



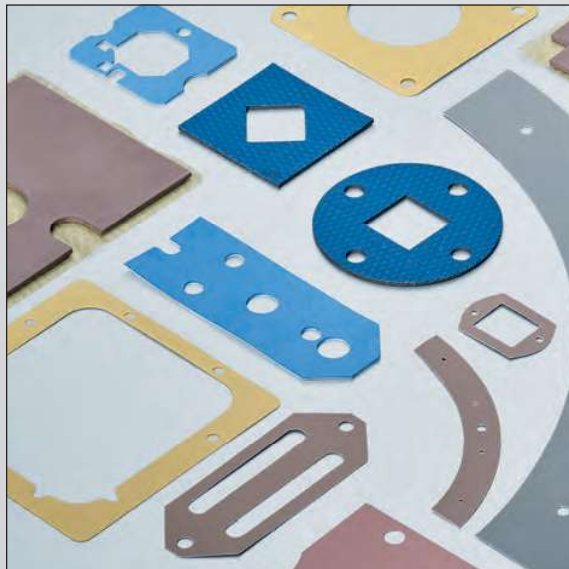
Thermal contact materials

- aluminium oxide-, Kapton- and mica discs
- high dielectric strength at very good thermal conductivity
- best mechanical properties
- easy and clean handling
- wide operating temperature range
- cuts and special designs acc. to customer's requirement



Thermal conductive materials

- with high long-term stability and thermal conductivity
- smallest heat transfer resistances
- excellent compensation of unevennesses
- electrical conductive and insulating
- as sheet material or rolled goods
- customised cuts by means of 24 h sample delivery service



Innovative thermal conductive foils

- very good thermal properties
- silicone containing and silicone-free versions
- optimal contacting between device and heat sink
- easy fitting by means of adhesive coating
- 24 h sample cut service
- individual cuts according to customer specifications



Efficient thermal conductive materials

- fluid GEL thermal conductive material, thermal conductive paste and glue
- optimum balance of roughnesses and unevennesses
- good performance and processing properties
- automatic dispensable
- containing silicone and silicone-free
- other packaging sizes and container types upon request

A

Thermal conductive foils for semiconductors

B

– other thermal conductive materials and cuts according to to customer's specifications

C

art. no.	thermal conductivity [W/m·K]	material thickness [mm]	type
WFQ 25 ...	2.5	0.152	aluminium foil
WLFG 9010 ...	5.5	0.150	graphite foil
WLFG 9015 ...	6.0	0.200	
WLFG 9020 ...	4.0	0.250	
WLFG S 900 K	7.5	0.175	
FSF 15 P 011	1.5	0.114	phase-change thermal conductive foil
FSF 15 P 012	1.5	0.127	
FSF 15 P 014	1.5	0.140	
FSF 20 P	2.0	0.200	

D

Order example

E

WLFG 9010	54 x 94
Thermally conductive foil	dimension

F

G

H

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M

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IGBT

dimension [mm]	blanks	manufacturer	component
34 x 94		Infineon MCC IXYS Semikron	Int-A-Pak (New) / 34mm modules MF ... F2 / MT ... T2 / MD ... D2 Y4-M6 SEMITRANS 2 / SEMIPACK 2
45 x 108		Infineon IXYS	Econo 2 / Econo PIM 2 / Econo PACK 2 / Econo BRIDGE / Iso PACK 2 E2-Pack
54 x 94		Infineon MCC IXYS Semikron	MTC / Iso PACK 54 MD ... M3 / MD ... M5 PWS-E Flat / PWS-E SEMIPOINT 4
62 x 107		Infineon MCC IXYS Semikron	Dual Int-A-Pak / 62 mm modules MT ... L2 E3-Pack SEMITRANS 3 / SEMITRANS 4
62 x 122		Infineon IXYS Semikron	Econo 3 / Econo DUAL + / Econo PIM 3 / Econo PACK 3 SimBus F SEMIX 3p / SEMIX 3lp
73 x 140		Infineon	IHV
130 x 140		Infineon	IHM / IHV
140 x 190		Infineon	IHM / IHV

A

Thermal conductive foils for semiconductors

B

DC/DC converter

dimension [mm]	blanks	component
36.9 x 58		Micro DC/DC-converter
55.9 x 58		Mini DC/DC-converter
55.9 x 117		Maxi DC/DC-converter

D

E

F

Solid State Relais

dimension [mm]	blanks	component
45 x 57		SSR 1
73.5 x 104.5		SSR 2
17 x 38.1		SSR 3
34 x 94		SSR 4

G

H

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Thermal conductive foils for LED

– other thermal conductive materials and cuts according to customer's specifications

art. no.	thermal conductivity [W/m·K]	material thickness [mm]	type
WFQ 25 ...	2.5	0.152	aluminium foil
WLFG 9010 ...	5.5	0.150	graphite foil
WLFG 9015 ...	6.0	0.200	
WLFG 9020 ...	4.0	0.250	
WLFG S 900 K	7.5	0.175	
WLFT 404	0.4	0.127	double-sided adhesive thermal conductive foil
WLFT 405	0.5	0.150	
WLFT 8805	0.6	0.130	
WLFT 8810	0.6	0.250	
WLFT 8815	0.6	0.380	
WLFT 8820	0.6	0.500	
WLFT 8926	1.5	0.2 / 0.25 / 0.5	
WLFT 30	3.0	0.15 / 0.23	one-side adhesive thermal conductive foil
FSF 15 P 011	1.5	0.114	phase-change thermal conductive foil
FSF 15 P 012	1.5	0.127	
FSF 15 P 014	1.5	0.140	
FSF 20 P	2.0	0.200	

