

PRODUCT CATALOGUE 2019

/ THERMAL INTERFACE
MATERIALS /

CREATING DIMENSIONS

An aerial photograph of a city grid, showing streets and buildings from a high angle. A white rectangular box is overlaid on the left side of the image, containing the title text.

PRODUCT CATALOGUE **2019**

/ THERMAL INTERFACE
MATERIALS /

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HEATPIPES & CFD SIMULATION

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12	DR. BREIER CONSULTING. CFD Simulation

THERMAL INTERFACE MATERIALS

	Material	Product Code	Insulating	Conductivity
13	1 GAP FILLER			W/mK
14	Silicone Gap Filler / soft	TGF-C-SI	■	1.5
15	Silicone Gap Filler / soft	TGF-M-SI	■	2.5
16	Silicone Gap Filler / soft	TGF-R-SI	■	3.0
17	Silicone Gap Filler / soft	TGF-U-SI	■	4.5
18	Silicone Gap Filler / soft	TGF-V-SI	■	5.0
19	Silicone Gap Filler / soft	TGF-W-SI	■	6.0
20	Silicone Gap Filler / soft	TGF-Z-SI	■	11
21	Silicone Gap Filler / very soft	TGF-BXS-SI	■	1.2
22	Silicone Gap Filler / very soft	TGF-HUS-SI	■	1.8
23	Silicone Gap Filler / very soft	TGF-JUS-SI	■	2.0
24	Silicone Gap Filler / very soft	TGF-JXS-SI	■	2.0
25	Silicone Gap Filler / very soft / optional fibreglass reinforced	TGF-MXS-SI	■	2.4
26	Silicone Gap Filler / very soft	TGF-MUS-SI	■	2.5
27	Silicone Gap Filler / very soft	TGF-SSS-SI	■	3.0
28	Silicone Gap Filler / very soft	TGF-SXS-SI	■	3.0
29	Silicone Gap Filler / very soft	TGF-TSS-SI	■	3.2
30	Silicone Gap Filler / very soft	TGF-USS-SI	■	3.3
31	Silicone Gap Filler / very soft	TGF-WSS-SI	■	5.5
32	Silicone Gap Filler / very soft / fibreglass reinforced	TGF-DXS-SI-GF	■	1.3
33	Silicone Gap Filler / very soft / fibreglass reinforced	TGF-EXS-SI-GF	■	1.4
34	Silicone Gap Filler / plastic	TGF-YP-SI	■	7.0
35	Silicone Gap Filler / plastic	TGF-ZP-SI	■	11
36	Silicone Gap Filler / Putty / dispensable	TGL-W-SI	■	5.5
37	2-Part Gap Filler / dispensable	TDG-L-SI-2C-Y	■	2.0
38	2-Part Gap Filler / dispensable	TDG-T-SI-2C	■	3.0
39	2-Part Gap Filler / dispensable	TDG-U-SI-2C	■	3.6
40	2-Part Gap Filler / dispensable	TDG-W-SI-2C	■	4.5
41	Silicone-free Gap Filler / siloxane-free	TGF-G-NS	■	1.5
42	Silicone-free Gap Filler / siloxane-free	TGF-GUS-NS	■	1.5
43	Silicone-free Gap Filler / siloxane-free	TGF-HSS-NS	■	2.0
44	Silicone-free Gap Filler / siloxane-free	TGF-Z-NS	■	15
45	Silicone Gap Filler / highly conductive	TEL-R-SI	■	15
46	Silicone Gap Filler / highly conductive	TEL-X-SI	■	20
47	Silicone Gap Filler / highly conductive	TEL-Z-SI	■	50
48	Silicone Gap Filler / highly conductive	TEL-YSS-SI	■	16
49	Silicone Gap Filler / highly conductive	TEL-ZS-SI	■	20
50	Silicone-free Gap Filler / adhesive	TAG-L-AC	■	0.8
51	Silicone-free Gap Filler / adhesive	TAG-Q-AC	■	1.6
52	Silicone-free Gap Filler / adhesive	TAG-T-AC	■	2.6

- electrically insulating
- electrically non-insulating
- low dielectric

	Material	Product Code	Insulating	Conductivity W/mK
53	2 FOILS & FILMS			
54	Silicone foil / fibreglass reinforced	TFO-D-SI	■	1.2
55	Silicone foil / fibreglass reinforced	TFO-G-SI	■	1.6
56	Silicone foil / fibreglass reinforced	TFO-H-SI	■	1.8
57	Silicone foil / fibreglass reinforced	TFO-J-SI	■	2.0
58	Silicone foil / fibreglass reinforced	TFO-K-SI	■	2.5
59	Silicone foil / fibreglass reinforced	TFO-O-SI	■	3.0
60	Silicone foil / fibreglass reinforced	TFO-T-SI	■	4.1
61	Silicone foil / fibreglass reinforced	TFO-X-SI	■	5.0
62	Silicone foil / fibreglass reinforced	TFO-ZS-SI	■	8.0
63	Silicone foil / not reinforced	TFO-L-SI	■	2.1
64	Insulating film / silicone coated	TFO-M-SI-PI	■	-
65	Insulating film / silicone coated	TFO-Q-SI-PI	■	-
67	3 SILICONE CAPS			
68	Silicone cap	TCP-C-SI	■	0.8
69	Silicone cap	TCP-J-SI	■	1.5
71	4 PHASE CHANGE MATERIAL			
72	Polyimide film / phase change coated	TPC-N-PI	■	-
73	Polyimide film / phase change coated	TPC-P-KA	■	-
74	Phase change film	TPC-W-PC	■	3.5
75	Aluminum film / phase change coated	TPC-R-AL	■	-
76	Aluminum film / phase change coated	TPC-T-AL-CB	■	-
77	5 GRAPHITE FOIL			
78	Graphite foil / anisotropic	TFO-S-CB	■	z:8 / x-y: 140
79	Graphite foil / pyrolytic	TFO-Y-PG	■	z: >15 x-y: >700
80	Graphite foil / pyrolytic	TFO-ZS-PG	■	z:30 / x-y:500
81	6 PSA INSULATING TAPE			
82	PSA Insulating tape / acrylate with insulating film	TAT-J-PE	■	0.7
83	PSA Insulating tape / acrylate	TAT-N-AC	■	0.8
84	PSA Insulating tape / silicone	TAT-M-SI	■	1.0
85	7 THERMAL GREASE			
86	Silicone-free grease / highly thermally conductive	TGR-J-NS	■	2.0
87	Silicone-free grease / highly thermally conductive	TGR-M-NS	■	2.4
88	Silicone grease / highly thermally conductive	TGR-S-SI	■	3.3
89	8 ADHESIVES			
90	Silicone adhesive / thermally conductive / 1K	TAD-G-SI-1C	■	1.38
91	Silicone adhesive / thermally conductive / 1K RTV	TAD-I-SI-1C	■	1.55
92	Silicone adhesive / thermally conductive / 1K	TAD-O-SI-1C	■	2.1
93	Silicone adhesive / thermally conductive / 1K RTV	TAD-P-SI-1C	■	2.3
94	Silicone adhesive / thermally conductive / 2K RTV	TAD-I-SI-2C	■	1.55
95	9 POTTING GEL			
96	Silicone potting gel / 2 parts	TCR-D-SI-2C	■	0.68
97	Silicone potting gel / 2 parts	TCR-G-SI-2C	■	1.19
99	10 HALA CLIPS			
100	Hala Clip for TO-220	● TO-220-1		
101	Hala Clip for TO-247	● TO-247-1		
102	Hala Clip for TO-264	● TO-264-2		

TOMORROW IS TODAY AND YESTERDAY

Competence and know-how is one side. Development and innovation the other. Our wide portfolio of products and services in the Thermal Management stands for best products for every type of application. On the other hand we co-operate with partners worldwide to develop future solutions, considering all technologic trends and scientific experiences. The outcome of all this is: Our customers' success and satisfaction. Today but more than ever tomorrow.



THE METHOD BEHIND SUCCESS

We work precisely according to your specifications, adding our know-how and experience. We understand ourselves as development partners – from A to Z. Thus we do not strive for the processing only, but take over the whole project management. It starts by doing the design-in and ends up with supplying perfect products. This means prototypes, single parts, small batches and final full-production run. And that is really convenient: through our versatile machinery consisting of punching machines, plotters and printers we do the processing and conversion of raw materials to customized products.



PRINTING



PUNCHING



PLOTTING



QUALITY HAS A PRINCIPLE

The way we live and see things is simple: From the beginning of a project until production start and delivery, specifications and controls are decisive and indispensable. At the same time we audit our partners regularly as much as we push up our own quality standards pro-actively. Our team members are all committed to quality, thus bringing in line our company targets and assuming responsibilities: The best performance.

We are certified according to DIN EN ISO 9001:2015.

In the end we realize prototypes ready for production and deliver samples in a very short time. We look forward to being challenged by your individual ideas. Trust us, you are in good hands!



SERVICE IS MAKING CAREER

The customer as king belongs to the past. Today he is an Emperor, at least or even more in the awareness of a target-oriented enterprise. It is our common understanding that the team acts and thinks related to our customers' needs – truly and only. Keen commitment is our passion, our flexibility guarantees tailor-made products and convincing performances. You have a mission and ideas: we work on their realization.

To meet the future we have founded our new production site in Kirchheim unter Teck. The new production center expands the manufacturing and processing capabilities for our materials as well as our production flexibility and deliveries world-wide.

If necessary around the clock!



TOTAL-THERMAL-MANAGEMENT

TTM with vast experience of solving thermal problems, project management, procurement and supply.
TTM working across borders and globally from initial ideas to product maturity.

PROJECT MANAGEMENT

As project managers we develop and optimize system solutions for thermal management. We can work with you from the initial idea to end product in your language in your country.

Our approach is to consider all components, taking into account mechanical, thermal, electronic and manufacturing interactions.

Time to Market

Using modern development methods and early involvement across all engineering disciplines, we reduce time and development costs and minimize the number of prototypes thus reducing time to market.

Keeping your technical requirements in mind we will be able to deliver the optimum economic and quality solution.

THERMAL SYSTEMS

On a system level we realize integrated high-performance thermal solutions for next generation products in a wide range of markets, including power semiconductor, automotive, energy conversion, medical and test equipment, transportation, defense, aerospace, computers, communications and many other industries.

For that purpose engineering, CAD, CFD simulation, prototyping, series manufacturing and operations as well as testing and analysis are integrated.

