



# **Overseas Branch Offices**

# **Production Plants**



#### Kumkang Kind India

Office no.105, 1st floor, Sky Vista BLDG, near Town Square Dorabjee, Viman Nagar, Pune-411014, Maharashtra, India

#### Kumkang Kind Malaysia

B-9-01, Block B, Oasis Square No.2, Jalan PJU 1A/7A Ara Damansara 47301 Petaling Jaya Selangor Darul Ehsan, Malaysia

#### Kumkang Kind Vietnam

9th, Beautiful Saigon BLDG., 02 Nguyen Khac Vien St, District 7, Ho Chi Mihn City, Vietnam

#### Kumkang Kind East Africa

Office 5, 4th Floor, Tower 1, The Mirage Chiromo Rd., Westlands Nairobi, Kenya

#### Kumkang Kind Indonesia

Gedung Wisma Slipi Unit 801, Jl..Let. Jend. S. Parman Kav. 12 Jakarta, Indonesia

#### Kumkang Kind America

1215 W. Imperial HWY., Ste 216 Brea, CA 92812 USA

- **+ Eumseong #1 Factory** (Production of aluminum formwork) 505, Yonggwang-ro, Eumseong-eup, Eumseong-gun, Chungcheongbuk-do, Korea
- **+ Eumseong #2 Factory** (Aluminum Recycling and Extruding) 1994, Daegeum-ro, Saenggeuk-myeon, Eumseong-gun, Chungcheongbuk-do, Korea
- + Jincheon #1 Factory (Production of aluminum formwork)
  515, Jingwang-ro, Iwol-myeon, Jincheon-gun,
  Chungcheongbuk-do, Korea
- + Jincheon #2 Factory (Production of aluminum formwork)
  27-29, Sincheokseo-gil, Iwol-myeon, Jincheon-gun,
  Chungcheongbuk-do, Korea
- + Nilai Factory in Malaysia (Production of aluminum formwork)

  Lot 119-120, Jalan Permata 1/4, Arab Malaysian Industrial Park, 71800 Nilai,

  Negeri Sembilan Darul Khusus, Malaysia
- + Changnyeong Factory (Production of climbing formwork and infrastructure)
  149-16, Gwanggyemaeul-gil, Gyeseong-myeon, Changnyeong-gun,
  Gyeongsangnam-do, Korea
- **+ Eonyang Factory** (Production of steel pipe)
  359, Bangudae-ro, Samnam-myeon, Ulju-gun, Ulsan, Korea

# **Kumkang Kind History**

# 00's

- 03. 04 Completion of Jincheon #1 Factory
- 03. 12 Obtained ISO 9001 Certificate
- 05. 10 Establishment of Research and
  Development department
- 06. 05 Completion of Jincheon #2 Factory
- 06. 12 Completion of Eumseong Factory
- 07. 09 Establishment of Kumkang Kind (M) Sdn.
  Bhd as a subsidiary in Malaysia
- 08. 06 Obtained KR [The Korean Register of Shipping] Certificate
- 09. 10 Completion of Nilai Factory in Malaysia
- 09. 11 Achieved \$30 million in exports

# **10's**

- 10. 01 Establishment of Kumkang Kind America
- 10. 06 Establishment of Kumkang Kind Vietnam
- 11. 11 Achieved \$50 million in exports
- 12. 01 Changed Jincheon #2 Factory into Jincheon Modular factory
- 12. 09 Completion of Eumseong #2 factory
- 12. 10 Establishment of Kumkang Kind India
- 12. 12 Achieved US\$ 70 million in exports
- 13. 01 Merged Kumkang Fostem Inc.
- 14. 12 Achieved \$100 million in exports
- 15. 03 Completion of Changnyeong Factory
- 15. 08 Completion of Cheonan Modular Factory
- 17. 02 Establishment of Kumkang Kind East Africa
- 17. 03 Establishment of Kumkang Kind Indonesia
- 17. 10 Relocated Modular factory to Changnyeong Factory
- 19. 08 Establishment of Kumkang Kind Philippines

90's

- 90. 01 Completion of Eonyang factory
- 92. 01 Completion of Busan factory
- 92. 05 Obtained KS certificate

  [pipes for ordinary, pressure and structural]
- 92. 07 Obtained quality certificate from Japanese scaffolding association
- 92. 11 Achieved \$10 million in exports
- 93. 02 Obtained JIS Certificate [structural pipe]
- 99. 05 Obtained ISO 9002 Certificate

**70's** 

79. 08 Establishment of Kumkang Kind Co., Ltd.

