

## Global Network

### Houston Engineering and Sales Centre

11757 Katy Freeway, Suite 1100, Houston,  
Texas 77079, USA  
Tel +1.281.599.3377 (201)  
Fax +1.281.599.7734

### Moscow Office

206, 40-4, Bolshaya Ordynka Str. BC Legion-I,  
Moscow 119017, Russia  
Tel +7-499-750-1733

### Milan Office

Viale Brianza, 181, 20092, Cinisello Balsamo,  
Milan, Italy  
Tel +39.02.38608.248

### Abu Dhabi Office

P.O.Box 2621, 5th Floor Guardian Towers,  
Danet Abu Dhabi, Abu Dhabi, U.A.E  
Tel : +971-4-447-8610  
FAX : +971-4-447-8666

### Shanghai Office

200233 20/F, New Caohejing International  
Business Center A, No391, Guiping Road,  
Shanghai, China  
Tel : +86-21-5427-1155  
Fax : +86-21-5423-5122

### Tianjin Office

300385 No.11 Weiliu Road,  
Micro-Electronic Industrial Park,  
Economic- Technological Development Area,  
Tianjin, China  
Tel +86.022.23887788  
Fax +86.022.23887788.8261

### Chengdu Office

610066, 1307, Sunshine Xinye Building 1st, no83,  
Yihuandonglu, Wuduan, Jinjiang District,  
Chengdu, Sichuan  
Tel +86.10.5900.6082  
Fax +86.10.5900.6084

### Headquarters

Hanwha Power Systems R&D Center, 6,  
Pangyo-ro 319beon-gil, Bundang-gu,  
Seongnam-si, Gyeonggi-do, 13488, Korea  
Tel +82.70.7147.4258  
Fax +82.31.8018.3729

### Changwon Plant

1204, Changwon-daero, Seongsan-gu,  
Changwon-si, Gyeongsangnam-do,  
51542, Korea  
Tel +82.55.260.2663, 2492  
Fax +82.55.260.2610

Website : [hanwhapowersystems.com](http://hanwhapowersystems.com)

E-mail : [turbosales@hanwha.com](mailto:turbosales@hanwha.com)

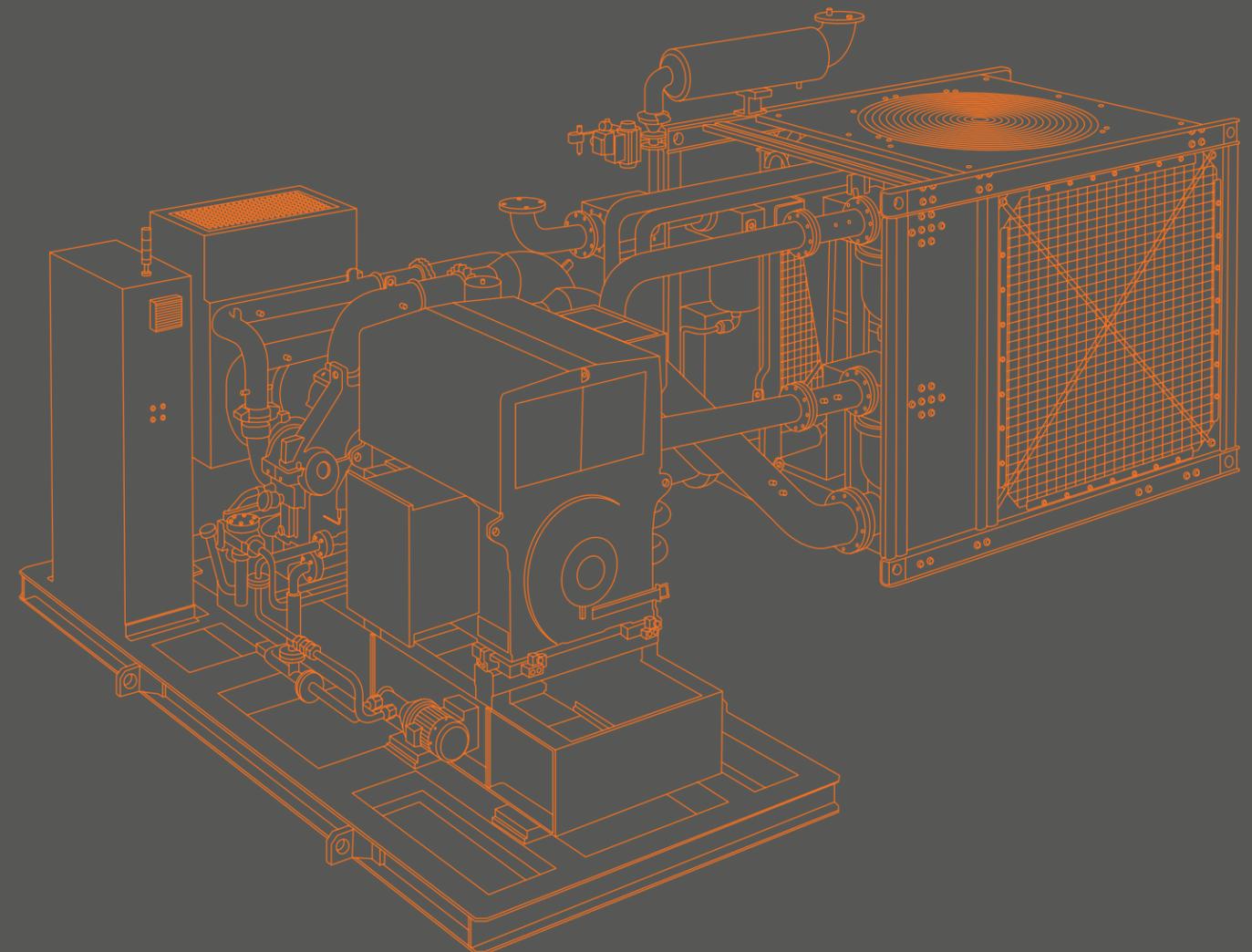


Present State of Hanwha Power Systems  
Turbo Compressor Authentication

- ISO14001 Authentication
- Korea New Technology Authentication
- IR52 Jang Young Sil Award
- ISO9001 Authentication
- CE Authentication
- ASME-compliant
- ISO 8573-1 Class zero Authentication

The information in this publication is  
subject to change without a notice for  
improvement.

# AIR-COOLED TURBO AIR COMPRESSOR SA3100



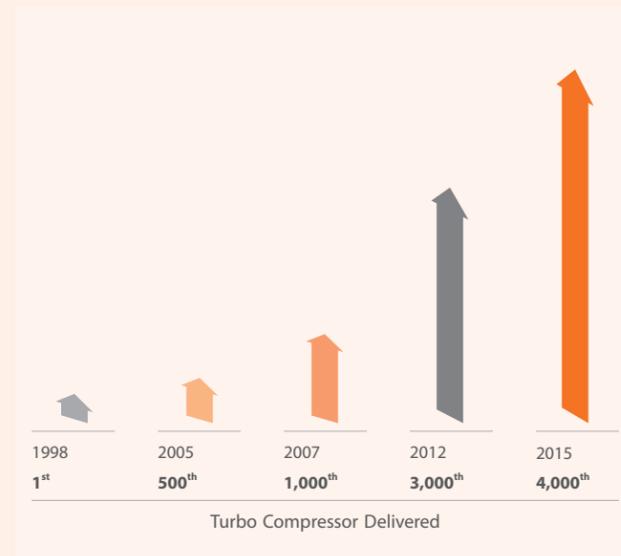
## History

Based on over 35 years of accumulated experience in precision machine industry from Gas Turbine to Compressor Business, Hanwha Power Systems has been chosen by more than 1,000 customers worldwide.

- **1977** Company Established (Samsung Techwin) in Samsung Group
- **1979** Overhaul and Repair of Aircraft Gas Turbine Engines
- **1996** Industrial Gas Turbine Developed
- **1997** First model of Turbo Compressor Introduced
- **2011** Penetrated into Gas Compressor Market
- **2013** SA3100, the World's Largest Capacity of Air Cooled Compressor Introduced ISO8573-1 (Class 0) Certified
- **2014** Contract to Supply the World 1st Integrally Geared Centrifugal Compressor for Offshore VRU Application
- **2015** New Beginning in Hanwha group as "Hanwha Techwin"  
Penetrated into the Offshore Market with Turbo Air & Gas Compressors  
Launched Long-term Aftermarket Service Program  
Expanding Portfolio by Cooperation with Screw Compressor Manufacturers
- **2016** Saudi Aramco Approved Vendor registered (API617 Process Compressor & Blower)  
Reciprocating compressor packager agreement with GE Oil&Gas
- **2017** MOU signed with KEPCO to jointly develop Oxy-Fuel Gas Turbine technology  
New beginning as "Hanwha Power Systems"

Hanwha Power Systems is one of the fastest growing solution providers in its industry since 1997.

During the last two decades Hanwha Power Systems delivered over 4,000 units of turbo compressors worldwide.



## Industries & Applications

### Upstream & Offshore

- Flash Gas, LP, MP
- Vapor Recovery / Instrument Air

### Refinery

- Make-up, Recycle, Booster (H<sub>2</sub>, Wet)
- Sulfur Recovery / Process Air / Instrument Air

### LNG

- Boil off gas (Terminal, LNG Plant)
- High Pressure (Terminal)
- Low / High duty (LNGC, LNG FPSO)

### Power Generation

- Fuel Gas Booster / N<sub>2</sub> booster (IGCC)
- Syngas / Instrument Air

### Air Separation

- Main Air / Booster Air or N<sub>2</sub>
- Cryogenic Expansion

### Fertilizer / Gas Processing

- Process Air / Process Gas (NG, NH<sub>3</sub>, CO<sub>2</sub>)
- N<sub>2</sub> Booster / Instrument Air / NGL

### Petro-chemical

- High Pressure (Terminal)
- Refrigeration (Propane, Propylene)
- PTA / Boil off gas / Process Air / Instrument Air

### Environment & Energy Saving

- Aeration for wastewater treatment
- Pneumatic conveying materials
- Mechanical vapor recompression

Hanwha Power Systems is proud to introduce the SA3100 model designed with proven technology for the first time in the world as the largest air-cooled standardized compressor with VFD (Variable Frequency Drive) option for the fan motor and a variety of installation options depending on the customer site conditions without having cooling water towers. These system air compressors provide an improved performance map for customers in various industries especially in a water shortage area, area with bad water quality, severe coldness area and high mountain region.

## Benefits



### No Cooling Water Tower Needed

With air cooling fan, customer does not need to make an investment for a cooling water tower and water supply



### High efficiency

5-axis machined impellers and optimized pinion speeds using industry proven bearing and seal technologies  
-API 672 standard applicable



### Precise Control

Full PLC controller and total control monitoring system available



### Low Operation Costs

Easy maintenance structure and components designed for extended life are applied



### "SYSTEM" package solutions available

Open or closed sound canopy, with all standard or optional accessories pre-mounted for plug-n-play



### Expanded range

Each frame has optimized pressure and flow cuts for actual system air requirements



### Proven technology

Based on over 4,000 Hanwha Power Systems installed Plant Air, System Air, Process Air and Engineered Air compressor units

## Applications

- Steel, Minerals and Mining, Power plants
- Food and Beverage processing plants
- Oil Refinery, Petrochemical/Chemical
- Electronics, Textile, Automotive, Aerospace and Aviation
- Small and medium sized Air Separation
- High altitude system air requirements
- High ambient temperature up to 45°C (Higher than 45°C also available upon request)
- Water shortage area and high mountain region



# A Package Full of Customer Value

## Inlet Guide Vanes

### Highly efficient variable inlet guide vanes

- Optimizes the control of the air flow through the efficient regulation of inlet air
- Improves the performance of compressor at part load and reduces power consumption

## Cooling System

### Independent Cooler Module with Enhanced Serviceability and Flexibility

- Easy cooler cleaning and maintenance
- Able to be located in around 6 planes relative to core compressor
- VFD cooler motor to minimize power according to the site climate
- Flexible Noise Control
- Excellent Shipping and Installation Feature: Plug& play just after pipe connection

## Main Drive Motor

### Saving energy costs with high efficiency packaged motor

- Custom motors available for different environments(Optional)

## Horizontally split Gearbox

### Optimal design gearbox for easy access and maintenance

- Horizontally split allows fast inspection and easy access to major components
- Inspection and maintenance checks at minimum costs

## Lubrication System

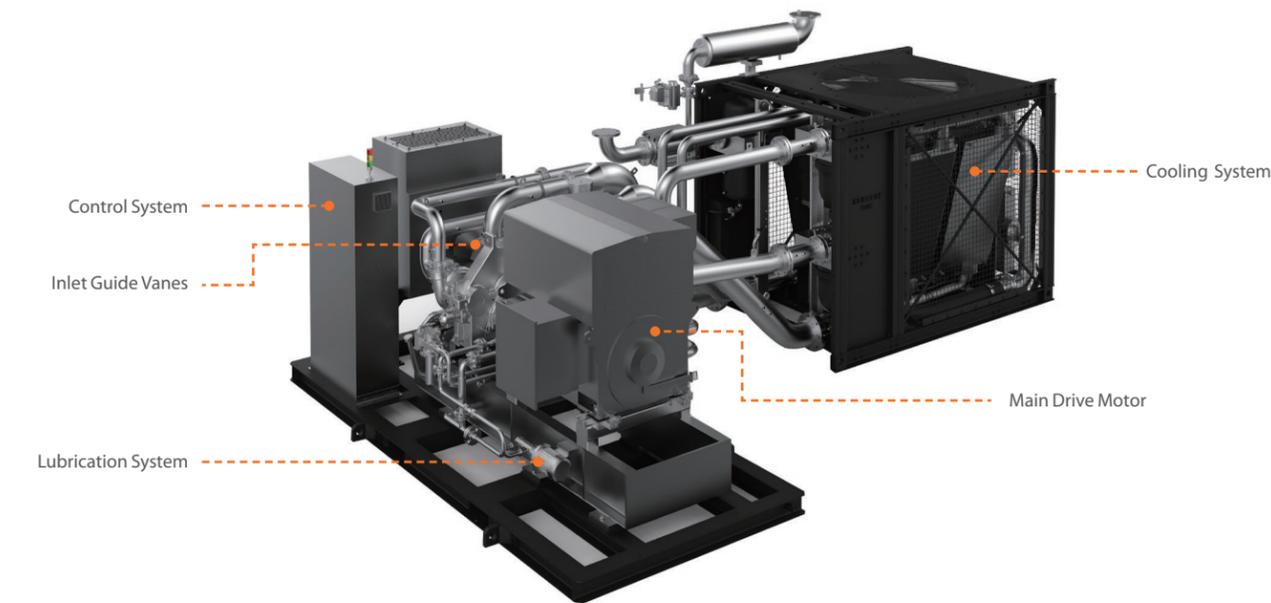
### Complete lubrication system package

- Oil reservoir, Auxiliary oil pump, Oil heater, Oil demister
- Compact design for minimal foot print
- High grade 10 $\mu$ m filter prevents impurities to gearbox
- Air-cooled oil cooler

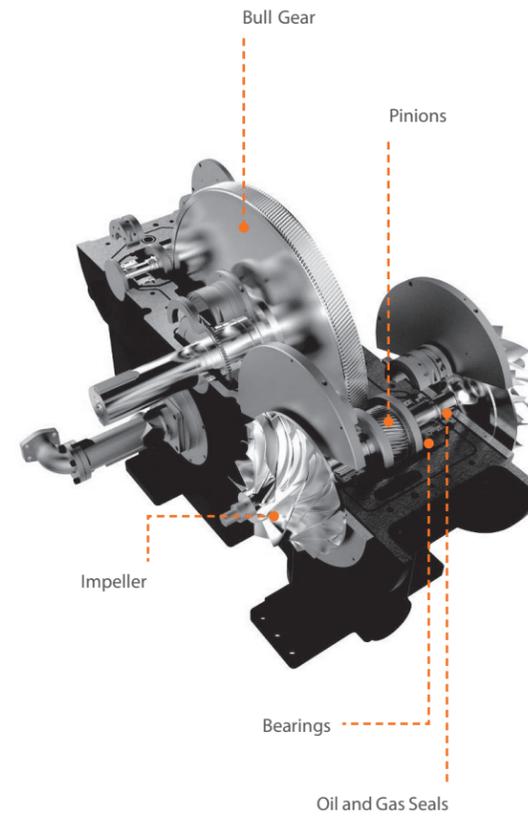
## Control System

### Reliable and precise control and monitoring system

- User friendly HMI with high resolution LCD panel
- Various hardwired connections and serial communications available
- Advanced auto dual & modulate control



# Designed to modern engineered standards



## Bull gear and Pinions

### High precision AGMA 12 & 13 gearing system

- Optimized gear design and manufacturing reduces noise
- Long life time and minimal mechanical loss
- Individually replaceable pinion and bull gear for easy maintenance

## Impeller

### State of the art master Impeller in 17-4 PH SS

- High efficiency 5-axis machined backward-swept impellers
- High turndown capability
- Parts balanced in accordance with API672

## Bearings

### Reliable split bearing systems

- Tilting pad journal bearing applied on pinion gear
- Low friction loss sleeve journal and taper landed bearing and thrust collar
- RTD incorporated into the bearings
- Bearing case provides good corrosion resistance and durability

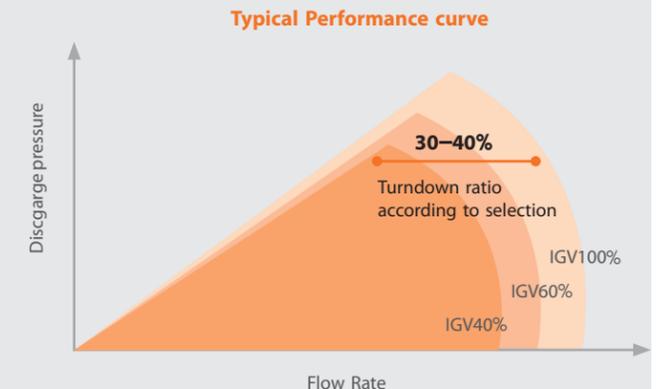
## Oil and Gas Seals

### Sealing system satisfies API specification

- Labyrinth seal combination guarantees long-life
- Low pressure oil lubrication and improved oil seals prevent oil contamination in the air flow
- Split type for ease of maintenance

## Maximum Energy Saving

Energy cost is the largest part of a compressor's total life cycle cost. Considering today's increasing cost of energy, energy efficiency is the primary concern when selecting compressors. Our SA3100 maximizes efficiency for lowest energy cost.



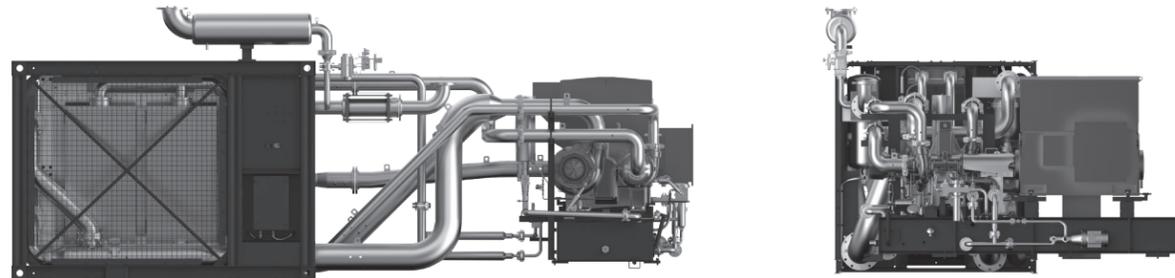
## Specification

Model		SA3100	
Capacity	m <sup>3</sup> /hr	3,750-5,500	
	CFM	2,200-3,250	
Motor	kW	400-580	
	HP	540-780	
Discharge Pressure	bar A	8.0-11	
	Psi A	116-160	
Dimension (LxWxH)	mm	Compressor	4,650 x 2,050 x 1,990
		Cooler	4,420 x 2,110 x 2,290
	inch	Compressor	183 x 81 x 78
		Cooler	174 x 83 x 90
Weigth (Excluding motor)	ton	Compressor	4
		Cooler	5.3

## Product Range



\* Flexible cooler options are available.



## Standard scope of supply

### Core Unit

- Efficient 3 stage IGC, with optimized aero component
- Electrically actuated IGV
- Horizontally split gearbox
- Split labyrinth seals(not contact type) and horizontal split tilting pad journal bearings for easy service
- Complete low pressure lube system including high grade demister elements
- AGMA 13 pinions able to be field removed for upgrade or service –API service factor on Bull Gear
- Low loss gear transmission system
- Bearing RTD as an option
- 5 Axis machined 17–4 PH impellers

### Package

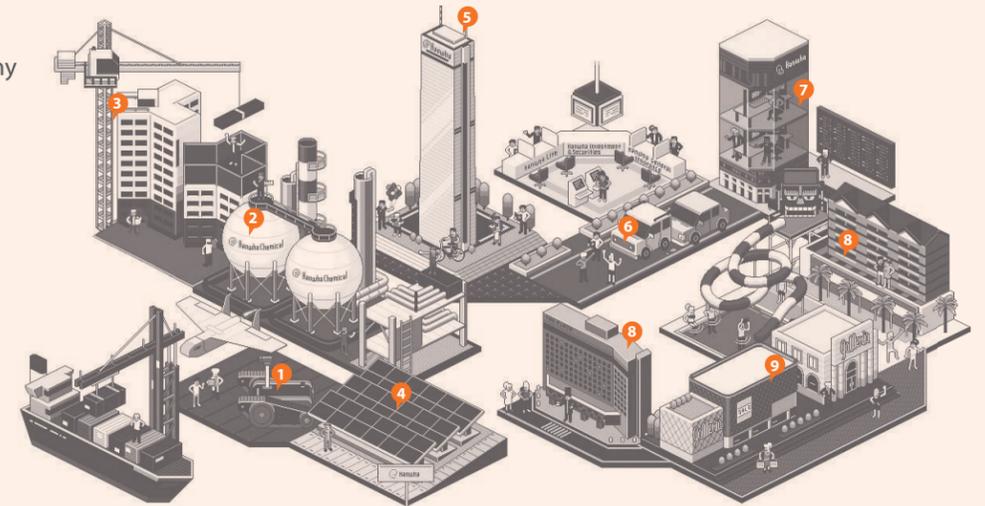
- High efficiency motors to IP23 grade (IP54 or IP55 available)
- Cooler Module
  - Designed at 35°C, RH 80% Ambient Condition and max 5500m<sup>3</sup>/min inlet flow capacity with 10 barG discharge pressure
  - Plate–Fin Type Intercooler#1 & #2, Aftercooler, Oil Cooler
  - Axial Fan/Motor(50HP) with VFD(Variable Frequency Driver)
  - Moisture Separators installed at the 2nd & 3rd stage with drain trap each
- Touch Plus operating screen with 7 inch display (10 inch available as an option)
- Modern comms protocol(optional): Ethernet, Modbus, RS–485
- Auto dual or Modulate control as standard
- PLC Controller, not Microprocessor; Expandable and open software
- Load test of complete as built package including motor as supplied.

## Hanwha Businesses

a FORTUNE Global 500 Company

64 years of business experience with 190 global networks

2015 Total assets of \$146billion and total sales of \$53billion



## Manufacturing & Construction

- Hanwha Corporation ①
- Hanwha Techwin ①
- Hanwha Power Systems ①
- Hanwha Land Systems ①
- Hanwha Precision Machinery ①
- Hanwha Thales ①
- Hanwha Chemical ②
- Hanwha General Chemical ②
- Hanwha Total Petrochemical ②

- Hanwha Fine Chemical ②
- Hanwha Engineering & Construction ③
- Hanwha Q CELLS ④
- Hanwha Q CELLS Korea ④
- Hanwha Advanced Materials
- Hanwha Energy
- YEOCHUN NCC
- Hanwha City Development

## Finance

- Hanwha Life ⑤
- Hanwha General Insurance ⑥
- Hanwha Investment & Securities ⑦
- Hanwha Asset Management ⑧
- Hanwha Investment
- Hanwha Savings Bank

## Services & Leisure

- Hanwha Hotels & Resorts ①
- Hanwha Galleria ⑧
- Hanwha Galleria Tmeworld
- Hanwha 63 City ⑧
- Hanwha S&C
- Hanwha Station Development

## Global Network

190 Global Networks (As of June 2015)

- |                 |                   |              |              |
|-----------------|-------------------|--------------|--------------|
| Ponitac         | London            | Bismayah     | Seoul        |
| Chicago         | Weybridge         | Kuwait city  | Tokyo        |
| Bremen          | Aix-en-Provence   | Tehran       | Nagasaki     |
| Franklin        | Stuttgart         | Dubai        | Fukuoka      |
| London(Ontario) | Warsaw            | Baghdad      | Shenzhen     |
| Forest          | Eschborn          | Almaty       | Chongqing    |
| New York        | Ismaning          | Mumbai       | Guangzhou    |
| Cranbury        | Bitterfeld-Wolfen | New Delhi    | Beijing      |
| Bakersfield     | Berlin            | Yangon       | Lingyungang  |
| Irvine          | Dietfurt          | Bangkok      | Hangzhou     |
| Shelby          | Diosd             | Samut Prakan | Ningbo       |
| Hawaii          | Budapest          | Ho Chi Minh  | Zhangjiagang |
| Monterrey       | Moscow            | Phnom Penh   | Shanghai     |
| Hartford        | Frydek-Mistek     | Selangor     | Qidong       |
| Teaneck         | Bolzano           | Kuala Lumpur | Dongguan     |
| Ridgefield park | Athens            | Singapore    | Suzhou       |
| Opelika         | Istanbul          | Jakarta      | Tianjin      |
| Monroe          |                   | Manila       | Hong kong    |
| Sao Paulo       |                   | Saipan       | Taipei       |
| Santiago        |                   |              | Sydney       |
|                 |                   |              | Johannesburg |

58 Affiliates all over the world