Order example

WLFT 8810	20 x 24
Thermally conductive foil	dimension

A

Thermal conductive foils for LED

B

C

D

E

F

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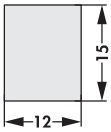
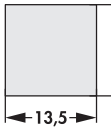
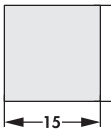
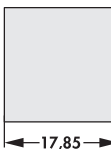
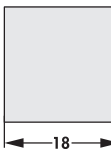
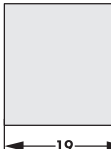
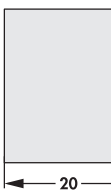
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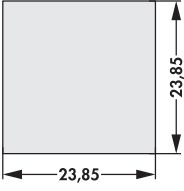
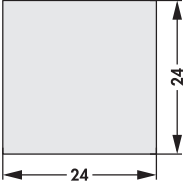
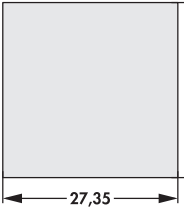
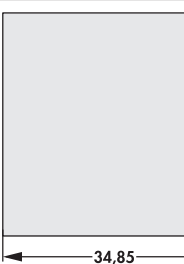
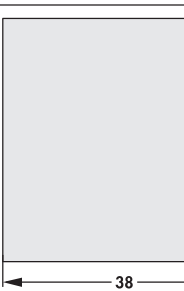
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L

M

dimension [mm]	blanks	manufacturer	LED package
12 x 15		Lumileds Luxeon Sharp Nichia LG Innotec	CoB 1202S Mini ZENIGATA / GW6BMG / GW6BGG / GW6BMW / GW6BGW / GW6NGW NTCWT / NTCWS / NVNWS / NJCWS LEMWM12480 / LEMWM12490
13.35 x 13.35		Cree Seoul Semiconductor	CXA13XX / CXB13XX SAW 806 / SAW810 / SAW906 / SAW910
13.5 x 13.5		Citizen	CLU026 / CLU027 / CLU028 / CLU700 / CLU701
15 x 15		Osram	Solericq P9
15.85 x 15.85		Cree	CXA15XX / CXB15XX
16 x 19		Lumileds Luxeon Nichia LG Innotec	CoB 1202 / CoB 1203 NFCWL / NVEWL / NVCWL LEMWM19480 / LEMWM19490 / LEMWM19680 / LEMWM19690
17.85 x 17.85		Cree	CXA18XX / CXB18XX
18 x 18		Osram	Solericq S13
19 x 19		Citizen Seoul Semiconductor	CLU036 / CLU038 / CLU710 / CLU711 / CLU720 / CLU721 SAW815 / SAW915
20 x 24		Lumileds Luxeon Sharp LG Innotec	CoB1204 / CoB1205 / CoB1208 Mini ZENIGATA / GW6DMB / GW6DGB / GW6DMC / GW6DGC / GW6DMD / GW6DGD / GW6DME / GW6DGE / GW6TGB / Tiger ZENIGATA / GW6TGC LEMWM24780 / LEMWM24790 / LEMWM24980 / LEMWM24990 / LEMWM24B80 / LEMWM24B90

N

dimension [mm]	blanks	manufacturer	LED package
23.85 x 23.85		Cree	CXA25XX / CXB25XX
24 x 24		Osram	Soleriq S19
27.35 x 27.35		Cree	CXA30XX / CXB30XX
28 x 28		Lumileds Luxeon Citizen Seoul Semiconductor LG Innotec	CoB 1211 CLU046 / CLU048 / CLU731 SAW822 / SAW922 LEMWM28D80 / LEMWM28D90 / LEMWM28E80 / LEMWM28E90
34.85 x 34.85		Cree	CXA35XX / CXB35XX / CXA2Studio
38 x 38		Citizen Seoul Semiconductor Nichia	CLU056 / CLU058 / CLU550 SAW833 / SAW933 NFEWH

A

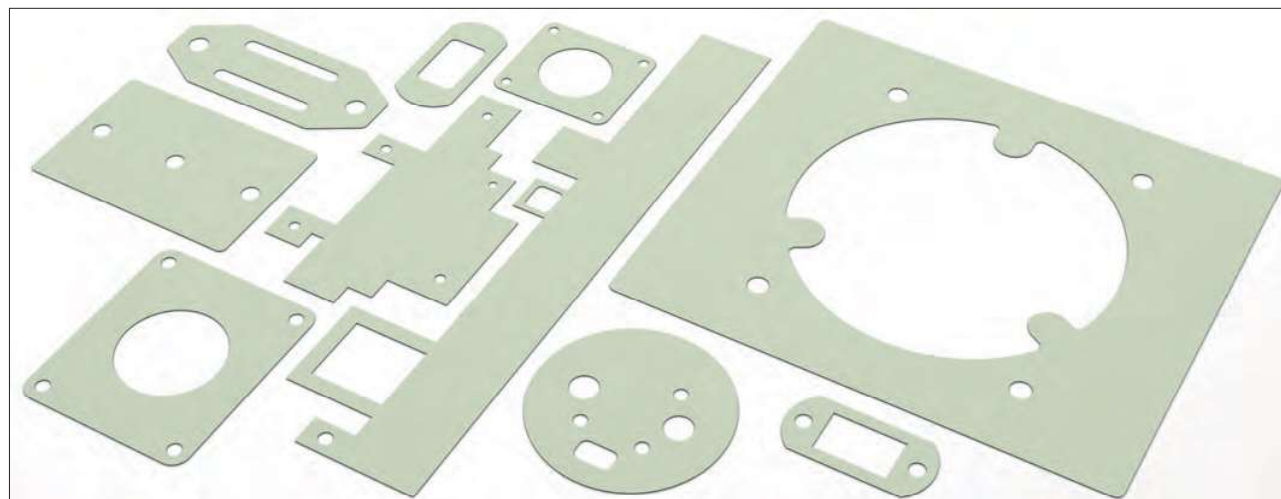
Thermally conductive foil made of siliconelastomer

