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GLOBAL LEADER OF HEATING SYSTEM

SH KOREA CO.,LTD

The Innovation of Architectural Heating System in 21th Century

21C 21C
HOT-FILM HOT-CABLE



SH KOREA Introduction



We "SH Korea co.,ltd. are manufacturer of heating film,heating cable,special cable which are far-infrared ray, eco-friendly, high efficiency, energy saving, leading a new innovation of architectural heating system.

Demanding of heating film and heating cable are explosively growing due to rising price of oil,global recession and global warming since heating system is essential for human life.

Far-infrared ray heating film and heating cable are suitable for current situation such as running out of fossil fuel and high expectation of improving daily life.

In technology and quality, korean manufacturers are keeping top notch in the world. We are top level manufacturer in Heating system industry and superior pioneer in production scale,technology and quality.

We have been making an effort to develop new product such as all-in-one type and special heating element which is more safe and easy to install, in oder to cope with fast changing global market.

We are going to lead Korean wave in heating system and to keep front position and Also we will do our best to improve customer's satisfaction.

Management Philosophy and Goals

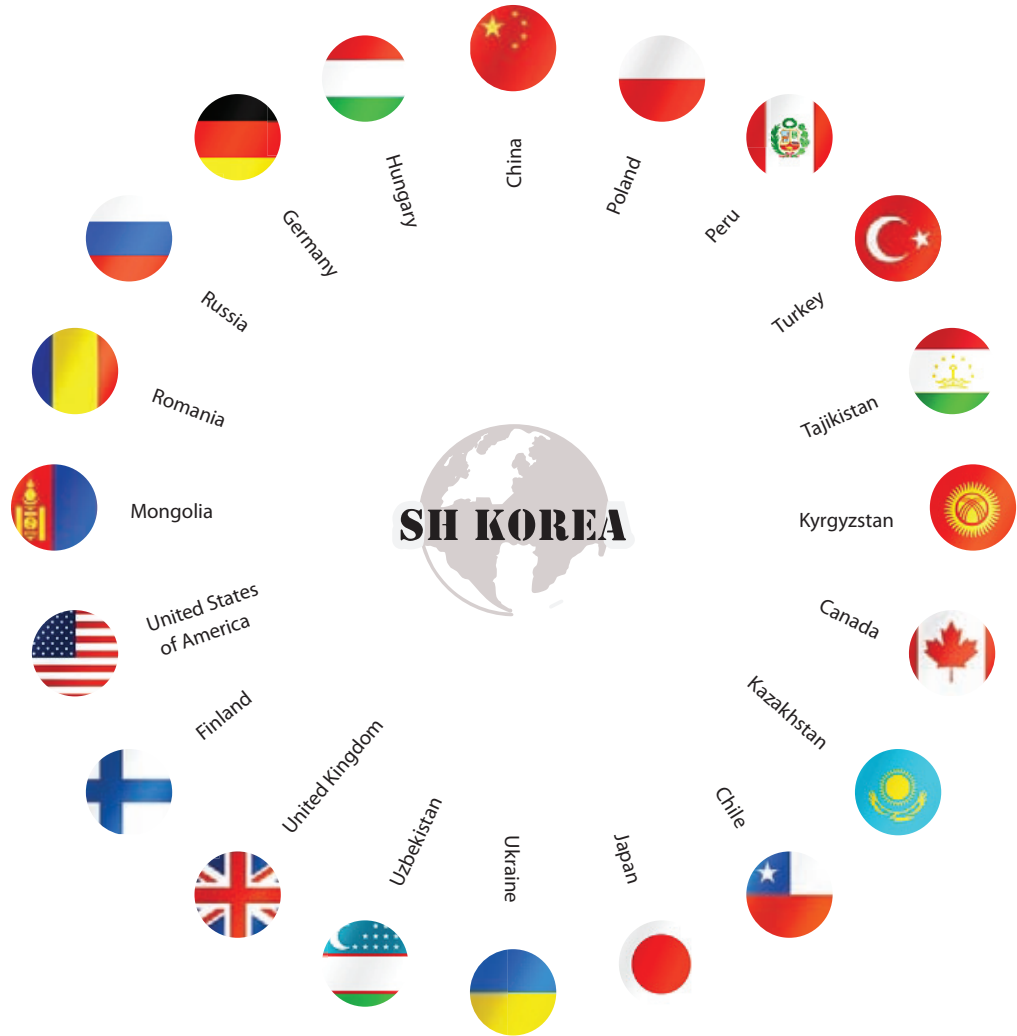


Technology is our life, Quality is our pride

1. We will do our best to develop top quality product.
2. We will keep trying to improve customer's satisfaction.
3. We will develop new product in customer's standpoint.
4. We will take the lead in this competitive heating system industry.
5. We will do our best to obtain advanced new technology and to improve services for customer.



Global leader of Heating System- SH Korea Co.,Ltd.



Messenger of global Korean Floor Heating Culture- SH Korea Co.,Ltd.



We "SH korea" are export heating film and heating cable to all over the world, based on craftsmanship and top notch quality.

As a messenger of korean floor heating system, we are trying to manufacture and supply world class heating film and heating cable made in korea but loved by the world.

Exporting country : US, Canada, UK, Germany, Russia, Finland, Hungary, Poland, Romania, Ukraine, Turkey, China, Japan, Mongolia, Chile, Kazakhstan, Uzbekistan, Tadjikistan, Kyrgyzstan etc.

International Certificates



CE Certificate



GOST Certificate



ISO 9001



ISO 14001



ROHS



International product liability insurance



Certified FTA exporter



Test report

Domestic Certificates



Patent for heating mat



Registration of design



Trademark registration



Business registration



Factory registration



Venture Business certificate



Procurement supplier



Certified R&D laboratory

SH Korea Co.,Ltd.
Production
Facilities



Heating film
production line



Slitter



Gravure
printer



Heat
treatmentor



Laminator



Die cutter



Automated 2 production line for heating film



Teflon extruder



Silicon
extruder



PVC extruder



High speed
braider



Conductive
wire twiner



Automatic
winder



Automated heating cable production line

Heating Film (Hot Film)



Our product "HOT-FILM" will be main stream of heating system and has priority and competitiveness in production scale, technology and quality compare to other company.

Our main brand "HOT-FILM" is consist of carbon paste (electric conductor) and silver paste are applied on the insulated and flame-retardent PET film and copper foil is used as electrode, Laminex Film is combined with the PET film.

Hot-film is the state-of-the art and future oriented heating material for a ceiling and wall.

Far-infrared radiation and anion offer a pleasant and warm environment, deodorizing your environment and restraining proliferation of germ and speeding up metabolism.

Superiority of Hot Film



Easy and economic heating system

Easy-to-install heating system for economic feasibility Saving of unnecessary heating cost due to partial heating (feasible introduction of central control system) No need of separate boiler room. Wider residential space

Healthy and environmental friendly heating system

Low emission of electromagnetic wave due to use of carbon as heating element like charcoal Generated far-infrared radiation and anion in heating against sick house syndrome, odor, bacterial growth No noise, dust, carbon monoxide due to heating without flame Ideal for the facilities which the old, sick and children usually use.

