

STANDARD HEATER FOIL

VERSION 2020/1



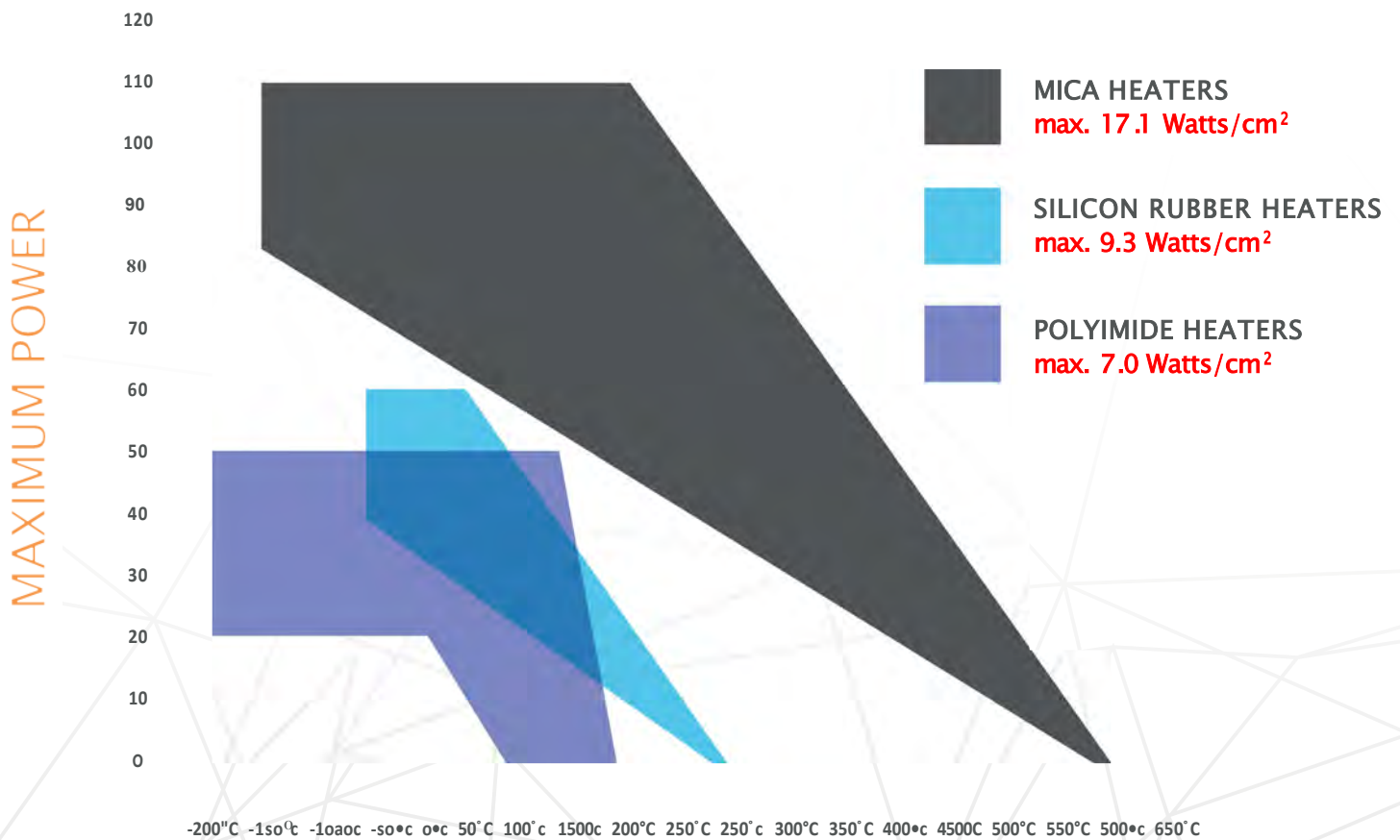
HEATER FOIL SOLUTIONS



ADEO HEATER FOIL

General Information

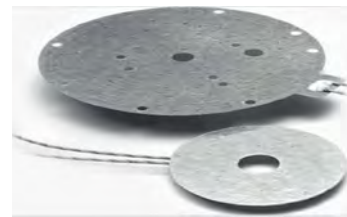
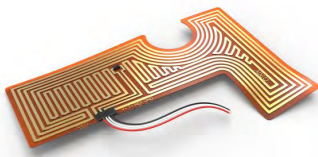
Power vs temperature basic evaluation overview



