope of work, such as management, government relations, and sales.



Hanwha Techwin Tianjin

On April 15th, 2017, Hanwha Techwin Tianjin conducted a teambuilding event where participants hiked Tianyun Mountain in Beijing. A total of 260 employees climbed together to reach the 1149 meter Lianhua peak. The company hosts events like this every year to encourage physical and mental fitness and to provide employees an opportunity to interact with their colleagues. The team plans to host a similar event in the second half of 2017.



Germany

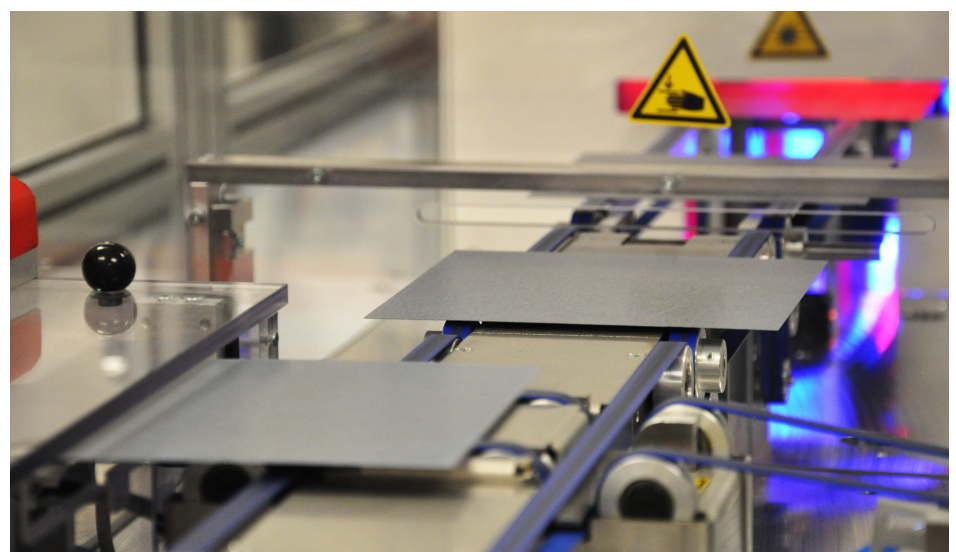


Hanwha Q CELLS GmbH

Driven by R&D, Hanwha Q CELLS Sets New Milestones

Hanwha Q CELLS and 1366 Technologies have reached yet another milestone in their R&D partnership which is already in its second year. The partnership has yielded a number of outstanding products. One of the products was piloted at the Hanwha Q CELLS' Global R&D center in Germany – an optimized solar cell called Direct Wafers that sets a new standard in cell efficiency.

The US firm 1366 Technologies invented this technology by crystallizing wafers directly from molten silicon instead of casting it into large ingots and then



slicing them into wafers. Hanwha Q CELLS then applied its proprietary Q.ANTUM cell process in order to turn the Direct Wafers into highly efficient solar cells. The vision of both partners was to reach and exceed the standard levels of wafers in terms of efficiency, reliability, and manufacturability while being cost competitive. They succeeded.

“We have improved cell efficiency by more than 1.8%, bringing us to overall

efficiencies of around 19.5%. And in early 2017, by using the 6-busbar-technology, we achieved even higher efficiency at 19.9%, confirmed by the Fraunhofer ISE institute,” said Dr. Kai Petter, project leader at Hanwha Q CELLS’s center for Technology, Innovation & Quality in Germany.



Korea



Hanwha Corporation

Hanwha Corporation Reveals Four Major Machine Tool Products in China

From April 17th to the 22nd, Hanwha Corporation participated in the China International Machine Tool Show (CIMT) 2017 in Beijing to reveal four XD series automatic lathe products (XD12II-H, XD20M, XD26N, and XD35N). The CIMT is one of the largest machine tool conventions in the world and this year’s event was attended by a total of 1,600 companies from 30 different countries.

Hanwha Corporation’s XD26N and XD35N can manufacture industrial components for in several industries including the automobile, electricity and electronics industries. On the other hand, XD12II-H is an optimized solution for high precision and productivity, intended for the small components market.

