

PLASTIC SHEET PILE

BEAUTIFUL ENVIRONMENTAL CONSTRUCTION CO., LTD.



Total Environmental Solutions _____
Beautiful Environmental
Construction Co., Ltd.



What **PSP** is

Plastic Sheet Pile (PSP) was developed to replace the conventional steel piles or concrete retaining walls that protect the embankments or soil erosion protection walls; and various reagents were added to make lighter weight PVC chemical- and weather- resistant.

► Economical

PSP (Plastic Sheet Pile) is very economical because its material cost is less expensive than existing steel sheet piles.

► Environment-friendly

The main material for PSP is a recycled PVC and not releasing any contaminants to ecosystem. In addition, PSP can reduce 94% of CO₂ generation compared to steel sheet pile.

► Formability

Available in various choices of shapes and color, and possible to create formable outdoor spaces combined with any landscaping projects.

► Durability

PSPs are resistant against the corrosion, weathering, and pest infestation, and last 50 years or more, and no special maintenance is required.

► Constructability

It is lighter than traditional steel sheet piles, and known to have high workability, allowing for easy cutting and transporting site.



Characteristics

► Type

U-shape pile with the female and male interlocking features is the most common type of piles, and it can be made to a special shape and size according to the Client's requirements.



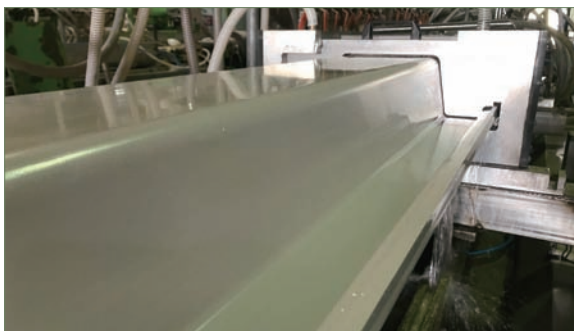
► Materials

Made from rigid polyvinyl chloride and modified with polymer stabilizers to enhance chemical-, weather-, temperature-, impact-resistance (heat stabilizers, ultraviolet stabilizers, fillers, and pigments)



► Manufacturing

Depending on the usage, the pile is manufactured by continuous extrusion process using domestic recycled PVC and can produce desired color and gloss performance.



► Packing and Transportation

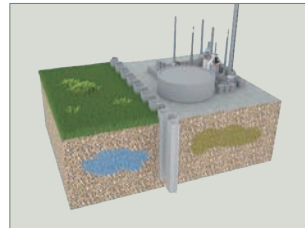
Manufactured PSP is packed and secured so as to enable them load and unload safely, and promptly delivered to their destinations.