ADEO HEATER FOIL

General Information

Overview of standard Heater Foil technologies by ADEO



	Kapton	Silicone	Mica
Isolation	Kapton (Polyimid)	Silicone Rubber	Mica
Temperature range	-200 to +200 °C	-45 to +235 °C	-150 to +600 °C
Material Flexibility	*****	***	*
Max. resistance density	70 Ω/cm ²	30 Ω/cm ²	4 Ω/cm ²
Usual mounting system	Adhesive	Adhesive	Must be
Resistance to most chemicals (acids and solvents)	Good	Good	Clamped Low

POLYIMIDE HEATER FOIL

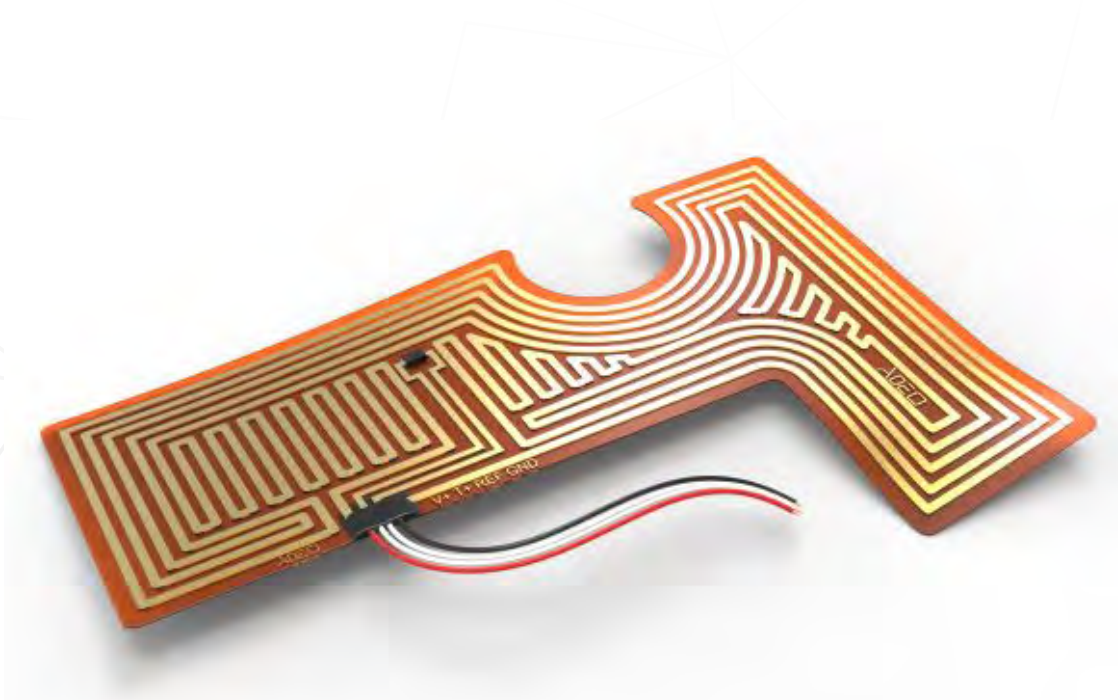
(Kapton¹ Heater Foil)

General Information

Description:

Typical features of polyimide heater foils:

- Thin, lightweight and easy to apply (adhesive backside)
- Etched-foil heating technology provides a big flexibility on shapes
- Internal or external adhesive, up to 150 °C (302 °F)
- Standard adhesive, acrylic pressure sensitive adhesive (PSA)
- Resistant to most chemicals, acids and solvents
- Maximum Watts/cm²: 7.0 (without PSA)



¹ Kapton is a trade name of DuPont polyimide films.