B

C

D

E



- silicone foil with high temperature range
- self-adhesive properties
- high mechanical stability
- with adhesive coating and adhesive film upon request
- cuts and contours according to customer's drawing specifications

F

art. no.	material thickness [mm]	
WFK 18	0.225	
WFK 18 G 022		
	WFK 18	WFK 18 G 022
version	silicone foil without glass fibre reinforcement, one-sided protection foil	silicone foil with glass fibre reinforcement, one-sided protection foil
colour	lime-green	
hardness	65 - 75 Shore A	
thermal conductivity	1.8 W/m·K	
thermal resistance	0.32 K/W	0.5 K/W
temperature range	-60°C ... +250°C	
density	2,29 g/cm ³	
elongation	75 %	
volume resistance	2,5·10 ¹¹ Ω·m	
dielectric constant	2,9 [1 kHz]	
tensile strength	2 N/mm ²	7,5 N/mm ²
dielectric strength	8 kV	
class of inflammability	UL 94 V-0	
type of delivery	sheet material/ rolled goods/ cuttings on customer's requirements	

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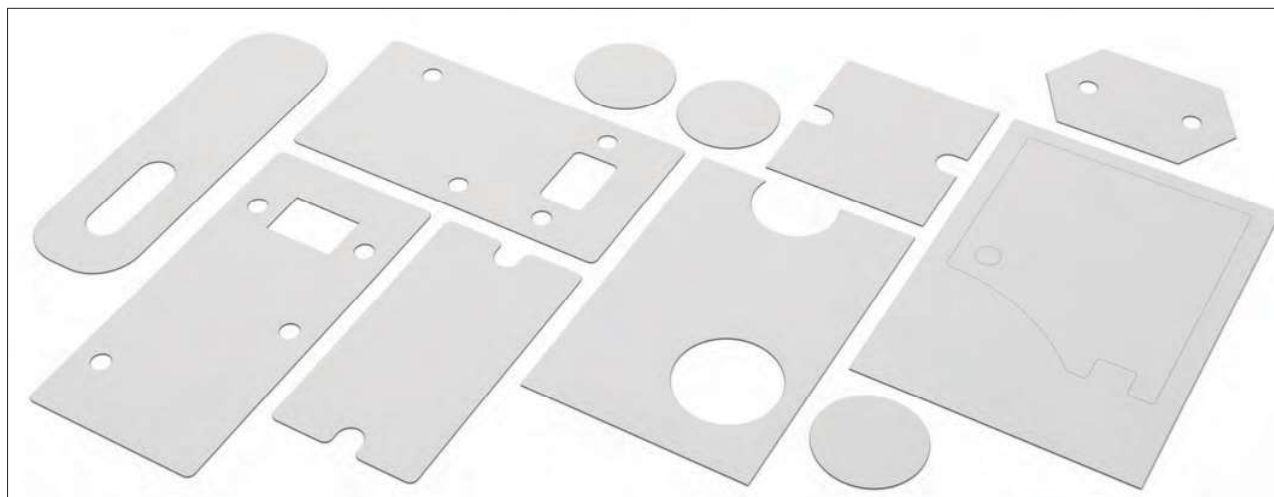
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Thermal resistances vs. contact pressure				
pressure [psi]	7.25	29	58	87
thermal resistance WFK 18 [K/W]	0.50	0.42	0.37	0.33
thermal impedance WFK 18 [K·cm ² /W]	1.75	1.38	1.25	1.18

L

M

N



- silicone foil with very good thermal properties
- good electrical insulation
- optionally with glass fibre reinforcement and adhesive coating
- easy handling and use
- cuts and contours according to customer's drawing specifications

art. no.	material thickness [mm]			
WFK 25	0.225			
WFK 25 G				
WFK 25 GK	0.250			
WFK 25 K				
	WFK 25	WFK 25 G	WFK 25 GK	WFK 25 K
version	silicone foil without glass fibre reinforcement, one-sided protection foil	silicone foil with glass fibre reinforcement, one-sided protection foil	silicone foil with glass fibre reinforcement and one-sided adhesive layer, one-sided protection foil	silicone foil without glass fibre reinforcement with one-sided adhesive layer, one-sided protection foil
colour	white			
hardness	70 - 80 Shore A			
thermal conductivity	2.5 W/m·K			
thermal resistance	0,22 K/W	0,25 K/W	0,3 K/W	0,265 K/W
temperature range	-60°C ... +250°C			
density	2,33 g/cm³			
elongation	31 %			
volume resistance	2,5·10 ¹¹ Ω·m			
dielectric constant	3 [1 kHz]			
tensile strength	1,5 N/mm²	7,5 N/mm²		1,5 N/mm²
dielectric strength	1,5 kV			
class of inflammability	UL 94 V-0			
type of delivery	sheet material/ rolled goods/ cuttings on customer's requirements			

Thermal resistances vs. contact pressure				
pressure [psi]	7.25	29	58	87
thermal resistance WFK 25 [K/W]	0.38	0.33	0.30	0.27
thermal impedance WFK 25 [K-cm ² /W]	1.13	1.00	0.92	0.83

A

Thermally conductive foil made of siliconelastomer

B

C

D

E

- silicone foil with very good thermal properties
- good electrical insulation
- optionally with glass fibre reinforcement and adhesive coating
- easy handling and use
- cuts and contours according to customer's drawing specifications

