




Welcome

KECO



People around the world go fanatical
about K-Pop, K-Drama, K-Movie

There is **KECO**
In the new material field of
eco-friendly construction in Korea

+ KEco is KCMT's own brand that adds eco-friendliness to the new material GFRP that replaces rebar.



Recycle

25% recycled PET chips used for raw resin materials

National brand of GFRP construction materials



Environment

Prevention of odor and fire by using SM-removed eco-friendly resin



Performance

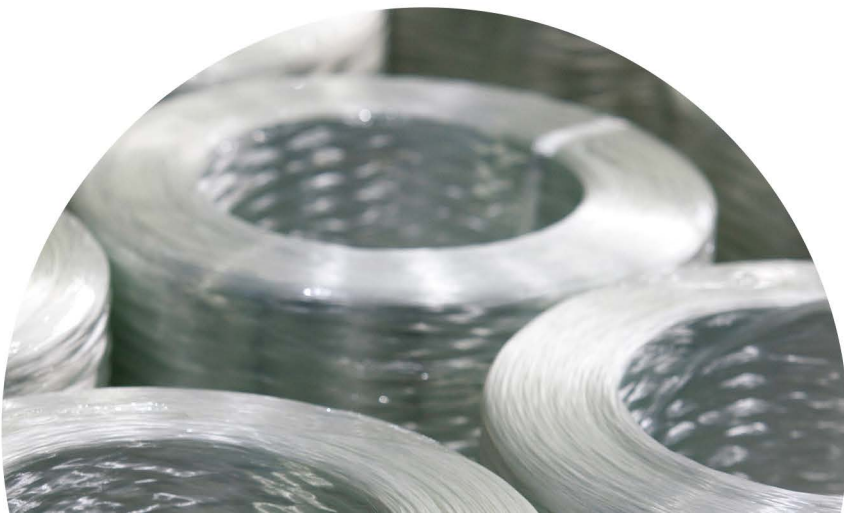
Revolutionary improvement in the adhesion strength of first-generation GFRP (10MPa → 15MPa)

Company History

KCMT is a specialized production company, produces products that replace construction material steel rebar with new material product GFRP. In 2016, GFRP rock bolts were supplied to 'Ministry of Land, Infrastructure and Transport' and 'Korea Expressway Corporation' for the first time in Korea. We have led the market by establishing the quality standards for Korea GFRP construction materials.

The logo for KCMT is centered within a circular graphic. The circle has a blue-to-green gradient. The text "KCMT" is written in a bold, white, italicized sans-serif font.

KCMT



2014

- Established KCMT

2016

- Started supplying GFRP rock bolts for the first time in Korea ('Ministry of Land, Infrastructure and Transport', and 'Korea Expressway Corporation')
- Quality standard establishment, revision of standard specifications and professional specifications



2020

- Established the first GFRP rebar production factory



2021

- Promotion of joint R&D with SK ecoplant
- Commercialization of KEco bar that combines colored PET recycling and SM removal eco-friendly resins



2022

- Launched GFRP construction material brand 'KEco'
- Ulsan City Energy Convergence Industrial Complex 2nd Production Factory to be established





Replace steel bar to **GFRP** by a new material

The construction industry in modern society has developed with steel rebar for more than 100 years. However, the corrosion of the main construction material as the steel rebar, causes a huge cost loss, and the corrosion of the steel rebar has a fatal impact on safety. Developed to address these problems, GFRP is a new construction material that stronger than steel, lighter than aluminum, and non-corrosive. GFRP has essential advantages as 1/4 weight of the steel rebar, more than twice its strength, corrosion resistance, and 43% less carbon emissions.



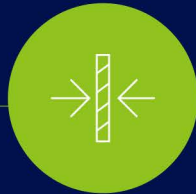
KCMT with the best GFRP production technology in Korea

KCMT has been leading the domestic GFRP quality standards by supplying GFRP construction materials to national infrastructure construction projects for the first time in Korea. KEco, which upgraded the existing GFRP material, is a product brand that dramatically improves eco-friendliness and work safety by recycling discarded PET chips and using resin without SM that causes odors and fire.