Economic heating with low cost of maintenance

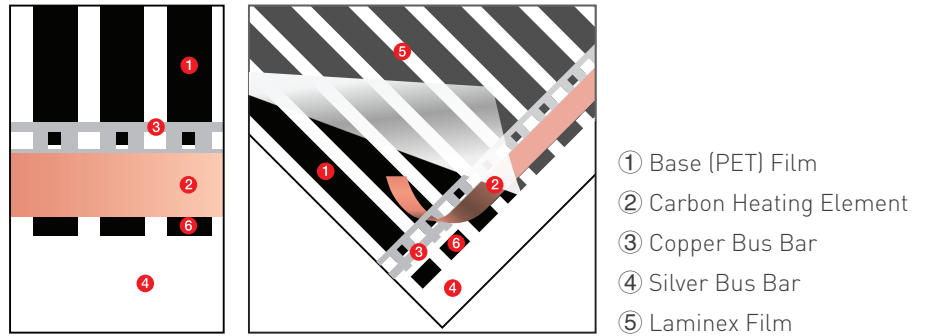
50% energy cost reduction compared with an oil boiler, 30% compared with an electric panel Semi-permanent product life due to simple structure with a small factor of breakdown Possibility of simple elimination, when remodeling, transfer and installation.

Installation and Maintenance Cost according to Heating Method



Classification		Oil/Gas boiler	Electric ONDOL Panel	Hot-Film
Installation Method	Installation Method Boiler Room Heating Pipe Installation Period Thickness	Capable of wet installation A separate boiler Room needed External exposure 4-5 days 110-220mm	Capable of dry installation Not needed None 1-2 days 15-20m	Capable of dry installation Not needed None 1 days 1 Within 10mm
Heating Method	Fuel to Use Heating system Generation of Far-Infrared Ray Heating speed Noise & dust Electronic Wave	Fossil fuel Conduction & Convection None 30-60 minutes Generated None	Electricity Conduction None 15-30 minutes None High	Electricity Radiant heat More than 90% 4-10 minutes None Harmless to human body
Maintenance	Frozen to rupture Remodelling Relocation & reinstallation Demerit Durability	Frozen to rupture Overhauling and repairing (Concrete dismantling work needed) Thin pipes cannot be used for boiler High oil expenses Within 10 years	None Easy Easy Cannot be used in case of broken wires 2-3 year	None Easy Easy Water heater to be needed separately Semi-permanent

Hot Film Structure



Design for Preventin of Electric Spark

(This design devised for prevention electric spark between silver booth and copper foil.)

Hot Film Patent Technology of Silver Pattern



1. Band Silver Booth Bar (other companies)

- Air space is formed due to flat adhesion
- High consumption rate of silver(impossible to thicken printing of silver or make the content of silver high)
- Due to double printing of carbon and silver on the contact surface of copper plate, there is a chance for spark caused by destruction of insulation from carbon layer
- Maximum load over 0.136 ampere(30W). Content rate and resistance of silver is important. As the maximum load of one 1m wide carbon band on heating film is below is below 0.018 ampere(4W), it is safe but there is possibility of spark caused by destruction of insulation from an external impact
- Heat generation rate - 860KCAL / 1KW

2. Terracing Silver Booth Bar

- Due to designing terracing silver booth bar, perfect contact of silver booth bar and copper plate helps to minimize air space.
- Low consumption rate of silver(possible to thicken printing of silver or make the content of silver high)
- Thanks to separation of printing of carbon and silver, no destruction of carbon and no spark
- Maximum load of silver both ber is 0.136 ampere(30W)
As the maximum load of a 1m wide carbon band on heating film is below 0.018 ampere(4W), it is safe and there is no spark even if an external impact come about.
- Heat generation rate - 860KCAL / 1KW

3. Safe Heating Film

- Our core technology is preventing spark from the line between copper plate and silver booth bar
- Even if folding and unfolding 80cm and 100cm wide heating film over 30 times along the line between copper foil and silver booth bar, there is no spark because of the designing of korea Heating regarding silver both bar
- As current of electricity is like running water, electricity converges on electrically loaded areas. So, you can consider the concentrated load on the contact surface of copper plate, silver booth bar and carbon
- Therefore, it is needed to design silver booth bar Which has enough purity and resistance against the maximum load the contact surface, which meand overall application of silver on the whole copper place is meaningless

Specification of Hot Film

HS Code	Model no	Width	Thickness	Power Consumption [w/m]	Packing Length (m/box)	Weight (Kg/box)	Remarks	
Heating Film 3921.90.6020	SH-203	30 cm	0.275mm	67w/m	150 m	21 Kg	Milky White Color (Not Easily Burning & Insulation PET)	
	SH-205	50 cm		110w/m	150 m	32 Kg		
	SH-206	60 cm		130w/m	100 m	26 Kg		
	SH-208	80 cm		180w/m	100 m	32 Kg		
	SH-210	100 cm		220w/m	100 m	40 Kg		
	SH-305	50 cm	0.338mm	110w/m	150 m	38 Kg		
	SH-308	80 cm		180w/m	100 m	40 Kg		
	SH-310	100 cm		220w/m	100 m	48 Kg		
	SH-205PTC	50 cm	0.275mm	110w/m	150 m	32 Kg		Energy Saving Product
	SH-305PTC		0.338mm			38 Kg		
	SH-305T	50 cm	0.338mm	110w/m	150 m	38 Kg	Transparent	
	SH-308T	80 cm		180w/m	100 m	40 Kg		
	SH-310T	100 cm		220w/m	100 m	48 Kg		
	SH-205E	50 cm	0.275mm	200w/m	150 m	32 Kg	For High Temperature	
	SH-305E		0.338mm			38 Kg		
	SH-3050	50 cm	0.338mm	110w/m	150 m	39 Kg	Overall Carbon Type	
	SH-3100	100 cm		220w/m	100 m	49 Kg		
	SH-203DC12v	30 cm	0.275mm	67w/m	150 m	21 Kg	DC Using Heating Film	
SH-203DC24v	67w/m			150 m	21 Kg			

※ In regard of OEM, change of thickness, shape of carbon heating element, power consumption, copper foil booth bar, tinned foil booth bar, position of silver booth bar and spec. of custom-built DC film, specific voltage, please have a prior discussion with our technical team

Hot Film Product Image



PTC Hot Film

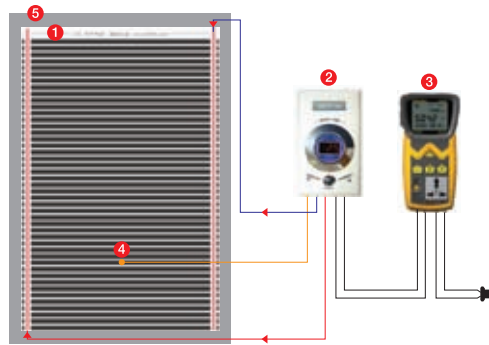


Self-Regulating

Ambient temp	Hot temp	Warm temp	Cold temp
Power output	Low	Medium	High

PTC characteristic: as temperature of heating element goes up, power consumption(Watt) Goes down inversely

- While a normal heating film has no change of power consumption even if the temperature of heating film rises from 10°C to 60°C, PTC hot film has 23% reduction of power consumption when the temperature rises to 60°C.
- PTC Hot film is safe because it has an energy saving effect and no partial overheating due to a big decline of power consumption according to temperature change.
- Applicable product : 30cm / 50cm / 60cm width HOT-FILM (high temperature film excluding)