POLYIMIDE HEATER FOIL

(Kapton¹ Heater Foil)

Standard ADEO Heater Foils

Specification:

Temperature range	-35°C to + 150°C (optional -80°C to +220°C, without PSA)
Adhesive	Acrylic pressure sensitive adhesive (PSA), 3M9485 or similar
Max. res. Denstiy	70 Ω/cm ² (without PSA)
Material	Polyimide/Kapton, thin, semitransparent, excellent
Heater Layer	dielectric Etched foil, resistance depend on design
Cable length	typ. 300 mm, PTFE, without connector



Type	Size X mm	Size Y mm	Voltage V	Power W	Resistance Ohm	Order No. PN
Polyimid Kapton	10	50	12	5.00	28.80	HFP/10-50-24/20 PSA PN11104
			24	20.00		
	10	50	12	3.30	43.50	HFP/10-50/28/18 PSA PN11026
			24	13.25		
	25	50	12	1.80	78.50	HFP/25-50-28/10 PSA PN10720
			24	7.35		
			28	10.00		
	25	75	12	2.75	52.00	HFP/25-75-28/15 PSA PN10721
			24	11.00		
			28	15.00		
	39.4	77.5	12	3.65	39.50	HFP/39-77-32/26 PSA PN10726
			24	14.60		
32			26.00			

¹ Kapton is a trade name of DuPont polyimide films.

POLYIMIDE HEATER FOIL

(Kapton¹ Heater Foil)

Standard ADEO Heater Foils

Type	Size X mm	Size Y mm	Voltage V	Power W	Resistance Ohm	Order No. PN
Polyimid Kapton	50	50	115	20.00	661.25	HFP/50-50-115/20 PSA PN10722
			32	1.55		
			24	0.80		
	50.8	101.6	32	48.00	21.35	HFP/50-101-32/48 PSA PN10727
			24	27.00		
			12	6.75		
	75	75	115	45.00	295.00	HFP/75-75-115/45 PSA PN10723
			32	3.45		
			24	1.95		
	100	100	115	80.00	165.00	HFP/100-100-115/80 PSA PN10724
			32	6.20		
			24	3.45		
	101.6	177.8	24	52.00	11.25	HFP/101-177-24/52 PSA PN10728
			12	13.00		
			5	2.25		
	101.6	203.2	115	160.00	82.70	HFP/101-203-115/160 PSA PN10725
			32	12.35		
			24	6.95		
115	26	24	20.00	28.80	HFP/115-26-24/20 PSA PN10729	
		12	5.00			
		5	0.85			
200	200	230	20.00	2645.00	HFP/200-200-230/20 PSA PN10730	
		115	5.00			

¹ Kapton is a trade name of DuPont polyimide films.

POLYIMIDE HEATER FOIL

(Kapton¹ Heater Foil)

Customized ADEO Heater Foils

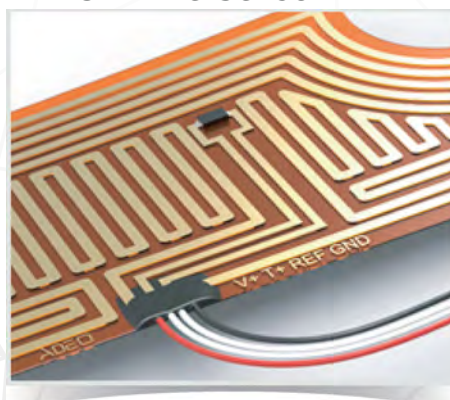
Specification for customer adjustments:

Temperature range	Can be adjusted by selection of PSA usage
Shape	Standard: kiss-cut, complex: laser-cut, bending possible
Layers	Additional aluminum foil inlay, optimizing heat distribution
Sensors	4 wire versions with: NTC, PTC or other sensors/logic.
Cables	Mounted connectors, change length, crimped terminals
Engineering	Thermal engineering support by CFD simulation (Joule heating)

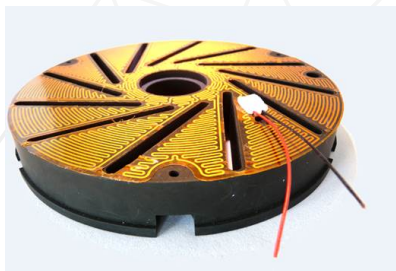
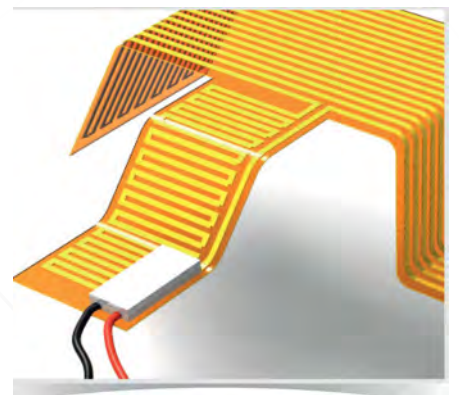
ADEO Heating & Cooling