KECO Upgraded from GFRP

High Strength

- 2-3 times stronger than steel rebar



Light Weight

- 1/4 weight of steel rebar
- Increase constructability, prevent safety accidents

GFRP

Corrosion Resistance · Non-magnetic

- Increase durability
- Preventing signal disturbances of wireless network equipment



Low Thermal and Electrical Conductivity

- Blocking of thermal bridges in building structures

PET Chip Recycling

- Patent No. 10-2301724
- Recycling of discarded plastic resources



Using SM Removal Resin

- Eliminate the cause of odor and fire
- Prevention of environmental pollution

KECO

- + Increase construction productivity
 - + Zero maintenance, long life
- + Overcoming disaster vulnerability
 - + Realization of carbon neutrality
 - + Environmental protection

KECO Rebar

KEco rebar used in concrete to reinforce the tension of civil structures
(steel reinforcing bar alternative products)



Resource Circulation

- Recycling of PET bottles for household use, PET sludge for industrial use
- Produced KEco rebar 1m per 2.0L colored/mixed PET bottle

CO₂ Emission Reduction

- 45% reduction in energy produced compared to steel rebar
- Reduced CO₂ emissions by 43%

Cost Reduction

- 15~25% cost reduction in raw materials by using recycled PET

Working Environment

- SM removed product, which has a low odor and fire
- Removes SM from the resin is KCMT's proprietary technology around the world

Durability

- KEco rebar is a semi-permanent material with a service life of 100 years without rust and corrosion.
- Construction costs can be reduced by extending the life of civil construction structures, reducing maintenance costs, and slimming structures.

Low weight, Easy handling

- The KEco rebar weighs 1/4 of the steel and is very light and easy to handle.
- Various construction expenses such as labor costs, equipment costs, and logistics costs savings.

High tensile strength

- KEco rebar can secure structural stability with twice the strength of steel rebar.

Anti-magnetic, No electrical conductivity

- KEco rebar is a non-magnetic, non-conductive material that excels in structures that support magnetic resonance imaging (MRI) devices or other electromagnetic field-sensitive equipment.

High thermal isolation

- The KEco rebar is highly heat shielded and non-flammable, making it difficult to catch fire even in serious fire sites.

Cuttability

- The KEco rebar is easy to cut, and the TBM method allows excavation of the tunnel without damage to the machine and equipment.



Comparison of KEco Rebar and Steel Rebar Rust



KEco Rebar Standard Specification

Type No.	Nominal Diameter (mm)	Nominal Area (mm ²)	Ultimate Tensile Load (kN)	Guaranteed Tensile Strength (MPa)	Modulus of Elasticity (GPa)	Weight (g/m)	Shear Strength (MPa)
VRS100-6	6.4	31.7	35	1,105	46	77.4	
VRS100-8	8.0	49.5	52	1,051	46	159.0	
VRS100-10	9.5	71.3	74	1,038	46	159.0	
VRS100-13	12.7	126.7	123	971	46	281.3	
VRS100-16	15.9	198.6	182	916	46	427.1	
VRS100-19	19.1	286.5	253	883	46	607.2	150
VRS100-22	22.2	387.1	325	840	46	809.6	
VRS100-25	25.4	506.7	402	793	46	1,046.2	
VRS100-29	28.6	642.4	481	749	46	1,413.7	
VRS100-32	31.8	794.2	560	705	46	1,711.4	

KEco CFRP Rebar

KEco CFRP rebar with carbon fiber as a reinforcement material has excellent specific strength and mechanical performance, making it widely used in pre-stress and high-strength structures.



