

# KMC

Kumkang Modular  
Coordination

.....  
The new paradigm  
in the construction  
technique!

 **kumkang** Kind

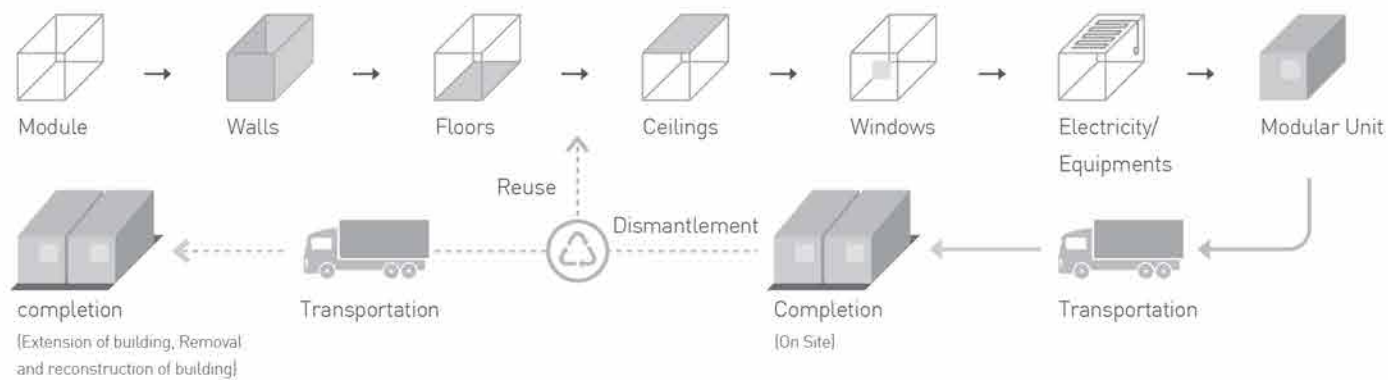
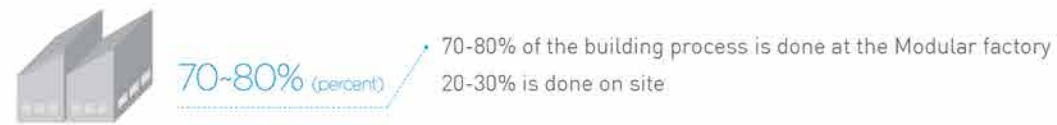
# What is the Modular System?

The concept of modular system

## A new Paradigm in Modern Construction, Kumkang Kind Modular System!

Kumkang Kind's Modular Building System is a new conceptual building system, where 70-80% of the building process is completed at the factory (wall, floor, ceiling, fitting, electrical and etc) with iron and steel materials. From the factory, the building is delivered to jobsite where the remaining tasks are completed. The Modular Building System can, not only bring down the construction cost through mass production at factory, it also ensures a standardized system with high quality. Finally, this system allows flexibility: extension, removal or variation of design.

## The Modular Manufacturing and Recycling Process



Kumkang Kind opens the future of the Modular building industry.

Modular construction site of a dormitory for the singles



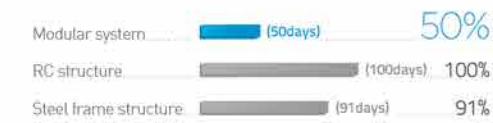
## Features of the Modular Building System

### SPEEDY

Significantly reduces construction time as the process on site and in the factory runs simultaneously.



#### Comparison of construction period

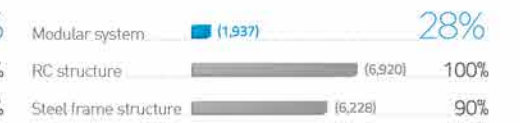


### ECONOMICAL

Mass production system can lower the building cost. Streamlining of the on-site construction process reduces the cost incurred by processing waste.



#### Comparison of building waste



### ECOFRIENDLY

Module is renewable as it is made with eco-friendly materials and adopts a high strength bolted connection.



#### Comparison of recycling rate



### FLEXIBILITY

Modular units are easily removed, reconstructed or extended and also come in various types of arrangements and combinations.



#### Comparison of expandability & variability



### SAFETY

Professional design, thorough checking and verification process to ensure its resistance to earthquakes and fire, as well as durability.



### HIGH QUALITY

Quality modular units are produced via the standardized manufacturing system.





# Application of Modular System

Kumkang Kind's Modular system.....