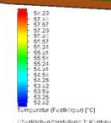
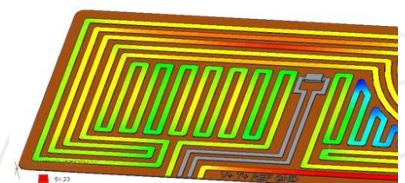
ADEO 4wire Sensor



ADEO Bending



ADEO Assembling



ADEO Engineering

¹ Kapton is a trade name of DuPont polyimide films.

SILICONE HEATER FOIL

(Rubber Heater Foil)

General Information

Description:

Silicone rubber is a rugged, flexible elastomer material with excellent temperature properties. It is most suited to larger heaters and industrial waterproof, chemical applications.

Features

- Silicone heaters provides high reliability in a wide range of ruggedized industrial heating applications.
- Components can be implemented vulcanization process
- Good properties outdoor, waterproof
- Maximum Watts/cm²: ca. 9.3



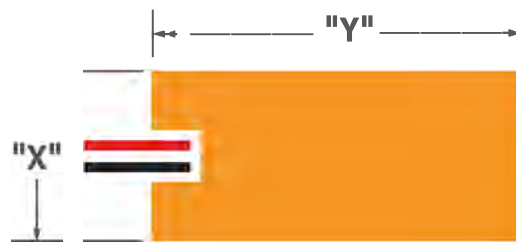
SILICONE HEATER FOIL

(Rubber Heater Foil)

Standard ADEO Heater Foils

Specification:

Temperature range	-50 °C to + 235 °C
Adhesive	Standard with adhesive PSA, (without PSA on request)
Material	Fiberglass reinforced silicon rubber.
Cable length	Standard 300 mm, without connector



Type	Size X mm	Size Y mm	Voltage V	Power W	Order No. PN
Silicone	10	50	28	18.00	HFS/10-50-28/18 PSA PN10731
	10	100	28	10.00	HFS/10-100-28//10 PSA PN10732
	25	25	28	10.00	HFS/25-25-28/10 PSA PN10733
	25	75	28	15.00	HFS/25-75-28/15 PSA PN10734
	25	125	115	25.00	HFS/25-125-115/25 PSA PN10735
	75	75	115	45.00	HFS/75-75-115/45 PSA PN10736
	75	125	115	75.00	HFS/75-125-115/75 PSA PN10737
	100	100	115	308.00	HFS/100-100-115/308 PSA PN10738
	100	200	115	160.00	HFS/100-200-115/160 PSA PN10738

MICA HEATER FOIL

(GLIMMER Heater Foil)

General Information

Description:

Mica heaters is build by an etched foil element, sandwiched between layers of mica. The unquie technical point of MICA heater is, they provide the fastest temperature rise until 600°C, and power density.

Features

- Highest power density capability, 17 Watt/cm²
- Mounting or better heat induction is a important issue to this heater technology
- Because of mechanical issues–bigsize are not very common



MICA HEATER FOIL

(GLIMMER Heater Foil)

Standard ADEO Heater Foils

Specification:

Temperature range	-150°C to +600°C
Adhesive	None, standard without PSA (adhesive)
Material	MICA, diameter or shapes (punching tool)
Mounting	Mounting with high mechanical pressure, no bending possible
Cable	PTFE, or high temperature textile cable, without connector

Please contact us for definition of your most suitable MICA Heater define: size, performance and thickness.

