Green Technology Company

ECO-FRIENDLY GERMINATION PROMOTING VEGETATION MAT MANUFACTURING TECHNOLOGY

Hojeong Industry Co.,Ltd

December 17, 2015

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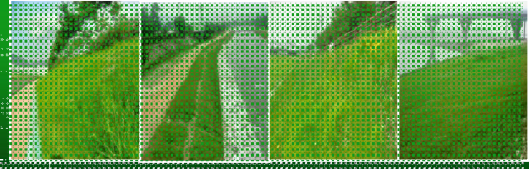
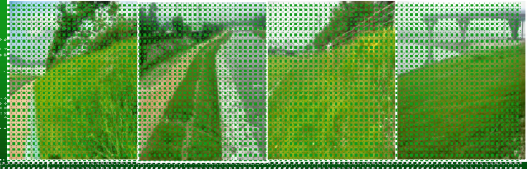
1. Company Overview



❖ Company Overview

Company Name	Hojeong Industry Co., Ltd.	CEO	Yeo Jung-Hun
Intellectual Property	4 registered patents, 2 registered utility models, 2 registered designs		
Date of Foundation	Oct 15, 1996 *Incorporation of Going Business: Dec 21, 2001		
Address	Head Office: Yeongcheon City, Gyeongbuk / Branch: Yeongju City Gyeongbuk		
Main Products	Eco-friendly biodegradable vegetation mat, non-woven fabric, sun protective cover, vegetation block		
Employee	6 employees / 4 employees		
Sales Amount	1 billion 571 million won (2013)	Export Amount	3,271 USD (2014)
Coorperate Type	Small and medium business / Venture business		

2. Company History

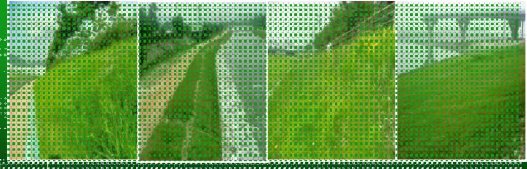


❖ Major History

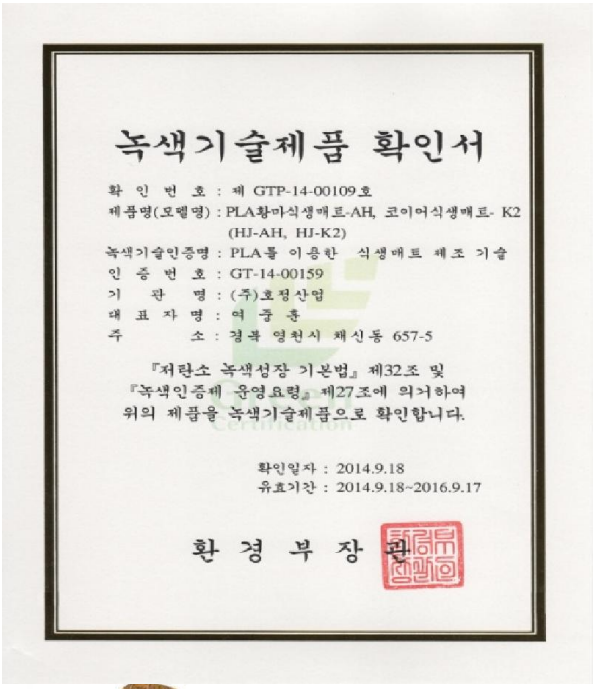
Company history

Dec 2014	Korea-Vietnam Pre FTA Show , Hanoi Export Consultation
Sep 2014	Cinte Techtextile Exhibition in China & Green Technology (Product) Certification
Mar 2014	Kortex 2014 & Techtextil North America (Atlanta) Exhibition
Oct 2013	Acquired Eco-label Certification (EL724. Bio-degradable Resin)
May 2013	Designated as eco-friendly innovative enterprise – Daily Sports Seoul
Oct 2012	Designated as Venture Business
Sep 2011	Completed and operated Yeongju Branch (factory) (Expand the production line for 10,000㎡ /day of vegetation mat)
May 2011	Registered the patent of the seed supply device for vegetation mat and the design of needle for vegetation mat punching
Sep 2010	Concluded the agreement of business cooperation with Institute of Kolon Global Tech
Jul 2006	Developed the needle punching method of non-flammable interior materials and Acquired the ISO 9001 certification
Dec 2001	Changed the company to corporation, Hojeong Industry. Produced the non-woven fabric and industrial felt
Oct 1996	Established Hojeon Industry, Co., Ltd.