HEAT PIPE ASSEMBLIES

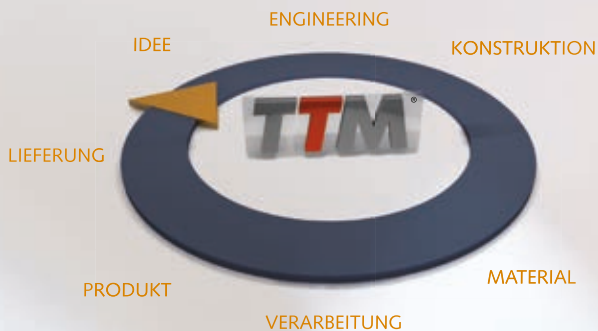
Heat Spreading



Heat Transfer



LIQUID COOLING

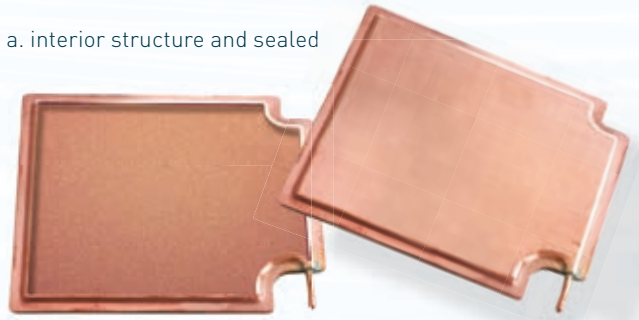


FLATTENED HEAT PIPES

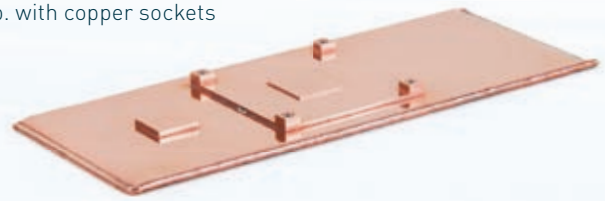


VAPOR CHAMBER

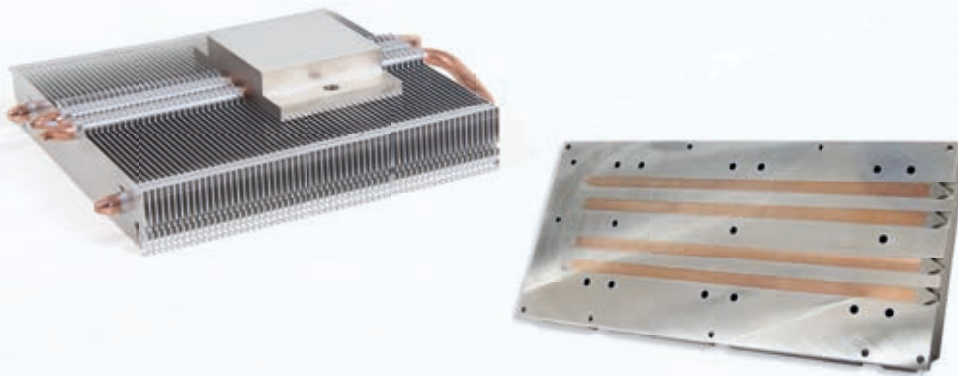
a. interior structure and sealed



b. with copper sockets



HEAT SPREADER



HEAT COLUMN



HEAT TRANSFER



DR. BREIER CONSULTING IS PARTNER OF HALA

CFD SIMULATION

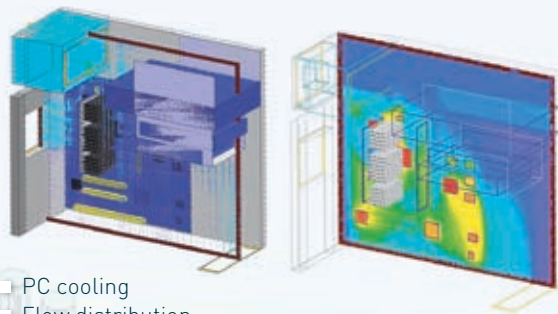
Cooling should be considered as early as possible in the development process instead of trying to implement the heat transfer somewhere at the very end, because in general thermal redesigns are very expensive and time-consuming, especially when they affect the overall dimensions or the design of the equipment.

The „CFD Simulation“ aims at fluid mechanical and thermodynamical transport mechanisms and is already applicable to predict the potential failure occurrence and the change of functionality over time (e.g. LED applications).

All distributions inside the fluid are taken into account (pressure, pressure drop, flow vectors, flow rate, fluid temperatures) as well as in solids (temperatures, heat conduction, heat sources) with the related heat transfer effects from the surfaces to the fluid (local heat transfer coefficients), between solid surfaces (contact resistances, heat radiation) and heat radiation exchange between ambient and system (surrounding walls, solar radiation).

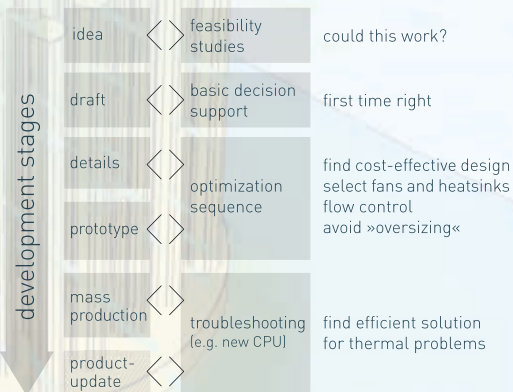
With the CFD simulation realized by our partner Dr. Breier Consulting we support all development phases with system-level analysis of all heat transfer effects and hence offer the possibility of thermal optimization down to the component level - before any prototype is available. With benefits to: Minimizing Time-to-Market, rapid upgrades, quick failure mode analysis.

SIMULATION EXAMPLE PERSONAL COMPUTER

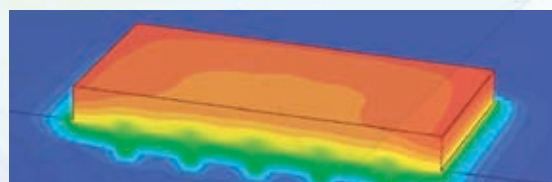


- PC cooling
- Flow distribution
- Temperature distribution air / solids
- Optimisation strategies for CPU heat sinks
- Strategies to optimize e.g. by ventilation duct through air deflectors at the entrance or at the hood.

DEVELOPMENT STAGES SIMULATION

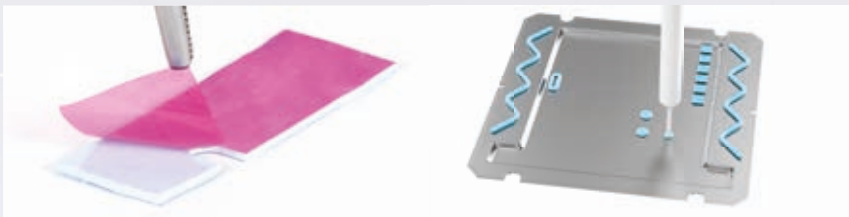


TIM GAP FILLER ELASTOMER COMPACT MODEL with structural THERMAL VIAS



1 GAP-FILLER

/ PAD / PUTTY / 2-PART DISPENSABLE



SILICONE GAP FILLER TGF-C-SI

soft, flexible

TGF-C-SI is an electrically insulating thermally conductive silicone gap filler. It is ideal for use in applications where thermal transfer over large gaps caused e.g. by big tolerances or different stack up heights must be achieved. Due to the specific formulation and filling with ceramic particles the silicone elastomer has a good thermal conductivity. Through its softness and flexibility the material perfectly mates to irregular surfaces thus filling gaps at low pressure. By its use the total thermal resistance is minimised.



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PROPERTIES

- Soft and compliant
- Thermal conductivity: 1.5 W/mK
- Operates at low pressure
- Extraordinary chemical resistance and longterm stability
- Shock-absorbing

AVAILABILITY

- Sheet 305 x 305 mm (0.5 to 4.0 mm)
- Sheet 250 x 250 mm (> 4.0 mm) (TGF-CXXXX-SI)
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

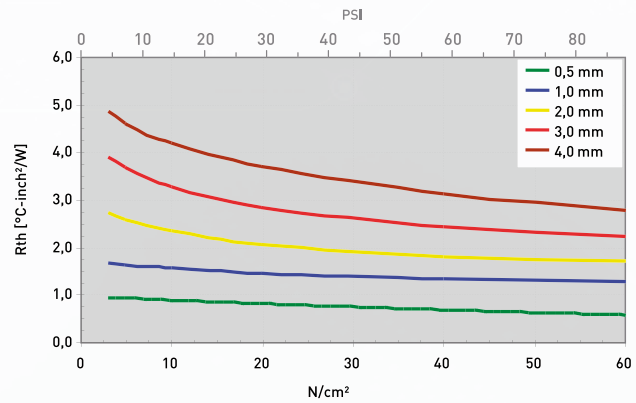
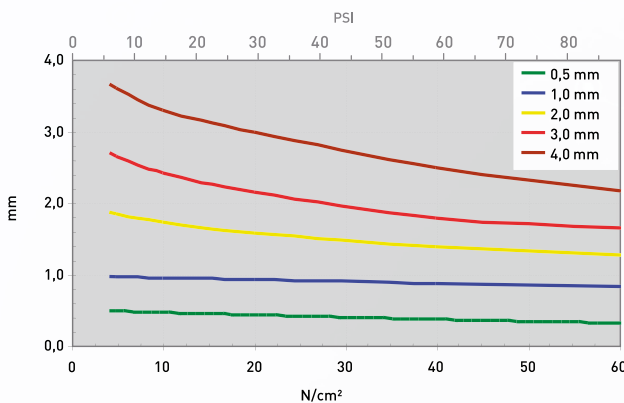
- Thermal link of:
- SMD packages
 - Through-hole vias
 - Capacitors
 - Electronic parts to heat pipes
- For use in Automotive applications
/ Laptops / Medicine engineering
/ Industrial PCs

Property	Unit	TGF-C0500-SI	TGF-C1000-SI	TGF-C2000-SI	TGF-C3000-SI
Material		Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone
Colour		Pink	Pink	Pink	Pink
Thickness	mm	0.5	1.0	2.0	3.0
Hardness	Shore 00	65	65	65	65
UL Flammability	UL 94	V0	V0	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes	Yes
Thermal					
Resistance ¹ @ 60 PSI @ Thickness	°C-inch ² /W (mm)	0,71 (0.37)	1.38 (0.87)	1.82 (1.38)	2.45 (1.79)
Resistance ¹ @ 30 PSI @ Thickness	°C-inch ² /W (mm)	0.83 (0.43)	1.50 (0.94)	2.08 (1.57)	2.87 (2.15)
Resistance ¹ @ 10 PSI @ Thickness	°C-inch ² /W (mm)	0.97 (0.49)	1.64 (0.96)	2.50 (1.80)	3.54 (2.55)
Thermal Conductivity	W/mK	1.5	1.5	1.5	1.5
Operating Temperature Range	°C	- 50 to + 150	- 50 to + 150	- 50 to + 150	- 50 to + 150
Electric					
Dielectric Strength	kV / mm	9.0	9.0	9.0	9.0
Volume Resistivity	Ohm - cm	1.6 x 10 ¹³	1.6 x 10 ¹³	1.6 x 10 ¹³	1.6 x 10 ¹³

Measurement technique according to: ¹ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 0.5 mm / 1.0 mm / 1.5 mm / 2.0 mm / 2.5 mm / 3.0 mm / 3.5 mm / 4.0 mm / 4.5 mm / 5.0 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



All technical data and information are without warranty and believed to be reliable and accurate corresponding to the latest state of the art. Since the products are not provided to conform with mutually agreed specifications and their use and processing are unknown we cannot guarantee results, freedom from patent infringement, or their suitability for any application. Product testing by the applicant is recommended. We reserve the right of changes.

SILICONE GAP FILLER TGF-M-SI

soft, flexible

TGF-M-SI is an electrically insulating thermally conductive silicone gap filler. It is ideal for use in applications where thermal transfer over large gaps caused e.g. by big tolerances or different stack up heights must be achieved. Due to the specific formulation and filling with ceramic particles the silicone elastomer has a very high thermal conductivity. Through its high softness and flexibility the material perfectly mates to irregular surfaces thus filling gaps at low pressure. By its use the total thermal resistance is minimised. The natural tackiness of the material allows for an easy and reliable pre-assembly.



Release 09 / 2019

PROPERTIES

- Soft and compliant
- Thermal conductivity: 2.5 W/mK
- Operates at low pressure
- Extraordinary chemical resistance and longterm stability
- Shock absorbing
- Easy mounting through self tackiness
- One or two-side self-tacky

AVAILABILITY

- Sheet 480 x 460 mm (Thickness 0.5/1.0 mm)
- Sheet 460 x 460 mm (Thickness 2.0 mm)
- Sheet 450 x 460 mm (Thickness 3.0 mm)
- Tacky on both sides (TGF-MXXXX-SI)
- Tacky on one side (TGF-MXXXX-SI-A1)
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

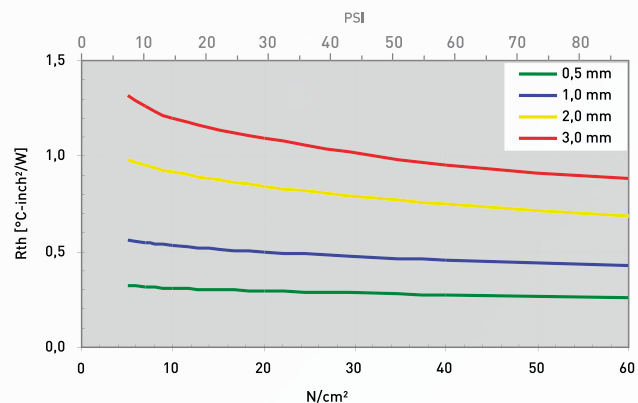
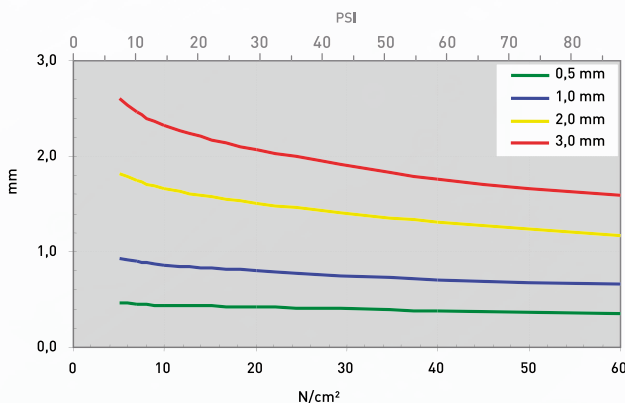
- Thermal link of:
- SMD packages
 - Through-hole vias
 - Capacitors
 - Electronic parts to heat pipes
- For use in Automotive applications / Laptops / Medicine engineering/ Industrial PCs