F

G

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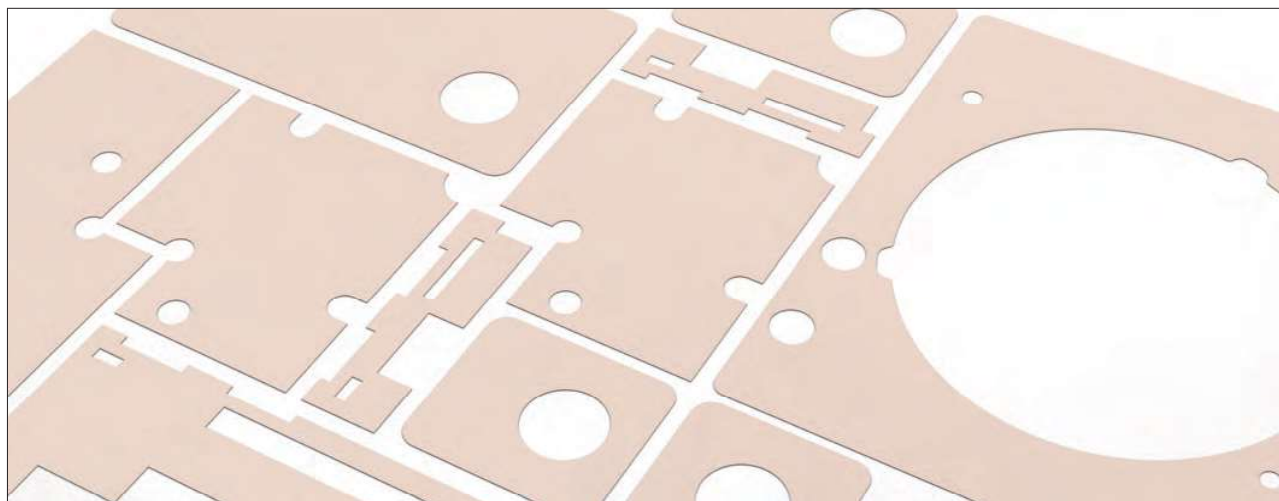
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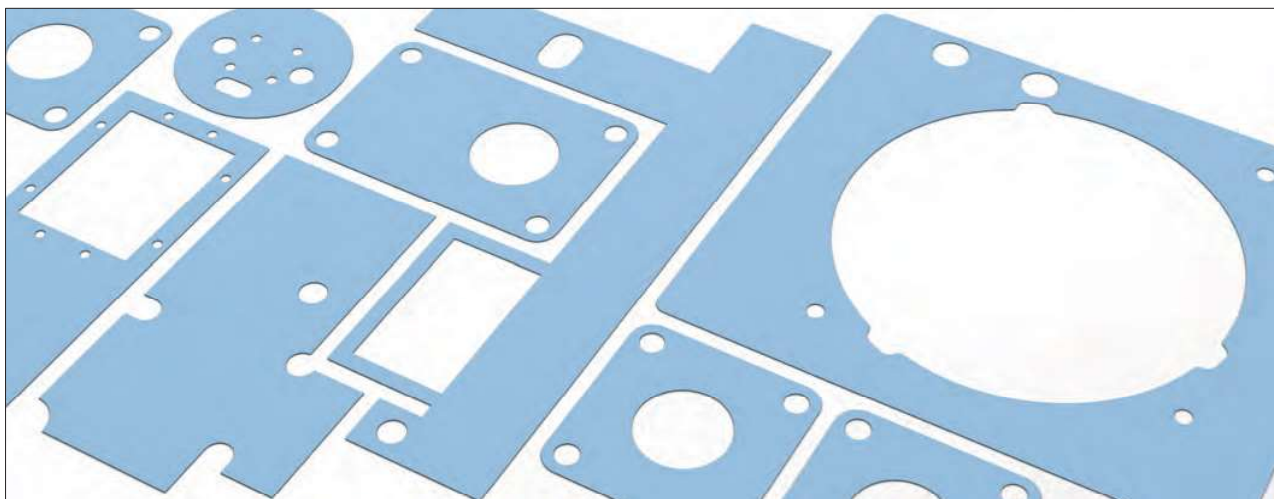
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art. no.	material thickness [mm]			
WFK 35 012	0.125			
WFK 35 022	0.225			
WFK 35 G	0.250			
WFK 35 GK				
WFK 35 K				
	WFK 35	WFK 35 G	WFK 35 GK	WFK 35 K
version	silicone foil without glass fibre reinforcement, one-sided protection foil	silicone foil with glass fibre reinforcement, one-sided protection foil	silicone foil with glass fibre reinforcement and one-sided adhesive layer, one-sided protection foil	silicone foil without glass fibre reinforcement with one-sided adhesive layer, one-sided protection foil
colour	pink			
hardness	70 - 80 Shore A			
thermal conductivity	3.5 W/m·K			
thermal resistance	0.16 K/W	0.22 K/W	0.27 K/W	0.26 K/W
temperature range	-60°C ... +250°C			
density	1,97 g/cm ³			
elongation	25 %			
volume resistance	1,3·10 ¹⁴ Ω·m			
dielectric constant	2,3 [1 kHz]			
tensile strength	1,3 N/mm ²	10 N/mm ²		1,3 N/mm ²
dielectric strength	1,5 kV			
class of inflammability	UL 94 V-0			
type of delivery	sheet material/ rolled goods/ cuttings on customer's requirements			

Thermal resistances vs. contact pressure				
pressure [psi]	7.25	29	58	87
thermal resistance WFK 35 [K/W]	0.25	0.21	0.17	0.15
thermal impedance WFK 35 [K·cm ² /W]	0.94	0.81	0.75	0.56



- silicone foil ceramic filled
- very good mechanical properties
- high thermal conductivity for smallest heat transfer resistances
- adhesive coating for easy handling
- cuts and contours according to customer's drawing specifications

art. no.	material thickness [mm]
WFK 60 01	0.100
WFK 60 02	0.200
WFK 60 03	0.300
WFK 60 K	0.225

	WFK 60	WFK 60 K
version	silicone foil without glass fibre reinforcement, one-sided protection foil	silicone foil with adhesive layer, one-sided protection foil
colour	light blue	
hardness	70 - 85 Shore A	
thermal conductivity	6 W/m·K	
thermal resistance	0,082 K/W	
temperature range	-40°C... +125°C	
density	1,46 g/cm ³	
elongation	150 %	
volume resistance	2·10 ¹¹ Ω·m	
dielectric constant	3,1 [1 kHz]	
tensile strength	2 N/mm ²	
dielectric strength	4 kV	
class of inflammability	UL 94 V-0	
type of delivery	sheet material/ rolled goods/ cuttings on customer's requirements	

Thermal resistances vs. contact pressure				
pressure [psi]	7.25	29	58	87
thermal resistance WFK 60 [K/W]	0.24	0.16	0.12	0.09
thermal impedance WFK 60 [K·cm ² /W]	0.88	0.56	0.38	0.31

A

Thermally conductive foil made of siliconelastomer

B

C

D

E

- silicone foil with excellent thermal conductivity
- very good electrical properties
- adhesive coating for easy assembly handling
- particularly suitable for high-performance applications
- cuts and contours according to customer's drawing specifications

F

art. no.	material thickness [mm]	
WFK 65	0.250	
WFK 65 K	0.275	
	WFK 65	WFK 65 K
version	silicone foil without glass fibre reinforcement, one-sided protection foil	silicone foil with adhesive layer, one-sided protection foil
colour	red	
hardness	60 - 70 Shore A	
thermal conductivity	6,5 W/m·K	
thermal resistance	0,09 K/W	
temperature range	-40°C... +200°C	
density	1,23 g/cm ³	
elongation	2 %	
volume resistance	2·10 ¹⁴ Ω·m	
dielectric constant	2,4 [1 kHz]	
tensile strength	13 N/mm ²	
dielectric strength	1 kV	
class of inflammability	UL 94 V-0	
type of delivery	sheet material/ rolled goods/ cuttings on customer's requirements	

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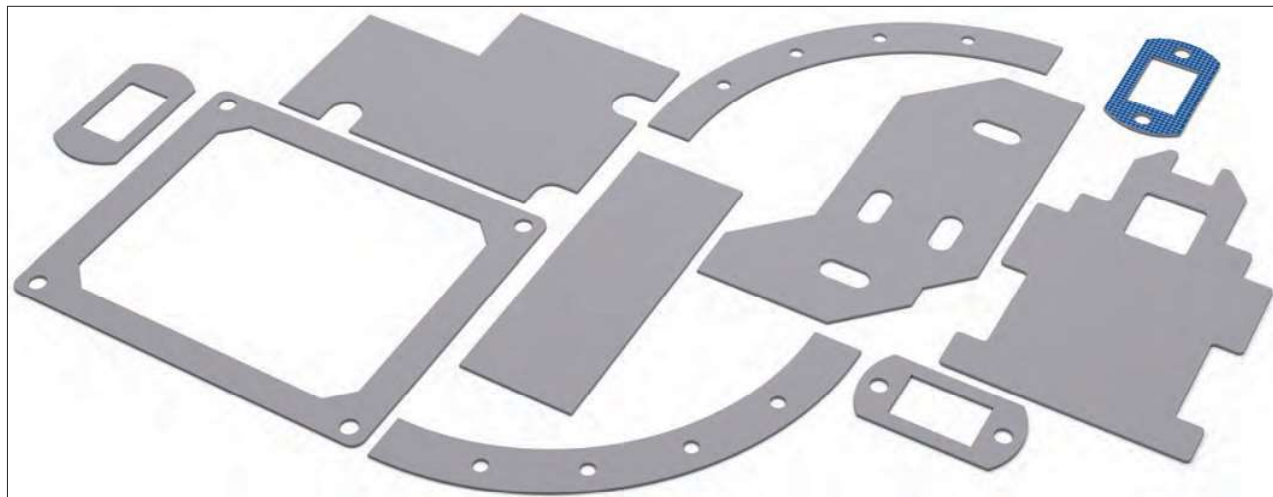
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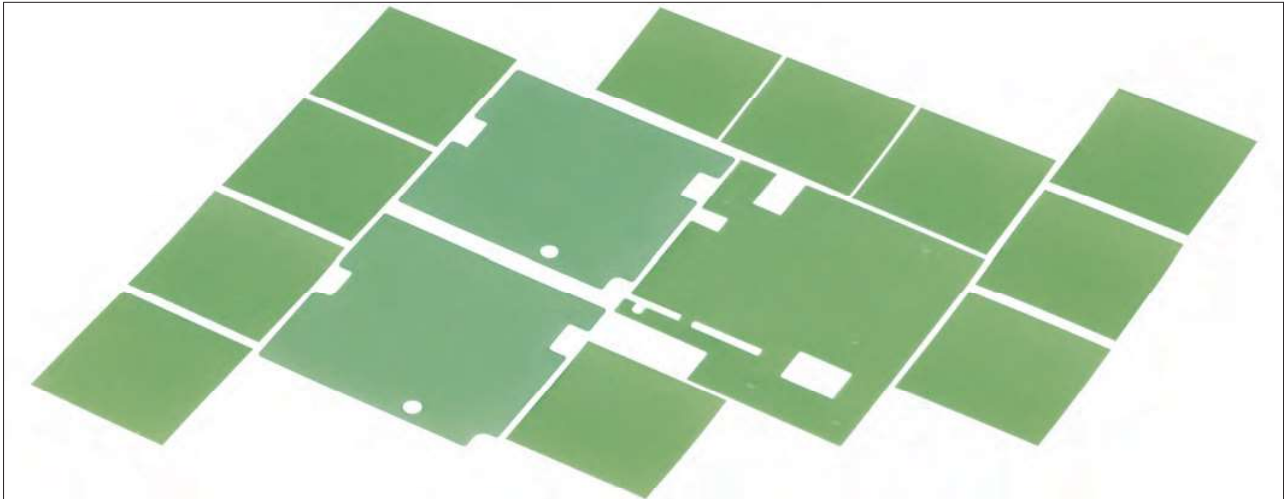
Thermal resistances vs. contact pressure				
pressure [psi]	7.25	29	58	87
thermal resistance WFK 65 [K/W]	0.18	0.12	0.10	0.08
thermal impedance WFK 65 [K·cm ² /W]	0.68	0.50	0.39	0.31