Type	Size X mm	Size Y mm	Voltage V	Power W	Order No. PN
Mica	25	100	22	21.20	HFM/25-100-22/21 000 PN10740
	50	200	18	24.00	HFM/50-200-18/24 000 PN10741
	76	200	18	46.30	HFM/76-200-18/46 000 PN10742
	100	200	18	21.00	HFM/100-200-18/21 000 PN10824
	200	200	18	42.50	HFM/200-200-18/42 000 PN10743

Type	Size X mm	Size Y mm	Voltage V	Power W	Order No. PN
Mica	2	50	22	18.30	HFM/dia-50-22/18 000 PN10744
	3	76	18	21.40	HFM/dia-76-18/21 000 PN10745
	4	100	18	54.80	HFM/dia-100-18/54 000 PN10746
	6	150	18	63.20	HFM/dia-150-18/63 000 PN10747

ORDER CODE

Order Information

Selection of the proper heater foil for a specific application requires an evaluation of the total system in which the heater will be used.

For most applications it should be possible to use one of the standard heater foil configurations while in certain cases a special design may be needed to meet electrical, mechanical, or other requirements. Although we encourage the use of a standard device whenever possible, ADEO specializes in the development and manufacture of custom heater foil and we will be pleased to quote an unique foil / solution that will exactly meet your requirements.

The overall cooling system is dynamic in nature and system performance is a function of several interrelated parameters. We urge to validate by qualified testing the heater foil to your requirements.

The publishing of thermal data entails some risk because there are numerous application parameters and conditions that will affect the end result. Therefore we cannot be held responsible for damaging any equipment by using our standard foils.

Requesting of other specifications, shape, please use the below nomenclature:

---	/	---	-	---	-	---	/	---	PSA	CM
Technology		Length (mm)		Width (mm)		Voltage (V)		Watt (W)	Adhesive	Shape/Spec
HFP Polyimid (Katpon)						12			PSA*	custom-made
HFS Silicone (Rubber)						24			00 without PSA	
HFM Mica										
									*3M9077, 3M9485 or similar	

- pls consider power loss on cable, adhesive and mounting driven factors
- custom-made versions need to be defined by specification (Watt, Voltage) and the shape by drawings, DWG, DXF

CUSTOMIZED HEATER

Adeo foil heaters give you design options that other heater vendors can't match.

ADEO's custom design options can be qualified into three sections:

Design elements

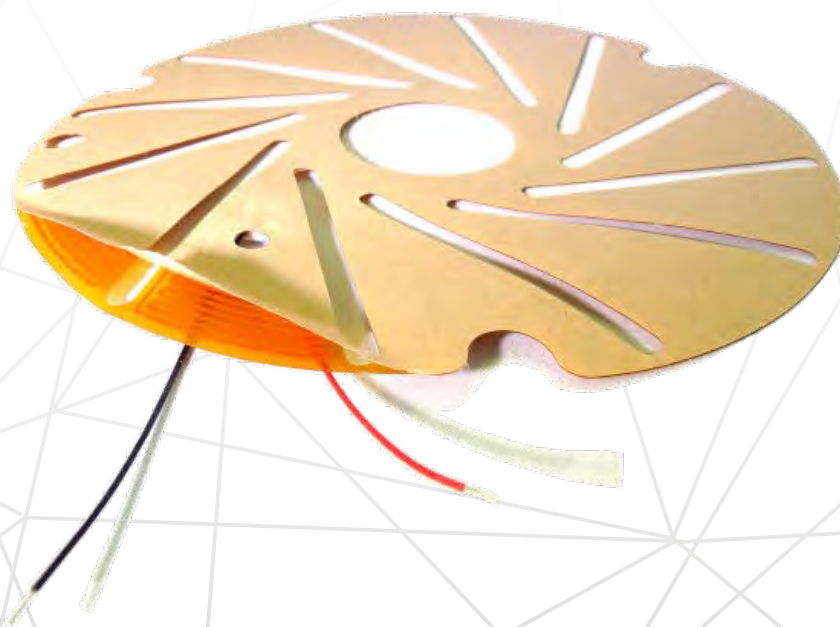
Freedom of patterns, outline shapes, heat specifications and usage can be fine-tuned to create the exact thermal and physical component to fit your requirements. Get more information below.

Integration of components

Integrating temperature sensors or glue logic directly on the Adeo heater foil, giving your heater foil design the possibility to be an active component of your equipment.