Property	Unit	TGF-M0500-SI	TGF-M1000-SI	TGF-M2000-SI	TGF-M3000-SI
Material		Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone
Colour		Light blue	Light blue	Light blue	Light blue
Thickness	mm	0.5	1.0	2.0	3.0
Hardness	Shore 00	50	50	50	50
UL Flammability	UL 94	V0	V0	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes	Yes
Thermal					
Resistance ¹ @ 60 PSI @ Thickness	°C-inch ² /W (mm)	0.27 (0.38)	0.45 (0.71)	0.75(1.31)	0.96 (1.76)
Resistance ¹ @ 30 PSI @ Thickness	°C-inch ² /W (mm)	0.29 (0.42)	0.50 (0.80)	0.84 (1.50)	1.09 (2.07)
Resistance ¹ @ 10 PSI @ Thickness	°C-inch ² /W (mm)	0.32 (0.45)	0.55 (0.90)	0.95 (1.75)	1.26 (2.46)
Thermal Conductivity	W/mK	2.5	2.5	2.5	2.5
Operating Temperature Range	°C	- 60 to + 180	- 60 to + 180	- 60 to + 180	- 60 to + 180
Electrically					
Dielectric Strength	kV / mm	10	10	10	10
Volume Resistivity	Ohm - cm	1.0 x 10 ¹¹	1.0 x 10 ¹¹	1.0 x 10 ¹¹	1.0 x 10 ¹¹
Dielectric Constant	@ 1 kHz	5.2	5.2	5.2	5.2

Measurement technique according to: IASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 0.5 mm / 1.0 mm / 1.5 mm / 2.0 mm / 2.5 mm / 3.0 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



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SILICONE GAP FILLER TGF-R-SI

soft, flexible



TGF-R-SI is an electrically insulating thermally conductive silicone gap filler. It is ideal for use in applications where thermal transfer over large gaps caused e.g. by big tolerances or different stack up heights must be achieved. Due to the specific formulation and filling with ceramic particles the silicone elastomer has a very high thermal conductivity. Through its high softness and flexibility the material perfectly mates to irregular surfaces thus filling gaps at low pressure. By its use the total thermal resistance is minimised. The natural tackiness of the material allows for an easy and reliable pre-assembly.



Release 09 / 2019

PROPERTIES

- Soft and compliant
- Thermal conductivity: 3.0 W/mK
- Operates at low pressure
- Extraordinary chemical resistance and longterm stability
- Shock absorbing
- Easy mounting through self tackiness
- One or two-side self-tacky

AVAILABILITY

- Sheet 480 x 460 mm (Thickness 0.5/1.0 mm)
- Sheet 460 x 460 mm (Thickness 2.0 mm)
- Sheet 450 x 460 mm (Thickness 3.0/4.0 mm)
- Sheet 450 x 450 mm (Thickness 5.0 mm)
- Tacky on both sides (TGF-RXXXX-SI)
- Tacky on one side (TGF-RXXXX-SI-A1)
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

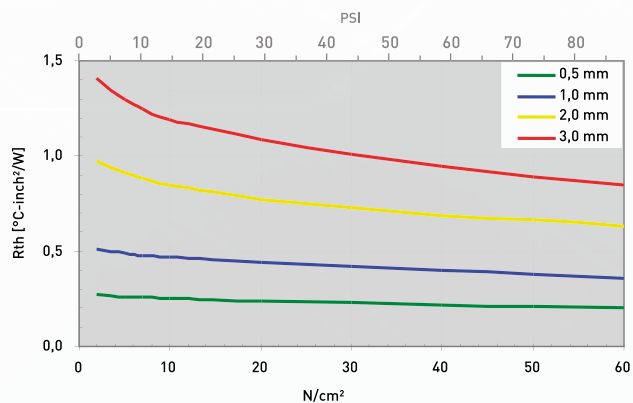
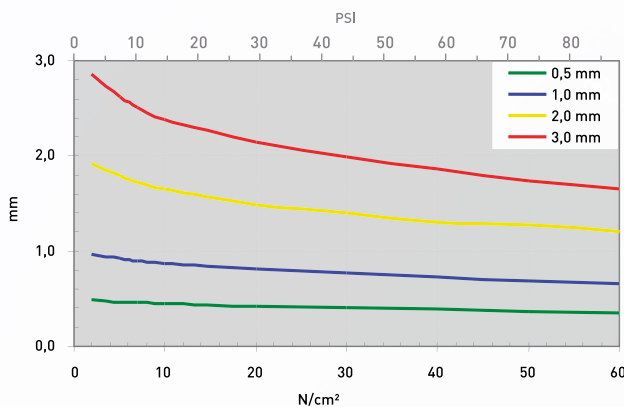
- Thermal link of:
- SMD packages
 - Through-hole vias
 - Capacitors
 - Electronic parts to heat pipes
- For use in Automotive applications / Laptops / Medicine engineering / Industrial PCs

Property	Unit	TGF-R0500-SI	TGF-R1000-SI	TGF-R2000-SI	TGF-R3000-SI
Material		Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone
Colour		Light blue	Light blue	Light blue	Light blue
Thickness	mm	0.5	1.0	2.0	3.0
Hardness	Shore 00	55	55	55	55
UL Flammability	UL 94	V0	V0	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes	Yes
Thermal					
Resistance ¹ @ 60 PSI @ Thickness	°C-inch ² /W (mm)	0.22 (0.39)	0.40 (0.73)	0.68 (1.31)	0.95 (1.86)
Resistance ¹ @ 30 PSI @ Thickness	°C-inch ² /W (mm)	0.24 (0.42)	0.44 (0.81)	0.77 (1.49)	1.09 (2.15)
Resistance ¹ @ 10 PSI @ Thickness	°C-inch ² /W (mm)	0.26 (0.46)	0.48 (0.90)	0.88 (1.72)	1.25 (2.50)
Thermal Conductivity	W/mK	3.0	3.0	3.0	3.0
Operating Temperature Range	°C	- 60 to + 180	- 60 to + 180	- 60 to + 180	- 60 to + 180
Electrically					
Dielectric Strength	kV / mm	10	10	10	10
Volume Resistivity	Ohm - cm	1.0 x 10 ¹¹	1.0 x 10 ¹¹	1.0 x 10 ¹¹	1.0 x 10 ¹¹
Dielectric Constant	@ 1 kHz	5.2	5.2	5.2	5.2

Measurement technique according to: *ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 0.5 mm / 1.0 mm / 1.5 mm / 2.0 mm / 2.5 mm / 3.0 mm / 4.0 mm / 5.0 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



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SILICONE GAP FILLER TGF-U-SI

soft, flexible



TGF-U-SI is an electrically insulating thermally conductive high performance silicone gap filler. It is ideal for use in applications where a very good thermal transfer over large gaps caused e.g. by big tolerances or different stack up heights must be achieved. Due to the specific formulation and filling with ceramic particles the silicone elastomer has an extremely high thermal conductivity. Through its softness and flexibility the material perfectly mates to irregular surfaces thus filling gaps at low pressure. By its use the total thermal resistance is minimised. The natural tackiness of the material allows for an easy and reliable pre-assembly.



Release 09 / 2019

PROPERTIES

- Soft and compliant
- Thermal conductivity: 4.5 W/mK
- Operates at low pressure
- Extraordinary chemical resistance and long-term stability
- Shock absorbing
- Easy mounting through self tackiness

AVAILABILITY

- Sheet 300 x 400 mm
- Tacky on both sides (TGF-UXXXX-SI)
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

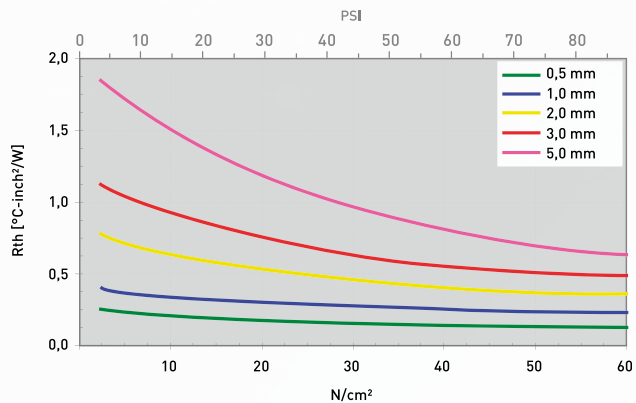
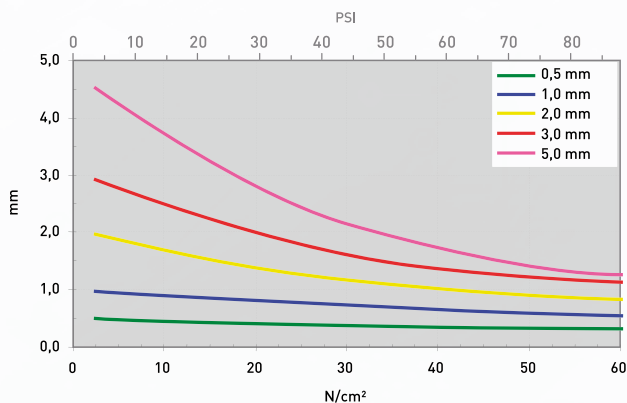
- Thermal link of:
- SMD packages
 - Through-hole vias
 - RDRAMs Smemory modules
 - Flip Chips, DSPs, BGAs, PPGAs
- For use in Automotive applications / Laptops / Medicine engineering / Embedded boards

Property	Unit	TGF-U0500-SI	TGF-U1000-SI	TGF-U2000-SI	TGF-U3000-SI	TGF-U5000-SI
Material		Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone
Colour		Grey	Grey	Grey	Grey	Grey
Thickness	mm	0.5	1.0	2.0	3.0	5.0
Hardness	Shore 00	60	60	60	60	60
UL Flammability	UL 94	V0	V0	V0	V0	V0
RoHS Conformity	2011/65/EU	Yes	Yes	Yes	Yes	Yes
Thermal						
Resistance ¹ @ 60 PSI @ Thickness	°C-inch ² /W (mm)	0.15 [0.35]	0.27 [0.65]	0.42 [1.03]	0.57 [1.40]	0.84 [1.75]
Resistance ¹ @ 30 PSI @ Thickness	°C-inch ² /W (mm)	0.17 [0.40]	0.32 [0.81]	0.55 [1.40]	0.78 [1.98]	1.20 [2.75]
Resistance ¹ @ 10 PSI @ Thickness	°C-inch ² /W (mm)	0.22 [0.45]	0.36 [0.91]	0.68 [1.77]	0.99 [2.63]	1.62 [3.95]
Thermal Conductivity	W/mK	4.5	4.5	4.5	4.5	4.5
Operating Temperature Range	°C	- 40 to + 180	- 40 to + 180	- 40 to + 180	- 40 to + 180	- 40 to + 180
Electrically						
Dielectric Strength	kV / mm	15	15	15	15	15

Measurement technique according to: ¹ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 0.5 mm / 1.0 mm / 1.5 mm / 2.0 mm / 2.5 mm / 3.0 mm / 4.0 mm / 5.0 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



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SILICONE GAP FILLER TGF-V-SI

soft, flexible

TGF-V-SI is an electrically insulating thermally conductive high performance silicone gap filler. It is ideal for use in applications where a very good thermal transfer over large gaps caused e.g. by big tolerances or different stack up heights must be achieved. Due to the specific formulation and filling with ceramic particles the silicone elastomer has an extremely high thermal conductivity. Through its softness and flexibility the material perfectly mates to irregular surfaces thus filling gaps at low pressure. By its use the total thermal resistance is minimised. The natural tackiness of the material allows for an easy and reliable pre-assembly. The material is double-side self-tacky or alternatively one-side tacky through lamination with a thermally conductive film.