L

M

N





- one-side adhesive thermal conductive foil
- glass fibre reinforced design
- very good thermal conductivity
- simple handling and mounting
- cuts and contours according to customer's drawing specifications

art. no.	material thickness [mm]	
WLFT 30 015	0.15	
WLFT 30 023	0.23	
	WLFT 30 015	WLFT 30 023
version	silicone foil with glass fibre reinforcement	
colour	green	
hardness	80 Shore A	
thermal conductivity	3 W/m·K	
temperature range	-60°C ... +200°C	
elongation	5 %	
volume resistance	>10 ¹¹ Ω·cm	
dielectric constant	6.1 [1 kHz]	
tear strength	1 N/mm ²	
dielectric strength	4 kV	6 kV
class of inflammability	UL 94 V-0	
type of delivery	plates, usable area 300x200mm	

A

Thermally conductive foil both sides adhesive

B

C

D

E

- double-sided adhesive thermal conductive foil
- excellent adhesive properties on different materials
- filling material with ceramic particles
- very good thermal conductivity and technical performance
- cuts and contours according to customer's drawing specifications

F

art. no.	type of delivery		
WLFT 8926 02	plates, usable area 300x200mm		
WLFT 8926 025			
WLFT 8926 05			
	WLFT 8926 02	WLFT 8926 025	WLFT 8926 05
version	double sided adhesive, filled acrylic polymer		
material thickness	0.2 mm	0.25 mm	0.5 mm
filling material	ceramic		
protection cover	silicone treated polyester		
colour	yellowish white		
thermal conductivity	1.5 W/m·K		
specific thermal resistance	8.49 °C cm ² /W	8.74 °C cm ² /W	9.7 °C cm ² /W
temperature range	permanent up to 80°C		
peel strength at RT 70°C and 72 h	15 N/cm		
dielectric strength	15 kV/mm		
class of inflammability	UL 94 V-0		

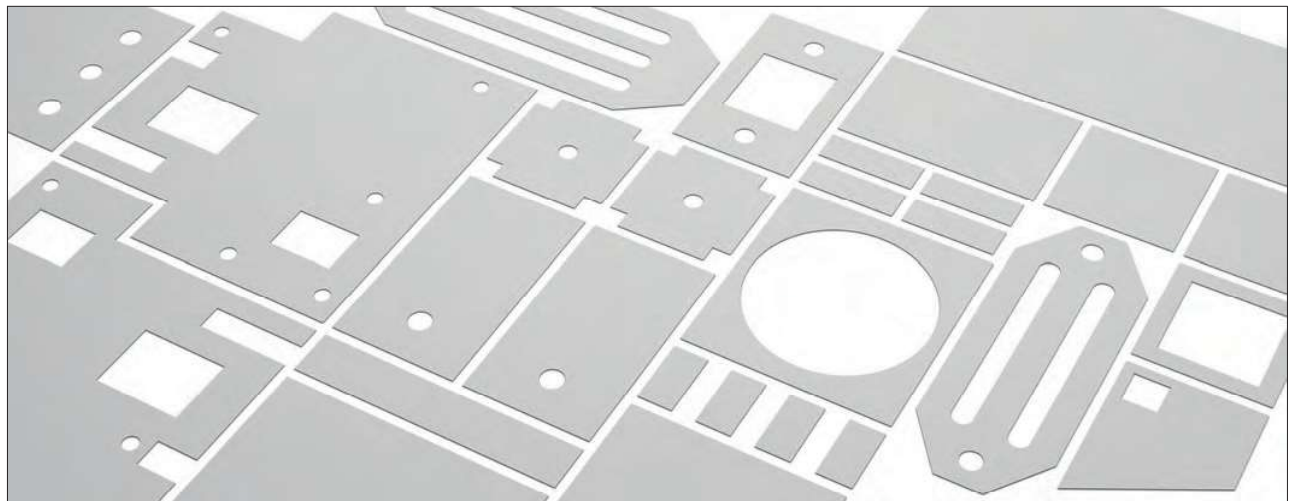
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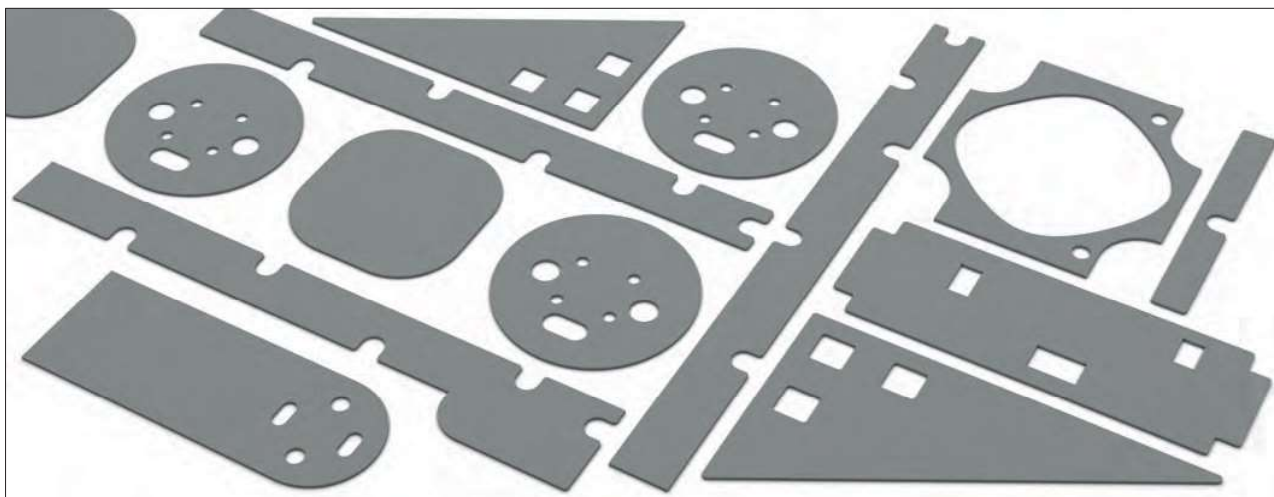
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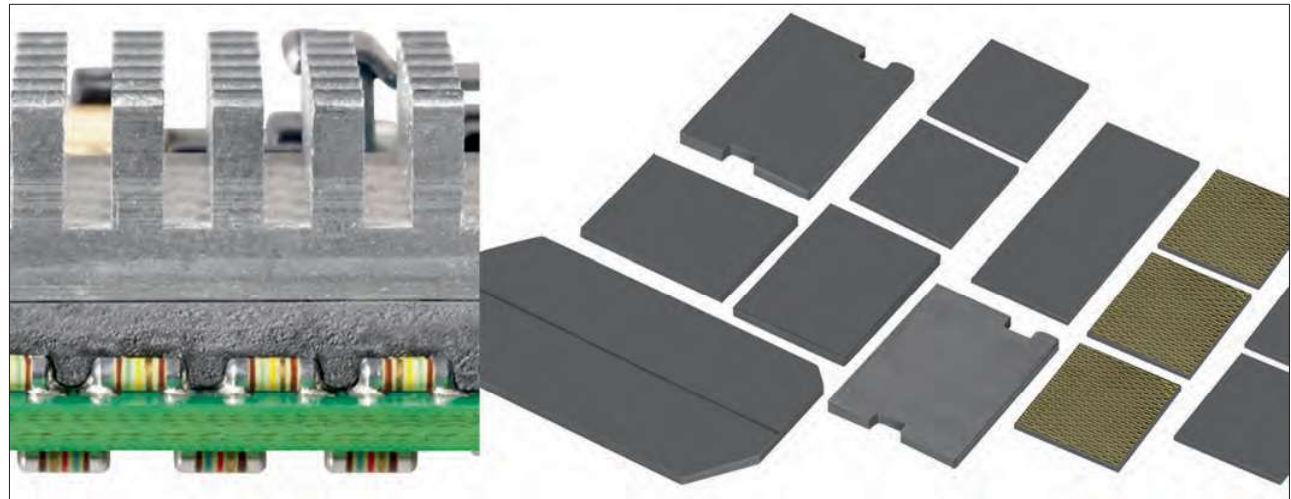


