

www.enerpia.com

ENERPIA

FAR INFRARED
HEATING FILM

SMART HEATING SYSTEM

*Smart heating
specialist*



ENERPIA strives to create
a warm and safe world.



ENERPIA
Smart heating specialist

It's not conventional heating
where only the upper air is warm
while the lower air is cold.



Eco-friendly Enerpia is at a different level
Make all your living spaces warm

*Smart heating
specialist*

ENERPIA

HEATING SYSTEM

We will even fill your heart with the
warmth from the floor.

You can lay down any concerns
about the cold even in the bitter
winter months!

Enerpia is a recognized maker of the
luxurious far-infrared heating film!




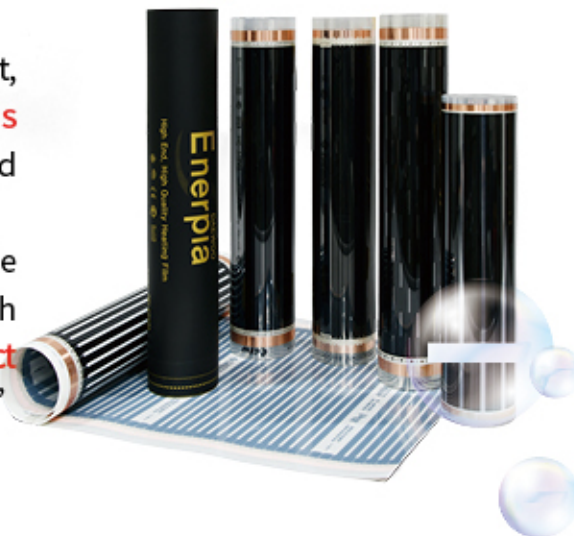
ENERPIA
Smart heating specialist



Eco-friendly advanced heating system Enerpia far infrared ray heating film

“A heating method that uses far infrared radiant heat, which **emits far infrared rays and negative ions** when heated. Ideal heating effects can be obtained immediately.

In addition, far infrared rays and negative ions provide a healthy and comfortable heating environment with its **deodorizing and bacteria growth inhibiting effect** and revitalizing the metabolism of the human body.”



The product is made with consideration of comfortable and economical heating, safer and more durable environment, and environment and health.

It is the thinnest (0.3-0.5T) electrical heating product that is printed on a PET film using nano-particle conductive carbon paste (smaller than 1 micron) and the gravure rotary press method, and is laminated with a film after making electrodes copper foil and silver busbar.

Why?

Why Enerpia heating film?



Reduces unnecessary heating costs by using partial heating



Reduces construction costs with easy construction and a short construction period



Instant heating due to fast heating time



Various product groups are available from 0.3T to 0.5T, which can be applied according to the situation.



Available for various purposes other than floor heating (half body bath, sauna facility, fog removal, bidet, air conditioner filter drying)



Safer from local heating if PTC characteristics are added

Comparison of Enerpia vs. other vendor's heating film

Item	Enerpia	Competitors
Production method	Gravure printing method (Utility Model No. 0372489)	General rotary press printing method (label printing method)
Technology	Acquired various certificates such as domestic production/construction certification and ISO 14000 environmental certification	1st or 2nd generation level
Heating performance	Excellent heating performance due to the wide contact area of the copper foil and silver busbar	Poor heating performance due to the narrow contact area of the copper foil and silver busbar
Construction safety	Triple safety treatment (99%)	Possibility of fire due to connection through soldering
Product life	Semi-permanent	Lifespan cannot be guaranteed due to defects in construction
Construction maintenance	Lifetime service after a 1-year warranty	Please make sure to check.

* The copper busbar plays the role of wires. The allowable current value and heating efficiency improves when the width is increased. However, it can only be allowed within the range the thickness of the copper busbar can be attached well.

Fill the entire room with warmth using far infrared ray radiant heat on the floor, ceiling, and wall

Film heating is easy to control, such as partial, central, and concentrated management, and can drastically reduce heating costs by only heating the necessary spaces when needed.



Let's reduce both heating time
and energy.