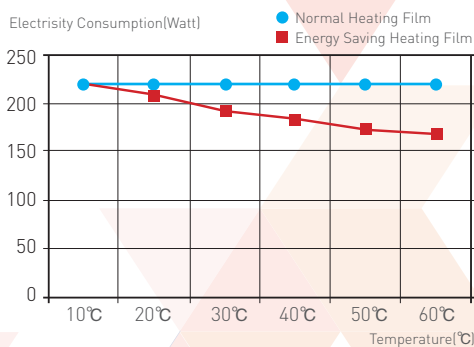
PTC HOT-FILM Test plan

1. PTC HOT-FILM
2. Thermostat
3. Power Consumption/Current/Tester of Resistance
4. Thermal sensor
5. Insulation pad

Specification of product for test

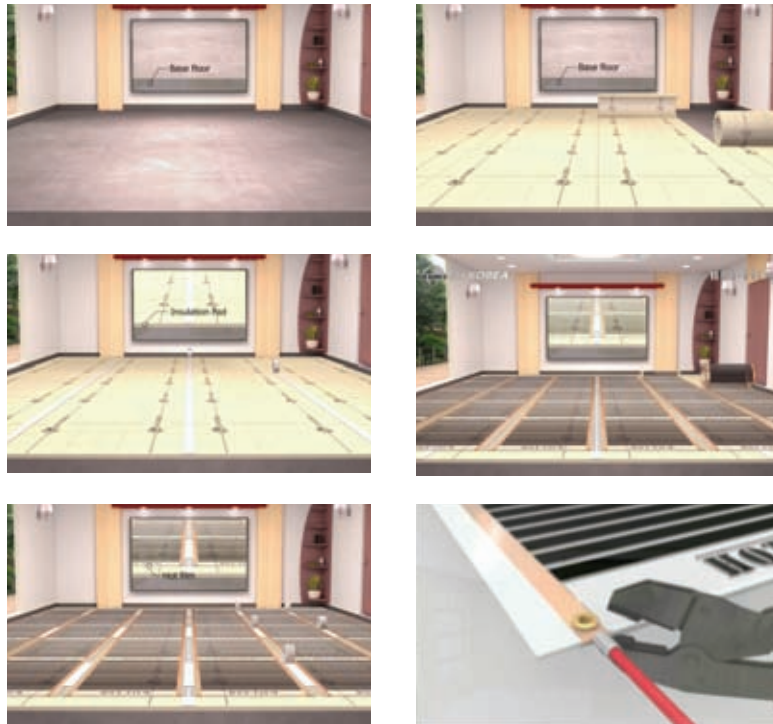
1. PTC film: 50cm width, 220watt/m²
2. Thermostat: UTH-120
3. Insulation pad: 5mm thickness
4. Electric wire: 2.5mm UL certified
5. Watt and current measuring: Wattman HPM-100A

The Changes of Power Consumption in Accordance with the Changes of Temp



Temperature	10°C	20°C	30°C	40°C	50°C	60°C	
Standard film	Power consumption (Watt)	220w	220w	219w	217w	218w	218w
	Decrease(%)	100%	100%	99.5%	98.6%	99.1%	99.1%
PTC film	Power consumption (Watt)	220w	212w	195w	185w	175w	170w
	Decrease(%)	100%	96.4%	88.6%	84.1%	79.5%	77.3%

Hot Film Installation Process

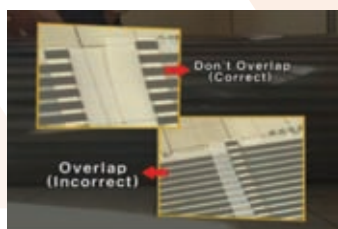


1. If the base floor has moisture, you have to take water-proof treatment.
2. Put the insulation pad on the base floor and fix it with OPP tape. To increase insulation, more thicker insulation pad is better.
3. According to shape of the wall, cut the edge of insulation pad.
4. Leave the space for wiring, when you install the insulation pad in case that you need to lay the electric wire between each insulation pad, leave the space as 2~3cm.
5. Cut the heating film according to installing space. Leave 10~20cm space from the wall. Between the each block of film over 1cm spacing is required.
6. When you cut the heating film, you should cut the heating film along the dotted line
7. Please note that the Maximum length of your heating film should be not over the installable maximum length.
8. With OPP tape, paper tape or electric tape, fix the heating film and insulation pad.

Formula for power Consumption

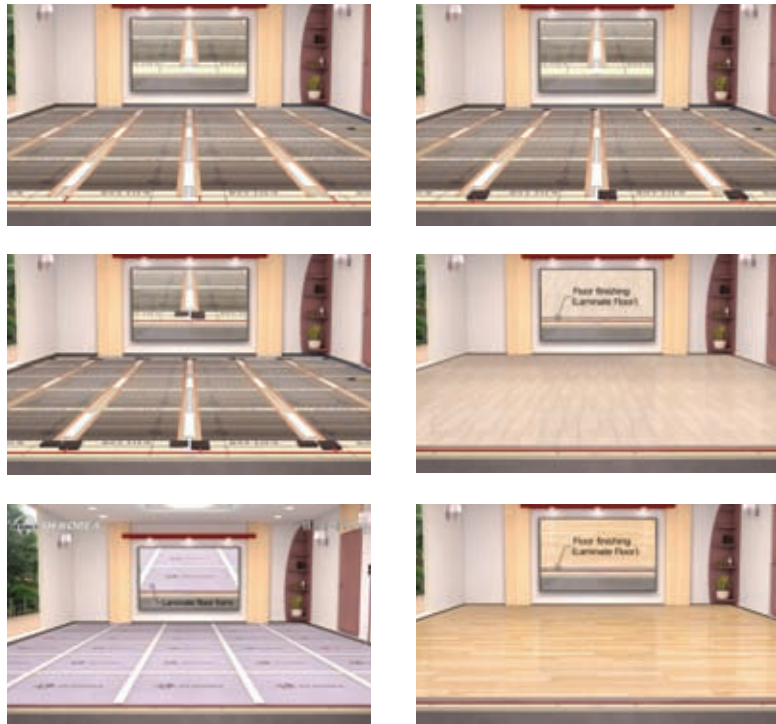
: Power Consumption(Watt) = V(Voltage)²/R(Resistance)

※ Maximum Cutting Length of Heating Film
 50cm width : 12~13m / 80cm width : 7~8m/ 100cm width : 5~6m



※ Do not have heating film overlapped during installation. Make sure that the interval between heating film to be 1cm ~ 3cm.

Hot Film Installation and Wiring



9. Cut the special insulation tape into wide pieces and insulate the cutted spots of copper foil on heating film with the special insulation tape against moisture.
10. Measure the resistances of all heating films installed by a resistance meter
11. Calculate the power consumption.
12. Put the mould for electric wire close to power outlet and arrange the wires into the mould.
13. Fix the thermostat close to power outlet.
14. Before operate the thermostat please check the wiring of the heating film and if you have current leakage tester please check leakage current.
15. Start the thermostat and check the temperatrue of heating film with thermal measuring tool.
16. Incase of floor finishing is laminate floor, cover the heating film with non-wooven fabric for protection.
17. Incase of floor fhinishing is linoleum,deco tile you need to install protection board on the heating film.
(when you install the protection board, 5mm spacing is required)
18. Install the laminate floor,linoleum,deco tile as floor finishing.