Release 09 / 2019

PROPERTIES

- Soft and compliant
- Thermal conductivity: 5.0 W/mK
- Operates at low pressure
- Extraordinary chemical resistance and long-term stability
- Shock absorbing
- One or two-side self-tacky

AVAILABILITY

- Sheet 210 x 420 mm (Thickness 0.5 – 2.0 mm)
- Sheet 200 x 200 mm (Thickness 2.5 – 3.0 mm)
- Tacky on both sides (TGF-VXXXX-SI)
- Tacky on one side by film laminate (TGF-VXXXX-SI-A1)
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

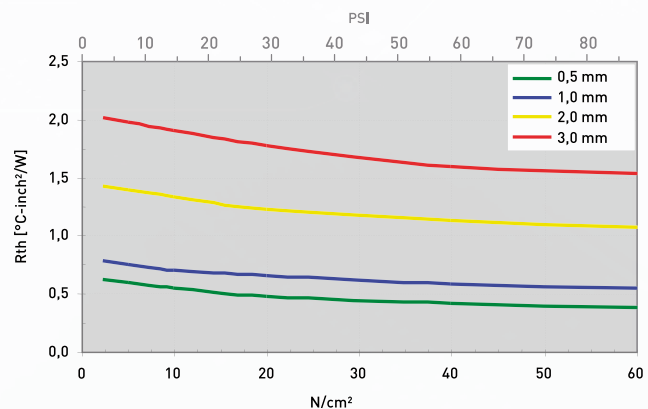
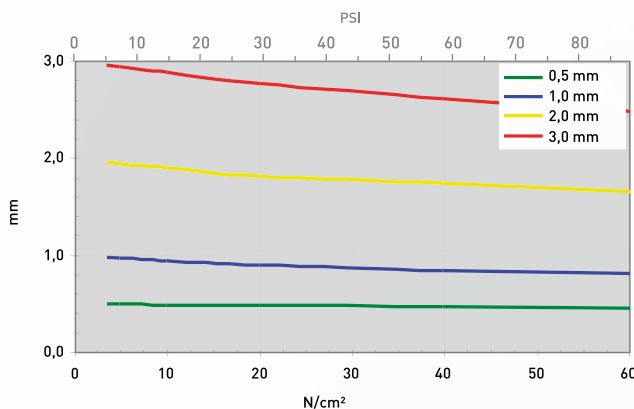
- Thermal link of:
- SMD packages
 - Through-hole vias
 - Capacitors
 - Electronic parts to heat pipes
- For use in Automotive applications / Laptops / Medicine engineering / Industrial PCs

Property	Unit	TGF-V0500-SI	TGF-V1000-SI	TGF-V2000-SI	TGF-V3000-SI
Material		Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone
Colour		Grey	Grey	Grey	Grey
Thickness	mm	0.5	1.0	2.0	3.0
Hardness	Shore 00	65	65	65	65
UL Flammability	UL 94	V0	V0	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes	Yes
Thermal					
Resistance ¹ @ 60 PSI @ Thickness	°C-inch ² /W (mm)	0.41 [0.47]	0.58 [0.84]	1.13 [1.74]	1.60 [2.61]
Resistance ¹ @ 30 PSI @ Thickness	°C-inch ² /W (mm)	0.48 [0.48]	0.65 [0.90]	1.22 [1.82]	1.77 [2.77]
Resistance ¹ @ 10 PSI @ Thickness	°C-inch ² /W (mm)	0.57 [0.49]	0.73 [0.96]	1.37 [1.93]	1.94 [2.91]
Thermal Conductivity	W/mK	5.0	5.0	5.0	5.0
Operating Temperature Range	°C	- 40 to + 200	- 40 to + 200	- 40 to + 200	- 40 to + 200
Electrically					
Dielectric Strength	kV / mm	>10	>10	>10	>10
Volume Resistivity	Ohm - cm	> 1.0 x 10 ¹⁰	> 1.0 x 10 ¹⁰	> 1.0 x 10 ¹⁰	> 1.0 x 10 ¹⁰

Measurement technique according to: 'ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: Double-side tacky 0.7 mm / 1.0 mm / 1.5 mm / 2.0 mm / 3.0 mm
 One-side tacky 0.5 mm / 1.0 mm / 1.5 mm / 2.0 mm / 3.0 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



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SILICONE GAP FILLER TGF-W-SI

soft, flexible

TGF-W-SI is an electrically insulating thermally conductive very high performance silicone gap filler. It is ideal for use in applications where a very good thermal transfer over large gaps caused e.g. by big tolerances or different stack up heights must be achieved. Due to the specific formulation and filling with ceramic particles the silicone elastomer has an outstandingly high thermal conductivity. Through its softness and flexibility the material perfectly mates to irregular surfaces thus filling gaps at low pressure. By its use the total thermal resistance is minimised. The natural tackiness of the material allows for an easy and reliable pre-assembly.



Release 09 / 2019

PROPERTIES

- Soft and compliant
- Thermal conductivity: 6.0 W/mK
- Operates at low pressures
- Extraordinary chemical resistance and long-term stability
- Shock absorbing
- Two-side self-tacky

AVAILABILITY

- Sheet 400 x 200 mm
- Tacky on both sides (TGF-WXXX-SI)
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

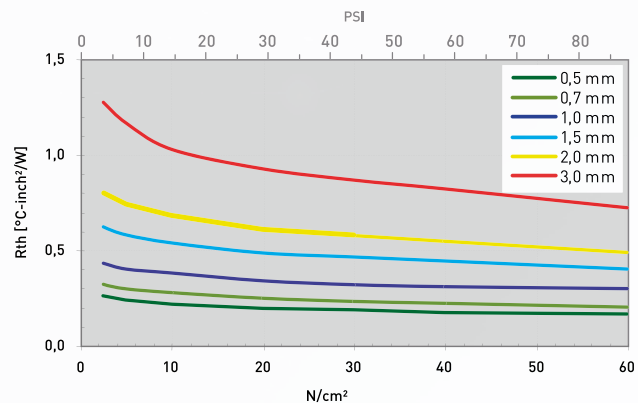
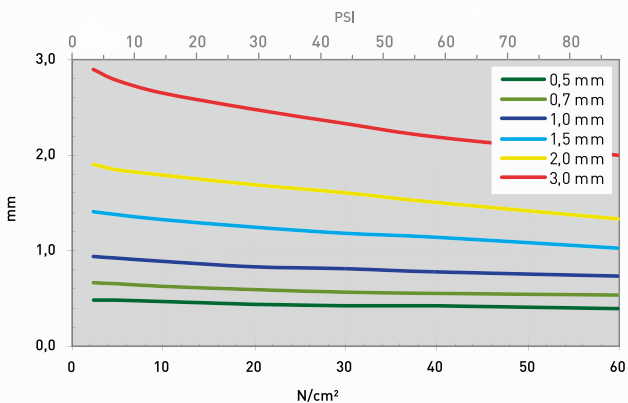
- Thermal link of:
- SMD packages
 - Through-hole vias
 - Capacitors
 - Electronic parts to heat pipes
- For use in Automotive applications / Laptops / Medicine engineering / Industrial PCs

Property	Unit	TGF-W0500-SI	TGF-W1000-SI	TGF-W2000-SI	TGF-W3000-SI
Material		Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone
Colour		Grey	Grey	Grey	Grey
Thickness	mm	0.5	1.0	2.0	3.0
Hardness	Shore 00	65	65	65	65
UL Flammability (Equivalent)	UL 94	V0	V0	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes	Yes
Thermal					
Resistance ¹ @ 60 PSI @ Thickness	°C-inch ² /W (mm)	0.16 [0.43]	0.29 [0.78]	0.54 [1.51]	0.81 [2.19]
Resistance ¹ @ 30 PSI @ Thickness	°C-inch ² /W (mm)	0.18 [0.45]	0.32 [0.84]	0.60 [1.69]	0.92 [2.48]
Resistance ¹ @ 10 PSI @ Thickness	°C-inch ² /W (mm)	0.21 [0.48]	0.38 [0.91]	0.71 [1.83]	1.11 [2.73]
Thermal Conductivity	W/mK	6.0	6.0	6.0	6.0
Operating Temperature Range	°C	- 40 to + 150	- 40 to + 150	- 40 to + 150	- 40 to + 150
Electrically					
Dielectric Strength	kV / mm	>10	>10	>10	> 10
Volume Resistivity	Ohm - cm	> 1.0 x 10 ¹²	> 1.0 x 10 ¹²	> 1.0 x 10 ¹²	> 1.0 x 10 ¹²

Measurement technique according to: ¹ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 0.5 mm / 1.0 mm / 1.5 mm / 2.0 mm / 2.5 mm / 3.0 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)

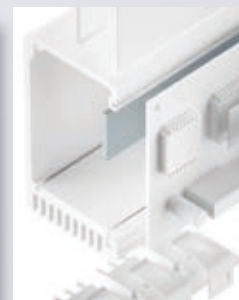


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SILICONE GAP FILLER TGF-Z-SI

soft, flexible

TGF-Z-SI is an electrically insulating thermally conductive silicone gap filler. It is ideal for use in applications where thermal transfer over large gaps caused e.g. by big tolerances or different stack up heights must be achieved. Due to the specific formulation and filling with ceramic particles the silicone elastomer has an extremely high thermal conductivity. Through its softness and plasticity the material perfectly mates to irregular surfaces thus optimizing the thermal contact at low pressure. By its use the total thermal resistance is minimised. The natural tackiness of the material allows for an easy and reliable pre-assembly.



Release 09 / 2019

PROPERTIES

- Soft and compliant
- Thermal conductivity: 11 W/mK
- Operates at low pressure
- Extraordinary chemical resistance and long-term stability
- Shock absorbing
- Easy mounting through self tackiness
- One or two-side self-tacky

AVAILABILITY

- Sheet 200 x 300 mm
- Tacky on both sides (TGF-ZXXXX-SI)
- Tacky on one side by talcum coating (TGF-ZXXXX-SI-A1)
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

Thermal link of:

- SMD packages
 - Through-hole vias
 - RDRAMs memory modules
 - Capacitors
- For use in Automotive applications / Laptops / Medicine engineering / Embedded-boards

Property	Unit	TGF-Z1000-SI	TGF-Z1500-SI	TGF-Z2000-SI
Material		Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone
Colour		Light grey	Light grey	Light grey
Density	g/cm ³	3.3	3.3	3.3
Hardness	mm	1.0	1.5	2.0
Thickness	Shore 00	64	64	64
UL Flammability (Equivalent)	UL 94	V0	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes
Thermal				
Resistance ¹	°C-inch ² /W	0.17 @ 0.90 mm	0.24 @ 1.40 mm	0.30 @ 1.80 mm
Resistance ¹	°C-inch ² /W	0.15 @ 0.70 mm	0.23 @ 1.20 mm	0.27 @ 1.60 mm
Thermal Conductivity	W/mK	11.0	11.0	11.0
Operating Temperature Range	°C	- 50 to + 180	- 50 to + 180	- 50 to + 180
Electrically				
Dielectric Strength	kV / mm	>10	>10	>10
Dielectric Constant	Ohm - cm	7.0 x 10 ¹¹	7.0 x 10 ¹¹	7.0 x 10 ¹¹
Volume Resistivity	1 MHz	ca. 7.5	ca. 7.5	ca. 7.5

Measurement technique according to: 'ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 1.0 mm / 1.5 mm / 2.0 mm

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SILICONE GAP FILLER TGF-BXS-SI

ultrasoft, flexible



TGF-BXS-SI is an electrically insulating thermally conductive silicone gap filler. It is ideal for use in applications where thermal transfer over large gaps caused e.g. by big tolerances or different stack up heights must be achieved. Due to the specific formulation and filling with ceramic particles the silicone elastomer has a good thermal conductivity. Through its ultra softness and flexibility the material perfectly mates to irregular surfaces thus filling gaps at minimum pressure. By its use the total thermal resistance is minimised. The natural tackiness of the material allows for an easy and reliable pre-assembly. The optional PSA on one side provides for a strong adhesiveness.