More than **50%** of
heating costs can be reduced,
compared to oil heating!

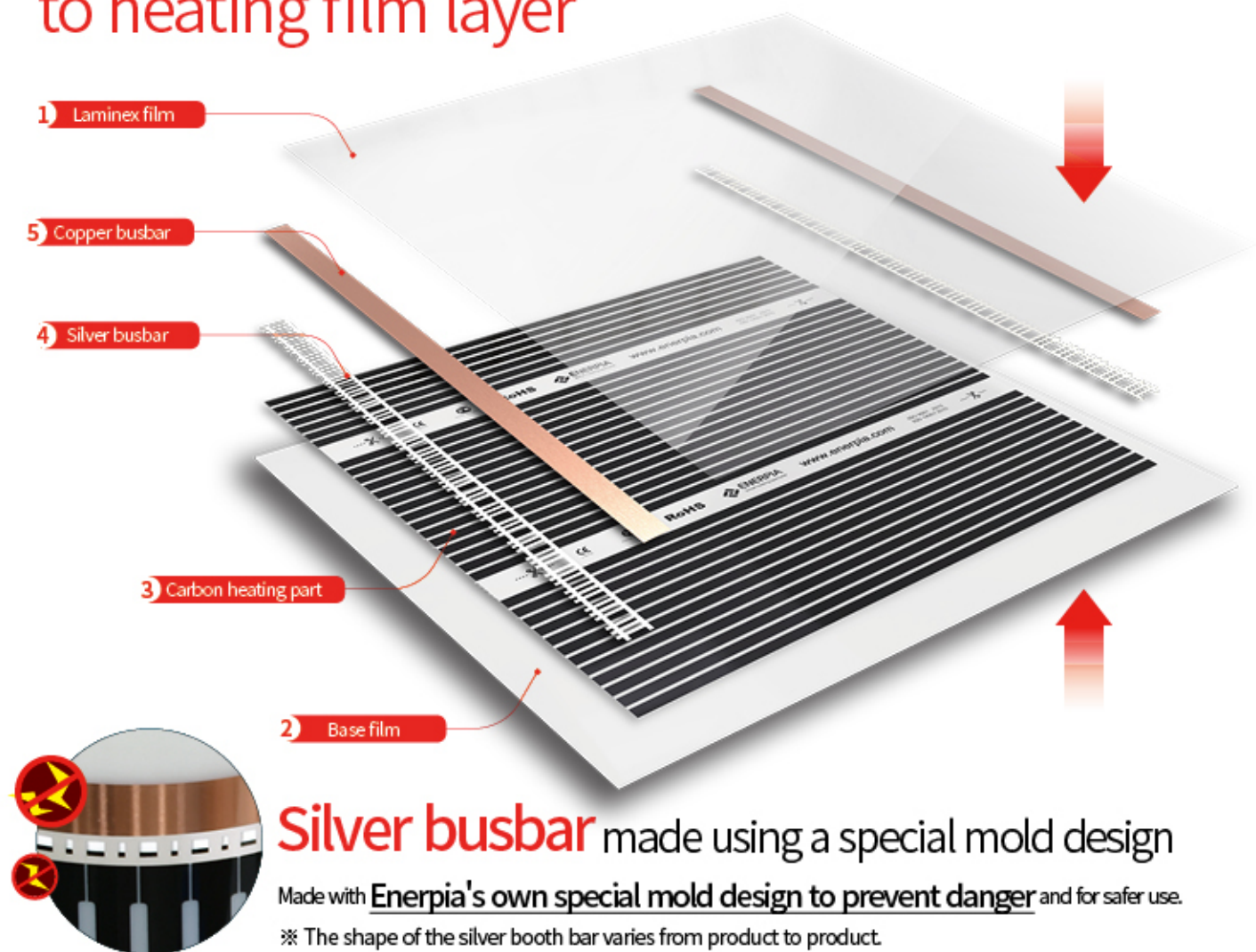
Warm up immediately after turning on!

Providing a healthy and pleasant heating
environment by emitting far infrared rays
and negative ions.