Type No.	Size	Nominal Diameter (mm)	Nominal Area (mm ²)	Ultimate Tensile Load (kN)	Guaranteed Tensile Strength (MPa)	Modulus of Elasticity (GPa)
C100-6	2	6	31.7	71	2241	124
C100-10	3	10	71.3	154	2172	
C100-13	4	13	126.7	262	2068	

KEco BFRP Rebar

The KEco BFRP rebar, which uses basalt fibers as a reinforcing material, is suitable for permanent structures due to its high strength and elastic modulus.

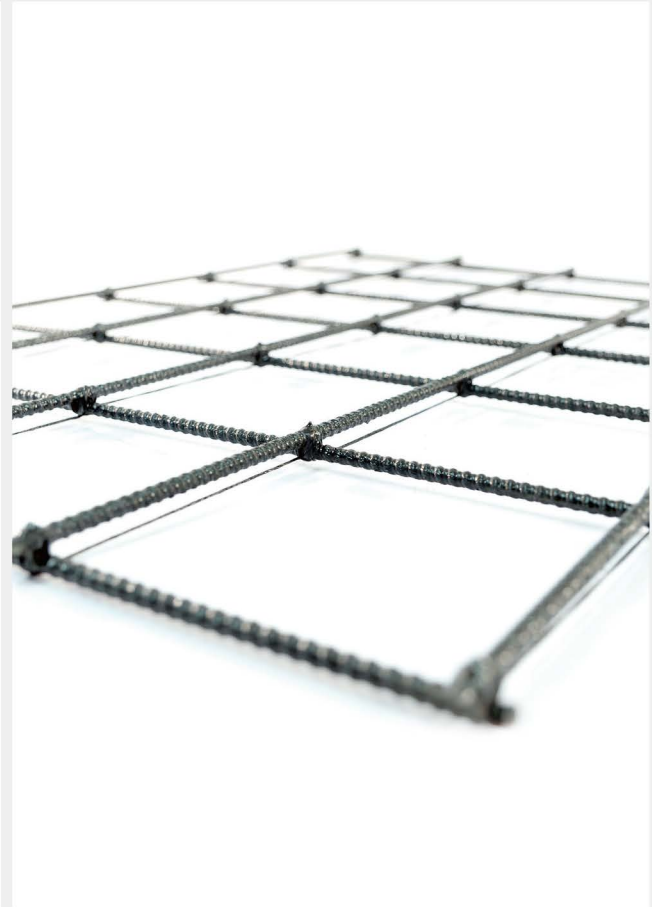


Type No.	Diameter (mm)	Ultimate Tensile Load (kN)	Cross Section (mm ²)	Ultimate Tensile Strength (MPa)	Modulus of Elasticity (GPa)	Ultimate Shear Strength (MPa)
B100-6	6	50	50.3	1000	≥45	≥150
B100-10	10	79	78.5	1000		
B100-16	16	159	177.0	900		
B100-20	20	227	284.0	800		
B100-25	25	362	452.0	800		



KEco Bending Type

- Processing of foundations, columns, beams, slabs, retaining walls, etc., reinforcement of concrete in various parts required the product
- Can be customized, but difficult to process on site



KEco Mesh Type

- The mesh type is buried at the horizontal joint and installed to maintain safety at the intersection of the expansion and contraction cracks and the lateral force

KEco Rebar Construction(Highway Bridge in Korea)



KECO Rock bolt & Soil-Nail

It is divided into a rock bolt used for bedrock and a soil-nail used for soil and sand.

It is a civil engineering material to secure the stability of natural slopes with high risk of collapse or artificial slopes due to excavation



Verified Material

- Civil engineering materials used since the 1990s after the development of GFRP in the 1950s(40% share of the domestic rock bolt market)
- Long life of facilities and reduced resource consumption due to strong corrosion resistance

Eco-friendly Materials

- Reduce production resource less than 45% comparison of steel rebar
- CO₂ emissions less 40% than production of steel rebar

Safe Materials

- 1/4 weight ratio of steel rebar address increasing worker safety
- 4 times many loads can be transported in comparison with the steel reinforcement
- Increased convenience of construction management by allowing coloring

GFRP Rock bolt Quality Standards

2016 Apr Established GFRP rock bolt specification by Korea Highway Corporation

2017 Aug Establishment of GFRP rock bolt quality standard by Korea Rail Network Authority and Ministry of Land, Infrastructure and Transport

Division	Unit	Quality Standards	Remarks
Tensile Strength	MPa	≥ 850	
Shear Strength	MPa	≥ 150	
Glass Fiber Content	%	≥ 75	
Minimum Diameter	mm	≥ 20	

Keco Rock bolt / Soil-Nail Standard Specification

Solid Type

Type No.	Outer Diameter (mm)	Ultimate Tensile Strength (MPa)	Shear Strength (MPa)	Glass Fiber Content (%)
SS-25	25	850	≥ 150	≥ 75

Hollow Type

Type No.	Outer Diameter (mm)	Hole Diameter (mm)	Ultimate Tensile Strength (MPa)	Shear Strength (MPa)	Glass Fiber Content (%)
HS-25	25	12	850	≥ 150	≥ 75
HS-27	27	12	850		

KECO vs Steel Bar

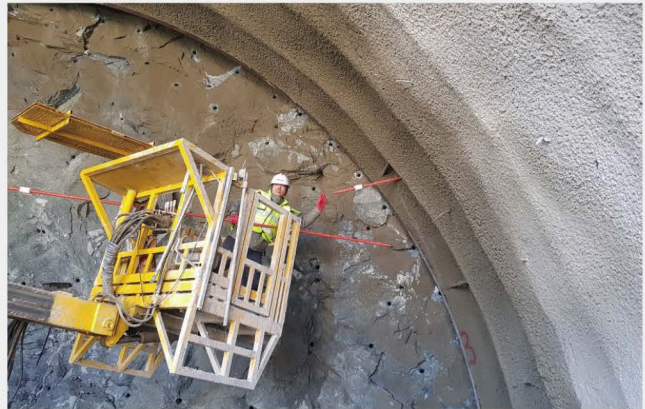
KEco Rock bolt

	Steel Rock bolt	KEco Solid Rock bolt	KEco Hollow Rock bolt
Materials	SD35	GFRP	GFRP
Nominal Diameter	D= 25.4mm	D= 23.5mm	D= 27/12(Hole)mm
Weight (4m)	15.92kg	3.88kg	3.88kg
The tensile strength	More than 490 MPa	More than 850 MPa	More than 850 MPa
Ultimate	25.3 t/unit	37.0 t/unit	32.0 t/unit
Electrical conduction	O	X	X
Durability	Poor durability	Approximately 100 years (corrosion resistance)	Approximately 100 years (corrosion resistance)
Constructability	<ul style="list-style-type: none"> · The heavy weight of steel rock bolt can caused fatal accidents during the operation. · Two or more people are required to install the steel rock bolt · Drop-out frequently occurs in the ceiling rock bolt installation due to the heavy weight of the steel rock bolt. · A separate process is required for connecting the injection pipe · Difficulty in inserting the steel rock bolt connected to the injection pipe · Difficulty working in the water section 	<ul style="list-style-type: none"> · Lightweight (4kg/4m) for easy to handle · KEco solid rock bolt can be installed by one person · A separate process is required for connecting the injection pipe · There is almost no dropout due to its own weight when working on the end of the ceiling. · Easy to insert KEco solid rock bolt compared to steel rebar · Difficulty working in the water section 	<ul style="list-style-type: none"> · Lightweight (4kg/4m) for easy to handle · KEco hollow rock bolt can be installed by one person · it Can be injected through a hollow hole without connecting a separate injection tube · It is possible to shorten the construction time and to fill it by 100% · Excellent effect in the work of the water section
Stability	<ul style="list-style-type: none"> · Increased risk of using equipment when transporting with high weight (2 people can carry it) · Use of equipment when inserting steel rock bolts (A number of safety accidents occur) 	<ul style="list-style-type: none"> · KEco solid rock bolt can be inserted by humanpower · Secure structural stability by using high strength rock bolt · it is a non-conductive product, it can be used safely even in high-moisture and high-pressure sites. 	<ul style="list-style-type: none"> · Reduced risk factors with lightweight materials and excellent workability · Stable excavation cycle management is possible by reducing worker fatigue and increasing work efficiency · Workers can check the mortar filling status by themselves · 100% filling possible (prevention of falling accidents) · Zero safety accidents by ensuring quality and minimizing risky work



KEco rock bolt has widely used in tunnel and slope supporting, and provide a very beneficial substitution for traditional steel rock bolt system

KEco Rock bolt Application field



KECO Manufacturing Factory

**KEco 1st
Factory**



**KEco 2nd
Factory**



**KEco 3rd
Factory**



KEco Smart Factory

The new KEco manufacturing factory, which will be completed in 2022, is a 38,000-capacity production facility, a factory with full process automation and state-of-the-art engineering methods, capable of producing 40,000 tons of GFRP per year equal to 160,000 tons of steel rebar. In addition, the new factory will address a manufacturing logistics automation system, an automatic warehouse system, and its own quality system to produce the best products.



Supply Status of KEco Rock bolt

Client	Project	Supplied Products
Korea Expressway Corporation	The Expressway Construction works between Busan Ring Expressway No.600 (Section No. 2, 4)	SS25 Ø25mm
	The Construction works between Miryang and Ulsan of Expressway No. 14(Section No. 2, 3, 4, 5, 6, 9)	SS25 Ø25mm
	The Expressway Construction works between Hwa-do and Yang-pyeong (Section No. 2)	SS25 Ø25mm
	The Construction works between Daegu Ring Expressway No. 700(Section No. 2)	SS25 Ø25mm
	The Expressway Construction works between An-seong and Gu-ri (Section No. 11-1, 11-2, 13)	SS25 Ø25mm
	The Construction works between Hamyang and Changnyeong of Expressway No. 14(Section No. 1, 2, 3, 9, 11)	SS25 Ø25mm
	The Construction works between Paju and Yangju-Pocheon of Expressway No. 400(Section No. 2)	SS25 Ø25mm
	The Construction works between Saemangeum and Jeonju(Section No. 6, 7, 8)	SS25 Ø27mm
	The Construction works between Anseong and Seongnam of Expressway No. 29(Section No. 4, 7, 9)	SS25 Ø27mm
Korea National Railway	Gimpo Metro Area 1, 3	SS25 Ø25mm
	Subway Line NO.4 Extension Project (Jinjeop Line), Section 1	SS25 Ø25mm
Busan Regional Office of Construction Management	National Road Construction of Geoje-Masan(3)	SS25 Ø25mm
	National Road Construction of Seomyeon-Geunnam(1)	SS25 Ø25mm
	Goseong ~ Tongyeong national road construction project	SS25 Ø25mm
	Alternative Bypass Construction Project of National Highway in Changwon-si(2nd Anmin Tunnel)	SS25 Ø25mm
Busan Transportation Corporation	Busan urban rail Sasang-Hadan 5th Section Construction	SS25 Ø25mm
	Yongsan Metro Line(Nopo~Bukjeong) 1th Section Construction	SS25 Ø25mm
Construction Headquarters, Busan Metropolitan City	International Industrial Logistics City (1-2 Phase) After Busan New Port (Section 9)	SS25 Ø25mm
	The Construction Management for inner circulation (Mandeok~Centum) Urban expressway Zone1(Private-Public Partnership Project)	SS25 Ø27mm

Client	Project	Supplied Products
Seoul Metropolitan Infrastructure Headquarters	The Road Construction Works for Sillim-Bongcheon Tunnel (Section No.1, 2)	SS25 Ø25mm
	Construction of Byeollnae Line Extension of Seoul Metro No.8, Section 2	SS25 Ø25mm
Seoul Regional Construction and Management Administratio	The Construction works between Icheon and Osan of Expressway No. 400(Section No. 1-1, 1-2)	SS25 Ø25mm
Daejeon Regional Construction and Management Administration	Cheongju national road bypass(Bukil ~ Namil2) construction project	SS25 Ø25mm
Korea Southern Power Co., Ltd	Construction of Namjeju Combined Cycle Power Plant	SS25 Ø25mm
Ministry of the Interior and Safety	Construction work of National Computing & Information Agency (Gongju)	SS25 Ø25mm
SG Rail Co., Ltd	The Seoul Metropolitan Area Express Railway A Line (Section No. 1, 2, 3, 4, 5, 6)	SS25 Ø25mm
Kangwon-do Youngwol-gun	Gundo Line 9 Linear Improvement Project (Bundeokjae Tunnel)	SS25 Ø25mm
Gangneung Eco Power	Construction of Plant Facilities for Gangneung Anin Thermal Power Plant	SS25 Ø25mm
Gyeonggi Province	HANAM lines(Sangil ~ Geomdansen) Construction of Double Track Railway Section 5	SS25 Ø25mm
Busan regional office of aviation	The Construction works of UI-leung airport	SS25 Ø25mm
Comprehensive Construction Headquarters of Ulsan Metropolitan City	Infrastructure maintain business around Ulsan Station complex transfer center	HS27 Ø27mm
Smart-rail Co., Ltd	Double-track electrification project for Bujeon-Masan section 1	SS25 Ø25mm
Incheon Metropolitan Urban Railroad Construction Headquarters	Construction of Seoknam Line Extention of Seoul Metro No.7 Section 2	SS25 Ø25mm
Wonju Regional Construction and Management Administration	National Road Construction of Dogye-Singi	SS25 Ø25mm
Gyeonggi Province/ Korea National Railway	Subway Line NO.8 Extension Project (Byelnae Line), Section 4	SS25 Ø25mm
West Seoul Expressway	The Construction for Seobu Expressway Tunnel construction Project (Private-Public Partnership Project) Zone 2-1	SS25 Ø25mm
WESTERN Metro Co., Ltd	Subway Line NO.8 Extension Project (Byelnae Line), Section 4	SS25 Ø25mm

Client	Application	Supplied Products
Gyeongnam National University of Science and Technology(R&D Assignment)	Precast track modular steel-concrete	RS Ø13mm
TB Block Inc.	Prevent Thermal Bridging in Architecture	VRS Ø16mm
Inchoen International Passenger Terminal - foundation constuction Phase1	Handrail rebar	RS Ø10mm, Ø14mm
Ecosite Inc.	Micro-pile	RS Ø25mm, Ø28mm
Sampyo P&C	Precast Steel in Architecture	RS Ø14mm, VRS Ø16mm
Chungnam National Univ. Sejong Hospital	Foundation rebar in MRI suite	RS Ø19mm
Hyosung LB-DECK	Deck rebar	RS Ø13mm
pyeongtaek-godeok infrastructure construction(Semiconductor Factory, Samsung Electronics)	Slurry wall rebar	RS Ø25mm
Kepeco Research Institute	Construction of an Empirical Test Site for Reducing Transmission and Magnetic Fields	VRS Ø10mm
The Expressway Construction works between An-seong and Gu-ri (Section No. 13)	Bridge Slab rebar	VRS Ø16, 19, 22, 25mm
West coast railway construction	Precast concrete for soundproof walls	VRS Ø13mm
Manufacturing Factory, Janglim, Busan	Foundation work, Retaining wall	VRS Ø19mm
West coast railway construction	Soundproof walls(cast in site)	VRS Ø13mm
Pyeongtaek P3 PROJECT	Tunneling Construction	VRS Ø25mm
Jungyang SG	Prevent Thermal Bridging in Architecture	VRS Ø16mm , Ø19mm
KCMT CO., LTD	Foundation for Manufacturing Factory	VRS Ø19mm, Ø25mm
JMG Tech	Foundation for Manufacturing Factory	VRS Ø19mm

Patent · Certification Status







KCMT

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