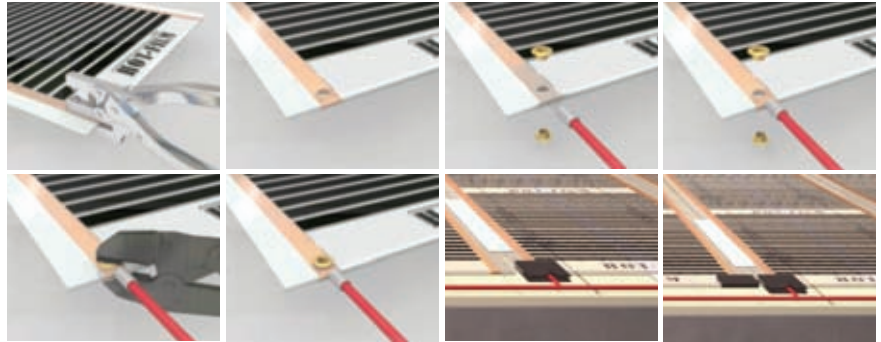


Working drawing for laminate floor

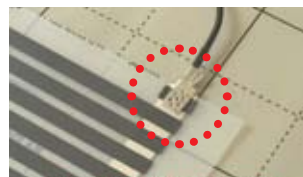


Working drawing for linoleum

Hot Film Wiring for Hot Film



1. Pierce a hole on copper foil with eyelet punch
2. Picture of punched copper foil
3. Push connection terminal into the slot between copper foil and silver booth bar
4. Fix connection terminal to heating film with eyelet terminal
5. Put together male and female eyelet terminal
6. Press all terminals with a presser
7. Picture after connecting electric wire
8. Insulate spots with widely cut pieces of special insulation tape where electric wire and terminal are connected to heating film



※ People sometimes use crocodile clip for connection between film and electric wire. But if you use crocodile clip, it can cause spark on the film and the connected part of terminal gets loose because of external impact. So, please take care when using crocodile clip.

Caution : Please don't use Crocodile clip

Wiring for Thermostat

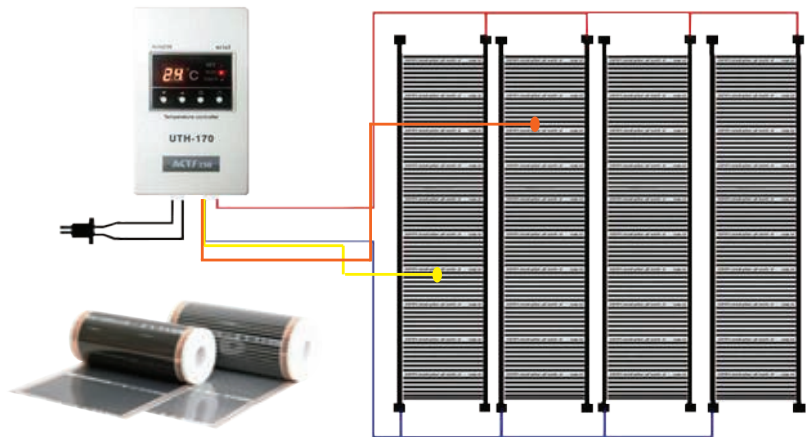


- IN : Supply the power
- OUT : Heating film
- SEN : Thermal sensor
- OHT : Overheating thermal sensor
- Hole for screw

For proper operation, fix the thermal sensor on the film with insulation tape

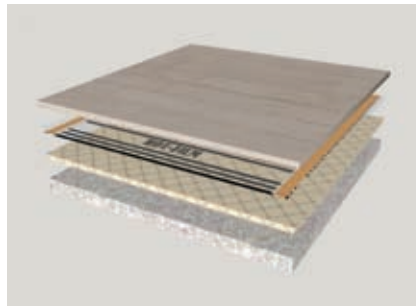
※ Thickness of Electric wire for power should be thicker or same as wire for heating film

Hot Film Installation Diagram

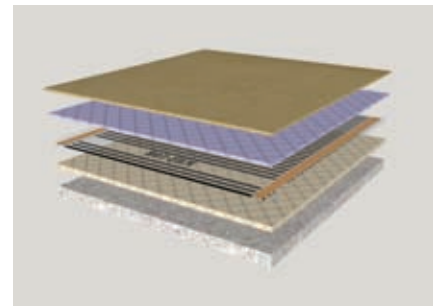


※ When you connect the wire on the film, parallel connection is recommended

Hot Film Structure of Installation



Installation for laminate floor



Installation for linoleum

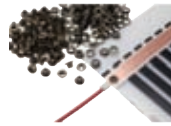
Hot Film Installation Precautions

- Before installation. Please clean the floor.
- If the base floor has moisture ,you have to take water – proof treatment
- Do not use insulation pad with silver layer and conductive materials. It should be foamed polyethylene insulation pad.
- Take care not to damage heating film or step on it while installation. In case of damage on heating film, insulate heating film using thin insulation tape .
- Check the contact power when installing heating film and if don't abide by this, a fire could break.
- You have to check Watt/m on the film and calculate total power consumption of installing place. It should not be exceed 80% of the capacity of thermostat.
- Cut part of film to be covered with insulation tape.
- Please don't run the heating film without thermostat.
- Please attach terminals firmly to heating film and make sure electric wires aren't overlapped.
- After testing operation with completely installed heating film, install finishing materials.

Hot Film Submaterials



Insulation pad



Eyelet terminal



Pressed terminal



Special Insulation tape



Electric wire



Thermostat



Presser



Eyelet puncher



OPP Tape



Electric tape

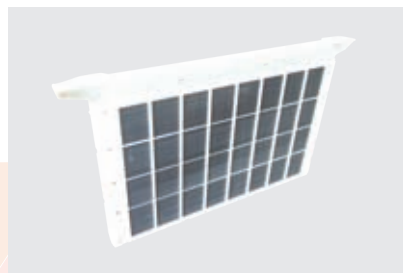
Electric Consumption Comparison by Heating Method



Classification	Oil Boiler	Residential Gas (LNG)	Heating panel	Heating Film
Daily consumption	5.83L	4.3m³	64.0kw	34.8kw
Monthly consumption	175L	130m³	1,920kw	1,044kw

1. Based on 30days operation in 33m² space(8 hours a day)
2. When outside temperature is 0°C, maintaining indoors temperature at 22 °C
3. The above values may vary according to testing environment(e.g. insulation condition of the place)

Other Product Item



Air Conditioner Purification Filter



Flat electric wire



Water-proof heating film



DIY Film

Heating Cable (Hot Cable)



In the way of integration and diversification of heating system, SH Korea Co., Ltd. has adopted cutting edge heating cable production line and produce high quality various heating cables by top notch engineers.

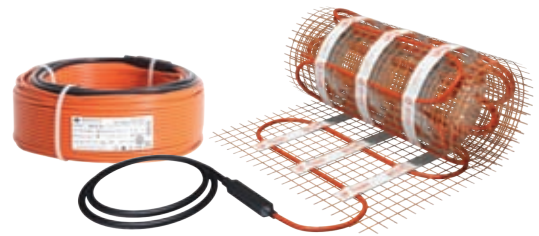
Heating element of cable is made by special conductor considering resistance value, insulation.