## Application of Modular Building System

The Modular System offers total process solutions ranging from building designs based on the building techniques of steel frame, manufacturing of the module in the factory through the standardized manufacturing system, to work on the on-site construction using additional buildings. The Modular system can be applied to a variety of construction areas with the best quality and competitive building techniques.



- 1 **Military facilities:** Effective in rearranging the facilities following the reorganization of the military base.
- 2 **Dormitories:** Comes in a variety of sizes and arrangements and makes the work easier for management and repair/maintenance.
- 3 **Education Facilities:** Allow a quick installation and completing of buildings which allows an effective educational environment.
- 4 **Offices:** Through a fast construction, it increases the moving-in and out of the residents and improve the rental period.
- 5 **Housing:** Allows a pleasant living environment through various possible design using eco-friendly materials.
- 6 **Hotels and pension:** Provides beautiful exteriors with a various combination of designs.
- 7 **Relief Housing:** Can be used for temporary housing for those affected by disasters.
- 8 **Hospitals:** It increases efficiencies in managing hospitals through the systematic designs.

1	2	
3	4	5
6	7	8

# Modular System Interior

Kumkang Kind's Modular system.....

## The Modular System Interior which brings the best comforts to your home!

The adoption of the Modular System not only ensures a pleasant residential environment while maximizing the living experience, it also optimizes the energy efficiency.



- **U.B.R (Unit Bath Room)**  
Factory-manufactured toilets,  
Water-saving toilet bowl.....
- **Minimizing the size of the windows using Low-E double glass**  
Saves the cost of heating and cooling energy.....
- **Using eco-friendly finishing materials**  
The use of certified green materials, improvement in air quality.....
- **Kitchen/washing machine/refrigerator**  
Optimization of living space through built-in refrigerator and washing machine.....

## Module combination





# What is the K·M·C method?

Kumkang Kind's Modular system .....

## Kumkang Modular Coordination .....

The Kumkang Kind's Modular Building System was studied and developed at our R&D Center in 2004. This conceptual building solves the problems of joints between units, floor noises, vibration and lack of precision between the modules.

\* Construction tolerance between modules ( $\pm 2\text{mm}$ )

## Feature of K·M·C method .....

### High strength junctional structure

#### CONNECTION

- Welded connection of pillars and beams
- The use of high strength bolts between modules
- Stability against earthquakes and wind loads



K-M-C characteristic 01

### Higher percentages of works done in the factory

#### FACTORY

- 70~80% manufactured in the factory
- Precise manufacturing of UBR, fittings, panels and electrical equipment at the factory.



K-M-C characteristic 02

### Optimization of transportation

#### TRANSPORTATION

- Delivery of the modules to jobsite using a 5-ton truck
- Easy to remove and rebuild, assemble and dismantle



K-M-C characteristic 03

### Control of top floor noises and water leaks

#### ROOF

- Various finishing materials available
- Triple safety structure for reinforcing the jointed parts



K-M-C characteristic 04

### Securing airtight function

#### AIRTIGHTNESS

- Water-proof sheet between the panels
- Prevent water leaks through the use of silicon gasket between the modules



K-M-C characteristic 05

### Improved floor function

#### FLOOR

- Higher structural stability and noise reduction
- Use of resilient materials between floors



K-M-C characteristic 06

### Dual wall system

#### WALL

- Application of variable wall system
- Better quality in damp-proof and insulation through dual wall system

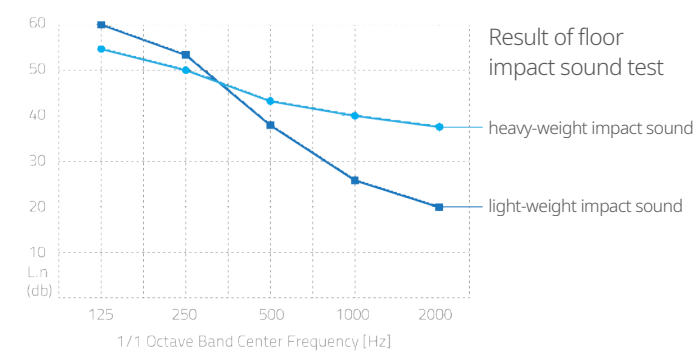


K-M-C characteristic 07

### Floor impact sound test

#### SOUND LEVEL

- 2nd grade(under 48dB) in function: 43dB of light-weight impact sound
- 4th grade(under 50dB) in function: 49dB of heavy-weight impact sound
- Floor impact sound test : Korea Marine Equipment Research Institute



## Patent of K·M·C method obtained .....



- 1 Patent No. 10-0984207
- 2 Patent No. 10-0929112
- 3 Patent No. 10-0926883



- 4 Patent No. 10-0984196
- 5 Patent No. 10-0947297
- 6 Patent No. 10-0923634



- 7 Patent No. 10-0927312
- 8 Patent No. 10-0923637
- 9 Patent No. 10-1279139

## K·M·C Industrialization residence(Approved by Ministry of Land)-2019.8.1



- 1 Transport and Maritime Affairs regarding K-M-C Approval No. 19-2





## Modular Construction Process

By using standardized materials, the Modular system produces the best quality units according to the standardized manufacturing system and it also effectively reduces the work terms with the factory finishing 70~80% of the whole process and 20~30% completed on-site.

The new paradigm in the construction technique!



# Exclusive factory for modular

Kumkang Kind's Modular system.....

## The cutting-edge production equipments optimized to manufacture the same high-quality modulars

Jincheon Factory of Kumkang Kind can produce more than 8,000 modular units a year maintaining the same high quality. The factory manufactures the best quality modular units with the basic frame, equipments, electricity and finishing materials installed based on the standardized manufacturing system.

### Exclusive factory in Jincheon for the production of modular system.....

**Location:** 27-29 Sincheokseo-gil, Iwol-myeon, Jincheon-gun, Chungcheongbuk-do  
**Scale:** 7,500m<sup>2</sup>  
**Land area:** 61,680m<sup>2</sup>

Production of Modular units

25 / 1day.....Daily production

700 / 1month.....Monthly production

8,000 / 1year.....Yearly production



Aerial photograph of Jincheon factory



Jincheon factory exclusive for modulars

“ Korea's largest factory exclusive for modular manufacturing ”

#### MANUFACTURING LINE

The standardized manufacturing line of modulars has the capacity for mass production and increases efficiencies in production of modular units



Jincheon Factory

#### GANTRY CRANE

The gantry cranes with their capacity of max. 15 tons can move and transport the modulars with high efficiency



Gantry Crane

#### MANUFACTURING EQUIPMENTS

The factory is equipped with various processing facilities for raw and finishing materials essential to modular production



Press

#### FIRE-PROOF TEST

Durability test against fire for 90 minutes certified by the Korean Institute of Construction Technology



Fire Test

#### EARTHQUAKE & WIND-PROOF

Lateral displacement safety and wind-proof safety tested and certified by the Korean Institute of Construction Technology



Lateral Test

#### SOUND & FLOOR

Sound insulation proven by the dual wall system, 1st grade obtained in the floor impact sound test



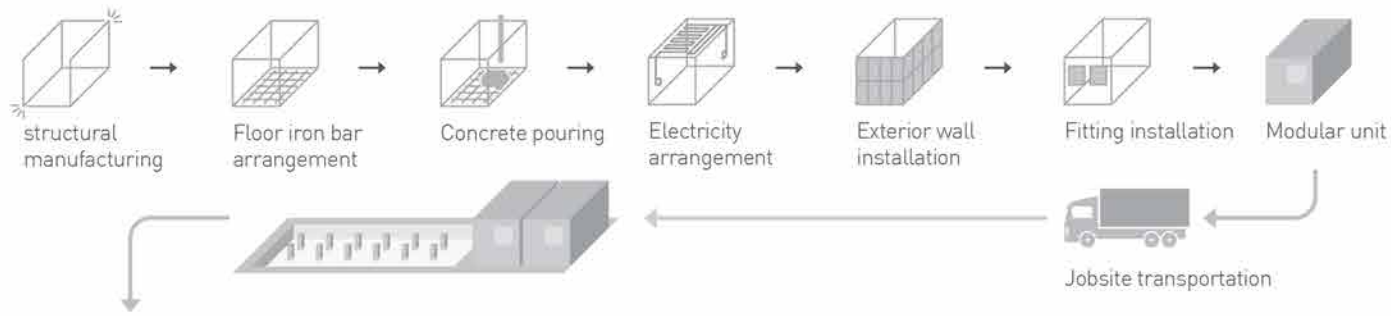
Sound insulation.