- silicone-free thermal conductive foil
- particularly suitable for silicone-free applications
- very good thermal and mechanical properties
- high electrical insulation
- cuts and contours made of sheet or roller material according to your specifications

art. no.	material thickness [mm]
WFKF 20 05	0.5
WFKF 20 10	1.0
WFKF 20	
version	silicone-free foil without glass fibre reinforcement
colour	grey
density	1,5 g/cm ³
hardness	55 - 65 Shore 00
thermal conductivity	2 W/m·K
thermal resistance	0.6 K/W
temperature range	-40°C ... +130°C
volume resistance	5,3·10 ⁹ Ω·m
dielectric constant	5.6 [1 KHz]
	244 g/cm ²
tensile strength	18 kN/m
dielectric strength	7 kV
type of delivery	sheet material/ rolled goods/ cuttings on customer's requirements
class of inflammability	UL 94 V-0

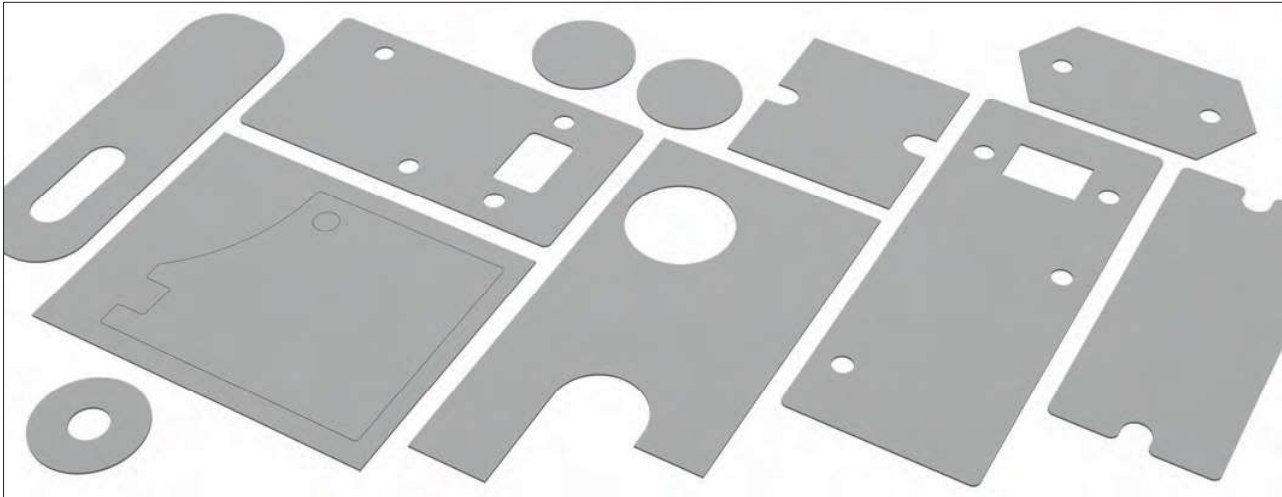
Thermal resistances vs. contact pressure				
pressure [psi]	0	14.50	29	43.51
thermal resistance WFKF 20 05 [K/W]	0.60	0.56	0.53	0.50
thermal impedance WFKF 20 10 [K/W]	1.31	1.20	0.98	0.89

Gel thermal conductive foils for extreme compression



- specially soft design
- levels smallest air gaps and unevennesses
- cuts and contours with cutouts according to customer's specifications

art. no.	material thickness [mm]	R_{th} (100 kPa) [°C in ² /W]	R_{th} (100 kPa) [°C cm ² /W]
GEL 28 S 10	1.0 ±0.15	0.42	2.7
GEL 28 S 15	1.5 ±0.20	0.60	3.9
GEL 28 S 20	2.0 ±0.30	0.76	4.9
GEL 28 S 25	2.5 ±0.30	0.90	5.8
GEL 28 S 30	3.0 ±0.30	1.02	6.6
GEL 28 S 35	3.5 ±0.35	1.15	7.4
GEL 28 S 40	4.0 ±0.40	1.27	8.2
GEL 28 S 45	4.5 ±0.45	1.45	9.4
GEL 28 S 50	5.0 ±0.50	1.64	10.6
GEL 28 S			
version	standard		
colour	grey		
density	2.6 g/cm ³		
hardness	9 ASKERC		
thermal conductivity	2.8 W/m·K		
temperature range	-40°C... +150°C		
volume resistance	1·10 ¹¹ Ω·m		
dielectric constant	7.21 [50 Hz] / 6.73 [1 kHz] / 6.25 [1 MHz]		
dielectric loss factor	0.059 [50 Hz] / 0.031 [1 kHz] / 0.007 [1 MHz]		
dielectric strength	18 kV/mm		
type of delivery	on both sides covered with protective foil/ plates, usable area 300x200mm/ other dimensions upon request		
class of inflammability	UL 94 V-0		



- silicone-free thermal conductive foil
- very good balance of unevennesses
- excellent thermal performance
- natural adhesive coating
- cuts and contours according to customer's drawing specifications

art. no.	material thickness [mm]
WFGF 30 025	0.254
WFGF 30 04	0.406
WFGF 30 058	0.584
WFGF 30 076	0.762
WFGF 30 10	1.016
WFGF 30 15	1.524
WFGF 30 20	2.032
WFGF 30 25	2.540
WFGF 30 31	3.175

WFGF 30	
version	silicone-free foil, one-sided protection foil
colour	light gray
density	3.2 g/cm ³
hardness	70 Shore 00
thermal conductivity	3 W/m·K
temperature range	-40°C... +125°C
volume resistance	1·10 ¹¹ Ω·m
dielectric constant	8 [1 kHz]
dielectric strength	6 kV
type of delivery	plates, usable area 457 x 228 mm/ cuttings on customer's requirements
class of inflammability	UL 94 V-0

Phase Change thermal conductive material

- phase change material on a polyimide basis
- very good thermal properties
- easy handling and high dielectric strength
- particularly suitable for the application of spring clips
- cuts and contours upon customised drawing specifications

art. no.	material thickness [mm]
FSF 16 P 010	0.102
FSF 16 P 011	0.114
FSF 16 P 012	0.127
FSF 16 P	
version	electrically insulating phase change material with polyimide reinforcement
colour	green
phase change temperature	55 °C
thermal conductivity	1.6 W/m·K
temperature range	-40°C... +150°C
elongation	40 %
volume resistance	10 ¹² Ω·m
dielectric constant	4,5 [1 kHz]
tear strength	7,000 psi
dielectric strength	5 kV
type of delivery	sheet material/ rolled goods/ cuttings on customer's requirements
class of inflammability	UL 94 V-0

Thermal resistances vs. contact pressure					
pressure [psi]	10	25	50	100	200
thermal resistance FSF 16 P 010 [K/W]	0.95	0.94	0.92	0.91	0.90
thermal resistance FSF 16 P 011 [K/W]	1.19	1.17	1.16	1.14	1.12
thermal resistance FSF 16 P 012 [K/W]	1.38	1.37	1.35	1.33	1.32
thermal impedance FSF 16 P 010 [K-cm²/W]	0.81	0.81	0.75	0.75	0.75
thermal impedance FSF 16 P 011 [K-cm²/W]	1.06	1.00	1.00	1.00	0.93
thermal impedance FSF 16 P 012 [K-cm²/W]	1.18	1.18	1.18	1.12	1.12



Thermally conductive adhesive

- space networking thermal conductive glue made on silicone basis
- very good thermal conductivity
- mixing in ration 1:1 with static mixing tube
- hardening will be proceeded at room temperature
- wide range of temperatures
- store cool, dark and dry



art. no.	basin	contents of delivery
WLK SK 50	cartridge	1x 50 ml cartridge / 3x mixer WLK M50
WLK SK 50		
version	2-component silicone thermal adhesive	
colour	violet	
density	2.8 g/cm ³	
hardness	65 Shore A	
thermal conductivity	2 W/m·K	
temperature range	-60°C... +180°C	
working life at room temperature	approx. 30 min	
hardening time	25°C approx. 8 h / 50°C approx. 4 h / 85°C approx. 1 h	
volume resistance	10 ¹¹ Ω·m	
dielectric constant	6.9 [1 KHz]	
heat capacity	1 J/g·K	
dielectric strength	10.8 kV/mm	
Scherfestigkeit bei RT	1.4 MPa	
class of inflammability	UL 94 V-0	

Accessories

art. no.	contents of delivery
WLK P	1x applicator gun for 50 ml cartridge

A

B

C

D

E

F

G

H

I

K

L

M

N