It has Primary insulation with Teflon which has 200°C heat resistance and covered with braided electronic magnetic wave screen.

Also PVC out sheath has flame retardance and heat resistance up to 105°C.

So it is efficient, economic and advanced safe heating system.

And we use high quality raw materials also we got patent technology for cold lead connection part. Thus we can guarantee quality and safety of heating cable.



Superiority of Hot Cable



Excellent safety

Blocking electro magnetic wave, it protects human body.

3 layers of insulation, shielding, flame-retardent structure reduce danger of leakage and fire outbreak.

Affordable heating

Low cost of installation and using electricity relatively cheap compare to oil, gas enables affordable heating.

Partial heating, concentrated heating, individual heating are available.

Semi permanent durability

Using durable and well insulated material, strengthen life span more than decades.

Various applications

Marble, Tile, Road, Pipe, roof, industrial, it's application is limitless.

Environmental friendly heating system

No dust, noise, contamination. Eco-friendly heating system.

Under mortar, using oil and gas boiler is not appropriate, heating cable is optimized heating system.

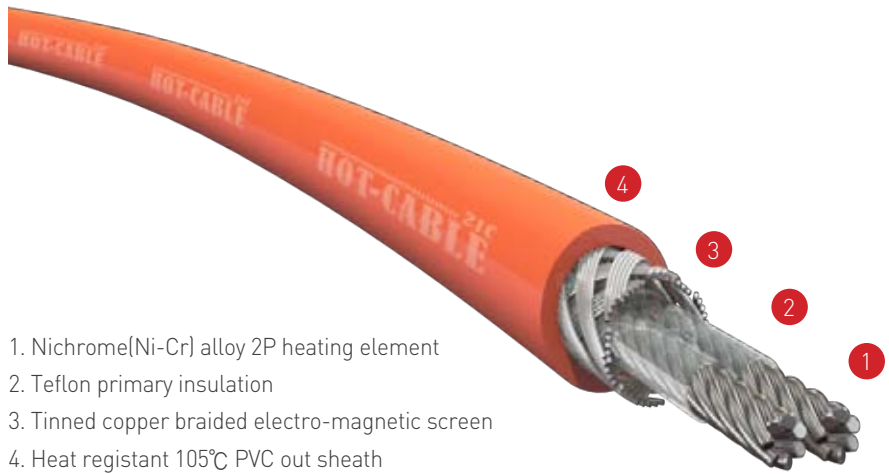
Technology of Hot Cable



With patent technology, we have completely solved frequent problem of connection part of heating cable using 3 layers of insulation, electro magnetic wave screen, high quality teflon and PVC. We can guarantee safety and quality.

Mat type heating cable is easy to install just unrolling the cable which has adhesive anti-alkali glass fiber mesh easily attached to insulation pad so it enables to save cost and labour charge.

Structure of Hot Cable



1. Nichrome(Ni-Cr) alloy 2P heating element
2. Teflon primary insulation
3. Tinned copper braided electro-magnetic screen
4. Heat resistant 105°C PVC out sheath

Hot Cable Patent technology of Insulation holder



Sectional view of SH korea's heating cable

SH korea's heating cable has been solved completely safety issue of general heating cable due to the patent technology of inserting silicone holder(200°C) to keep safe distance of each heating wire and to prevent overheating and Short circuit



Sectional view of other company's heating cable

Other company's heating wires of heating cable are laid one sided so it is very unstable and can cause overheating and short circuit. It can't guarantee the safety of heating cable

Definition of Roll Type Hot Cable



Heating element of cable is made by special conductor considering resistance value, insulation. It has Primary insulation with Teflon which has 200°C heat resistance and covered with braided electronic magnetic wave screen. Also PVC out sheath has flame retardance and heat resistance up to 105°C. So it is efficient, economic and advanced safe heating system Telfon is brand name of Polytetrafluoroethylene; PTFE) so called Plastic.

It is best solution of heating cable which has high electric insulation, heat resistance, chemical resistance SH KOREA Heating Cable is eco-friendly, efficient electric heating system for buildings, remodeling of house.

Roll Type Hot Cable Image



Specification of Roll Type Hot Cable



Model no.	Set up	Consumption	Applicable space	Length	Features
SHR-2P-05	5m/RL	90w	0.5m ²	5m	Ø 5.5-5.7mm
SHR-2P-10	10m/RL	180w	1.0m ²	10m	
SHR-2P-15	15m/RL	270w	1.5m ²	15m	220Volt
SHR-2P-20	20m/RL	360w	2.0m ²	20m	18w/1m
SHR-2P-25	25m/RL	450w	2.5m ²	25m	2P Non-magnetic
SHR-2P-30	30m/RL	540w	3.0m ²	30m	
SHR-2P-35	35m/RL	630w	3.5m ²	35m	Teflon insulation (-65°C~250°C)
SHR-2P-40	40m/RL	720w	4.0m ²	40m	
SHR-2P-50	50m/RL	900w	5.0m ²	50m	Tinned braided Shields
SHR-2P-60	60m/RL	1080w	6.0m ²	60m	
SHR-2P-70	70m/RL	1260w	7.0m ²	70m	105°C Heat resistant/flam
SHR-2P-80	80m/RL	1440w	8.0m ²	80m	
SHR-2P-100	100m/RL	1800w	10.0m ²	100m	
SHR-2P-120	120m/RL	2160w	12.0m ²	120m	
SHR-2P-140	140m/RL	2520w	14.0m ²	140m	
SHR-2P-165	165m/RL	2970w	16.5m ²	165m	

※ Maximum temperature: 75°C (Normal temperature), Maximum exposure temperature: 105°C, AC110V -OEM production

Roll Type Hot Cable Installation Process



Clean the ground(concrete) and check the flatness of ground.



Make insulation layer with 40mm thickness of cellular foam concrete.
For new or large scale building, cellular foam concrete is appropriate.
When remodeling the building,install insulation pad.
Cellular foam concrete: cement mixed with styrofoam.



Install the wire mesh #8-#10 on the insulation layer.



Install HOT CABLE with 10cm spacing and fix wire mesh with cable tie firmly (according to application and condition, adjustable as 7-15cm)
Connect lead wire to thermostat and put the thermal sensor(wet type) between the cables.