The CIMT was a great opportunity for Hanwha Corporation to create awareness for its products to potential clients in the Chinese market. Hanwha was also able to demonstrate the drone part manufacturing process using the XD35N, drawing attention from affiliates in the rapidly expanding Chinese drone market.

Hanwha Corporation officially entered the Chinese machine tool market back in 2003 and established a local production facility in November 2013. Since then, the company has been focusing on the production of its bestselling XD20/26/35 series and XP12/16/20 models.



Thailand



Hanwha Chemical (Thailand) Co., Ltd.

On April 12th, 2017, Hanwha Chemical (Thailand) commemorated the New Year with a day of fun, dressed up in colorful Thai garb and engaged in traditional Songkran activities.

Songkran is Thailand’s festival to celebrate the New Year. The festival takes place from April 13th to the 15th every year and is kicked off with a visit to the local temples. Participants then splash water on one another to symbolize purification and the washing away of sins. During the festival, all major streets are closed to traffic so people can celebrate on the streets.





Vietnam



Hanwha Techwin

Hanwha Techwin Advanced into Vietnam with its Security Business

On April 20th, 2017, Hanwha Techwin held a ground-breaking ceremony for its new subsidiary office in Vietnam.

The new office will be established in Bac Ninh Province, 35km northeast of Hanoi. This location is ideal from both a logistics and manpower standpoint. Hanwha Techwin plans to complete construction of the 60,000m² facility by December 2017. The production line and testing facilities are expected to be finalized in the first half of 2018. In the second half of 2018, Hanwha Techwin will begin mass production of its security products including security cameras and recording devices.

Hanwha Techwin has invested more than \$100 million USD to build this new subsidiary office but the project would not be successful if not for the help of the local Vietnamese government and labor force from the region's flexible labor market. Hanwha was also able to secure its logistics channels for import and export through various transportation networks.



With this investment, Hanwha Techwin will be able to increase production and be cost competitive so it can expand into the fast-growing Southeast Asian market. Hanwha Techwin is seeking to be a global leader in the security industry.



Hanwha Life Vietnam

On March 16, 2017, Nam Gyu Cha, the CEO of Hanwha Life, paid a visit to Hanwha Life Vietnam during his trip to South East Asia. At the Hanwha Life Vietnam office, Cha received reports on the state of the business in Vietnam. Mr. Cha also had lunch with the board of directors, sales management division and agency directors. His presence was a great encouragement to the staff and agents at Hanwha Life Vietnam. ■



Press Release

Hanwha Corporation to Build Logistics Automation Facility for Nexen Tire's Czech Factory

· Automation system to be implemented for \$79.26 million to improve productivity and efficiency



Hanwha Corporation recently closed a deal on a \$79.26 million project to build a logistics automation system and facility for Nexen Tire in the Czech Republic. A major Nexen Tire Czech plant is being built in Zatec, 70km northwest of Prague, the capital of the Czech Republic. The plant will serve as Nexen's tire production base in Europe as the location lends itself to easy access to key markets in Europe including the UK, France, and Germany.

Hanwha Corporation will provide an end-to-end engineering service for the plant that will deliver an automated logistics system for the entire manufacturing process including detailed design, process flow, and construction of the facilities. The facilities to be built will include an automated warehouse system, unmanned autonomous transport vehicles, ceiling conveyors, robot automation equipment, and roller conveyors. By automating the entire logistics process of the tire plant, the productivity and efficiency is expected to dramatically increase.

In 2011, Hanwha forged its first business relationship with Nexen Tire after completing a similar logistics automation system for all manufacturing processes at Nexen Tire's Changnyeong factory. Back then, Hanwha Corporation has been able to leverage its technology and expertise in logistics automation to provide comprehensive facilities construction services that included not only design and construction but also post-construction management. Hanwha and Nexen are looking to repeat their success.