Reduce
construction
time

Reduce
heating costs

Materials and structural map according to heating film layer



1 Laminex Film

EVA – General Laminex (melting point is at 80°C)
EEA – Applied to high-temperature Laminex (melting point is at 100°C)

2 Base film (PET FILM)

Less affected by temperature and humidity due to excellent heat resistance.
Transparent film - high transparency (for display)
Translucent film - for insulation, flame resistance, electric and electronic use

3 Carbon heating part

Strong against heat, and electrical and thermal conduction is high.

4 Silver busbar

Plays a role of making sure power is supplied to the carbon and copper foil.
For safety, the silver busbar between the copper foil and carbon should maintain a resistance value of less than 1 ohm, because the electric load is applied in places where electricity flows.

5 Copper busbar

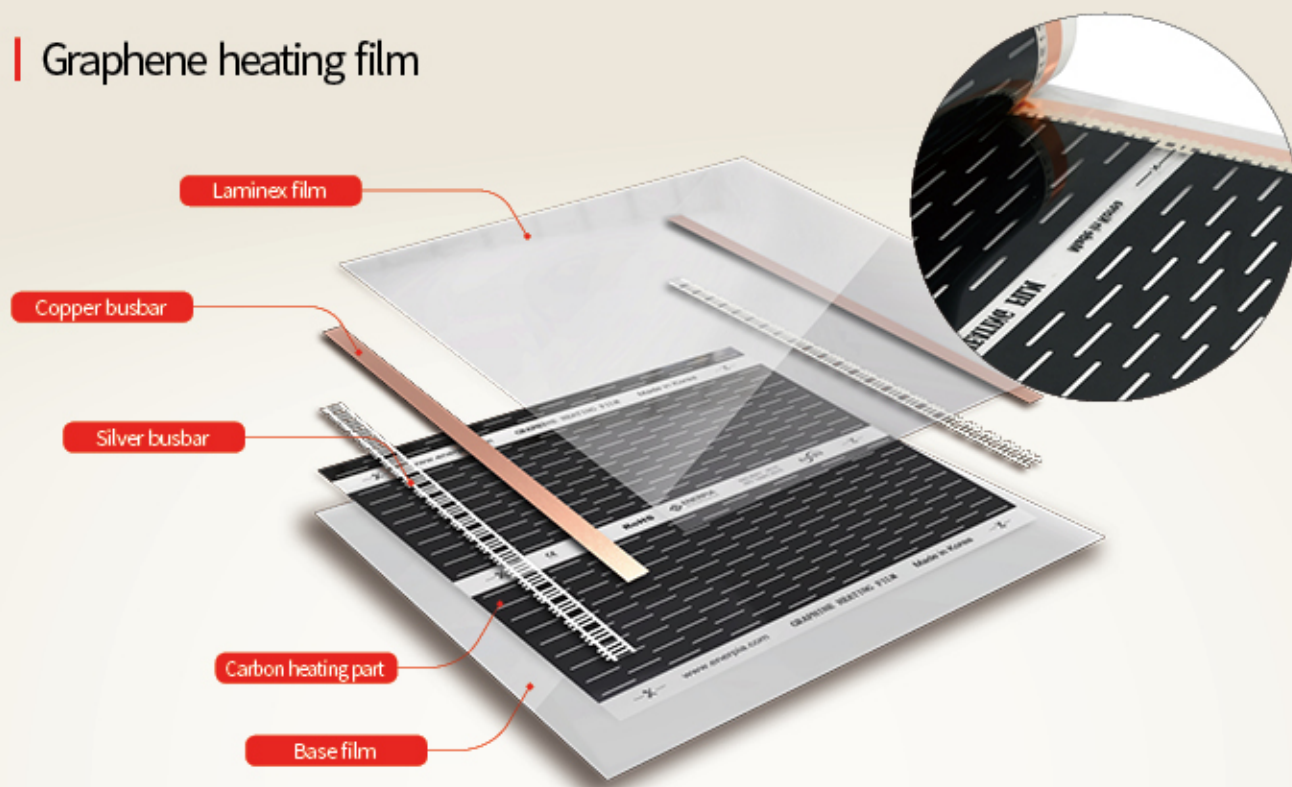
Pure copper - pure copper color
Copper foil mixed with iron - Black lines are created.
The copper foil appropriate for film heating must be thin with a soft surface in order to avoid scratching the silver busbar.

※A method of testing the lifespan of film heating

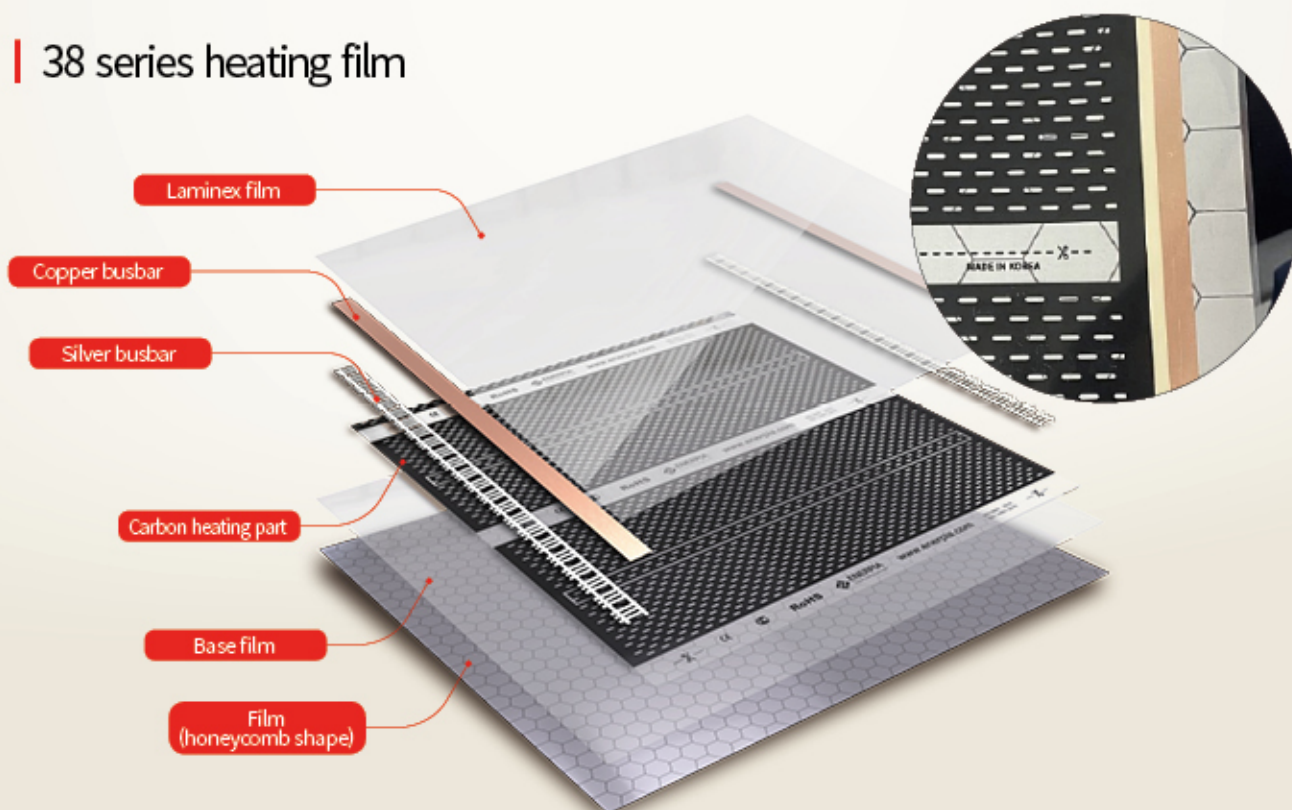
Fold and unfold between copper foil and silver busbar at least 10 times while supplying power to the 80-100cm wide heating film. If sparks appear on heating film, it has a critical impact to its lifespan.