Release 09 / 2019

PROPERTIES

- Ultra soft and compliant
- Thermal conductivity: 1.2 W/mK
- Operates at minimum pressure
- Extraordinary chemical resistance and longterm stability
- Shock-absorbing
- Easy mounting through self tackiness
- Two-side tacky or one-side adhesive

AVAILABILITY

- Sheet 200 x 400 mm
- Tacky on both sides (TGF-BXSXXX-SI)
- Tacky on one side, PSA adhesive on one side (TGF-BXSXXX-SI-A1)
- Die cut parts
- Kiss cut parts on sheet

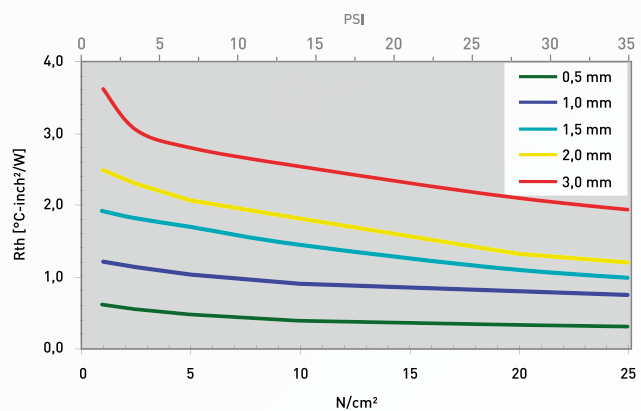
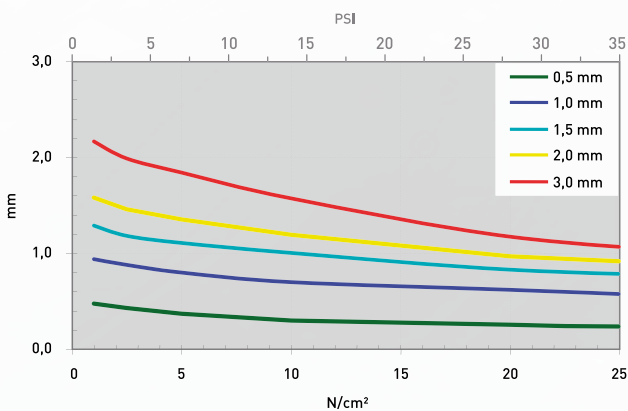
APPLICATION EXAMPLES

- Thermal link of:
- SMD packages
 - Through-hole vias
 - Capacitors
 - Electronic parts to heat pipes
- For use in Automotive applications
/ Laptops / Medicine engineering
/ Industrial PCs

Property	Unit	TGF-BXS0500-SI	TGF-BXS1000-SI	TGF-BXS1500-SI	TGF-BXS2000-SI	TGF-BXS3000-SI
Material		Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone
Colour		Pink	Pink	Pink	Pink	Pink
Thickness	mm	0.5	1.0	1.5	2.0	3.0
Hardness	Shore 00	15	15	15	15	15
Density	g/cm ³	2.3	2.3	2.3	2.3	2.3
UL Flammability	UL 94	V0	V0	V0	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes	Yes	Yes
Thermal						
Resistance ¹ @ 35 PSI @ Thickness	°C-inch ² /W (mm)	0.31 (0.24)	0.75 (0.58)	1.00 (0.80)	1.20 (0.92)	1.95 (1.09)
Resistance ¹ @ 15 PSI @ Thickness	°C-inch ² /W (mm)	0.39 (0.30)	0.90 (0.70)	1.45 (1.01)	1.81 (1.19)	2.54 (1.57)
Resistance ¹ @ 7 PSI @ Thickness	°C-inch ² /W (mm)	0.48 (0.37)	1.03 (0.80)	1.70 (1.11)	2.07 (1.35)	2.80 (1.84)
Thermal Conductivity	W/mK	1.2	1.2	1.2	1.2	1.2
Operating Temperature Range	°C	- 40 to + 150	- 40 to + 150	- 40 to + 150	- 40 to + 150	-40 to + 150
Electric						
Dielectric Strength	kV / mm	> 6.5	> 6.5	> 6.5	> 6.5	> 6.5
Volume Resistivity	Ohm · cm	3.5 x 10 ¹²	3.5 x 10 ¹²	3.5 x 10 ¹²	3.5 x 10 ¹²	3.5 x 10 ¹²
Dielectric Constant	@ 1 MHz	3.87	3.87	3.87	3.87	3.87

Measurement technique according to: ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 0.5 mm / 1.0 mm / 1.5 mm / 2.0 mm / 2.5 mm / 3.0 mm / 3.5 mm / 4.0 mm / 4.5 mm / 5.0 mm / .. 12.0 mm
mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



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SILICONE GAP FILLER TGF-HUS-SI

extremely soft, flexible

TGF-HUS-SI is an electrically insulating thermally conductive silicone gap filler. It is ideal for use in applications where thermal transfer over large gaps caused e.g. by big tolerances or different stack up heights must be achieved. Due to the specific formulation and filling with ceramic particles the silicone elastomer has a good thermal conductivity. Through its extreme softness and flexibility the material perfectly mates to irregular surfaces thus filling gaps at very low pressure. By its use the total thermal resistance is minimised. The natural tackiness of the material allows for an easy and reliable pre-assembly.



Release 09 / 2019

PROPERTIES

- Extremely soft and compliant
- Thermal conductivity: 1.8 W/mK
- Operates at very low pressure
- Extraordinary chemical resistance and long-term stability
- Shock absorbing
- Easy mounting through self tackiness
- Two-side self-tacky

AVAILABILITY

- Sheet 300 x 400 mm
- Tacky on both sides (TGF-HUSXXX-SI)
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

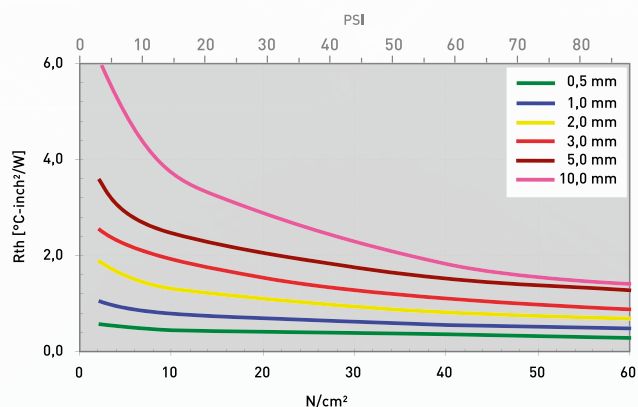
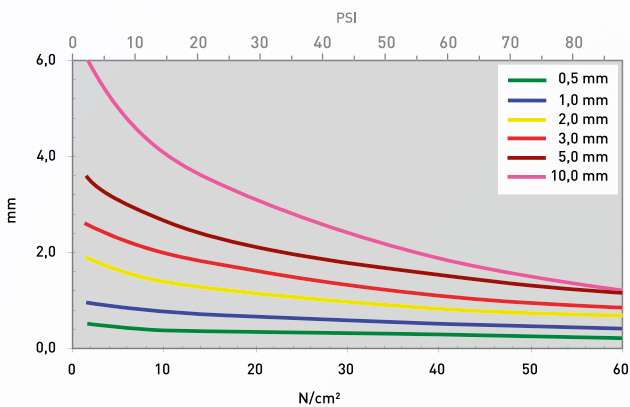
- Thermal link of:
- SMD packages
 - Through-hole vias
 - Capacitors
 - Electronic parts to heat pipes
- For use in Automotive applications / Laptops / Medicine engineering / Industrial PCs

Property	Unit	TGF-HUS00500-SI	TGF-HUS01000-SI	TGF-HUS02000-SI	TGF-HUS03000-SI	TGF-HUS05000-SI
Material		Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone
Colour		Dark grey	Dark grey	Dark grey	Dark grey	Dark grey
Thickness	mm	0.5	1.0	2.0	3.0	5.0
Hardness	Shore 00	30	30	30	30	30
UL Flammability	UL 94	V0	V0	V0	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes	Yes	Yes
Thermal						
Resistance ¹ @ 60 PSI @ thickness	°C-inch ² /W (mm)	0.34 (0.31)	0.56 (0.54)	0.82 (0.85)	1.10 (1.09)	1.52 (1.54)
Resistance ¹ @ 30 PSI @ thickness	°C-inch ² /W (mm)	0.40 (0.36)	0.69 (0.68)	1.12 (1.16)	1.53 (1.63)	2.06 (2.13)
Resistance ¹ @ 10 PSI @ thickness	°C-inch ² /W (mm)	0.50 (0.46)	0.85 (0.85)	1.48 (1.57)	2.10 (2.18)	2.71 (2.92)
Thermal Conductivity	W/mK	1.8	1.8	1.8	1.8	1.8
Operating Temperature Range	°C	- 40 to + 150	- 40 to + 150	- 40 to + 150	- 40 to + 150	- 40 to + 150
Electrically						
Dielectric Strength	kV / mm	> 10	> 10	> 10	> 10	> 10
Volume Resistivity	Ohm - cm	8.056 x 10 ¹²	8.056 x 10 ¹²	8.056 x 10 ¹²	8.056 x 10 ¹²	8.056 x 10 ¹²
Dielectric Constant		5.6	5.6	5.6	5.6	5.6

Measurement technique according to: 'ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 0.5 mm / 1.0 mm / 1.5 mm / 2.0 mm / 2.5 mm / 3.0 mm / 4.0 mm / 5.0 mm / 10.0 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



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SILICONE GAP FILLER TGF-JUS-SI

extremely soft, flexible



TGF-JUS-SI is an electrically insulating thermally conductive silicone gap filler. It is ideal for use in applications where thermal transfer over large gaps caused e.g. by big tolerances or different stack up heights must be achieved. Due to the specific formulation and filling with ceramic particles the silicone elastomer has a good thermal conductivity. Through its extreme softness and flexibility the material perfectly mates to irregular surfaces thus filling gaps at very low pressure. By its use the total thermal resistance is minimised. The natural tackiness of the material allows for an easy and reliable pre-assembly.



Release 09 / 2019

PROPERTIES

- Extremely soft and compliant
- Thermal conductivity: 2.0 W/mK
- Operates at very low pressure
- Extraordinary chemical resistance and long-term stability
- Shock absorbing
- Easy mounting through self tackiness
- One or two-side self-tacky

AVAILABILITY

- Sheet 480 x 460 mm (1.0 mm)
- Sheet 460 x 460 mm (2.0 mm)
- Sheet 450 x 460 mm (3.0 mm)
- Tacky on both sides (TGF-JUSXXX-SI)
- Tacky on one side (TGF-JUSXXX-SI-A1)
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

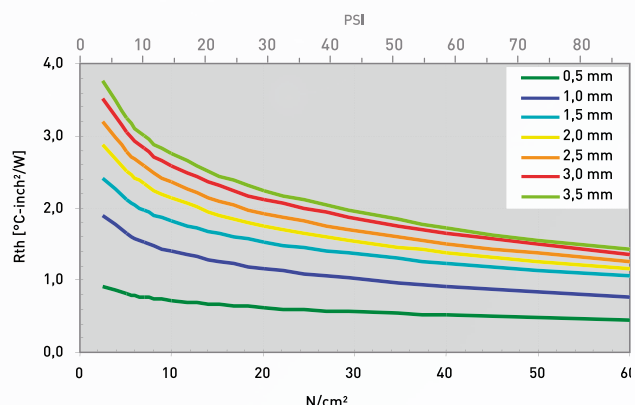
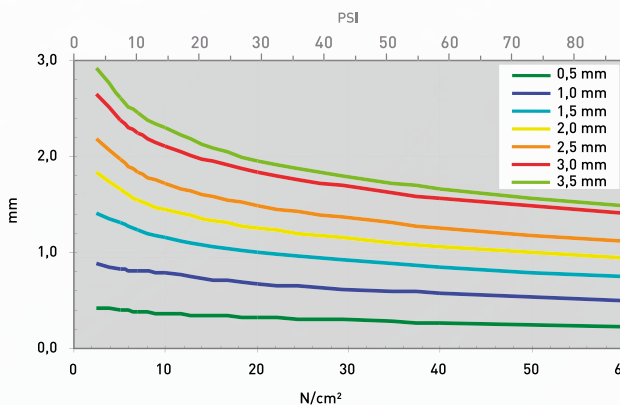
- Thermal link of:
- SMD packages
 - Through-hole vias
 - Capacitors
 - Electronic parts to heat pipes
- For use in Automotive applications / Laptops / Medicine engineering / Industrial PCs

Property	Unit	TGF-JUS0500-SI	TGF-JUS1000-SI	TGF-JUS2000-SI	TGF-JUS3000-SI
Material		Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone
Colour		Grey	Grey	Grey	Grey
Thickness	mm	0.5	1.0	2.0	3.0
Hardness	Shore 00	20	20	20	20
UL Flammability	UL 94	V0	V0	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes	Yes
Thermal					
Resistance ¹ @ 60 PSI @ thickness	°C-inch ² /W (mm)	0.60 (0.35)	1.00 (0.65)	1.40 (1.10)	1.70 (1.60)
Resistance ¹ @ 30 PSI @ thickness	°C-inch ² /W (mm)	0.70 (0.40)	1.20 (0.75)	1.80 (1.30)	2.10 (1.85)
Resistance ¹ @ 10 PSI @ thickness	°C-inch ² /W (mm)	0.80 (0.45)	1.50 (0.85)	2.30 (1.58)	2.80 (2.25)
Thermal Conductivity	W/mK	2.0	2.0	2.0	2.0
Operating Temperature Range	°C	- 60 to + 180	- 60 to + 180	- 60 to + 180	- 60 to + 180
Electrically					
Dielectric Strength	kV / mm	10	10	10	10
Volume Resistivity	Ohm - cm	1.0 x 10 ¹¹	1.0 x 10 ¹¹	1.0 x 10 ¹¹	1.0 x 10 ¹¹
Dielectric Constant	@ 1 kHz	5	5	5	5

Measurement technique according to: ¹ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 0.5 mm / 1.0 mm / 1.5 mm / 2.0 mm / 2.5 mm / 3.0 mm / 3.5 mm / 4.0 mm / 4.5 mm / 5.0 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



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SILICONE GAP FILLER TGF-JXS-SI

ultra soft, flexible



TGF-JXS-SI is an electrically insulating thermally conductive silicone gap filler. It is ideal for use in applications where thermal transfer over large gaps caused e.g. by big tolerances or different stack up heights must be achieved. Due to the specific formulation and filling with ceramic particles the silicone elastomer has a high thermal conductivity. Through its ultra softness and flexibility the material perfectly mates to irregular surfaces thus filling gaps at minimum pressure. By its use the total thermal resistance is minimised. The natural tackiness of the material allows for an easy and reliable pre-assembly. The material is one-side tacky through lamination with a thermally conductive film.