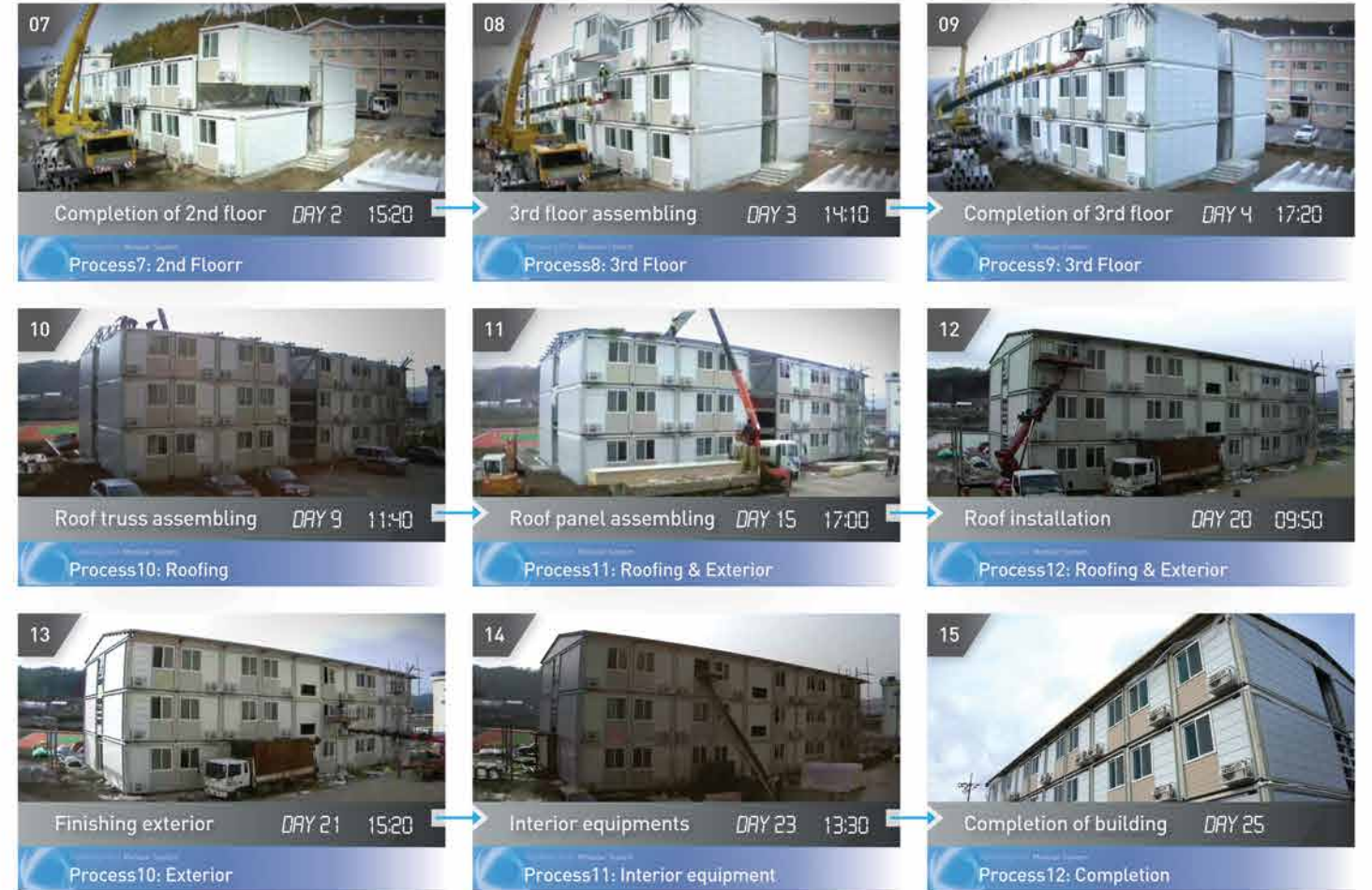
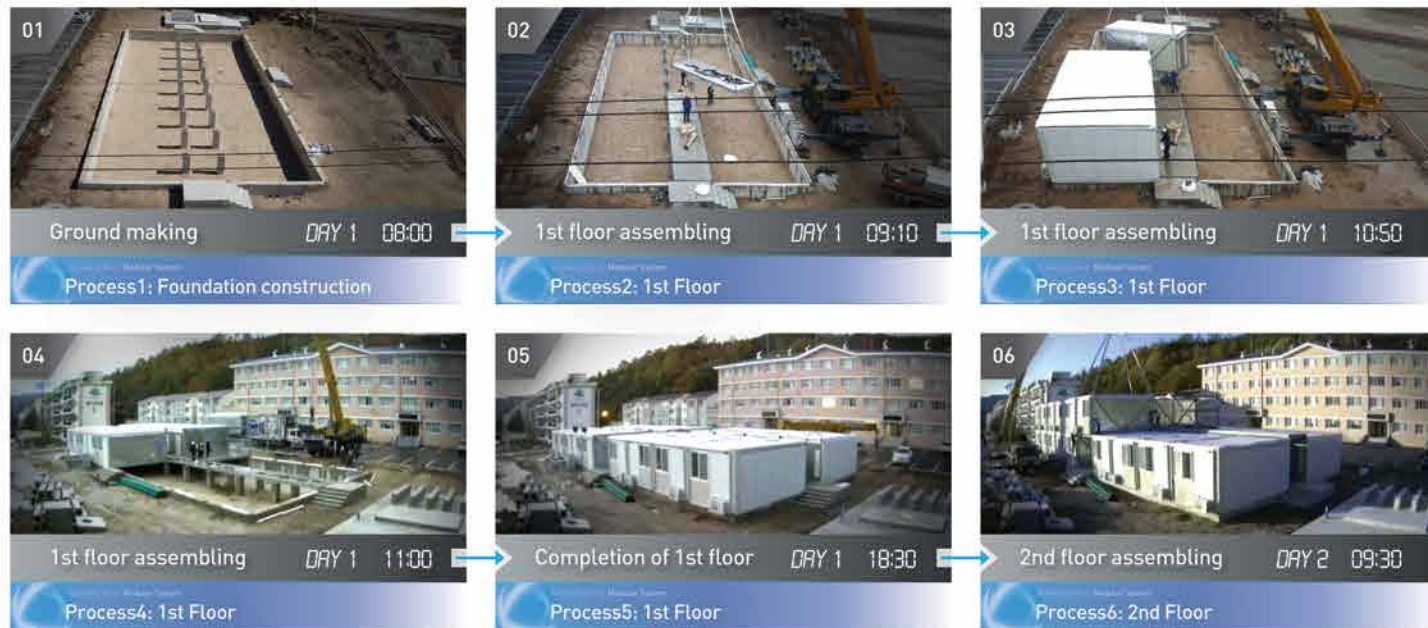
# Modular unit manufacturing process