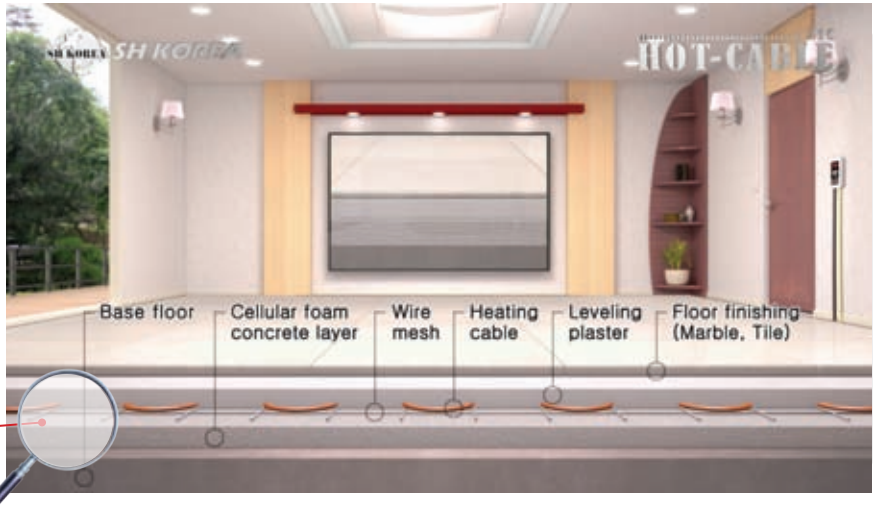
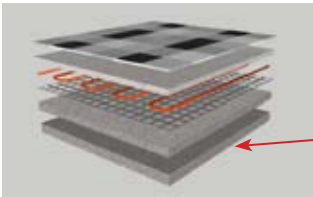


Before plaster work, check resistance value and power consumption of cable block surely.
During plaster work, pay attention and don't let the worker to tread the cable and don't let derailed or stick together. Do the leveling plaster work as 30mm thickness.



Choose marble,tile laminate floor as floor finishing and install.
After floor finishing work please check the heating cable to operate properly.

Roll Type Hot Cable – Working Drawing

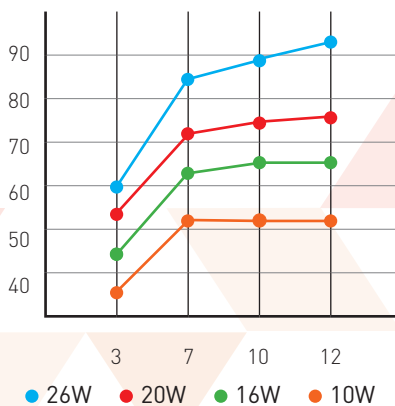


Roll Type Hot Cable – Installation Precautions



- Do not cut, connect, disassemble the cable.
- After the installation, please avoid nailing and anchoring.
- Be careful when installing heating cable, to avoid damage by sharp things and do not overlap heating cable.
- Please test the cable with a resistance tester to find cutting wires.
- Before installation, please consider the interval according to heat emission. Standard spacing is 10cm (7~15cm).
- When wire mesh needs connection to each other, do not use wire bands (use cable ties).
- Before plaster work, please check resistance value and power consumption.
- During plaster work, pay attention and don't let the worker tread the cable.
- Put the thermal sensor between the cables and it must be a wet type sensor.

Hot Cable * Efficiency of power consumption according to installing space



※ Above test result performed with equipment of SH Korea's laboratory and the temperature was 16°C. The result may be different according to insulation condition of installing place.

Total power consumption (3.3m²)

If you want to keep the temperature as 25 °C, total power consumption to be 0.6Kw.
If you plan 0.5kw, the power consumption will be 1.12times, 0.4kw will be 1.09 times.

Electricity cost (3.3m²)

If you want to keep the temperature as 25 °C total electricity cost to be 0.6Kw.
If you plan 0.5kw the power consumption will be 1.12times, 0.4kw will be 1.09 times.

Time to reach setting temperature (3.3m²)

If you want to keep the temperature as 25 °C if you plan 0.5kw/m² the power consumption, it takes 1.12times, 0.4kw/m² takes 1.09 times than 0.6kw plan.

Definition of Mat Type Hot Cable



SH KOREA's Mat type heating cable(Fiberglass Self-Adhesive Mesh+ Heating Cable) can provide convenient and time saving installation.

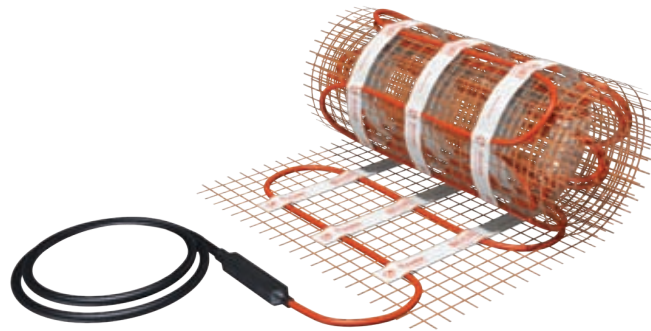
The existing heating cable needs wire mesh and fixation of cable to mesh but this Mat type cable enables convenient,economic and safe installation.

SH KOREA's Mat type cable is combined alkali-proof fiberglass to heating cable so it is proper for under concrete and special device for connection part improves it's lifespan and safety.

Not only mat type heating cable has safety same as roll type cable also the thickness is thin as 4.0mm it enables you to reduce loss of mortar for finishing floor.

Primary insulation for heating element is teflon and it has double core and tin braided shield so it is strong to heat and well insulated and safe.

Mat Type Hot Cable Images



Specification of Mat Type Hot Cable



Model no.	Set up(W x L)	Consumption	Applicable space	Length	Features
SHM-2P-05	0.5mx1m	80w	0.5m ²	5m	Ø 4.3-5mm 220Volt
SHM-2P-10	0.5mx2m	160w	1.0m ²	10m	
SHM-2P-15	0.5mx3m	240w	1.5m ²	15m	16w/1m
SHM-2P-20	0.5mx4m	320w	2.0m ²	20m	
SHM-2P-25	0.5mx5m	400w	2.5m ²	25m	2P Non-magnetic Tefloninsulation (-65°C~250°C)
SHM-2P-30	0.5mx6m	480w	3.0m ²	30m	
SHM-2P-35	0.5mx7m	560w	3.5m ²	35m	Tinned braided shields
SHM-2P-40	0.5mx8m	640w	4.0m ²	40m	
SHM-2P-50	0.5mx10m	800w	5.0m ²	50m	105°C Heatresistant/flame retardent PVC
SHM-2P-60	0.5mx12m	960w	6.0m ²	60m	
SHM-2P-70	0.5mx14m	1120w	7.0m ²	70m	3layers of insulation
SHM-2P-80	0.5mx16m	1280w	8.0m ²	80m	
SHM-2P-100	0.5mx20m	1600w	10.0m ²	100m	Adhesive anti-akali glass fiber
SHM-2P-120	0.5mx24m	1920w	12.0m ²	120m	
SHM-2P-140	0.5mx28m	2240w	14.0m ²	140m	
SHM-2P-165	0.5mx33m	1640w	16.5m ²	165m	

※ Width: 50cm, Maximum temperature: 75°C (normal temperature), Maximum exposure temp.: 105°C, AC110V- OEM production

Mat Type Hot Cable- Installation Process



Clean the ground(concrete) and check the flatness of ground.



Install 5mm(5~10mm according to applications) thickness foamed polyethylene insulation pad on the ground with 5cm spacing between the each insulation pad. Spacing secures firmness and crack prevention of surface of concrete.



Lay the mat Type Hot Cable on the insulation pad. Adhesive fiber glass wire mesh easily stick to the insulation pad. When you change the direction, cut only wire mesh and turn the direction to 180° Connect the lead wire to thermostat and put the thermal sensor (wet type) between the cables.



Install heat sink& crack prevention mesh on the heating cable mat.



Before plaster work, check the resistance value and power consumption of cable block surely.