80'5

87. 09 Obtained KS certificate [panel form]

88. 09 Listed on the Korean Stock Exchange

89. 06 Completion of Banwol factory







Our Kumkang Aluminum Formwork is made of high strength aluminum extrusion which, compared with steel formwork, allows a large but lightweight panels. Our formwork will not only achieve better concrete finishing but also allow a faster construction.

# Quality Improvement



Our Kumkang Aluminum Formwork produces an unbeatable concrete finishing which does not require any plastering and eliminate grinding task due to joints created by panels. Furthermore, our engineers will design the staircase formwork so that the concrete will be poured simultaneously on the wall, slab, column and beam.

# **Cost Reducer**



As our aluminum formwork allows an average of 6 days cycle, it considerably reduces the construction period. Reducing construction period will directly reduce the costruction cost. Furthermore, non-structural wall can also be done with our aluminum formwork which will reduce labour time and cost.

# Time Saver



The Kumkang Aluminum Formwork system allows a single pour of wall, beam, column, slab and staircases. Furthermore, our prop-head system will allow to dismantle the slab panels without removing the props. Thus, 6 days cycle is no longer a dream but a reality.

# Safety Provider



Compared with the conventional method, our formwork system will allow a large working area for jobsite workers (fewer props). Furthermore, through the supply of external working platform, jobsite workers will feel much safer and increase their efficiency.

# **Eco Friendly**



One of the best advantages of the aluminum formwork is repetition. While the conventional formwork must be thrown away after 5~10 repetitions and steel formwork after a maximum repetition of 50, the aluminum panels can last for over 300 repetitions. Furthermore, after 300 repetitions, the panels can be recycled. Thus, no harm is created to the environment and produce less site wastages.

P J T Megapolis

Builder Kumar properties & ABIL

Location Pune, India

T y p e Multipurpose Building

System K-Al formwork

# Advantages

The most important aspect of a successful structural construction is the formwork system.

Kumkang Kind will always offer you the most trustful, secure, efficient, and cutting edge of formwork system technology available on the market.



#### + Speed

 Due to its easiness of assembly, our Kumkang Aluminum Formwork allows an average of 6 days cycle compared to 14~30 days cycle with the conventional method.

#### + Quality

- With a smooth surface and accurate dimension of panels, there is no requirement of plastering or remedial work after concrete casting.

#### + Safety

- No need to remove props and prop heads when dismantling slab panels.

#### + Easy assembly

- No need for skilled workers nor carpenters.

#### + All-in-one system

- With our Kumkang Aluminum Formwork, shoring and external working platforms are also supplied.

#### + Mobility

- The formwork panels will be transferred manually to the next level through a slab transfer box; thus, the crane can be used for other tasks.

### + Freedom of design & jobsite planning

 - Unlike tunnel for table formwork, Kumkang Kind's Aluminum Formwork is a "modular" formwork; there is no constraint on any architectural or structural design.

#### + Durability

- Manufactured through a state of art technology with an aluminum alloy extrusion, our formwork can be repeated over 300 times.





# **Special Features**

	Application Application				
Construction Method	Single Storey (Terrace or Link Houses)	Double(2) Storey (Terrace or Link Houses)	Three(3) to Six(6) Storey (Apartments or Buildings)	High Rise (Buildings or Apartments)	
Traditional Bricks	The most common. Slow construction and labor intensive	Usually not acceptable without concrete beam	Structurally not suitable Requires concrete structural elements	Structurally not suitable	
Concrete Frame (Columns, Beams & Slabs) with Brick or Block infill	Most commonly used where bricks/blocks alone are not acceptable. Slow method	Most commonly used method, slow & costly compared to system	Traditionally used method worldwide. Slow & costly.  Remains the method of choice for small builders, but losing out on large-scale projects to new systems		
Precast / Prefabs Concrete	Suitable for large projects. High initial costs and slow start up for precast / prerab plant.  Transport and lifting costs are inefficient compared to cast in-situ system.		Careful supervision of con- struction is required. Noted for rampant instability of joints		
Cast in-situ concrete: Heavy Shuttering system	Not suitable - requires too much labor & time to move equipment from one house to another		Suitability increases in proportion to height of building & number of units. Not suitable for less than 250 units.  Resulting in efficiency loss		
Kumkang Kind Aluminum Formwork System			Kumkang Kind Aluminum Formv able, faster & environmentally fri		