Kumkang Kind's Modular system

## Modular unit factory manufacturing process



## On-site modular building process



The new paradigm in the construction technique!



Modular construction site of the dormitory for the singles

※ The above pictures of this building process are from Kumkang Kind's video advertisement, reconstructed from video clips using continuous shots taken from the module assembly to the building completion. To view the actual building scenes in detail, please visit [www.kumkangkind.com](http://www.kumkangkind.com)

### Modular construction schedule







## Modular Project References

Kumkang Kind's Modular Building System was applied in various projects including military barracks, dormitories, educational facilities, Jang Bogo Antarctic Research Station to name a few. Through our vast experience, Kumkang Kind is looking to expand its business to various fields.

The new paradigm in the construction technique!



# Major modular projects

Kumkang Kind's Modular system.....

## Housing

Kumkang Kind has dedicated its Modular Building System to create the most advanced and powerful military. Its new concept of housing with optimized unit plans made it possible to construct 46 military bases across the country including Pyeongchang in Gangwon-do.



### 2 Hour Fireproof performance

- Main steel structure apply 2 Hour Fireproof

### RC Slab floor

- Highly stabilized floor structure
- Easy to lay slabs and form insulation system

### High airtight Insulated housing

- Accurate construction of connecting parts, such as outer walls or ceilings, to maintain insulation and confidentiality

### Ease of maintenance

- Excellent durability and easy remodeling and maintenance

- |                           |                       |                 |
|---------------------------|-----------------------|-----------------|
| Choenan happy house       | • Chungnam Choenan    | • Modular: 20EA |
| Busan court dormitory     | • Busan Gangseo       | • Modular: 26EA |
| Pyeongchang modular house | • Gangwon Pyeongchang | • Modular: 15EA |

## Housing projects



Choenan happy house(2019)

Busan court dormitory(2018)

Pyeongchang modular house(2006)

## Office Building

Modular construction, which is good for combination with other construction methods, implements various forms of elevation design and large interior space. If it is applied to buildings for a certain period of time, such as the Olympics, it can make the most of modular construction.



### Can be moved after a period of use

- Modular Unit to Unit bolt connection for easy disassembly and reconstruction

### 50% shorter construction period than RC

- Construction period is shortened due to the simultaneous construction of the foundation and the manufacture of the module

### Interior Large Space

- Large internal space consisting of a combination of different modules

### Various Elevation Designs

- Various elevations by combining modular and conventional methods

- |                           |                       |                  |
|---------------------------|-----------------------|------------------|
| Pyeongchang Olypic office | • Gangwon Pyeongchang | • Modular: 219EA |
| Sinheung-dong eoul madang | • Gyeonggi Bucheon    | • Modular: 69EA  |
| Startupspace Station-G    | • Gyeonggi Ansan      | • Modular: 20EA  |

## Office Building projects



Olympic office(2016)

Sinheung-dong eoul madang(2019)

Startupspace Station-G(2019)





## Educational & Medical Institution

Modular is an appropriate method for new city schools and old city centers that need to respond quickly to school needs. It can be built or expanded through simple assembly construction.



### Easy to Remove and Rebuild

- Removing, reconstructing, and extending the modular units can be done as easy as disassembling the modules connected vertically and horizontally with high strength bolts

### Reduction of Work duration

- Small size projects or extension of the building work can be completed with a simple installation process during the vacation period

Oesol elementary school

Ongjin-gun public health center

• Ulsan Jung-gu Seo-dong

• Incheon Ongjin

Modular provides high-quality buildings that meet the confidentiality and corrosion resistance required by hospital facilities through factory production.



### Finishes suitable for medical facilities

- Chemical and pollution-resistant finishes that are not affected by the external environment

### High confidentiality performance

- Confidential construction to prevent air mixing in hospital rooms and public spaces

• Modular: 114EA

• Modular: 62EA

## Military Facility & Research Station

Through the construction project of bachelor officers' quarters, which maximizes modular advantages, Kumkang Kind has created a new concept home for strong troops.



### Dual Insulation wall & Roof structure

- Excellence in maintenance
- Dual airtight connection between the modules
- Maximized insulation and dew condensation blockage system

### Roof Finishing with metal shingles

- Increase in waterproofing capability and maximized maintenance and quality with the use of metal shingles on the roof panels

Bachelor officers' quarters

Military barrack

Antarctic base

• Gangwon Pyeongchang

• Gangwon Hongcheon

• Terra Nova Bay

Based on the accumulated technology, it made modular with complete confidentiality and insulation performance even in extreme climates and applied them to the second Antarctic base.



### Application of dry floor system

- Adoption of dry floor system, easy to transport and lift

### High Performance Modular

- Application of five-fold glass and high-performance insulation

• Modular: 1,345EA

• Modular: 2,736EA

• Modular: 186EA

## Educational & Medical Institution projects



Oesol elementary school(2014)



Ongjin-gun public health center(2020)



## Military Facility & Research Station projects



Bachelor officers' quarters(2012)



Military barrack(2012)



Antarctic base(2014)



#### **Headquarter**

Kumkang Kind Building, 21 Saemal-ro 5-gil, Songpa-gu, Seoul, Korea  
Tel.....82-2-3415-4115 Fax.....82-2-3415-4036

#### **Kumkang Kind America**

Kumkang America Inc.  
1215 W. Imperial HWY., Ste 216, Brea, CA 92812 USA  
Tel.....714-278-9089

#### **Kumkang Kind Malaysia**

Kumkang Kind [M] SDN, BHD  
B-9-01, Block B, Oasis Square, No.2, Jalan PUJ 1A/7A  
Ara Damansara 47301 Petaling Jaya, Selangor Darul Ehsan, Malaysia  
Tel.....+60-3-7831-0488 Fax.....+60-3-7831-2588

#### **Kumkang Kind Vietnam**

Kumkang Kind Vietnam,  
9th, Beautiful Saigon BLDG., 02 Nguyen Khac Vien St, District 7,  
Ho Chi Mihn City, Vietnam  
Tel.....+84-8-5413-6508 Fax.....+84-8-5413-6507

#### **Kumkang Kind India**

Kumkang Kind India,  
Office no.404, 4th floor, Sky Vista BLDG,  
near Town Square Dorabjee, Viman Nagar,  
Pune – 411 014, Maharashtra India  
Tel.....+91-20-6647-3800

#### **Kumkang Kind East Africa**

Kumkang Kind East Africa,  
Office 5, 4th Floor, Tower 1, The Mirage, Chiromo Rd, Westlands,  
Nairobi, Kenya  
Tel.....+254-2-0250-0882

#### **Kumkang Kind Indonesia**

Kumkang Kind Indonesia,  
Kawasan Industri Modern Cikande Jl. Utama Modern Industri Blok AA No.4,  
Kel. Sukatani, Kec. Cikande, Kab. Serang, Prov. Banten, Indonesia