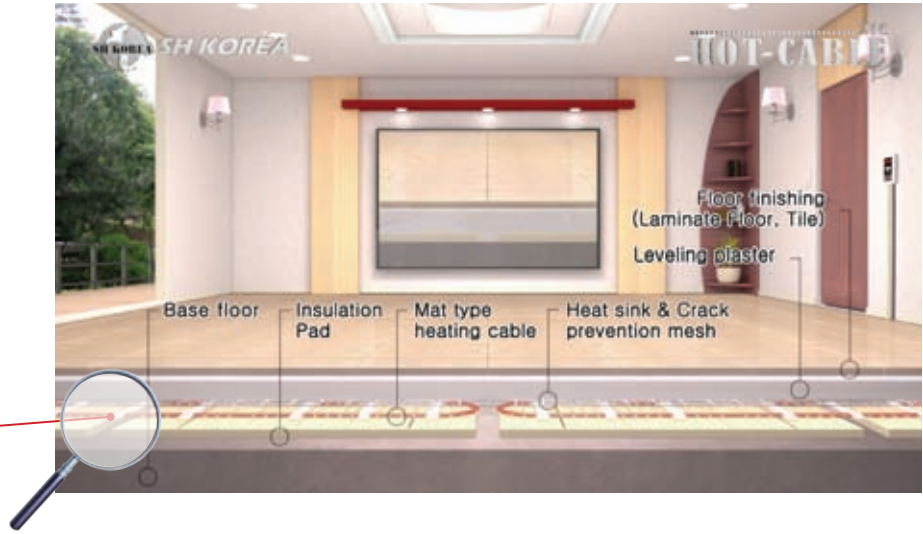
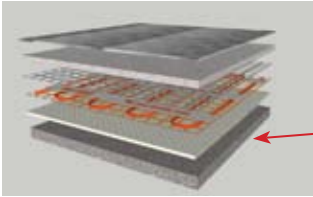
During plaster work, pay attention and don't let the worker to tread the cable and don't let derailed or stick together. Do the leveling plaster work as 30mm thickness.



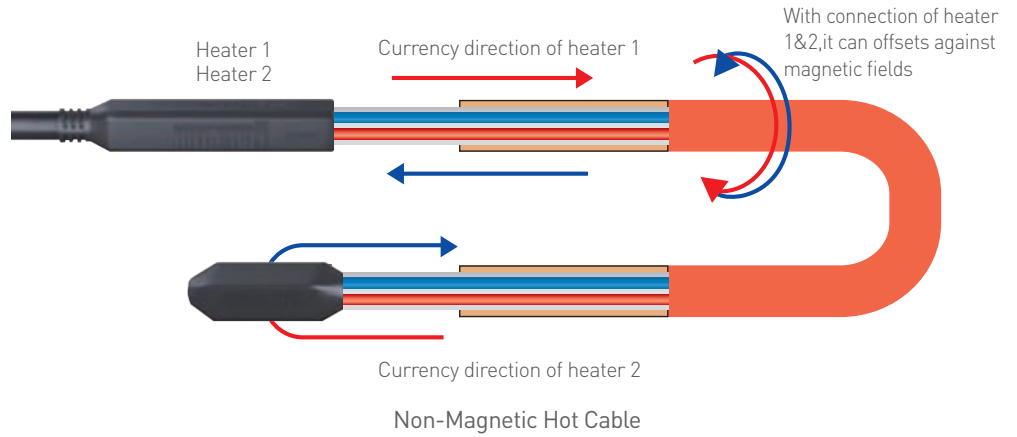
Choose marble,tile laminate floor as floor finishing and install.

After floor finishing work please check the heating cable to operate properly.

Mat Type Hot Cable - Working Drawing



Non-Magnetic Hot Cable



- Currents which has same amplitude and wave length but different direction, offsets against magnetic fields and minimize electro magnetic wave.
- Braided shields screen magnetic wave and be used as connection point of earthing. also it reduces risk of electrical hazard.

Hot Cable – Connection Method of Thermostat



- Cut the power line and earthing line of thermostat with different length and peel off the covering
- Cut the power line and earthing line of lead wire with different length and peel off the covering
- Connect tightly the each lines with the sleeves. Don't confused with power lines and earthing lines.
- Each connection part should be insulated with shringkage tube and electric tape.
- Connect the wet type sensor to sensor terminal of the thermostat and fix the end cap of sensor between the heating cables.

· After installation of heating cable, the test operation should be performed.

Definition of Snow Melting Hot Cable



SH KOREA's snow melting system operates automatically by using thermal/humid sensor and it removes snow effectively. It has 3 layers of complete insulation and has strength to physical impact.

Using calcium chloride for snow melting can cause damage of road, corrosion of vehicle,contamination of trees and plants a nearby roads.

Electric heating system can be design and install easily to secure safety from heavy snow,frozen roads in winter time and has strength to mechanical impact and vibration. also it can be installed on all kinds of roof,gutter,waterspout.golf course.

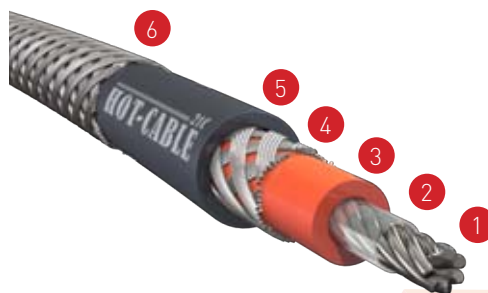
Specifications of Snow Melting Hot Cable



Type	Model no.	Specification	Wattage	Space	Amp.	Voltage	Make-up
Under Asphalt	SH-SA-120	Ø 8.5mmx120m	4200w	15.0m ²	11A	380V	35w/m Sus Braided
	SH-SA-85	Ø 8.5mmx85m	3000w	10.0m ²	7.9A		
Under Concrete	SH-SC-120	Ø 6mmx120m	4200w	15.0m ²	11A	380V	35w/m
	SH-SC-85	Ø 6mmx85m	3000w	10.0m ²	7.9A		

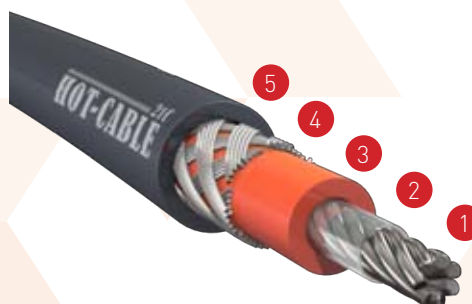
※ Spacing: 125mm, Maximun temperature: 85°C (Normal temp.),
Maximum exposure temp.: 200°C

Structures of Snow Melting Hot Cable



Heating cable for Asphalt

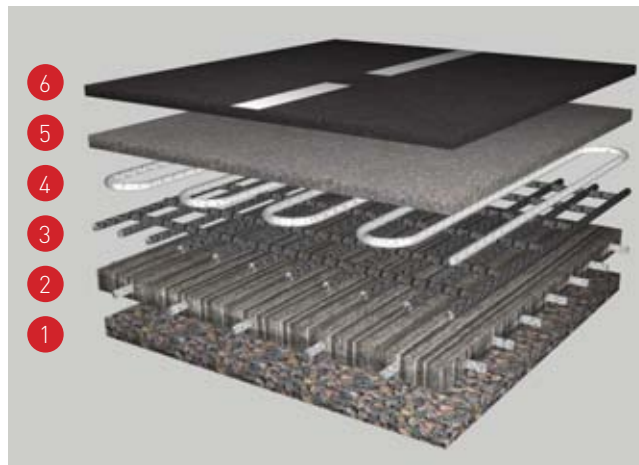
1. Nichrome Heating Element
2. Teflon Primary insulation
3. Silicon Secondary insulation
4. Tinned copper braided wave screen
5. Rubber sheath - Heat resistant 220°C
6. Braided stainless layer