	Formwork Type				
Characteristics	Hard Held Formwork	Tunnel Formwork	Table Formwork		Kumkang Kind Al. Formwork
No cranes or other heavy equipment required	<b>√</b>				<b>√</b>
Allows to pour wall, slab, beam, column and staircase in 1 single concrete pour		<b>√</b>			<b>√</b>
Dismantle slab panels without removing props.					<b>√</b>
Can form concrete columns and beams together	<b>√</b>			<b>√</b>	✓
No skilled labor required	<b>√</b>				✓
Suitable for single (1) or two (2) storey buildings		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>
Suitable for high-rise buildings				<b>√</b>	<b>√</b>
Formwork equipment adapts to different designs					<b>√</b>
Able to form all concrete elements				<b>√</b>	<b>√</b>
Lowest formwork to forming area ratio					✓
Respects all architectural and structural requirements of the client, without modifications.	✓			✓	✓
Self correction feature providing unmatched forming accuracy	<b>√</b>				$\checkmark$
Environmentally friendly - no huge debris, no messy disposals					<b>√</b>

Specification	Aluminum A6061-T6			
	List	Unit	Combined Aluminum (A6061-T6)	
** * * * *	Specific gravity -		2.7	
Material	Allowable bending stress	Allowable bending stress kg/cm <sup>2</sup>		
	Young's modulus	kg/cm²	7.0 x 10⁵	
	Inner wall panel	Slab corner & Beam		
Composition	Slab panel & prop	In-out corner & Hunch		
	Accessory	Flat-tie, PVC sleeve, round pin, wedge pin		
N. 1.1.1	Wall panel	600mm x Wall height (2,300 or 2,450) x 63.5 thk		
Normal module	Slab panel	600mm x 1,200 x 63.5 thk		

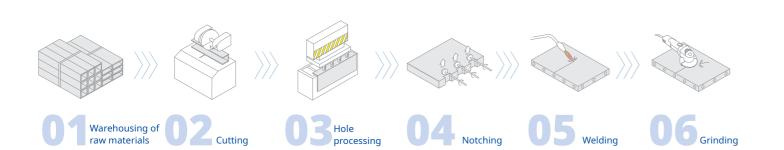
012 + 013

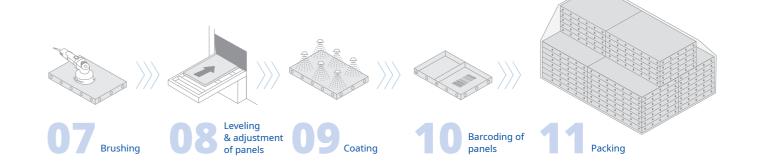


# **Manufacturing Facilities**



# **Manufacturing Process**





# Friction Stir Welding (FSW)

#### + Technological background

- Developed in 1991 in Cambridge, United Kingdom, this welding technology applies high pressure between 2 plates and welds them through the heat caused by the friction.
- As it is a joining technology on a solid state (low heat input), compared to the traditional welding method, FSW is environment-friendly, minimizing residual stress and strain.
- Not only FSW allows aluminum welding, but it also allows bimetallic welding such as aluminum/magnesium, alloy steel and lightweight alloy.
- Techology used in aerospace, rail, automotive, marine, and etc. FSW is being used for aluminum formwork since 2015 in Korea.

#### + Welding strength

	Test result	Raw		
ITEM	Manual welding	Robot welding	FSW	material A6061-T6
Tensile Strength (kgf)	900 ~ 1,470	1,770 ~ 2,000	2,600 ~ 3,800	5700
Compared with Raw material	26%	35%	67%	100%

#### + Advantages of FSW

- As a solid state process it can be applied to all the major aluminium alloys and avoids problems of hot cracking, porosity, element loss and etc. common to aluminium fusion welding processes.
- Bimetallic (aluminum/magnesium) welding is possible.
   [bimetallic: different metallic properties]
- No shielding gas or filler wire is required for aluminium alloys
- Excellent mechanical properties, competing strongly with welds made by other processes
- The absence of fusion removes much of the thermal contraction associated with solidification and cooling, leading to significant reductions in distortion
- Workplace friendly: there are no ultraviolet or electromagnetic radiation hazards as the absence of an arc removes these hazards from the process; the process is no noisier than a milling machine of similar power, and generates virtually zero spatter, fume and other pollutants
- As a mechanised process, FSW does not rely on specialised welding skills; indeed manual intervention is seldom required

# **Aluminum Recycling & Extrusion**

Since our establishment in 1979, Kumkang Kind, a manufacturer of steel pipes, formwork system, and modular coordination system has been playing an important role in the development of the South Korea economy and a variety of industries. With a belief in ethical management, the company takes seriously the responsibility toward society and contribution to its well-being.

Recycling is a core business operation in the aluminum formwork industry. The aluminum industry is highly dependant on the global economic cycle. Thus, depending on the economic condition, it becomes extremely difficult to procure raw materials (billet in either cut lengths or logs or scrap). Without billet, it is impossible to have extrusions which will directly affect the production and delivery of aluminum formwork. Thus, Kumkang Kind has newly invested in a billet casting facility in 2015. This facility allows Kumkang Kind to be self-sufficient and procure aluminum in either ingot or scrap form. Our new business will diversify our aluminum supply base and avoid any delays in delivery to our clients.

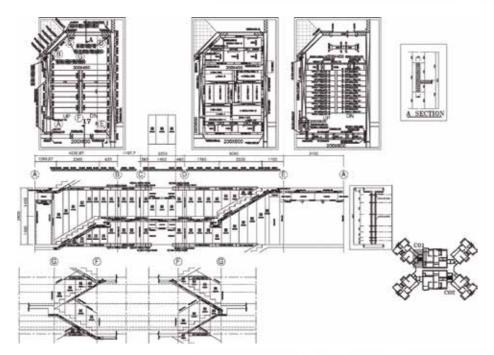




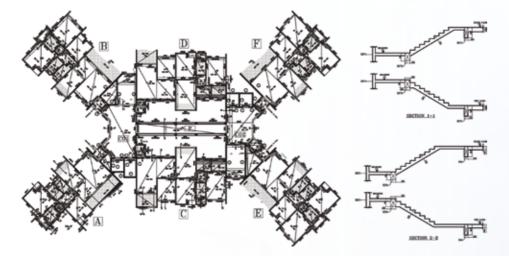
# **Technical Support**

Kumkang Kind offers a wide variety of services, from Aluminum Formwork CAD design to consulting services with an emphasis on commercial and residential construction.

# + Staircase Setting Layout



#### + Plan



Bundang Yongin U Tower

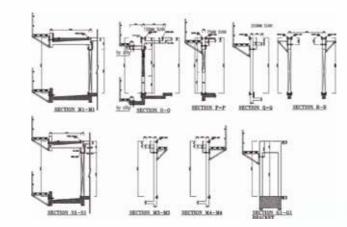
Builder POSCO E&C

Location Yongin, Korea

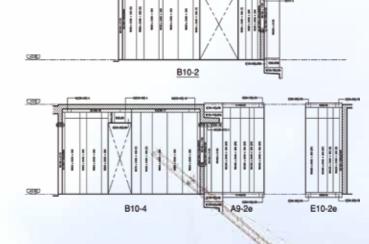
T y p e Multipurpose Building

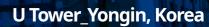
System K-Al formwork, KSB-H

## + External Working Platform Section



## + Elevation Drawing





# **Rigorous Supervision**



The most effective way of achieving high level of safety when using the formwork system is to have reliable supervision during erection and concrete pouring. Supervisors must assure that the formwork delivered is manufactured as per the client's design, so that no time is lost during its installation but under a safe working environment. Our experienced supervisors always check whether the formwork system is assembled and installed properly.

Many accidents could occur from handling the formwork materials when jobsite workers, particularly who are inexperienced, use machine and equipment or handle heavy and large materials without proper training.

Jobsite workers' safety is greatly dependant on proper information, instruction, training, and supervision.

#### Staff must be:

- Informed and trained, so that they understand the nature of risks to their health and safety, or that of other, from the work they do and the measures necessary to adequately control them.
- Supervised to ensure that they follow the instructions and training given to them.
- Involved in the health and safety management system and decision-making process.

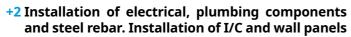
# **Setting Process**

Due to its easiness of assembly, our Kumkang Aluminum Formwork allows an average of 6 days cycle compared to 14~30 days cycle with the conventional method.

#### +1 Structural line and level check











## +3 Installation of beam and SC panels





+4 Installation of staircase panels



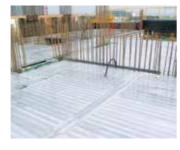


+5 Installation of slab panels





+6 Installation of slab panels



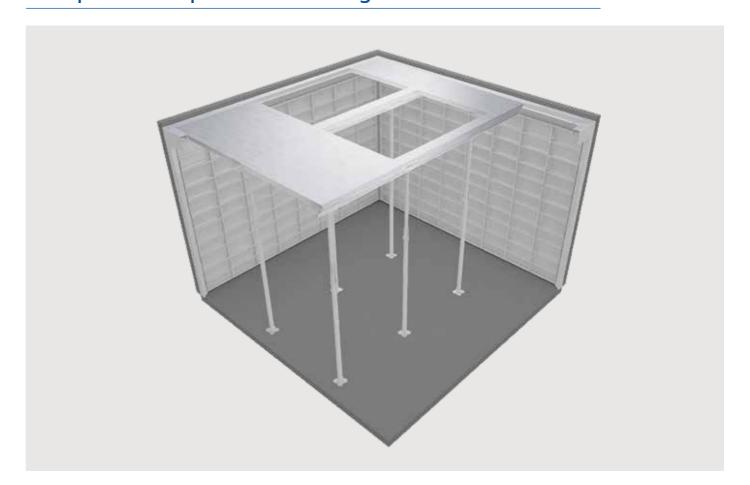


# +7 Installation of electrical, plumbing components and steel rebar.

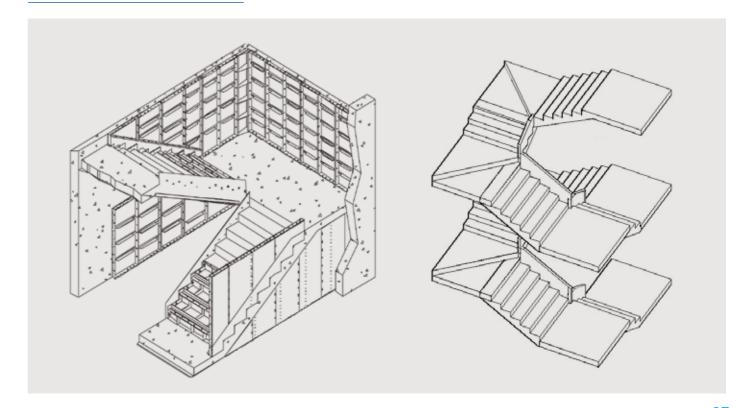


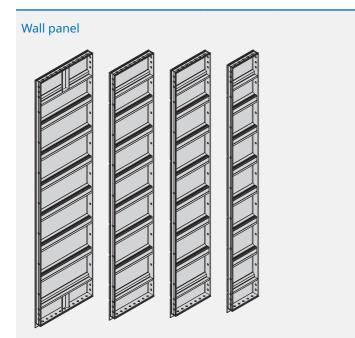


# Sample mock-up of the Kumkang Aluminum Formwork

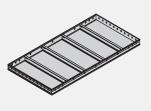


# 3D view of staircase



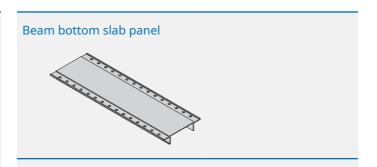


Components (mm)	Weight (kg)	Article No.
Wall standard panel 300 x 2400	15.8	
Wall standard panel 400 x 2400	19.6	
Wall standard panel 450 x 2400	21.5	
Wall standard panel 600 x 2400	27.6	31010000
Wall standard panel 300 x 2450	16.4	31010000
Wall standard panel 400 x 2450	20.4	
Wall standard panel 450 x 2450	21.6	
Wall standard panel 600 x 2450	28.5	



Slab panel

Article No.	Weight (kg)	Components (mm)
	13.5	Slab panel 600 x 1200
35000000	10.8	Slab panel 450 x 1200
3300000	9.9	Slab panel 400 x 1200
	8.1	Slab panel 300 x 1200



Weight (kg) Article No.

35440000

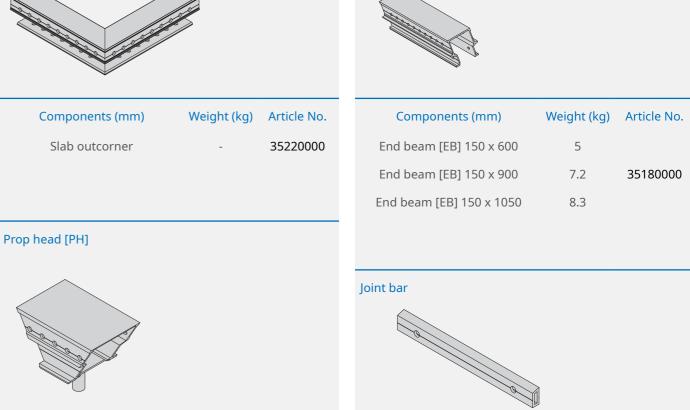
Components (mm)

Beam bottom slab panel



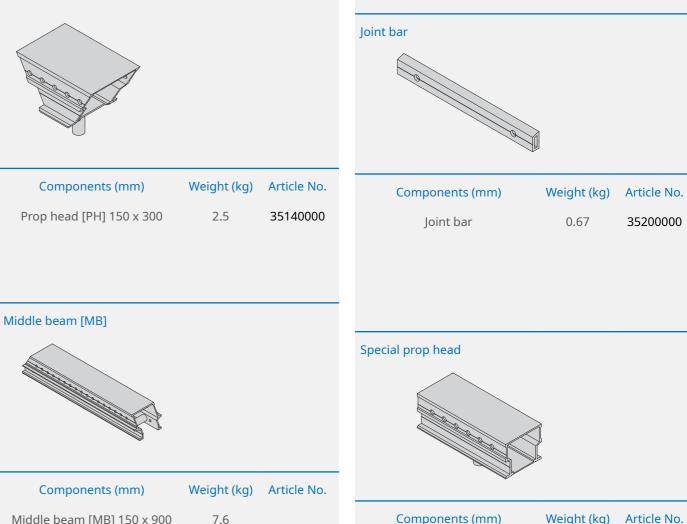






35200000

End beam [EB]



Components (mm)

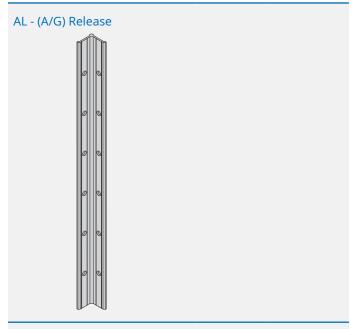
AL - (A/G) Release 63.5 x 63.5

Components (mm)

AL round pin

AL wedge pin

Wedge & Round pin



Weight (kg) Article No.

31470000

Article No.

38000100

38000500

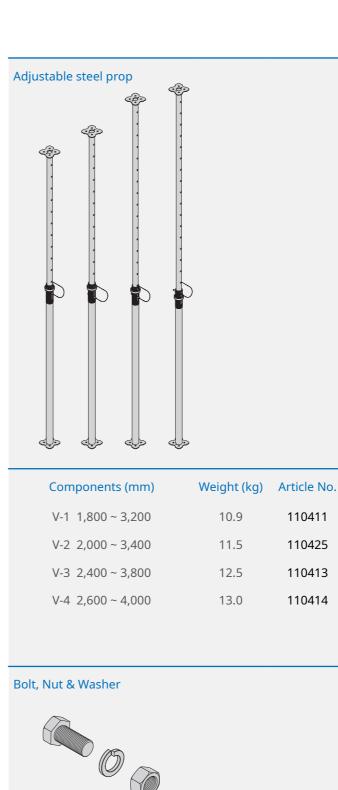
1.931

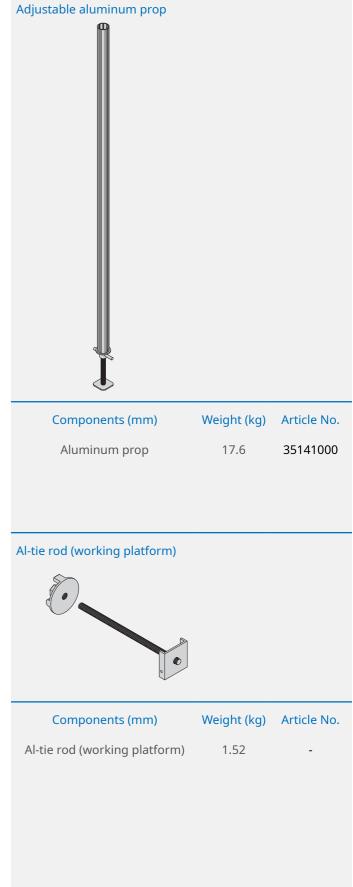
Weight (kg)

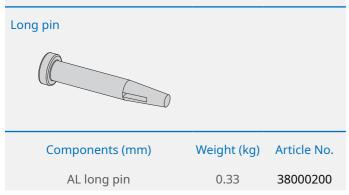
0.082

0.04



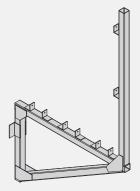


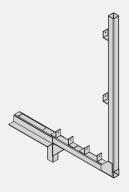


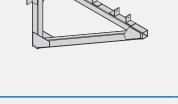




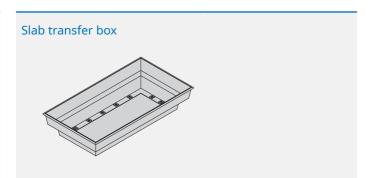
## Working platform





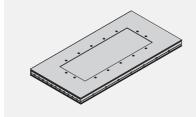


Components (mm)	Weight (kg)	Article N
Working platform for wall	15.7	-
Working platform for slab	10.6	-
working platform for core	10.3	-



Components (mm)	Weight (kg)	Article No.
Slab transfer box	24.19	34500000

#### Slab open panel



Components (mm)	Weight (kg)	Article No
Slab open panel	10.93	35480000

# Staircase landing panel



Components (mm) Weight (kg) Article No.

Staircase landing panel 11.43 36000000

#### Staircase wall panel(dw)



Components (mm) Weight (kg) Article No.

Staircase wall panel(dw) 3.37 36000000

#### Staircase wall panel(up)



Components (mm) Weight (kg) Article No.

Staircase wall panel(up) 3.37 36000000

#### Gun panel



Components (mm) Weight (kg) Article No.

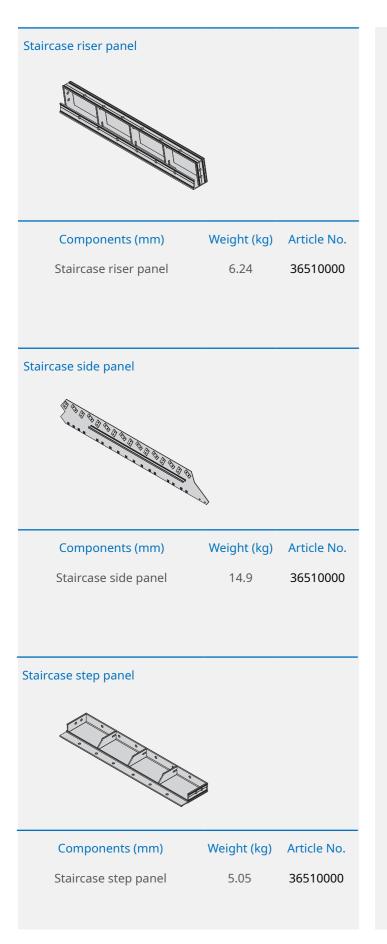
Gun panel 17.34 36510000

#### Staircase landing post panel



Components (mm) Weight (kg) Article No.

Staircase landing post panel 1.47 36510000



# Project References - Malaysia

### + PNB 118, Kuala Lumpur - Malaysia



+ KLCC Tower, Kuala Lumpur - Malaysia



+ Astaka, Johor Bahru - Malaysia



+ Universe Prime Condominium, Sabah - Malaysia

- K-Al Form



+ Oasis Damansara, Kuala Lumpur - Malaysia



+ The Troika, Kuala Lumpur - Malaysia

- K-Al Form



+ Fennel, Sentul - Malaysia

- K-Al Form



+ DNP Tower, Kuala Lumpur - Malaysia

- K-Al Form, KSB-C



+ Petronas Tower 3, Kuala Lumpur - Malaysia



+ Meridin, Johor Bahru - Malaysia

- K-Al Form



+ D'Rapport, Kuala Lumpur - Malaysia

- K-Al Form



+ ONE IFC Tower, Kuala Lumpur - Malaysia

- K-Al Form



# Project References - Singapore

### + Riversails Residence - Singapore

- K-Al Form



### + Sky Habitat - Singapore

- K-Al Form



### + Marina Bay Financial Center R2 - Singapore

- K-Al Form



### + Bendemeer Condo - Singapore

- K-Al Form



#### + Parkland Residence - Singapore

- K-Al Form



## + Foresque Residence - Singapore

- K-Al Form



## + Twin Waterfall - Singapore

- K-Al Form



## + Marina Bay Suites Project(BFC-R2) - Singapore

- K-Al Form



## + Minton Residence - Singapore



## + Viva Condominium - Singapore

- K-Al Form



## + Nus College - Singapore



#### + Anderson 18 Condominium - Singapore

- K-Al Form



# **Project References - Vietnam**

#### + Landmark 81, Ho Chi Minh - Vietnam

- K-Al Form, Gang form, KSC-100, KSC-50



#### + Keangnam Landmark Tower, Hanoi - Vietnam

- K-Al Form



#### + Kumho Asiana Plaza, Ho Chi Minh - Vietnam

- K-Al Form



#### + Masteri Complex, Ho Chi Minh - Vietnam

- K-Al Form for 5 Blocks



#### + Vietinbank, Hanoi - Vietnam

- K-Al Form



+ Dolphin Plaza, Hanoi - Vietnam

- K-Al Form, KGB-H



+ Vista II, Ho Chi Minh - Vietnam

- K-Al Form for 4 Blocks



+ Ascent A, B, Ho Chi Minh - Vietnam

- K-Al Form, Steel Gang Form



#### + Keangnam Landmark 72, Hanoi - Vietnam

- K-Al Form, Gang form, KSC-50



+ Discovery Complex, Hanoi - Vietnam

- K-Al Form



+ Green Valley, Ho Chi Minh - Vietnam

- K-Al Form



+ Vinhomes Tan Cang, Ho Chi Minh - Vietnam

- K-Al Form for 5 Blocks



# Project References - India

#### + Marathon Monte South, Mumbai - India

- K-Al Form



#### + Lodha Clariant, Mumbai - India

- K-Al Form



## + Vaibhava, Bangalore - India

- K-Al Form



### + Prestige Falcon, Bangalore - India

- K-Al Form



#### + Grand Arch, Delhi - India

- K-Al Form



## + Delhi one, Delhi - India

- K-Al Form, Gang form, KGB-H



### + Aratt Milano, Bangalore - India

- K-Al Form



## + Aratt Amora Villa, Bangalore - India

- K-Al Form



## + Nanded City, Pune - India

- K-Al Form



## + The Galleria, Bangalore - India

- K-Al Form



## + Megapolis, Pune - India

- K-Al Form



#### + Oasis, Mumbai - India

- K-Al Form



# **Project References - Africa**

#### + Villa Maya, Nairobi - Kenya

- K-Al Form



### + Unity Gardens, Eldoret - Kenya

- K-Al Form



## + Unity West, Kiambu - Kenya

- K-Al Form



#### + 80 logements LPA, Oued-Rhiou - Algeria

- K-Al Form



# + 50,000 housing project, Tripoli - Libya

- K-Al Form



## + JW Marriott Hotel, Tripoli - Libya

- K-Al Form



# Project References - Indonesia

+ The Elements, Jakarta - Indonesia

- K-Al Form



#### + The Alton, Kota semarang - Indonesia

- K-Al Form



#### + Urban Sky, Kota Bekasi - Indonesia

- K-Al Form



#### + Pollux Habibie, Kota Batam - Indonesia

- K-Al Form



#### + Darmohill, Surabaya - Indonesia

- K-Al Form



#### + Ayoma, Karawaci Serpong - Indonesia

- K-Al Form



# **Project References - Others**

### + Royal Atlantis, Dubai - UAE

- K-Al Form



### + 5JJ, Dubai - UAE

- K-Al Form



## + Rowhouse, Cebu - Philippines

- K-Al Form



## + Palawan Height, Puetro Princesa - Philippines

- K-Al Form



#### + Abraj Quartier, Doha - Qatar

- K-Al Form



## + Admir Residential, Jounieh - Lebanon

- K-Al Form



## + Shangri-La Hotel, Ulaanbaatar - Mongolia

- K-Al Form



## + Yangon Amara Hotel, Yangon - Myanmar

- K-Al Form



#### + Residential apartment, Colombo - Sri Lanka

- K-Al Form



#### + Tsubaki Hotel Guam - Guam

- K-Al Form



#### + Phnom Penh Tower, Phnom Penh - Cambodia

- K-Al Form



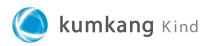
#### + Residencial Mirante, Suzano - Brazil

- K-Al Form



046 + 047





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