Structural map of the heating film by product

| Graphene heating film



| 38 series heating film



Structural map of the heating film by product

| Black heating film



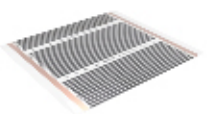
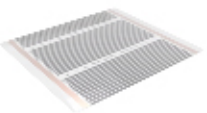

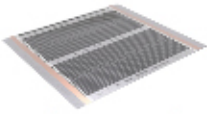

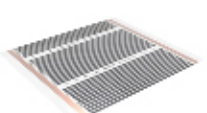
| Heating film for mirrors



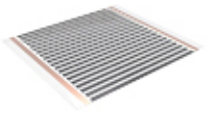
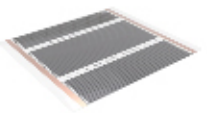
GOOD CHOICE!

Selecting heating film according to usage

| Heating film for floor heating

Product name	Product picture	Usage	Common features	Characteristics
Heating film	 Transparent	Home / Veranda / Restaurants Attached to the bottom of the floor	<ul style="list-style-type: none"> -Maintains stable electrical resistance values by using high-density carbon printing technology -Technology of preventing sparks from the carbon and contact surface using a special silver busbar design -Used waterproofing treatment, and Laminex insulation film -Far infrared ray emission -Energy saving effect -Blocks electromagnetic waves -Overheating prevention/fire prevention -Eco-friendly product produced using PMA -Applicable to Industrial & Engineering Electricity -High safety and long lifespan of the product using special printing methods and manufacturing 	-Transparent film where carbon is printed on 2 layers of PET film using the gravure method and copper busbars for 8A are placed on both poles.
	 Opaque			
	 Graphene			-Transparent film where carbon graphene is printed on 2 layers of PET film using the gravure method and copper busbars for 8A are placed on both poles.
	 38 series			-Premium film consisting of 3 layers of PET film
	 Black			-Premium film with increased PET thickness by performing black coating on two layers of the PET film, and inserts four lines of copper busbar for 8A and silver busbar, which can be used in 50 width or 100 width depending on the situation.
PTC heating film				-Smart heating film that adjusts the amount of heating according to the surrounding temperature

| Heating film for mirrors/saunas

Product name	Product picture	Usage	Common features	Characteristics
Heating film for mirrors		Anti-fogging Attach to the rear of the mirror	<ul style="list-style-type: none"> -Far infrared ray emission -Energy saving effect -Blocks electromagnetic waves -Overheating prevention/fire prevention -Eco-friendly product produced using PMA 	-Special heating function, fog prevention
Heating film for saunas		Attached to the bottom of the floor	<ul style="list-style-type: none"> -Applicable to Industrial & Engineering Electricity -High safety and long lifespan of the product using special printing methods and manufacturing 	

Product specifications

Specifications of the far infrared ray heating film (for floor heating)

Classification	Model no.	Thickness, width	Power consumption	Heating value	Packing unit
Opaque	EP305	0.338T, 50cm	110wh/m	95kcal/h	150m/roll
	EP308	0.338T, 80cm	170wh/m	146kcal/h	100m/roll
	EP310	0.338T, 100cm	220wh/m	190kcal/h	100m/roll
Transparent	EP305(T)	0.338T, 50cm	110wh/m	95kcal/h	150m/roll
	EP308(T)	0.338T, 80cm	170wh/m	146kcal/h	100m/roll
	EP310(T)	0.338T, 100cm	220wh/m	190kcal/h	100m/roll
38 series	EP3805	0.380T, 50cm	110wh/m	95kcal/h	100m/roll
	EP3808	0.380T, 80cm	170wh/m	146kcal/h	100m/roll
	EP3810	0.380T, 100cm	220wh/m	190kcal/h	100m/roll
Black	EP410	0.380T, 100cm	220wh/m	190kcal/h	75m/roll
Graphene	EP305(G)	0.338T, 50cm	110wh/m	95kcal/h	150m/roll

* Please note that only the applicable specifications are distributed and sold in Korea.