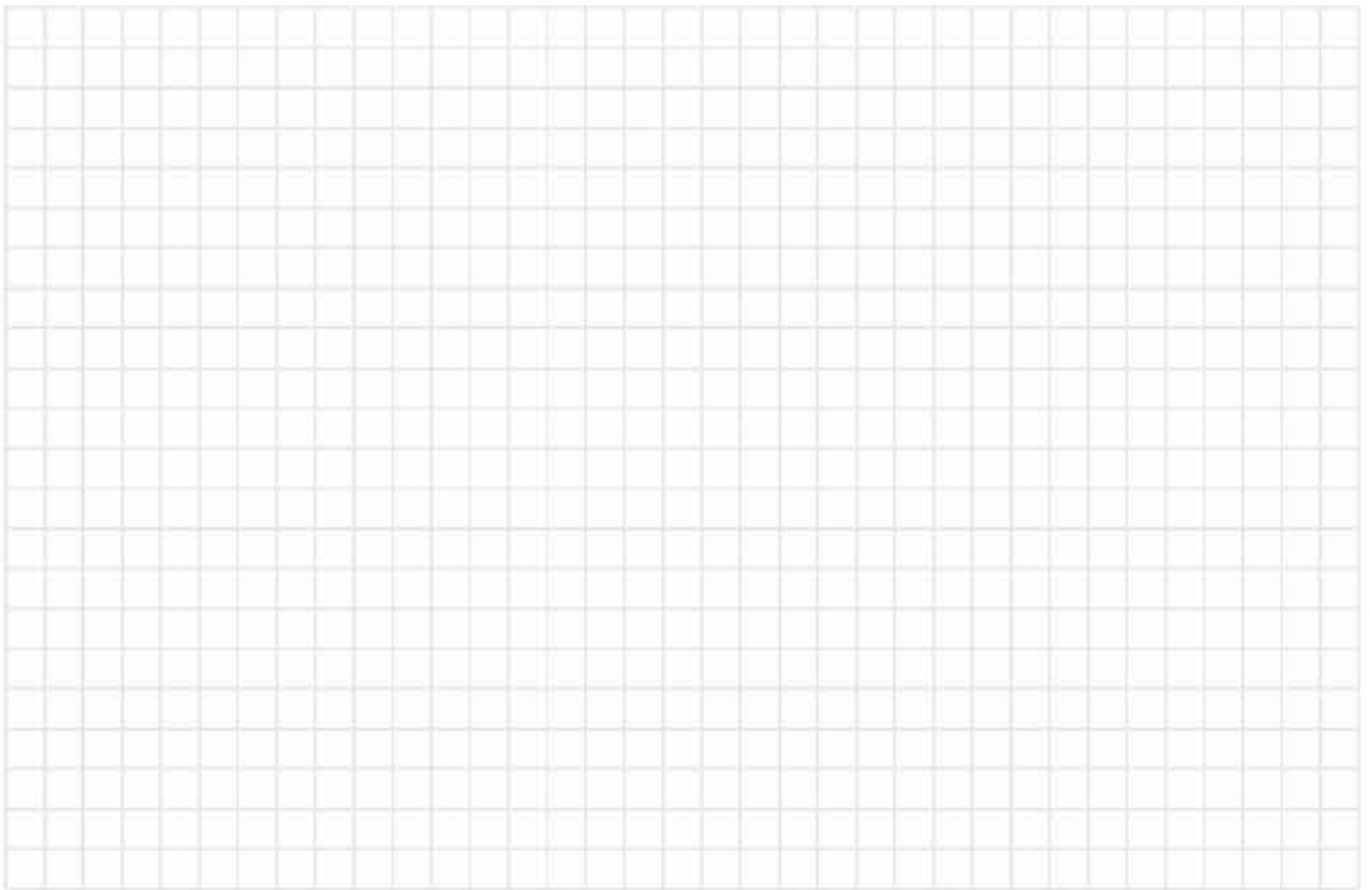
Value-added services

Complete thermal subassembly can provide a turn-key solution for your application, like: assembled on metall sheet implemented in plastic parts, special cable assemblies with connectors or others.



YOUR DESIGN

DRAWINGS:



Power/ Voltage: _____

Temp. Range: _____

Technology: _____

Special Remarks: _____

ADEO HEATPIPE



DISTRIBUTOR: