

STANDARD HEATER FOIL CATALOG

Version 2016/4

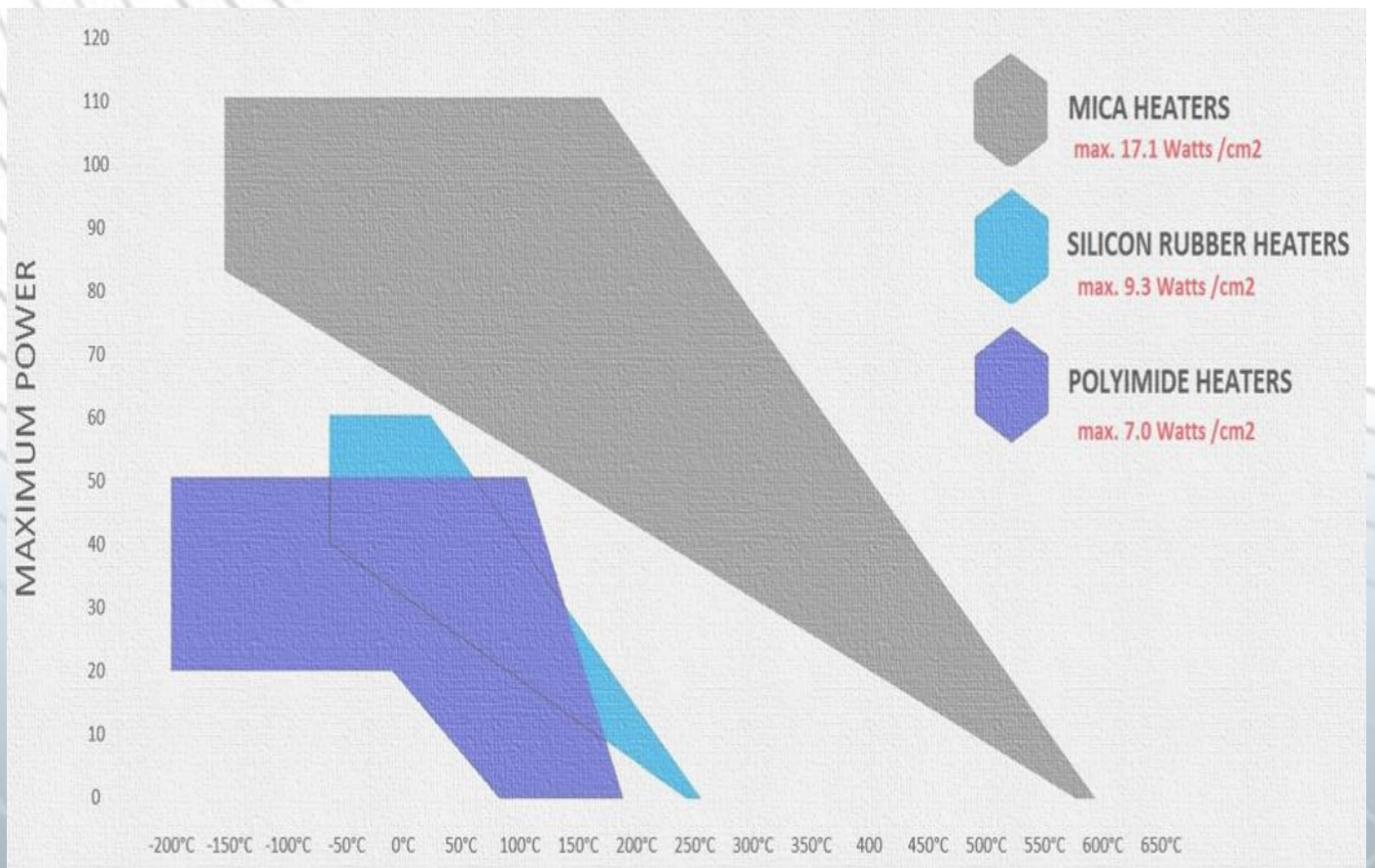


HEATER FOIL

ADEO HEATER FOIL

General Information

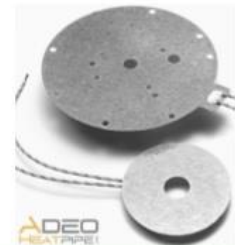
Power vs temperature basic evaluation overview:



ADEO HEATER FOIL

General Information

Overview of standard heater foil technologies by ADEO:



	Kapton	Silicon	MICA
Isolation:	Kapton (Polyimid)	Silicon Rubber	Mica
Temperature range:	-200 to +200°C	-45 to +235°C	-150 to +600°C
Material flexibility	High	Midle	Rigid
Max. resistance density	70 Ω/cm^2	31 Ω/cm^2	3.9 Ω/cm^2
Usual mounting system	Sticked	Sticked	Must be clamped
Resistance to most chemicals (acids and solvents)	Very good	Good	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 shape
- * internal or external adhesive for use to 150°C (302°F)
- * mostly adhesive used: acrylic pressure sensitive mounting adhesive (PSA)
- * resistant to most chemicals: acids and solvents
- * maximum Watts/cm²: ca. 7.0 (without PSA)

¹Kapton is a trade name of DuPont polyimide films.



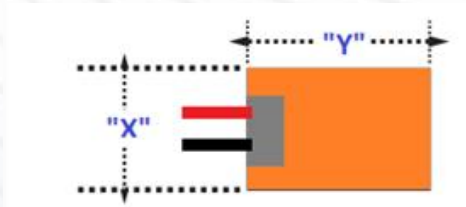
POLYIMIDE HEATERFOIL

(KAPTON¹ Heater Foil)

Standard ADEO heater foils

Specification:

Temperature range:	-35° to +160°C (optional -80°C to +220°C)
If adhesive:	Acrylic pressure sensitive mounting adhesive (PSA, 3M9485)
Max. res. destiny:	70 Ω/cm^2 (without PSA)
Material:	Polyimide/Kapton, thin, semitransparent, excellent dielectric
Heater:	Etched Cu-foil
Cable length:	typ. 300mm, PTFE, without connector



Type	Size X [mm]	Size Y [mm]	Voltage [V]	Power [W]	Resistance [Ohm]	Order number [PN]
Polyimide Kapton	25	50	28	10.00	78.50	HFP/25-50-28/10 PSA
			24	7.35		
			12	1.80		
Polyimide Kapton	25	75	28	15.00	52.00	HFP/25-75-28/15 PSA
			24	11.00		
			12	2.75		
Polyimide Kapton	39.4	77.5	32	26.00	39.50	HFP/39-77-32/26 PSA
			24	14.60		
			12	3.65		

POLYIMIDE HEATERFOIL

(KAPTON¹ Heater Foil)

Standard ADEO heater foils

Type	Size X [mm]	Size Y [mm]	Voltage [V]	Power [W]	Resistance [Ohm]	Order number [PN]
Polyimide Kapton	50	50	115	20.00	661.25	HFP/50-50-115/20 PSA
			32	1.55		
			24	0.80		
Polyimide Kapton	50.8	101.6	32	48.00	21.35	HFP/50-101-32/48 PSA
			24	27.00		
			12	6.75		
Polyimide Kapton	75	75	115	45.00	295	HFP/75-75-115/45 PSA
			32	3.45		
			24	1.95		
Polyimide Kapton	100	100	115	80.00	165	HFP/100-100-115/80 PSA
			32	6.20		
			24	3.45		
Polyimide Kapton	101.6	177.8	24	52.00	11.25	HFP/101-177-24/52 PSA
			12	13.00		
			5	2.25		
Polyimide Kapton	101.6	203.2	115	160.00	82.70	HFP/101-203-115/160 PSA
			32	12.35		
			24	6.95		
Polyimide Kapton	115	26	24	20.00	28.80	HFP/115-26-24/20 PSA
			12	5.00		
			5	0.85		
Polyimide Kapton	200	200	230	20.00	2645	HFP/200-200-230/20 PSA
			115	5.00		

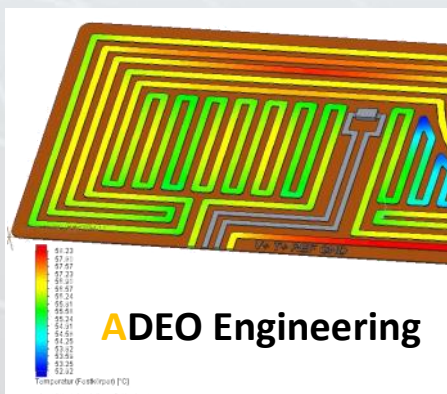
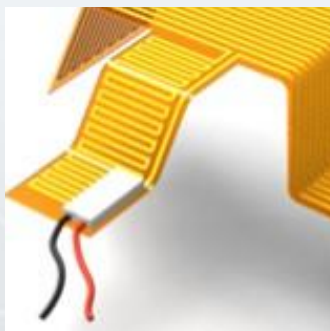
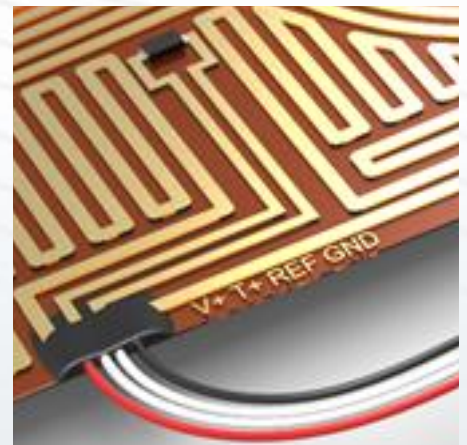
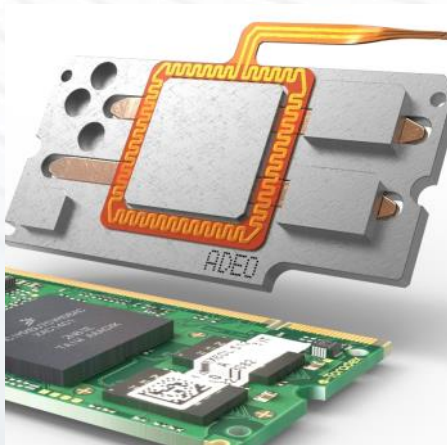
POLYIMIDE HEATERFOIL

(KAPTON¹ Heater Foil)

customized ADEO heater foils

Specification:

- Temperature range: can be adjusted by selection of PSA and/or mounting
- Shape: low cost by kiss-cut, complex shape by laser-cut, bending
- Layers: with aluminum foil inlay, assembling as heat spreader
- Sensors: 4 wire heaters with NTC, PTC and/other SMT or THT parts
- Cables: including connectors, length, protections, crimped parts
- Engineering: Thermal engineering support by CFD simulation (Joule heating)



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 applications.

Features:

- * This construction provides high reliability in a wide range of ruggedized industrial heating applications
- * Parts can be added by waterproof vulcanization process
- * Very good temperature properties
- * Maximum Watts/cm²: ca. 9.3



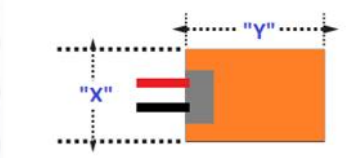
SILICONE HEATER FOIL

(RUBBER Heater Foil)

Standard ADEO heater foils

Specification:

Temperature range:	-50°C to +235°C
Adhesive:	Standard with adhesive PSA , (no PSA on request)
Material:	Fiberglass reinforced silicon rubber.
Cable length:	300mm standard, without connector.



Type	Size X [mm]	Size Y [mm]	Voltage [V]	Power [W]	Order number [PN]
Silicone	10	50	28	18	HFS/10-50-28/18 PSA
Silicone	10	100	28	10	HFS/10-100-28/10 PSA
Silicone	25	25	28	10	HFS/25-25-28/10 PSA
Silicone	25	75	28	15	HFS/25-75-28/15 PSA
Silicone	25	125	115	25	HFS/25-75-115/25 PSA
Silicone	75	75	115	45	HFS/75-75-115/45 PSA
Silicone	75	125	115	75	HFS/75-125-115/75 PSA
Silicone	100	100	115	308	HFS/100-100-115/308 PSA
Silicone	100	200	115	160	HFS/100-200-115/160 PSA

MICA HEATER FOIL

(GLIMMER Heater Foil)

General Information

Description:

Mica heaters is build by an etched foil element, sandwiched between layers of mica.

The unique technical point of MICA heaters is: they provide the best temperature and wattage capability for fast warm up.

Features:

- * Temperature range of -150°C to +600°C
- * highest watt density capability
- * Cooling or better heat inducting is a important issue to this heater technology
- * Because of mechanical issues - big sizes are not very common
- * Maximum Watts/cm²: ca. 17.0



MICA HEATER FOIL

(GLIMMER Heater Foil)

Standard ADEO heater foils

Specification:

Temperature range:	-150°C to +600°C
Material:	MICA, diameter are punched shape (tool)
Adhesive:	None, standard without PSA (adhesive)
Mounting:	High pressure in mounting needed, no bending possible
Cable:	PTFE, or high temperature textile cable, without connector

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

Type	Size X [mm]	Size Y [mm]	Voltage [V]	Power [W]	Order number [PN]
MICA	25	100	22	21.2	HFM/25-100-22/21 000
MICA	50	200	18	24	HFM/50-100-18/24 000
MICA	76	200	18	46.3	HFM/76-200-18/46 000
MICA	200	200	18	42.5	HFM/200-200-18/42 000
Type	Dia. [inch]	Dia. [mm]	Voltage [V]	Power [W]	Order number [PN]
MICA	2	50	22	18.3	HFM/dia-50-22/18 000
MICA	3	76	18	21.4	HFM/dia-76-18/21 000
MICA	4	100	18	54.8	HFM/dia-100-18/54 000
MICA	6	150	18	63.2	HFM/dia-150-18/63 000

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 on 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 can not be held responsible on damaging any equipment by using our standard foils.



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

<u>HFP</u>	/	<u>---</u>	-	<u>---</u>	-	<u>---</u>	/	<u>---</u>	<u>PSA</u>	<u>CM</u>
<u>Technologie</u>		<u>Lenght (mm)</u>		<u>Width (mm)</u>		<u>Voltage</u>		<u>Watt</u>	<u>Adhesive</u>	<u>shape/specs</u>
HFP <i>Polyimide (Kapton)</i>						12			<i>PSA = 3M9485</i>	<i>custom-made</i>
HFS <i>Silicone (Rubber)</i>						24			<i>000 = none</i>	
HFM <i>Mica</i>										

- pls consider power loss on cable, adhesive and mounting driven factors
- custom-made details are preferred defined by specification (Watt, Voltage) and the shape by drawings, dwg, dxf

CUSTOMIZED HEATER

Thermofoil heaters give you design options that other heater types can't match. ADEO's custom design options can be quantified into three sections.

Element design:

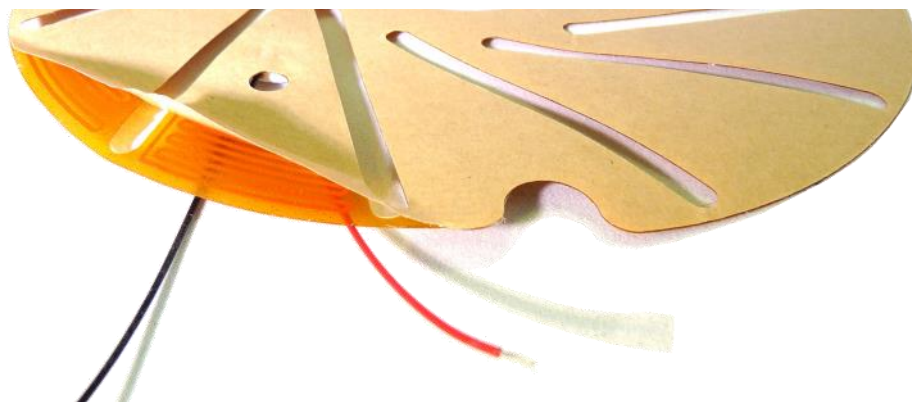
Element patterns, outline shapes, heat profiles and terminations can be fine-tuned to create the exact thermal and physical component to fit your unique requirements. Get more information below.

Integrated components:

Integrating temperature sensors directly into the Thermofoil heater improves your thermal control while at the same time simplifying the end-use assembly operation.

Value-added services:

Complete thermal sub-assembly can provide a turnkey solution for your application. This could entail factory mounting of heaters to fabricated heat sinks, SMT control electronics to the Thermofoil heaters, incorporated rigid multi-layer flex circuits and connector termination



YOUR DESIGN

DRAWING / DRAFT:

POWER:

TEMP. RANGE:

SURFACE TREATMENT:

SPECIAL REMARKS:



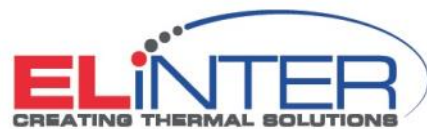
NOTES



ADEO HEATPIPE



Your local partner:



ELiNTER AG • Electronic International

Hinterbergstrasse 9 • CH-6330 Cham

Tel. +41 41 748 32 20

Fax. +41 41 748 32 10

www.elinter.ch