Specifications of the PTC far infrared ray heating film (for floor heating)

Classification	Model no.	Thickness, width	Power consumption	Heating value	Packing unit
Transparent /Opaque	EP-PTC305	0.338T, 50cm	Custom made	Custom made	150m/roll
	EP-PTC308	0.338T, 80cm	Custom made	Custom made	100m/roll
	EP-PTC310	0.338T, 100cm	Custom made	Custom made	100m/roll
	EP-PTC410	0.380T, 100cm	Custom made	Custom made	75m/roll
	EP-PTC3805	0.380T, 50cm	Custom made	Custom made	100m/roll
	EP-PTC3808	0.380T, 80cm	Custom made	Custom made	100m/roll
	EP-PTC3810	0.380T, 100cm	Custom made	Custom made	100m/roll

*The product specification (voltage, power consumption, heating area) and product structure can be customized.

Specification of heating film for mirrors

Model no.	Width(mm)	Length(mm)	Power consumption (W)
MHF 2750	270	500	26
MHF 2710	270	1000	51
MHF 4030	400	300	23
MHF 4040	400	400	30
MHF 4050	400	500	38
MHF 4010	400	1000	76
MHF 5050	500	500	48
MHF 5075	500	750	71
MHF 5010	500	1000	95

*Based on 220V voltage * The product specification and power consumption can be customized.

Specification of heating film for sauna

Model no.	Thickness, width	Length(m)	Power consumption (W)
EP-305S(T)	0.338T, 50cm	150	

*Based on the operating voltage of 220V *The product specification and power consumption can be customized.

*Heating film for saunas can be installed in a place where much heat is required (180°C).

*Smart heating
specialist*

ENERPIA HEATING SYSTEM



Enerpia far infrared ray heating film, A Patented Technology

Usage examples of the
Enerpia far infrared ray heating film ————>>



Utility Model (No. 0408349)

Certificates of the
Enerpia far infrared ray heating film ————>>



Russia GOST Standard

A company you can trust! Enerpia

Certificates of Enerpia



Certificate Of Patent
(No. 10-1746775)



Letter of Q-Mark
designation



Russia GOST Standard



CU (Russia compulsory
certification)



CE



G-PASS certificate



Quality management
system certificate



Environmental management
system certificate



Certificate of the
company-affiliated
research institute



Letter of designating as
a promising export SME



Letter of pre-star
company designation



Membership card of
the Korea International
Trade Association



Design registration
certificate



Design Registration/
Inno-Biz



Certificate of the
company specialized in
material parts



Venture company
certificate

The only Company in the Field That carries out the whole process of Manufacturing to Construction

Construction method

Enerpia provides convenience to our customers with our total solution - from design to repairs after construction completion.

1 Install insulators exclusive for the heating film



2 Install the far infrared ray heating film



3 Connect the solderless terminal



4 Wiring process



5 Attach insulation tape



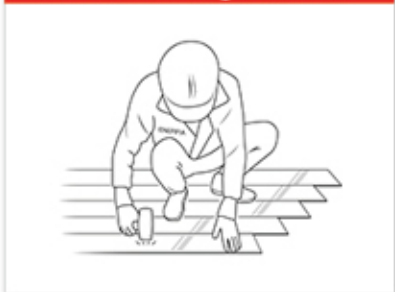
6 Performance test



7 Install the protective plate



8 Install finishing materials



9 Install thermostat



Main construction subsidiary materials for heating film



Insulators exclusive for
heating film



Crimping terminal

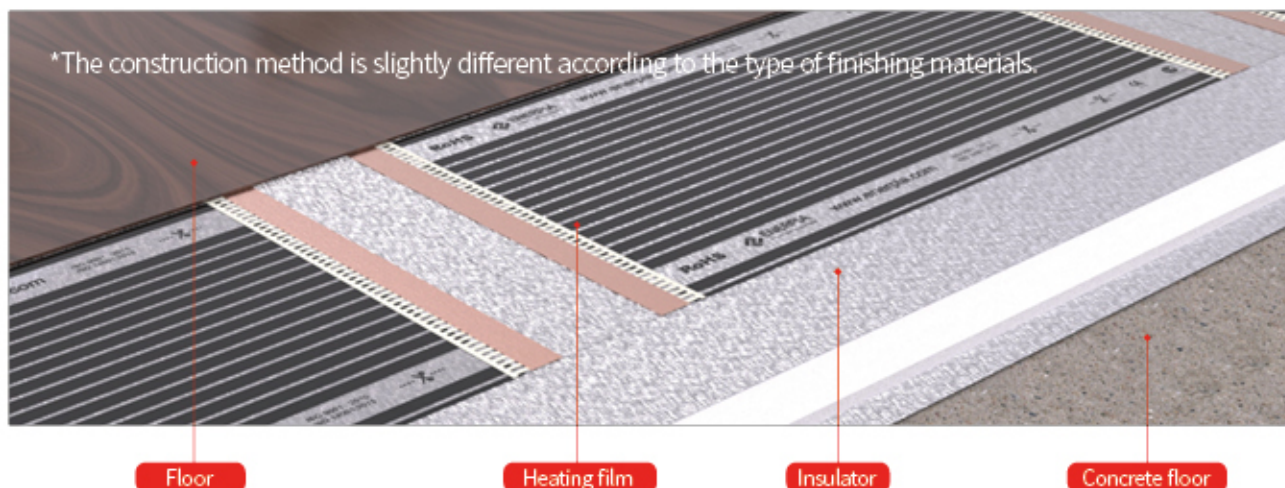


Presser



Butyl tape

Construction cross-sectional diagram of Enerpia heating film



Construction structural map of heating film (transparent/opaque)



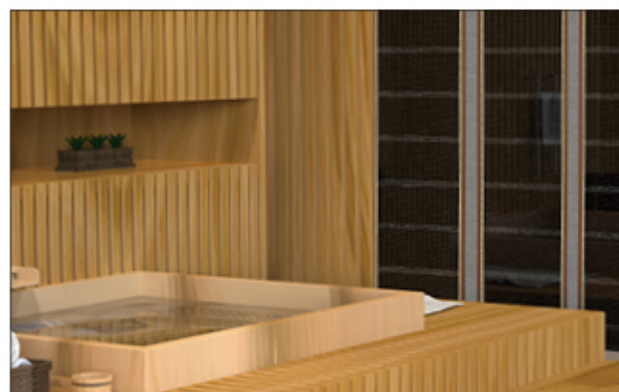
Construction structural map of heating film (black)



Construction structural map of heating film for mirror



Construction structural map of heating film for sauna



Enerpia continues to make warm spaces.

Smart heating specialist

Keep your floor and space warm while reducing costs with Enerpia electric floor heating.

The heat film made from carbon heating elements is more economical when it is used longer, thanks to its long lifespan.



| Installation recommended in various places.

Enerpia far-infrared heating film is suitable for **places such as where a boiler cannot be installed easily, fast heating is required (restaurants, etc.), heating is used for short periods of time, or partial heating is required.**



Residences



Restaurants



Hotels and accommodations



Childcare centers

As much as you need, wherever you need!

Enerpia heating film for floor heating DIY KIT

The **greatest effect** can be obtained at the **lowest cost**.
Heating film (50cm), solderless terminal, power line, and insulation tape are made into a package for easy installation.

A DIY kit is composed of heating film and subsidiary materials needed for construction, so that anyone can easily install heating film with excellent heating efficiency.

It is composed of heating film, connection cable, surface top terminal, and butyl tape.

A quick instruction manual is included for the user to read and follow easily.



Specifications of the Far infrared ray heating film

Item	Width and length	Power consumption	Construction area
Film kit 1m ²	50cm × 2M	220W/h	1.0m ²
Film kit 1.5m ²	50cm × 3M	330W/h	1.5m ²
Film kit 2m ²	50cm × 4M	440W/h	2.0m ²
Film kit 2.5m ²	50cm × 5M	550W/h	2.5m ²
Film kit 3m ²	50cm × 6M	660W/h	3.0m ²
Film kit 3.5m ²	50cm × 7M	770W/h	3.5m ²
Film kit 4m ²	50cm × 8M	880W/h	4.0m ²
Film kit 4.5m ²	50cm × 9M	990W/h	4.5m ²
Film kit 5m	50cm × 10M	1,100W/h	5.0m ²

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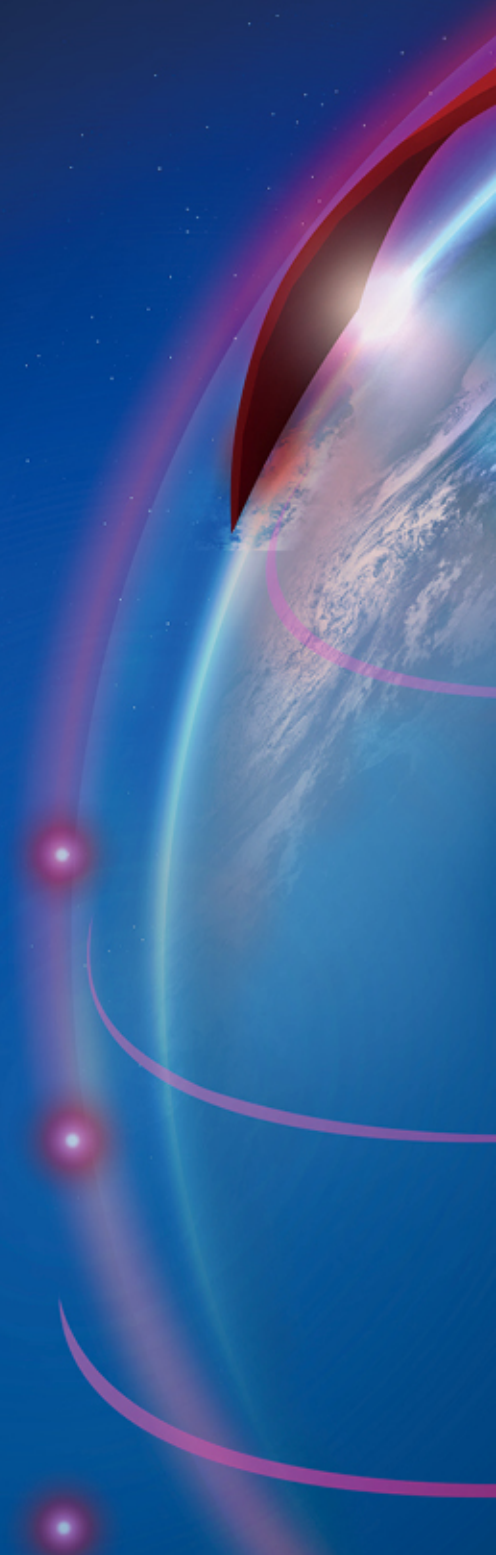
ENERPIA

HEATING SYSTEM

A new revolution! An eco-friendly heating system

A company completed with its extensive experience and patented technologies

Enerpia puts customers and the environment first





ENERPIA

The center of global connection!
It all starts here, in **Korea**.

Enerpia is a global company
that has **successfully entered
markets in 28 countries.**

Enerpia is a **global company** that has successfully entered markets in
28 countries including Russia and Europe.

Enerpia established local factories in  China,  Uzbekistan,  Kyrgyzstan,  Russia.

*Smart heating
specialist*

ENERPIA HEATING SYSTEM

The only company in the industry that both
manufactures and constructs the product

Enerpia provides convenience to our
customers with our total solution - from design
to repairs after construction completion.



| **Main office** . 349-13, Samunjin-ro, Hwawon-eup, Dalseong-gun, Daegu

| **Tel.** +82-53-474-8050 | **Fax.** +82-53-473-8050

| **E-mail.** master@enerpia.co.kr

| **China Branch** . Xiguo Zhuang Industrial Park, Chengyang District,
Qingdao City, Shandong Province, China

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