3. Technology Overview –Eco-friendly Germination Promoting Vegetation Mat Production



Technology Overview



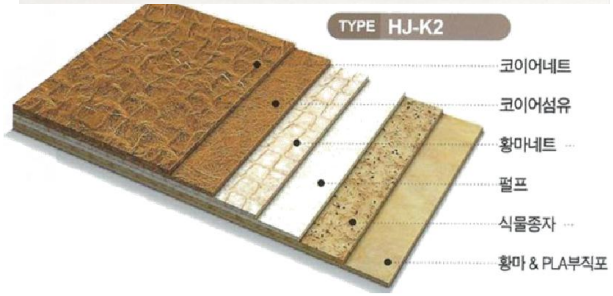
녹색기술제품 확인서

확 인 번 호 : 제 GTP-14-00109호
제품명(모델명) : PLA황마식생매트-AH, 코이어식생매트- K2 (HJ-AH, HJ-K2)
녹색기술인증명 : PLA를 이용한 식생매트 제조 기술
인 증 번 호 : GT-14-00159
기 관 명 : (주)호정산업
대 표 자 명 : 여 국 흥
주 소 : 경북 영천시 채신동 657-5

『저탄소 녹색성장 기본법』 제32조 및
『녹색인증제 운영요령』 제27조에 의거하여
위의 제품을 녹색기술제품으로 확인합니다.

확인일자 : 2014.9.18
유효기간 : 2014.9.18~2016.9.17

환 경 부 장 관



Technology to produce the eco-friendly germination promoting vegetation mat by spreading the seeds on the PLA biodegradable non-woven fabric, combining them with needle punching to produce the non-woven seed fabric and by quitting it after the lamination with the filler the net

Differentiation from Existing Technologies

☞ The damage by the rainwater infiltration and the freezing is minimized by developing existing seed fixing method, which fixing the seeds with adhesive after spreading the seeds between the pulps with both sides to the bio-degradable non-woven seed fabric needle punching method. In addition, PLA non-woven fabric is adhered to the ground during the rainy season preventing the scouring

-☞ The coconut fiber, fallen leaves, bark, cocopeat, etc. used as filler are light weight and are the eco-friendly materials that are degraded biologically and recycled to soil after germination of seeds.

☞ Reduction of expenses by the bank carried away and the collapse of The reconstruction and environment management expenses are saved by maintaining the seed layer and by increasing the germination rate due to using PLA non-woven seed fabric

(EX. Construction cost: 2,500 won/㎡ →2,000 won/㎡)

☞ When constructing once or twice within 5 years, the additional reconstruction cost and management cost will incur by carrying away the seed layer and collapsing the slope due to low germination rate

4. Differentiation and Effects

Differentiation and Effects

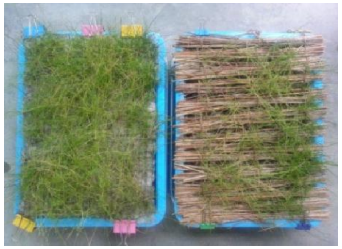
☞ Since the seed fixing method was changed from pulp to PLA bio-degradable non-won fabric, the damage is minimized when the rainwater is infiltrated or frozen, the filler is added works so that it works as the compost,, and since it is light weight for transportation, the construction efficiency can be improved,

Technical Effects

The seed fixing method was changed to non-woven fabric, and green technology certification was acquired (product)

<Seed fixing in pulp paper>

<Seed fixing in Bio-degradable Non-woven Fabric>



<Comparison of Initial Germination>

<Green Technology Certification / Eco-Label Certification>

Economical Effects

Save 30% of the construction cost and 20% of labor cost (per ㎡)

Description	Material Cost (won/㎡)	Equipment Cost, Labor Cost (won/㎡)
Concrete, Natural Stone	16.000~35,000	20,000~40,000
Eco-Friendly Germination Promoting Vegetation Mat	12,000~25,000	4,000~5,000
Saving %	30% won/㎡	5~8 Times

✓ Analysis Criteria
- Refer to 2015 January issue of Monthly Trade Price and Standard Wage Table of January, 2016

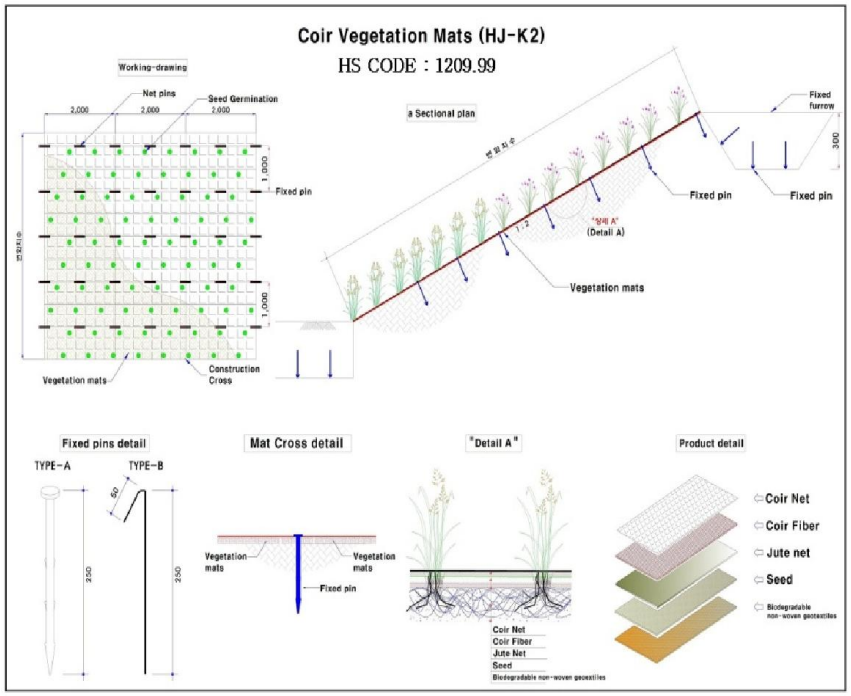
✓ Subject
B=1m, L=1m

5. Construction Records and Technical Details

Construction Records and Technical Details

- - 4 major rivers refurbishment project: Geum River Zone 1 Sejong City – delivered 550,000㎡ under OEM, and others such as Han River, Nakdong River, Yeongsan River, etc.

Vegetation Mat Construction Drawing



Dig fixing hole of 30cm on the upper and bottom section, spread the vegetation mat, fix the vegetation mat with the anchor pin and fix the vertical side of the vegetation mat with pin by overlapping more than 10 cm

Construction Method in River

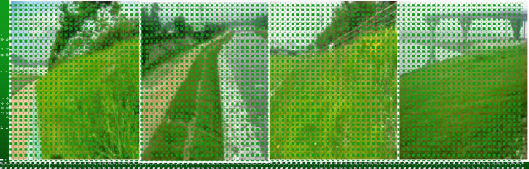
<Installation with concrete>

<Installation with natural stone>

<Installation of Vegetation Mat

<Afforestation with Vegetation Mat>

6. Consumer and Rights



Consumer and Rights

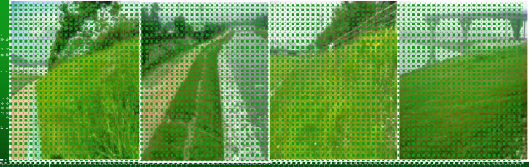
Consumer

Consumer	Application Area
• Vegetation Mat Manufacturer • Construction and Civil Engineering Company • Non-woven Fabric Manufacturer	• River Works • Slope works in cutting area • Prevention of the soil runoff and Afforestation

Rights: 4 registered domestic patents

Title of Invention	Patent No.	Remark
Seed Supply Device for Vegetation Mat	10-1038321	
Eco-Friendly Germination promoting Vegetation Mat	20-0467118	
Needle for Vegetation Mat Punching	20-0459956	
Needle for Punching Machine	30-0600710	

7. Manufacturing Process of Eco-Friendly Germination Promoting Vegetation Mat - Step 1



1. Fiber Cutting/

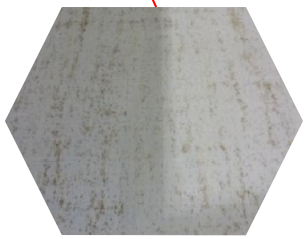
2. Non-woven Seed Fabric Forming

3. Seeds Supplying/

4.Needle Punching and Winding

7. Manufacturing Process of Eco-Friendly Germination Promoting Vegetation Mat - Step 2

1. Coir fiber



2. Non-wonven Seed Fiber

3. Net Lamination

4. Sewing

5. Packing

8.Construction Sequence of Eco-friendly Germination Promoting Vegetation Mat

1. Slope Arrangement

2. Excavation

3.Covering with Vegetation Mat

4. Fixing Pin Installation

5. Bury

6.Initial Afforestation

Thank you so much!

Hojeong Industry Co.,Ltd