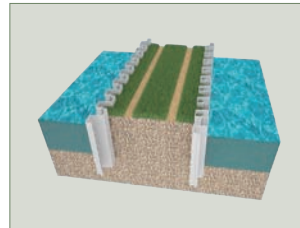


Applications

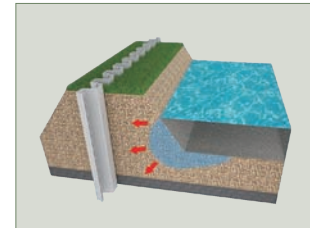
Scan and Watch the YouTube Video ▶



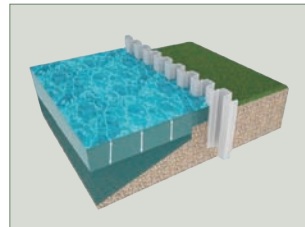
1 Contaminant Cutoff Walls



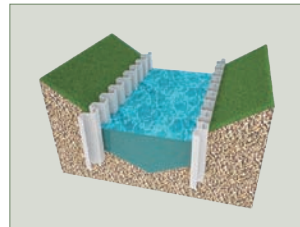
2 Reinforcing Walls on Soft Ground



3 Coastal / Waterways Erosion Control



4 Floodwalls



5 Canal Walls



6 Low Retaining Walls



Installation Procedures



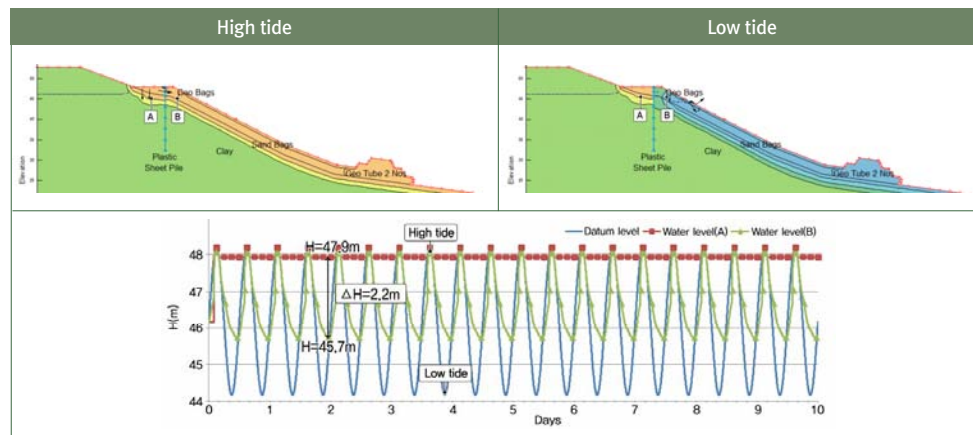
- 1** Install horizontal guide
[to secure accurate vertical and horizontal coordinates]
- 2** PSP and Mandrel Coupling
- 3** Driving Mandrel with PSP

- 4** Mandrel Pulling-out
- 5** Cut-to-length pile and Plastic CAP Installation
- 6** Completion of PSP Piling Works

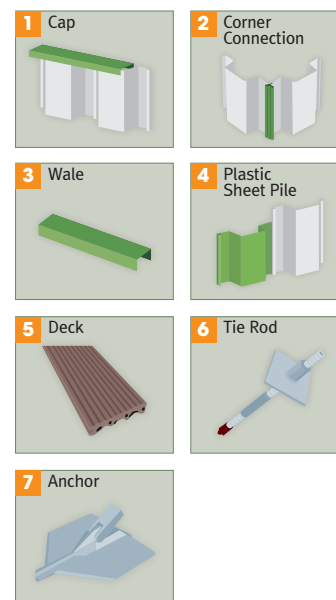
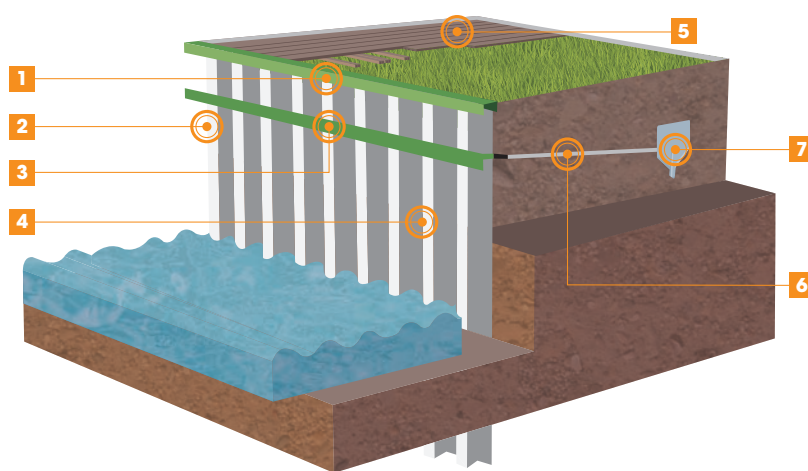


Technical Supporting

- BEC will provide the technical data and specifications on our product lines noting such properties as general dimension, allowable moment and tensile strength, modulus of elasticity, section modulus, and area moment of inertia for each project. BEC will provide design assistance for plastic sheet pile. Method of design will be based on the mechanics of materials that relate an input data such individual parameter; water table above the submerged depth, and calculated displacement, rotation angle, schematic variation of soil reaction, shear force and bending moment for intermediate mode of failure.



Typical Installation Details





Representative Project Examples

► Seepage Prevention



Dyer Khal Boat Pass, Bangladesh



Bago River, Myanmar



Kacharir Khal Drainage, Bangladesh



Twante Canal, Myanmar

► Slope Stabilization



Hwaong District Reservoir, Korea



► Temporary Construction Walls



SK Deuk-ryang Gas Station, Korea



SK Deuk-ryang Gas Station, Korea



Uijeongbu Soil Remediation Site, Korea



Hyundai Oilbank Intergis Gas Station, Korea

► Flood Protection



► Low Retaining Wall



May Phoo Kan Nar, Myanmar



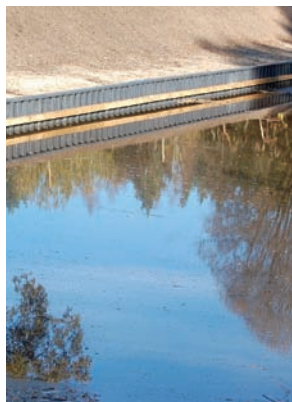
Chungju Remediation Center, Korea



Pro-1 Global Home Center, Myanmar



► Shore Protection



► Water Control System



Chunsuman Bay, Korea



Upstream of the Youngju Dam, Korea



► Cut-off Wall



Young Poong Sukpho Refinery, Korea



Young Poong Sukpho Refinery, Korea



LG Chem, Daesan Factory, Korea



Camp Market, Korea

► Past Performance

	Purpose	Date	Client	Project title
Korean (Private)	Retaining Wall	2017	Chohyun Development Co., Ltd.	Chungju Remediation Center, Korea
	Cut-off Wall	2017	SK Energy Co., Ltd.	SK Energy Gyeongju Oil Pipeline
	Cut-off Wall	2017	Aekyung Industrial Co., Ltd.	Aekyung Industrial Daejeon Factory
	Temporary Retaining and Permanent Cut-off Wall	2017	SK Energy Co., Ltd.	SK Deuk-ryang Gas Station
	Temporary Retaining and Permanent Cut-off Wall	2017	SK Networks Co., Ltd.	SK Seo-Gwangju Gas Station
	Cut-off Wall	2018	Hyundai Oilbank Co.	Hyundai Oilbank Intergis Gas Station
	Cut-off Wall	2018	Doosan Infracore Co.	Doosna Infracore Songlim-dong Shipping Center
	Cut-off Wall	2019	Doosan Electronic	Doosan Electronic Jeungpyeong Factory
	Cut-off Wall	2020	Young Poong	Young Poong Sukpo Refinery
	Cut-off Wall	2021	Young Poong	Young Poong Sukpo ZLD Area
	Cut-off Wall	2022	LG Chem.	LG Chem. Daesan Factory
	Cut-off Wall	2022	Doosan Electronic	Doosan Electronic Jeungpyeong Factory
Korean (Government)	Slope Stabilization	2016	Korea Rural Community Corporation (Hwa-an Project Team)	Hwaong District Reservoir
	Cut-off Wall	2017	Ministry of National Defense	Uijeongbu Soil Remediation Site
	Cut-off Wall	2017	K-Water	Upstream of the Youngju Dam
	Cut-off Wall	2018	Korea Rural Community Corporation	Navy Depot at Somo Island
	Waterway Control	2019	Korea Rural Community Corporation	Cheonsu Bay
	Waterway (Irrigation ditch)	2020	Korea Rural Community Corporation (Jeonnam Regional Headquarters)	Sunso District (Design)
	Slope Stabilization	2020	Daesan Regional Office of Oceans and Fisheries	Muchangpo Port
	Retaining Wall	2020	Pohang Regional Office of Oceans and Fisheries	Osan Port
	Cut-off Wall	2020	Ministry of National Defense	Camp Market
	Cut-off Wall	2020	Daehan Oil Pipe Corporation	Camp Humphreys
	Cut-off Wall	2022	Daegu Urban Development Corporation	Daegu Kumho Waterpolis
Oversea	Seepage Prevention	2018	Directorate of Water Resources and Improvement of River Systems, Myanmar	Twante Canel, Myanmar
	Seepage Prevention	2018	Directorate of Water Resources and Improvement of River Systems, Myanmar	Twante Canel, Myanmar
	Seepage Prevention	2018	Directorate of Water Resources and Improvement of River Systems, Myanmar	Htantabin River, Myanmar
	Seepage Prevention	2018	Directorate of Water Resources and Improvement of River Systems, Myanmar	Kha Naung To River, Myanmar
	Seepage Prevention	2018	Directorate of Water Resources and Improvement of River Systems, Myanmar	Bago River, Myanmar
	Seepage Prevention	2019	Directorate of Water Resources and Improvement of River Systems, Myanmar	Nga Moe River, Myanmar
	Retaining Wall	2019	San Hnjin Thit Co. Ltd. Myanmar	Pro-1 Global Home Center, Myanmar
	Seepage Prevention	2020	Directorate of Water Resources and Improvement of River Systems, Myanmar	Twante Canel, Myanmar
	Low Retaining Wall	2021	Ministry of Environment, Korean Loan Project	May Phoo Kan Nar, Myanmar
	Seepage Prevention	2022	Bangladesh Water Development Board	Kacharir Khal Drainage, Bangladesh
	Seepage Prevention	2022	Bangladesh Water Development Board	Dyer Khal Boat Pass, Bangladesh

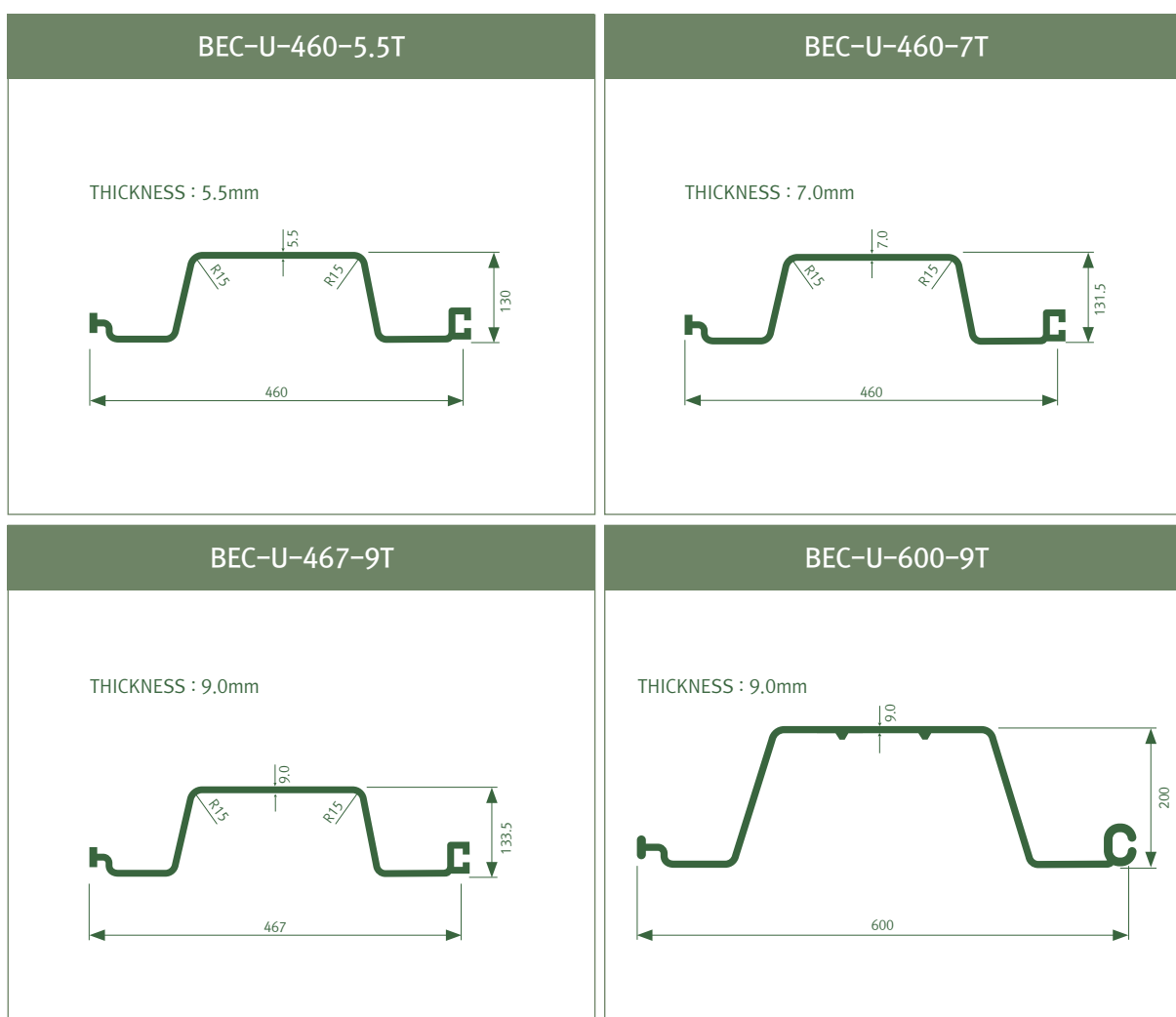
*Many other experiences and more



PSP Profiles

► Section Details by Products (PSP)

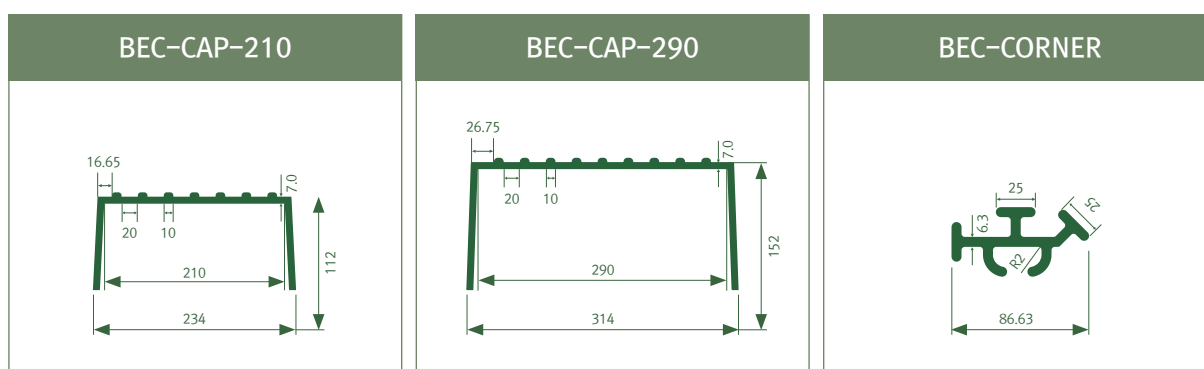
Products	Dimensions (mm)			Weight kg/m	Section Area cm ²	Moment of Inertia cm ⁴ /m	Modulus of Section cm ³ /m
	W	H	T				
BEC-U-460-5.5T	460	130	5.5	6.48	43.72	2,406	342
BEC-U-460-7T	460	131.5	7	7.98	53.83	3,015	430
BEC-U-467-9T	467	133.5	9	10.25	69.33	3,817	536
BEC-U-600-9T	600	200	9	13.32	91.24	9,353	925



*Actual specifications may vary slightly depending on the situation

► Section Details of Products (Cap, Wale)

Products	Dimensions (mm)			Weight
	W	D	T	kg/m
BEC - CAP - 210	210.0	100.0	7.0	4.82
BEC - CAP - 290	290.0	140.0	7.0	6.60
BEC - CORNER	86.6	43.9	6.3	1.95

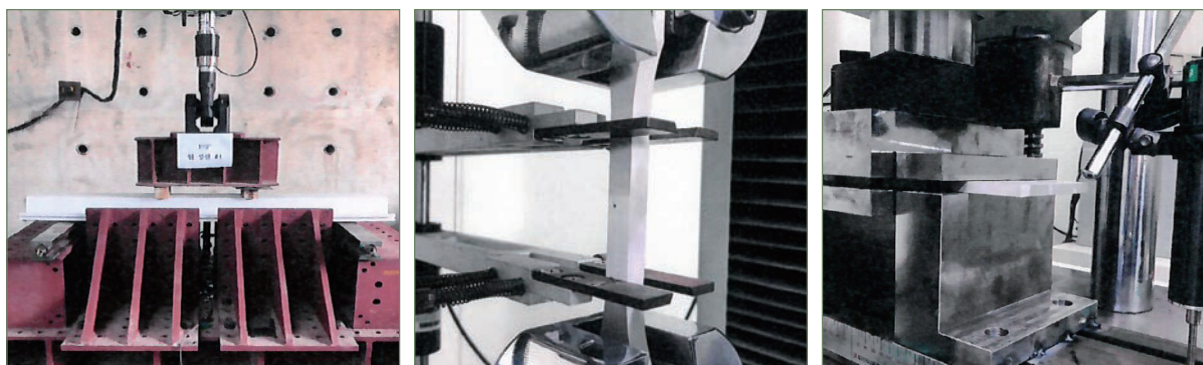


*Actual specifications may vary slightly depending on the situation

► Mechanical Properties

Item	Unit	Result
Tensile Strength	MPa	>40(± 5%)
Bending Strength	MPa	> 50
Bending Modulus of Elasticity	MPa	> 2400
Density	(23/23)°C	> 1.4
Charpy Impact Strength	KJ/m²	> 20
Shore Durometer	Shor'aD	> 70

*Actual test results may vary depending on the product.





Patents and Certificate

- ▶ **Registered for “Design Patent”**
Sheet Pile for Civil Works No. 30 - 0911552
- ▶ **Installation Patent Registration**
Sheet Pile Installation Method No. 10 - 1836413
- ▶ **Physical Property Registration**
Strength/Elasticity - Sheet Pile No. 10 - 2043182



- ▶ **ISO 9001 Certificate of Registration**
Quality Management System
- ▶ **ISO 14001 Certificate of Registration**
Environmental Management System
- ▶ **ISO 45001 Certificate of Registration**
Occupational Health and Safety Management System



- ▶ **Certificate of Product-Specific Approved Exporter**
Custom Authorisation No. : 010-20-200568
- ▶ **Promising Small and Medium Enterprise in Export**



- ▶ **Certificate of Environmental Marks No. 22056**
Environmental Marks Certified by the Korea Environmental Industry & Technology Institute
Recycled Synthetic Resin Products/No Release of any Contaminants to Ecosystem
 - Country of Origin : Republic of Korea
 - Recycled PVC Product (91%)
 - Reason for Certificate : Improvement of Resource Circulation



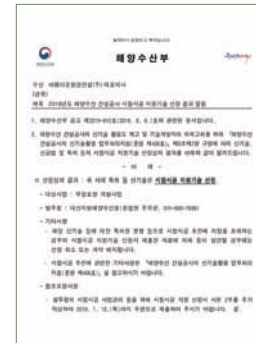


Awards

- ▶ Korea International Trade Association
Excellent Export Trader



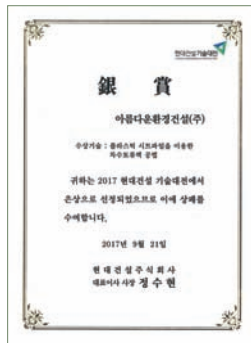
- ▶ Ministry of Oceans and Fisheries Excellent Product Award



- ▶ Technical Competition of Korean Society of Soil and Groundwater Environment
Technical Excellence Award



- ▶ Hyundai E&C Technology Grand Award
Cut-off and Retaining Wall Using Plastic Sheet Pile



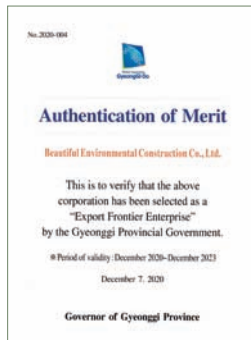
- ▶ Commendation for promoting eco-friendly technology and promoting consumption



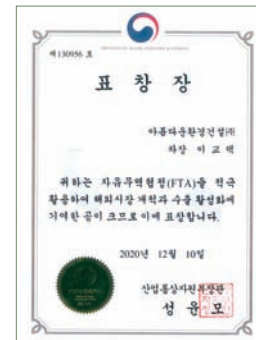
- ▶ An Idea Contest for Exploration of a Pilot Project in the field of Nuclear Disintegration



- ▶ Export Frontier Enterprise Rookie King
(Consumer Goods)



- ▶ Commendation of Meritorious Persons Using FTA





Test Reports

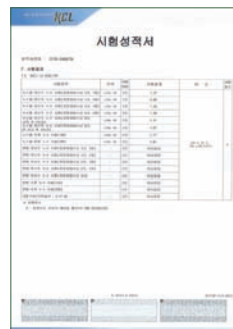
► Tensile Strength after Accelerated Weathering Test

- Korea Conformity Laboratories (KCL) Certified
- 1,000 hours, 2,000 hours (50mm/min)
- No significant change in tensile strength



► Leakage Test

- Korea Conformity Laboratories (KCL) Certified
- Test results: less than allowable leakage rate



► Chemical Test Report

- The Korea Testing & Research Institute (KTR) Certified
- Free of Hazardous Substances from Leachate

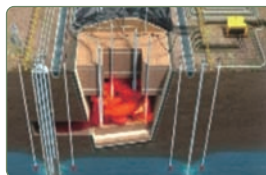




Company Introduction

▶ Company Name	· Beautiful Environmental Construction Co., Ltd.
▶ C.E.O.	· Lee, Jong Youl
▶ Website	· www.esakorea.com
▶ Business Item	· Environmental Engineering Services · Soil and Groundwater Remediation · Civil Engineering / Plastic Sheet Piling
▶ Date of Business Commencement	· 1996. 10. 01.
▶ Staff	· Approx. 300 (2022/06/30)

▶ Summary of Company Introduction

Engineer		Professional Engineer	11
The largest Technical personnel in Korea		Ph.D.	8
		Senior Engineer	60
		Junior Engineer	33
		Total 300 people	
Facilities		Soil Remediation Center	
The largest Soil Remediation Center in Korea		Environmental facility manufacturing plant	
		Plastic Sheet Pile manufacturing Plant	
Technology		83 Intellectual Properties	
The most Intellectual Property possessed in Korea		Korean New Excellent Technology	2
		Local patent	61
		International patent	4
		Model utility right	6
		Etc	10
Business Performance		Participation in Large domestic Project (LPP, TKP, Yong-san)	
Numerous Participation in Domestic and International Projects in Environmental remediation area		Participation in Large Overseas project (KOC, ERC, Myanmar Etc)	
		Most participation in USFK related projects in Korea (FED, CCK Etc)	
Business status/Credit Rating	Credit Rating	Excellent environmental company designated by Korean government	
High rank of corporate credit Rating	A+		



www.esakorea.com



HQ/R&D Center

Rm 501, MegaCenter, 124, Sagimakgol-ro, Jungwon-gu, Seongnam-si, Gyeonggi-do, Republic of Korea



Chungju Remediation Facility

54, Wondong-gil, Jungangtap-myeon, Chungju-si, Chungcheongbuk-do, Republic of Korea



Gamgok Factory

6-9, Gamno-ro, Gamgok-myeon, Eumseong-gun, Chungcheongbuk-do, Republic of Korea



Cheonan Factory

55, Baekseokgongdan 3-gil, Seobuk-gu, Cheonan-si, Chungcheongnam-do, Republic of Korea

Distributor Agency (overseas)



SAN HNJUN THIT CO., LTD / Myanmar

No. 1170, Thumana Road, Tharkayta Township, Yangon, Myanmar



NURI E&C / Cambodia

#431, Monivong Blvd, Khan 7 Makara Phnom Penh, Cambodia



COMMODITY CONNECT PTE. LTD. / Singapore

#21 Bukit Batok Crescent #23-72, Wcega Tower, Singapore



ELAND SHIPPING AND LOGISTICS PTE. LTD. / Bangladesh

Shadharan Bima Sadan, (4th floor), 102, Agrabad C/A, Chittagong, Bangladesh



MACH NATIONAL PTY. LTD. / Australia

Unit 3, 64 Canning Hwy, Victoria Park, WA 6100, Australia



HANGIL S&V CO., LTD. / Japan

202, 1-8-2 Mukojima Sumida-ku, Tokyo, Japan



TERRA YAMAKEN CONCRETE JOINT STOCK COMPANY / Vietnam

Lot CN2, KCN Song Than3, P.Phu Tan, TP.Thu Dau Mot, T.Binh Duong, Vietnam

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