Release 09 / 2019

PROPERTIES

- Ultra soft and compliant
- Thermal conductivity: 2.0 W/mK
- Operates at minimum pressure
- Extraordinary chemical resistance and long-term stability
- Shock absorbing
- Easy mounting through self tackiness
- One-side self-tacky

AVAILABILITY

- Sheet 210 x 420 mm (0.5 - 3.0 mm)
- Sheet of 210 x 350 mm (3.5 - 6.0 mm)
- Tacky on one side by film laminate (TGF-JXSXXX-SI-A1)
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

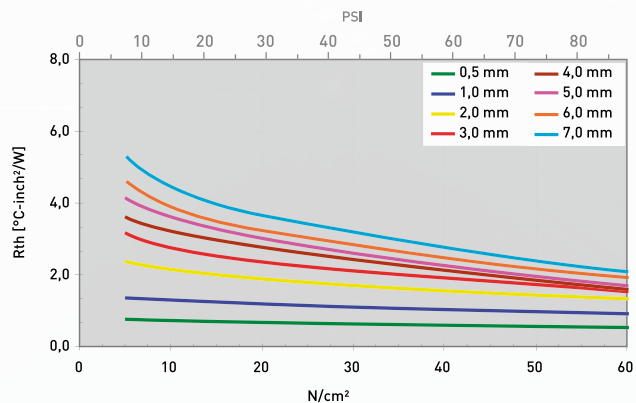
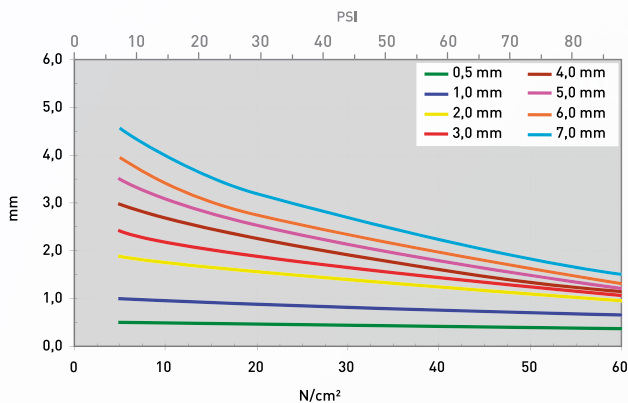
- Thermal link of:
- SMD packages
 - Through-hole vias
 - RDRAMs Smemory modules
 - Flip Chips, DSPs, BGAs, PPGAs
- For use in Automotive applications / Laptops / Medicine engineering / Embedded boards

Property	Unit	TGF-JXS0500-SI-A1	TGF-JXS1000-SI-A1	TGF-JXS2000-SI-A1	TGF-JXS3000-SI-A1	TGF-JXS5000-SI-A1
Material		Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone
Colour		Light blue / Grey	Light blue / Grey	Light blue / Grey	Light blue / Grey	Light blue / Grey
Thickness	mm	0.5	1.0	2.0	3.0	5.0
Hardness	Shore 00	20	20	20	20	20
No Paint Wetting Impairment Substances (PWIS) ¹		Passed	Passed	Passed	Passed	Passed
UL Flammability	UL 94	V0	V0	V0	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes	Yes	Yes
Thermal						
Resistance ² @ 60 PSI @ Thickness	°C-inch ² /W (mm)	0.59 [0.41]	1.03 [0.75]	1.57 [1.25]	1.90 [1.46]	2.26 [1.81]
Resistance ² @ 30 PSI @ Thickness	°C-inch ² /W (mm)	0.64 [0.45]	1.16 [0.86]	1.85 [1.55]	2.33 [1.87]	2.98 [2.52]
Resistance ² @ 10 PSI @ Thickness	°C-inch ² /W (mm)	0.74 [0.49]	1.32 [0.96]	2.27 [1.82]	2.96 [2.31]	3.89 [3.32]
Thermal Conductivity	W/mK	2.0	2.0	2.0	2.0	2.0
Operating Temperature Range	°C	- 40 to + 200	- 40 to + 200	- 40 to + 200	- 40 to + 200	- 40 to + 200
Electrically						
Dielectric Strength	kV / mm	>10	>10	>10	>10	>10
Volume Resistivity	Ohm - cm	1.0 x 10 ¹⁰	1.0 x 10 ¹⁰	1.0 x 10 ¹⁰	1.0 x 10 ¹⁰	1.0 x 10 ¹⁰

Measurement technique according to: ¹P-VW 3-10.7 57650 Temp. Test, ²ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 0.5 mm / 1.0 mm / 2.0 mm / 2.5 mm / 3.0 mm / 4.0 mm / 5.0 mm / 6.0 mm / 7.0 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



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SILICONE GAP FILLER TGF-MXS-SI

ultra soft, with or without fibreglass reinforcement



TGF-MXS-SI is an electrically insulating thermally conductive silicone gap filler. It is ideal for use in applications where thermal transfer over large gaps caused e.g. by big tolerances or different stack up heights must be achieved. Due to the specific formulation and filling with ceramic particles the silicone elastomer has a high thermal conductivity. Through its ultra softness and flexibility the material perfectly mates to irregular surfaces thus filling gaps at minimum pressure. By its use the total thermal resistance is minimised. The natural tackiness of the material allows for an easy and reliable pre-assembly. The optional conductive fibreglass reinforced silicone laminate on one side provides for a high mechanic stability and strength.



Release 09 / 2019

PROPERTIES

- Ultra soft and compliant
- Thermal conductivity: 2.4 W/mK
- Operates at minimum pressure
- Extraordinary chemical resistance and longterm stability
- Shock absorbing
- Easy mounting through self tackiness
- One or two-side self-tacky

AVAILABILITY

- Sheet 200 x 400 mm
- Tacky on both sides (TGF-MXSXXX-SI)
- Tacky on one side by fibreglass reinforced laminate (TGF-MXSXXX-SI-GF)
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

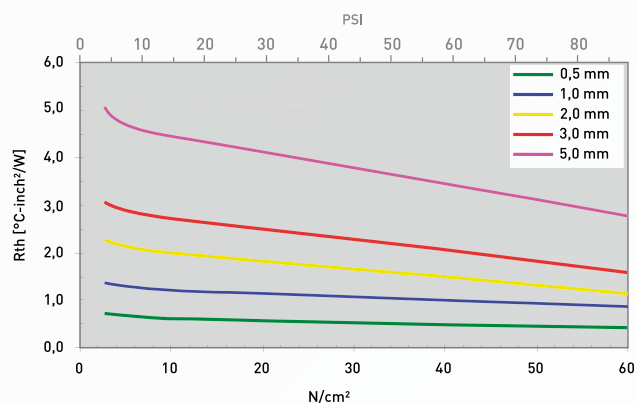
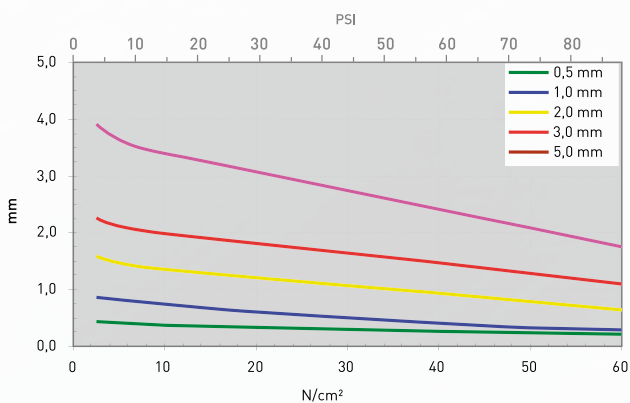
- Thermal link of:
- SMD packages
 - Through-hole vias
 - Capacitors
 - Electronic parts to heat pipes
- For use in Automotive applications / Laptops / Medicine engineering / Industrial PCs

Property	Unit	TGF-MXS0500-SI	TGF-MXS1000-SI	TGF-MXS2000-SI	TGF-MXS3000-SI
Material		Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone
Colour		Grey (/ Red laminate)	Grey (/ Red laminate)	Grey (/ Red laminate)	Grey (/ Red laminate)
Optional Reinforcement (TGF-MXSXXX-SI-GF)		Fibreglass laminate	Fibreglass laminate	Fibreglass laminate	Fibreglass laminate
Thickness	mm	0.5	1.0	2.0	3.0
Hardness	Shore 00	15	15	15	15
UL Flammability	UL 94	V1	V1	V1	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes	Yes
Thermal					
Resistance ¹ @ 60 PSI @ Thickness	°C-inch ² /W (mm)	0.44 (0.25)	1.00 (0.45)	1.49 (0.86)	2.05 (1.50)
Resistance ¹ @ 30 PSI @ Thickness	°C-inch ² /W (mm)	0.53 (0.32)	1.15 (0.63)	1.79 (1.15)	2.50 (1.73)
Resistance ¹ @ 10 PSI @ Thickness	°C-inch ² /W (mm)	0.63 (0.40)	1.26 (0.75)	2.03 (1.40)	2.77 (2.05)
Thermal Conductivity	W/mK	2.4	2.4	2.4	2.4
Operating Temperature Range	°C	- 40 to + 200	- 40 to + 200	- 40 to + 200	- 40 to + 200
Electrical					
Dielectric Strength	kV / mm	4	4	4	4
Volume Resistivity	Ohm - cm	1.7 x 10 ¹³	1.7 x 10 ¹³	1.7 x 10 ¹³	1.7 x 10 ¹³

Measurement technique according to: 1ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 0.5 mm / 1.0 mm / 2.0 mm / 3.0 mm / 4.0 mm / 5.0 mm / ... / 10.0 mm. Other thicknesses on request

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



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SILICONE GAP FILLER TGF-MUS-SI

extremely soft, flexible

TGF-MUS-SI is an electrically insulating thermally conductive silicone gap filler. It is ideal for use in applications where thermal transfer over large gaps caused e.g. by big tolerances or different stack up heights must be achieved. Due to the specific formulation and filling with ceramic particles the silicone elastomer has a very high thermal conductivity. Through its extreme softness and flexibility the material perfectly mates to irregular surfaces thus filling gaps at very low pressure. By its use the total thermal resistance is minimised. The natural tackiness of the material allows for an easy and reliable pre-assembly.



Release 09 / 2019

PROPERTIES

- Extremely soft and compliant
- Thermal conductivity: 2.5 W/mK
- Operates at very low pressure
- Extraordinary chemical resistance and long-term stability
- Shock absorbing
- Easy mounting through self tackiness
- One or two-side self-tacky

AVAILABILITY

- Sheet 480 x 460 mm (1.0 mm)
- Sheet 460 x 460 mm (2.0 mm)
- Sheet 450 x 460 mm (3.0 mm)
- Tacky on both sides (TGF-MUSXXX-SI)
- Tacky on one side (TGF-MUSXXX-SI-A1)
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

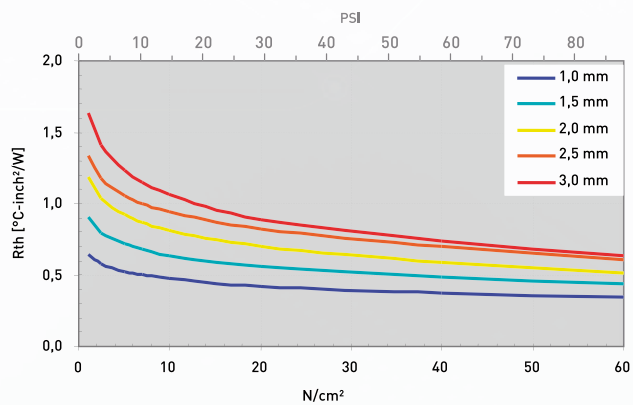
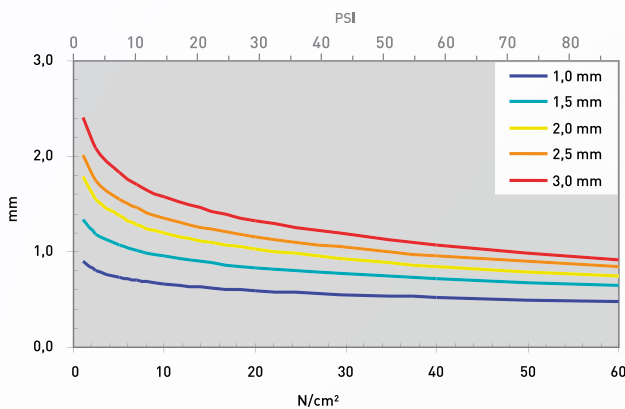
- Thermal link of:
- SMD packages
 - Through-hole vias
 - Capacitors
 - Electronic parts to heat pipes
- For use in Automotive applications / Laptops / Medicine engineering / Industrial PCs

Property	Unit	TGF-MUS1000-SI	TGF-MUS2000-SI	TGF-MUS3000-SI
Material		Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone
Colour		Light blue	Light blue	Light blue
Thickness	mm	1.0	2.0	3.0
Hardness	Shore 00	20	20	20
UL Flammability	UL 94	V0	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes
Thermal				
Resistance ¹ @ 60 PSI @ Thickness	°C-inch ² /W (mm)	0.37 (0.52)	0.58 (0.85)	0.74 (1.06)
Resistance ¹ @ 30 PSI @ Thickness	°C-inch ² /W (mm)	0.42 (0.59)	0.70 (1.02)	0.89 (1.32)
Resistance ¹ @ 10 PSI @ Thickness	°C-inch ² /W (mm)	0.49 (0.70)	0.89 (1.29)	1.20 (1.70)
Thermal Conductivity	W/mK	2.5	2.5	2.5
Operating Temperature Range	°C	- 60 to + 180	- 60 to + 180	- 60 to + 180
Electrical				
Dielectric Strength	kV / mm	10	10	10
Volume Resistivity	Ohm - cm	1.0 x 10 ¹¹	1.0 x 10 ¹¹	1.0 x 10 ¹¹
Dielectric Constant	@ 1 kHz	5.2	5.2	5.2

Measurement technique according to: ¹ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 1.0 mm / 1.5 mm / 2.0 mm / 2.5 mm / 3.0 mm / 4.0 mm / 5.0 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



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SILICONE GAP FILLER TGF-SSS-SI

very soft, flexible



TGF-SSS-SI is an electrically insulating thermally conductive high performance silicone gap filler. It is ideal for use in applications where thermal transfer over large gaps caused e.g. by big tolerances or different stack up heights must be achieved. Due to the specific formulation and filling with ceramic particles the silicone elastomer has a very high thermal conductivity. Through its extraordinary softness and flexibility the material perfectly mates to irregular surfaces thus filling gaps at very low pressure. By its use the total thermal resistance is minimised. The natural tackiness of the material allows for an easy and reliable pre-assembly. The material is one-side tacky through lamination with a thermally conductive film.



Release 09 / 2019

PROPERTIES

- Extraordinary soft and compliant
- Thermal conductivity: 3.0 W/mK
- Operates at very low pressure
- Extraordinary chemical resistance and long-term stability
- Shock absorbing
- Easy mounting through self tackiness
- One-side self-tacky

AVAILABILITY

- Sheet 210 x 420 mm (0.5 – 2.5 mm)
- Sheet 200 x 340 mm (3.5 – 5 mm)
- Tacky on one side by film laminate (TGF-SSSXXX-SI-A1)
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

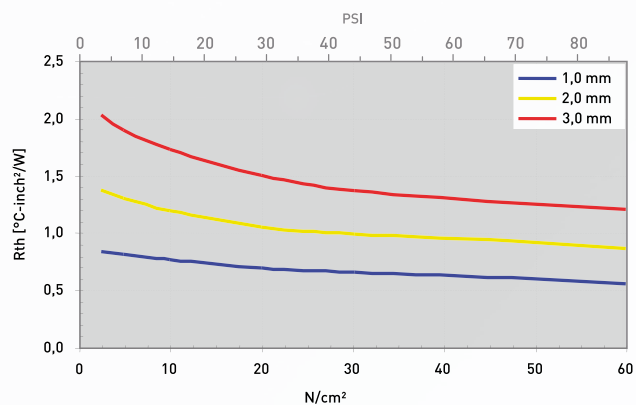
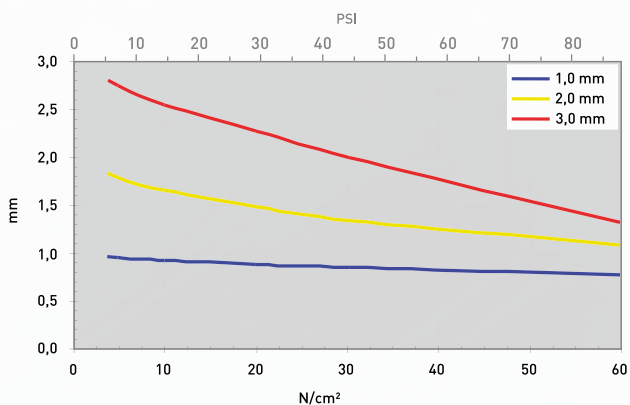
- Thermal link of:
- SMD packages
 - Through-hole vias
 - RDRAMs memory modules
 - Flip Chips, DSPs, BGAs, PPGAs
- For use in Automotive applications / Laptops / Medicine engineering / Embedded boards

Property	Unit	TGF-SSS1000-SI-A1	TGF-SSS2000-SI-A1	TGF-SSS3000-SI-A1
Material		Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone
Colour		Beige / Pink	Beige / Pink	Beige / Pink
Thickness	mm	1.0	2.0	3.0
Hardness	Shore 00	30	30	30
UL Flammability	UL 94	V1	V1	V1
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes
Thermal				
Resistance ¹ @ 60 PSI @ Thickness	°C-inch ² /W (mm)	0.64 [0.83]	0.96 [1.26]	1.32 [1.78]
Resistance ¹ @ 30 PSI @ Thickness	°C-inch ² /W (mm)	0.70 [0.89]	1.06 [1.48]	1.51 [2.27]
Resistance ¹ @ 10 PSI @ Thickness	°C-inch ² /W (mm)	0.80 [0.95]	1.26 [1.74]	1.83 [2.67]
Thermal Conductivity	W/mK	3.0	3.0	3.0
Operating Temperature Range	°C	- 40 to + 200	- 40 to + 200	- 40 to + 200
Electrical				
Dielectric Strength	kV / mm	>10	>10	>10
Volume Resistivity	Ohm - cm	1.0 x 10 ¹⁰	1.0 x 10 ¹⁰	1.0 x 10 ¹⁰

Measurement technique according to: ¹ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 0.5 mm / 1.0 mm / 2.0 mm / 3.0 mm / 4.0 mm / 5.0 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



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SILICONE GAP FILLER TGF-SXS-SI

ultra soft, flexible

TGF-SXS-SI is an electrically insulating thermally conductive high performance silicone gap filler. It is ideal for use in applications where thermal transfer over large gaps caused e.g. by big tolerances or different stack up heights must be achieved. Due to the specific formulation and filling with ceramic particles the silicone elastomer has a very high thermal conductivity. Through its ultra softness and flexibility the material perfectly mates to irregular surfaces thus filling gaps at minimum pressure. By its use the total thermal resistance is minimised. The natural tackiness of the material allows for an easy and reliable pre-assembly. The material is one-side tacky through lamination with a thermally conductive film.



Release 09 / 2019

PROPERTIES

- Ultra soft and compliant
- Thermal conductivity: 3.0 W/mK
- Operates at minimum pressure
- Extraordinary chemical resistance and long-term stability
- Shock absorbing
- Easy mounting through self tackiness
- One-side self-tacky

AVAILABILITY

- Sheet 210 x 420 mm (0.5 – 2.0 mm)
- Sheet 200 x 200 mm (3.0 mm)
- Sheet 150 x 200 mm (3.5 – 4.5 mm)
- Tacky on one side by film laminate (TGF-SXSXXX-SI-A1)
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

Thermal link of:

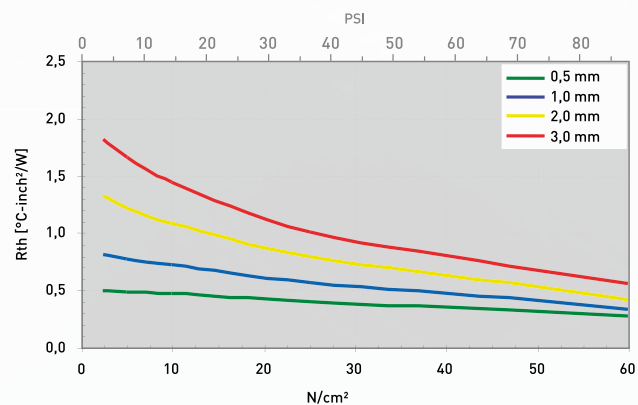
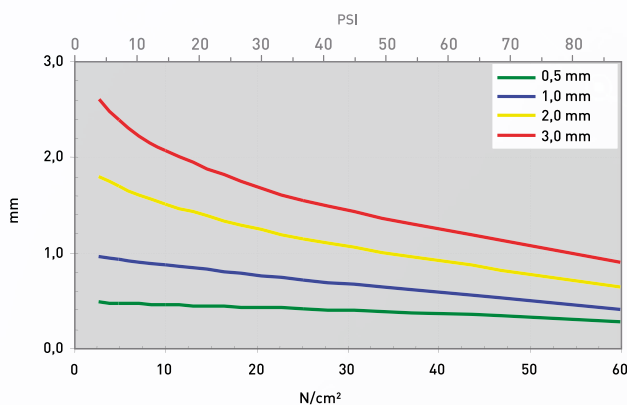
- SMD packages
 - Through-hole vias
 - RDRAMs memory modules
 - Flip Chips, DSPs, BGAs, PPGAs
- For use in Automotive applications / Laptops / Medicine engineering / Embedded boards

Property	Unit	TGF-SXS0500-SI-A1	TGF-SXS1000-SI-A1	TGF-SXS2000-SI-A1	TGF-SXS3000-SI-A1
Material		Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone
Colour		Light grey / Grey	Light grey / Grey	Light grey / Grey	Light grey / Grey
Thickness	mm	0.5	1.0	2.0	3.0
Hardness	Shore 00	25	25	25	25
No Paint Wetting Impairment Substances (PWIS) ¹		Passed	Passed	Passed	Passed
UL Flammability	UL 94	V1	V1	V1	V1
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes	Yes
Thermal					
Resistance ² @ 60 PSI @ Thickness	°C-inch ² /W [mm]	0.36 [0.38]	0.48 [0.60]	0.64 [0.94]	0.82 [1.27]
Resistance ² @ 30 PSI @ Thickness	°C-inch ² /W [mm]	0.43 [0.44]	0.62 [0.78]	0.89 [1.27]	1.15 [1.73]
Resistance ² @ 10 PSI @ Thickness	°C-inch ² /W [mm]	0.49 [0.48]	0.76 [0.92]	1.17 [1.63]	1.57 [2.26]
Thermal Conductivity	W/mK	3.0	3.0	3.0	3.0
Operating Temperature Range	°C	- 40 to + 200	- 40 to + 200	- 40 to + 200	- 40 to + 200
Electrical					
Breakdown Voltage	kV / mm	>10	>10	>10	>10
Volume Resistivity	Ohm · cm	1.0 x 10 ¹⁰	1.0 x 10 ¹⁰	1.0 x 10 ¹⁰	1.0 x 10 ¹⁰

Measurement technique according to: ¹P-VW 3-10.7 57650 Temp. Test, ²ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 0.5 mm / 1.0 mm / 2.0 mm / 3.0 mm / 4.0 mm / 4.5 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



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SILICONE GAP FILLER TGF-TSS-SI

very soft, flexible



TGF-TSS-SI is an electrically insulating thermally conductive high performance silicone gap filler. It is ideal for use in applications where thermal transfer over large gaps caused e.g. by big tolerances or different stack up heights must be achieved. Due to the specific formulation and filling with ceramic particles the silicone elastomer has a very high thermal conductivity. Through its extraordinary softness and flexibility the material perfectly mates to irregular surfaces thus filling gaps at very low pressure. By its use the total thermal resistance is minimised. The natural tackiness of the material allows for an easy and reliable pre-assembly.