Heating cable for concrete

1. Nichrome heating element
2. Teflon Primary insulation
3. Silicon Secondary insulation
4. Tinned copper braided wave screen
5. Rubber sheath - Heat resistant 220°C

Snow Melting Hot Cable – Installation Method



- 6. Ascon pavement
- 5. Cement
- 4. Snow melting heating cable for ascon
- 3. Reinforced steel mesh
- 2. Reinforced concrete
- 1. Base ground

- Check the flatness of base ground and install the reinforced concrete.
- Install the reinforced steel mesh.
- Install heating cable for ascon with 125mm spacing and fix with reinforced steel mesh firmly.
- Connect the heating cable with the lead wire.
- Snow melting cable made of single core for endurance for load on the road Connect two lines of lead wire seperately.
- Connect the stainless braided layer of snow melting cable for ascon to earthing line. Connect the tinned copper braided layer of snow melting cable for concrete to earthing line.
- Before plastering, check resistance value and power consumption of snow melting cable surely.
- Do the concrete plastering for endurance of heat from ascon and load on the road.
- Pave with ascon finally. Total thickness of plastering is 40~70mm.
- Connce the lead wire to junction box of automatic snow melting system.
- For snow melting cable for concrete, installation process is the same as ascon.
- Check the automatic snow melting system operates properly.

Lead Wire for Snow Melting Hot Cable



Lead wire for snow melting cable is special lead wire for ascon and concrete snow melting cable. It should be made as the same as snow melting heating cable. Lead wire for snow melting heating cable is specially designed for heat resistant up to 230°C.



- 1. Conductor(7P copper)
- 2. Teflon primary insulation
- 3. Silicon secondary insulation
- 4. Tinned copper braided screen
- 5. Rubber sheath -Heating resistant 220°C
- 6. Braided stainless layer

※ Cross section of conductor: 1.0sqmm, Diameter: Ø6~7mm, Spec.: 200m/1roll

Controller of Automatic Snow Melting System



This infrared sensor is installed outdoor and senses snow. It shows outstanding sensing ability in night as well as day and includes the function of measuring the air temperature.

This can sense even the number of snow exactly, which makes it easy to grasp the snowfall, and it is possible to communicate a long distance to main controller. Its installation is very simple and its cable is fixed tightly with lock unit. And in case of any leaf or alien substance on the sense window, the error signal is warned so as to prevent a malfunction in advance.



This controller works according to the signal of motion sensor. The power unit is installed easily in the method of terminal board treatment and the ground insert method. The surface temperature is always displayed via the soil sensor. In case that snow is falling, the output delay time is displayed. According to the set mode, the display is changed automatically and it makes user see at a glance. With the manual mode, it is possible to work the snow melting operation even if there is any error, including the malfunction of sensor.



This controller is two-way system and it is possible to operate it from any direction with main controller and 485 communication. It is easy to install with the ground insert type. User is able to use it in a room and it is possible to cope with any error. (if applying two-circuit)



This controller also works according to the signal of motion sensor. The power unit is installed easily in the method of terminal board treatment and the display screen is luxurious. The surface temperature is always displayed via the soil sensor. In case that snow is falling, the output delay time is displayed. According to the set mode, the display is changed automatically and it makes user see at a glance. It is possible to use 2-circuit with non-contacting method and the user is able to select easily a method from the diverse mode. It is possible to communicate to the room controller.

Precautions of Snow Melting System



- Please check the application and average temperature and calculate heat emission.
- Before installation you have to check contract power and electric capacity.
- You have to determine installation type(Asphalt/concrete)
- Please choose proper control method like thermal / humidity sensor or motion detector according to site.
- The intervals to each cable to be 20~25cm.
It can be adjustable as 10~15cm according to applications.

Definition of PTC Carbon Freeze Protection Hot Cable



SH KOREA's Freeze protection heating cable prevents pipe or tank from heat loss and heat up the inside liquid.

It helps to prevent the pipe or tank from frozen.

From the start to the end it conveys consistent and equivalent heat by using thermal sensor it keeps certain temperature and improves thermal efficiency at the same time it can reduce unnecessary energy loss.

It is semi-permanent, easy to install and can be installed on necessary spot . It dosen't makes noise and emits pollution.

Compare to using steam or other heat sources, it is simple and costs low.

Features of PTC Carbon Freeze Protection Hot Cable



You can cut the cable arbitrarily and freely.

In characteristic of PTC, carbon heating element heated up, the power consumption goes down and saves energy.

Standard power consumption is based on 10°C, if the temperature varies(under 0°C),the power consumption rise up to 3 times instantly.

Depends on the times of operation, the resistance value of carbon heating element can be changed.

Specifications of PTC Carbon Freeze Protection Hot Cable



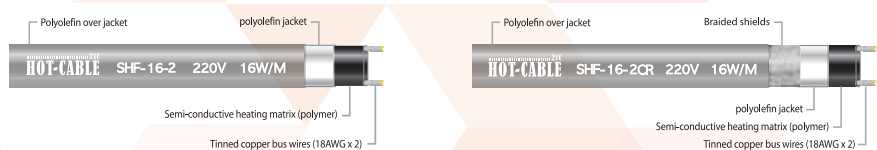
Model no.	consecutive operation temperature	Power consumption(10°C)	Length	Remarks
SHF-16-2	65°C	16w/m	300m/roll	PTC carbon
SHF-30-2		30w/m		
SHF-16-2CR		16w/m	200m/roll	PTCcarbon braided shields screen
SHF-30-2CR		30w/m		

※ Specifications of PTC Carbon Freeze Protection cable assembling

Ordering assembly kit is available : 1m/2m/3m/4m/5m/6m/8m/10m

- Maximum length of heating cable 16w/m is 140meter.
- Maximum length of heating cable 30w/m is 70meter.
- Ordering assembly kit by the length is available(timer thermostat is not included)

Structure of PTC Carbon Freeze Protection Hot Cable

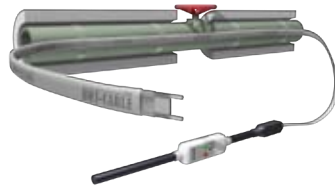


NORMAL TYPE

CR TYPE

※ End of cable never should be connected together. It needs insulation finishing.

Installation Precautions of PTC Carbon Freeze Protection Hot Cable



- Cutting wire never should be connected together.
- After installation, you need to cover the area with flame retardant insulation otherwise thermostat needs to install.
- If the cable overlapped or damaged by sharp things it can cause a fire.
- When using thermostat, thermal sensor need to place between cable and insulation to check exact temperature and to avoid overheating.
- You can freely cut cable and use. Minimum length to be over 3meter .

Applications of SH KOREA's Heating Systems



Residential area



Education facilities



Resort



Snow melting



Religious place



Parking lot



Office



Accommodations



Hospital



Restaurant



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