"We will build our most efficient logistics system with the highest efficiency by modeling it after the successful logistics automation project at Nexen Tire's Changnyeong plant. We'll also apply our deep and diverse experiences in both local and international constructions," said Yeon-chul Kim, CEO of Hanwha Corporation. "Our top priority is to build a smart factory that can maximize productivity through the application of advanced equipment manufacturing capabilities and automated unmanned facilities technology." ■

Hanwha Techwin Partners with Nvidia on AI-enabled CCTV

Hanwha Techwin to combine its security capabilities with Nvidia's AI technology to gain competitive edge in the Fourth Industrial Revolution



Hanwha Techwin took part in ISC WEST 2017, America's biggest security exhibition held from April 5 to 7 to announce its technical partnership with Nvidia's intelligent video analysis platform.

Hanwha Techwin has teamed up with Nvidia Corporation¹ and forged a global partnership to strengthen their competitiveness in the security business.

¹ Nvidia Corporation

a global company and a leader in artificial intelligence (AI) that develops and manufactures graphics processing units (GPUs). Nvidia recently became a pioneer in the field of artificial intelligence by releasing its deep-learning² GPU, dedicated to computers, robots, and autonomous vehicles.

² Deep learning is a machine learning algorithm based on artificial neural networks and vast amounts of data; the technology enables a machine to self-learn, like humans.

The intelligent video analysis platform conceptualized by Nvidia is an operating platform that installs a deep-learning-based GPU in security products such as a camera and an image storing device to transmit data more efficiently.

Hanwha Techwin plans to integrate this technology into AI-enabled cameras and storage devices so that they would also be able to self-recognize and capture irregular or suspicious activities.

The technology would be capable to assist in traffic control and alert emergency situations in urban surveillance. In retail stores, it could study customers' shopping patterns and organize the choices they make to provide insight and marketing data. Security cameras enabled with the intelligent video analysis platform would not only provide video imagery but also analytic data that could replace the perceptivity of humans faster, more consistently, and more accurately.

"The collaboration with Nvidia is part of our global business strategy to increase our security competitiveness by augmenting our products with artificial intelligence, in time for the Fourth Industrial Revolution," said Hanwha Techwin's Security & Machinery Solution Business Group CEO Man-Seob Lee. "We will be able to offer top-class security products and solutions to customers while building the momentum we need to conquer the global market." ■

Hanwha Techwin Invests \$100M in Its New Subsidiary in Vietnam

- Techwin secures production base investing \$100M in its new subsidiary in Vietnam to expand its security business globally
- Company plans to pursue bold investment in security business development and marketing going forward



Hanwha Techwin (Security Business Group, President and CEO Lee Man-Seob) held a groundbreaking ceremony on April 20th for its new establishment in Vietnam where the company invested US\$100 million as part of its endeavor to bolster its global security business.

After conducting a market survey on a number of viable locations considered for the new subsidiary in Vietnam, the Bac Ninh province, lying about 35 km northeast of Hanoi, was chosen as the most ideal location as it offers significant benefits in terms of parts supply, logistics, and manpower. A 60,000m² site in the Que Vo district of the Bac Ninh province will be developed as a base to produce Hanwha Techwin's security products, including network cameras and recording devices.

The construction is due to be completed by December 2017, with production line set-up and test production targeted for the first half of 2018 and mass production and full-fledged operation commencing in the second half of 2018. The investment was spurred by the Vietnamese government's "friendly policy," "flexible labor market" policy, and "securing various logistics channels for import and export" through land and neighboring ports.

Hanwha Techwin's new subsidiary is a demonstration of its plan to expand its security business in the mid to long term by diversifying its global production bases. Building a manufacturing plant in Vietnam, in addition to the existing factory in Tianjin, China, reflects this.

The investment will bring Hanwha Techwin significant benefits particularly in terms of expanding its production capacity (8 million units/year), enhanced cost competitiveness through production cost innovation, and securing skilled manpower at relatively low labor cost, driving the company to gain foothold in the rapidly growing Southeast Asian market and become a global security solution provider.

"This investment is a testimony to Hanwha Group's dedication to the security business as well as its strategy to continue making aggressive investments to conquer the global market," said a spokesperson of Hanwha Techwin's Security Business Group, stating the company's aspiration for its business. "We will not hesitate to make further bold investments in development and marketing going forward." ■