"Abundant life with advanced technology of Enerpia"

ENERPIA

ENERPIA HEATING SYSTEM

PTC HEATING FILM

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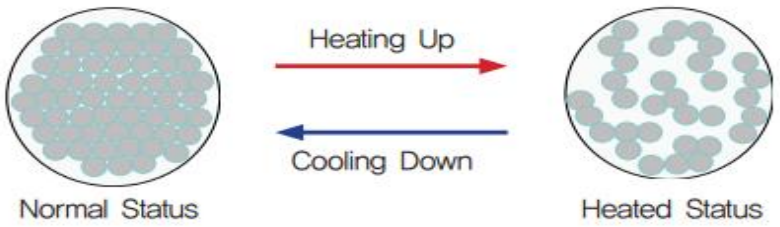
What is P.T.C Heating film?

P.T.C. is an abbreviation of Positive Temperature Coefficient and means a smart product that the heating element adjusts its own temperature by itself.

PTC Heating Film is a smart heating film that automatically adjusts the power consumption by controlling the resistance of the film without a temperature controller when the temperature of the film heater changes.

Enerpia P.T.C Heating Film is a device using the constant temperature characteristic that the temperature rises with the inflow of current and the volume change due to the melting point of the polymer blocks the conductive path of carbon.

At steady state, the carbon dispersed in the polymer forms a myriad of conductive pathways and shows low intrinsic resistance. When current flows through both ends of **P.T.C Heating Film, the temperature rises and the carbon path is gradually disconnected.**

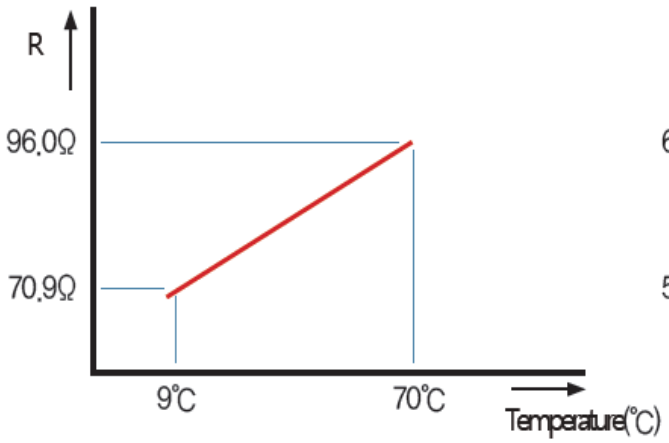


PTC FILM Characteristic

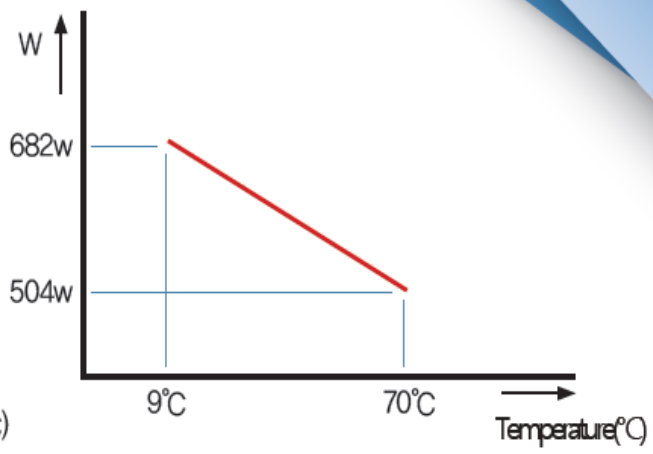
MODEL	170 Watt/m² Heating film	220 Watt/m² Heating film	**P.T.C Heating Film**
Risk of Overheating	Low risk	High Lisk	**Low risk**
Power Consumption (IF Temparture rise)	No change	No change	**Power consumption is reduced.**
Heating Capacity	Not suitable for initial heating	Suitable for initial heating	**Most stable and efficient Heating Film**

The PTC Heating film combines the advantages of 220 Watt / m² and 170 Watt / m².
The initial heating capacity is 220 Watt / m²,
but when the floor temperature rises,
power **consumption is reduced by 50%,**
enabling safe and economical heating from overheating.

P.T.C Heating film is Characteristic



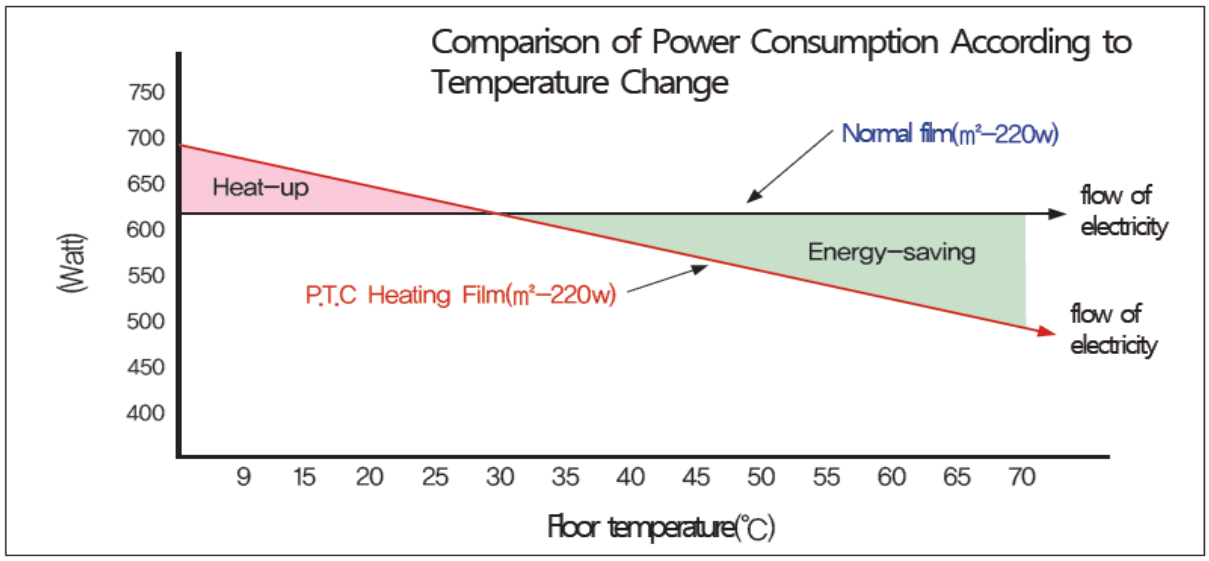
(Change of resistance with temperature change)



(Change of output with temperatur change)

The resistance of P.T.C Heating Film (50cm × 6m) was measured based on 113 watts
(based on 9 ° C). The measured resistance is (9 ℃ -70.9Ω, 70 ℃ -96.0Ω).
Therefore, the output is (220v × 220v / 70.9Ω = 682watt, 220v × 220v / 96.0Ω = 504watt).

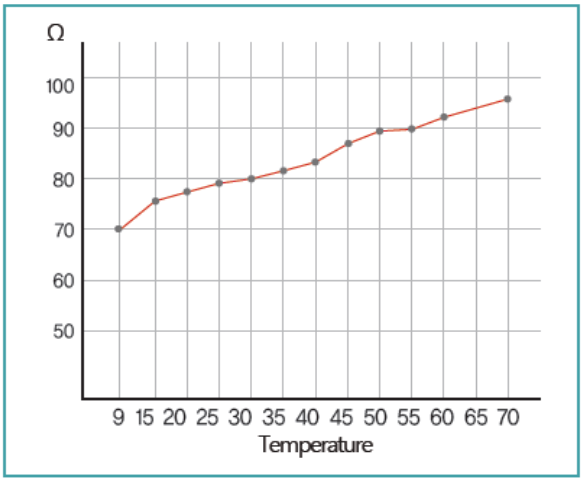
P.T.C Heating Film TEST DATA(Graph)



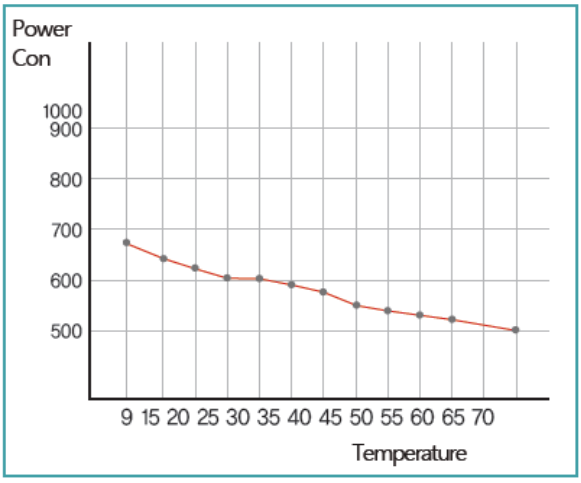
P.T.C Heating Film Change value of resistance and current amount

	A COMPANY		B COMPANY		P.T.C Heating Film		
W	Power Con	Reduction rate(%)	Power Con	Reduction rate(%)	Power Con	resistance	Reduction rate(%)
9℃	668	100	668	100	682	70.9Ω	100
15℃	668	100	668	100	642	75.4Ω	94
20℃	666	100	666	99	620	78.1Ω	91
25℃	666	99	666	99	609	79.4Ω	89
30℃	665	99	666	99	603	80.2Ω	88
35℃	665	99	666	99	593	81.6Ω	86
40℃	665	99	666	99	582	83.2Ω	85
45℃	665	99	666	99	556	87.0Ω	82
50℃	665	99	666	99	541	89.5Ω	79
55℃	665	99	666	99	539	89.8Ω	78
60℃	665	99	666	99	524	92.4Ω	79
70℃	665	99	666	99	504	96.0Ω	73

P.T.C Heating Film Graph of resistance



Resistance test (Measured value: 9 ~ 70 ℃)



Power consumption test (Measured value: 9 ~ 70 ℃)

Features of PTC Heating film

• Optimum space heating guarangteed with radiation heat.

• Good for health with the highest level of far infrared radiation.

• No Heating applicable with high efficiency providing freedom of selecting finishing materials.

• Fuel cost saving effect over 70% In comparison with oil boilers.

• Anion generation keeping room space comfortable

• Thin and light for convenience transportation and storage

• No risk of frozen burst and sectional heating applicable

• No trouble in operation guaranteed except with Temperature Controller.

• Current Temperature seting adjustable from Counter with central Control system

• Populor film heating with no explosion, fire & residential noise for healthy housing