Release 09 / 2019

PROPERTIES

- Extremely soft and compliant
- Thermal conductivity: 3.2 W/mK
- Operates at minimum pressure
- Extraordinary chemical resistance and long-term stability
- Shock absorbing
- Easy mounting through self tackiness

AVAILABILITY

- Sheet 300 x 400 mm
- Tacky on both sides [TGF-TSSXXX-SI]
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

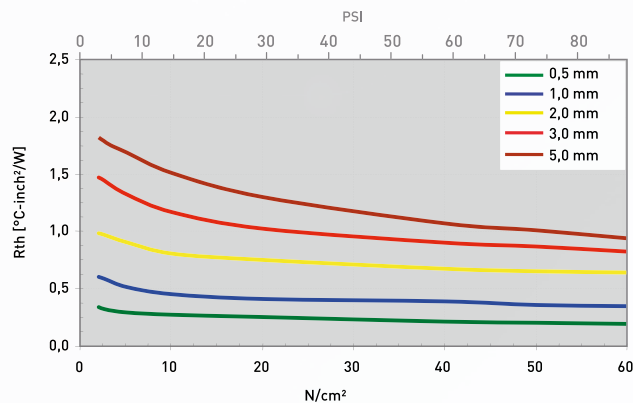
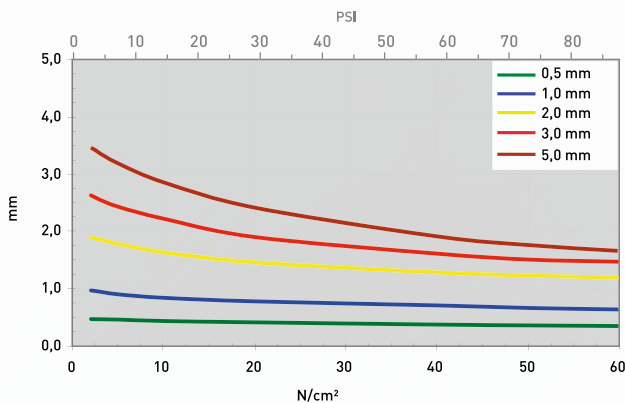
- Thermal link of:
- SMD packages
 - Through-hole vias
 - RDRAMs memory modules
 - Flip Chips, DSPs, BGAs, PPGAs
- For use in Automotive applications / Laptops / Medicine engineering / Embedded boards

Property	Unit	TGF-TSS0500-SI	TGF-TSS1000-SI	TGF-TSS2000-SI	TGF-TSS3000-SI	TGF-TSS5000-SI
Material		Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone
Colour		Light reddish purple	Light reddish purple	Light reddish purple	Light reddish purple	Light reddish purple
Thickness	mm	0.5	1.0	2.0	3.0	5.0
Hardness	Shore 00	37	37	37	37	37
UL Flammability	UL 94	V0	V0	V0	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes	Yes	Yes
Thermal						
Resistance ¹ @ 60 PSI @ Thickness	°C-inch ² /W (mm)	0.22 (0.37)	0.40 (0.70)	0.68 (1.27)	0.91 (1.60)	1.08 (1.90)
Resistance ¹ @ 30 PSI @ Thickness	°C-inch ² /W (mm)	0.26 (0.41)	0.42 (0.77)	0.76 (1.45)	1.03 (1.89)	1.31 (2.40)
Resistance ¹ @ 10 PSI @ Thickness	°C-inch ² /W (mm)	0.29 (0.44)	0.49 (0.86)	0.86 (1.70)	1.25 (2.31)	1.61 (3.01)
Thermal Conductivity	W/mK	3.2	3.2	3.2	3.2	3.2
Operating Temperature Range	°C	- 40 to + 180	- 40 to + 180	- 40 to + 180	- 40 to + 180	- 40 to + 180
Electrically						
Dielectric Strength	kV / mm	15	15	15	15	15

Measurement technique according to: ¹ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 0.5 mm / 1.0 mm / 2.0 mm / 2.5 mm / 3.0 mm / 4.0 mm / 5.0 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



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SILICONE GAP FILLER TGF-USS-SI

very soft, flexible

TGF-USS-SI is an electrically insulating thermally conductive high performance silicone gap filler. It is ideal for use in applications where thermal transfer over large gaps caused e.g. by big tolerances or different stack up heights must be achieved. Due to the specific formulation and filling with ceramic particles the silicone elastomer has a very high thermal conductivity. Through its ultra softness and flexibility the material perfectly mates to irregular surfaces thus filling gaps at minimum pressure. By its use the total thermal resistance is minimised. The natural tackiness of the material allows for an easy and reliable pre-assembly. The material is one-side tacky through lamination with a thermally conductive film.



Release 09 / 2019

PROPERTIES

- Ultra soft and compliant
- Thermal conductivity: 3.3 W/mK
- Operates at minimum pressure
- Extraordinary chemical resistance and long-term stability
- Shock absorbing
- Easy mounting through self tackiness
- One-side self-tacky

AVAILABILITY

- Sheet 210 x 420 mm (0.5 - 3.0 mm)
- Tacky on one side by film laminate (TGF-USSXXX-SI-A1)
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

Thermal link of:

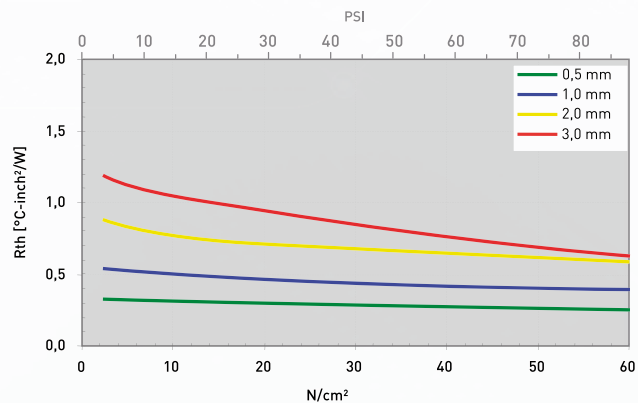
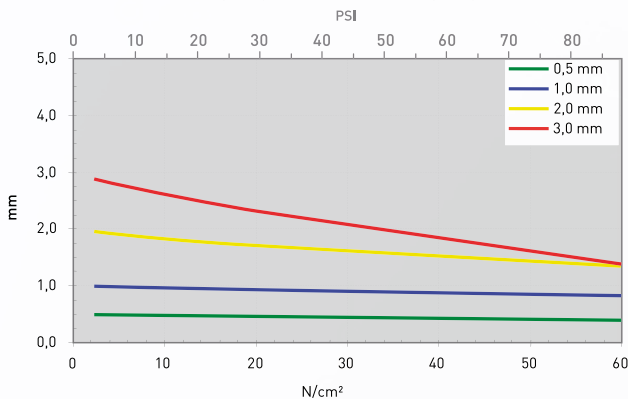
- SMD packages
 - Through-hole vias
 - RDRAMs memory modules
 - Flip Chips, DSPs, BGAs, PPGAs
- For use in Automotive applications / Laptops / Medicine engineering / Embedded boards

Property	Unit	TGF-USS0500-SI-A1	TGF-USS1000-SI-A1	TGF-USS2000-SI-A1	TGF-USS3000-SI-A1
Material		Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone
Colour		Dark grey / Grey	Dark grey / Grey	Dark grey / Grey	Dark grey / Grey
Thickness	mm	0.5	1.0	2.0	3.0
Hardness	Shore 00	45	45	45	45
No Paint Wetting Impairment Substances (PWIS) ¹		Passed	Passed	Passed	Passed
UL Flammability (Equivalent)	UL 94	V0	V0	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes	Yes
Thermal					
Resistance ² @ 60 PSI @ Thickness	°C-inch ² /W (mm)	0.26 (0.47)	0.40 (0.87)	0.63 (1.55)	0.75 (1.84)
Resistance ² @ 30 PSI @ Thickness	°C-inch ² /W (mm)	0.29 (0.48)	0.45 (0.93)	0.70 (1.70)	0.94 (2.30)
Resistance ² @ 10 PSI @ Thickness	°C-inch ² /W (mm)	0.31 (0.49)	0.51 (0.99)	0.80 (1.85)	1.07 (2.68)
Thermal Conductivity	W/mK	3.3	3.3	3.3	3.3
Operating Temperature Range	°C	- 40 to + 150	- 40 to + 150	- 40 to + 150	- 40 to + 150
Electrical					
Breakdown Voltage	kV / mm	>10	>10	>10	>10
Volume Resistivity	Ohm - cm	1.0 x 10 ¹⁰	1.0 x 10 ¹⁰	1.0 x 10 ¹⁰	1.0 x 10 ¹⁰

Test Methods: ¹P-VW 3-10.7 57650 Temp. Test, ²ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 0.5 mm / 1.0 mm / 2.0 mm / 3.0 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



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SILICONE GAP FILLER TGF-WSS-SI

very soft, flexible

TGF-WSS-SI is an electrically insulating thermally conductive high performance silicone gap filler. It is ideal for use in applications where thermal transfer over large gaps caused e.g. by big tolerances or different stack up heights must be achieved. Due to the specific formulation and filling with ceramic particles the silicone elastomer has an extremely high thermal conductivity. Through its high softness and flexibility the material perfectly mates to irregular surfaces thus filling gaps at very low pressure. By its use the total thermal resistance is minimised. The natural tackiness of the material allows for an easy and reliable pre-assembly.



Release 09 / 2019

PROPERTIES

- Very soft and compliant
- Thermal conductivity: 5.5 W/mK
- Operates at very low pressure
- Extraordinary chemical resistance and long-term stability
- Shock absorbing
- Easy mounting through self tackiness
- One or two-side self-tacky

AVAILABILITY

- Sheet 460 x 100 mm
- Tacky on both sides (TGF-WSSXXX-SI)
- Tacky on one side (TGF-WSSXXX-SI-A1)
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

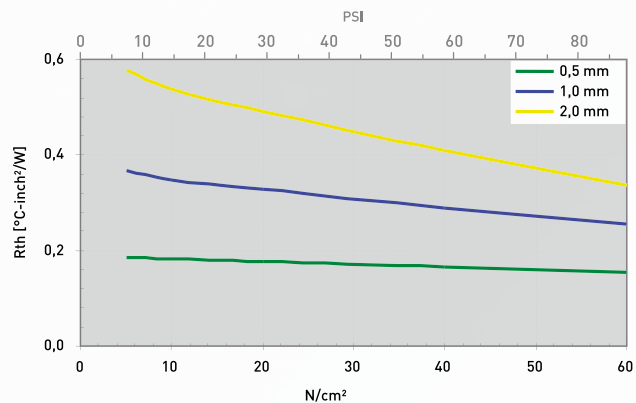
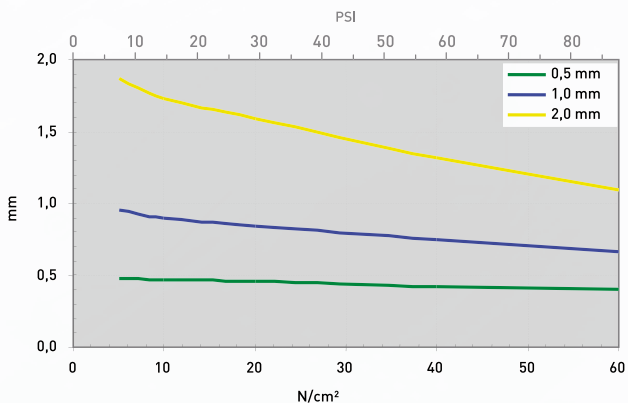
- Thermal link of:
- SMD packages
 - Through-hole vias
 - RDRAMs memory modules
 - Flip Chips, DSPs, BGAs, PPGAs
- For use in Automotive applications / Laptops / Medicine engineering / Embedded boards

Property	Unit	TGF-WSS0500-SI	TGF-WSS1000-SI	TGF-WSS2000-SI
Material		Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone
Colour		Grey	Grey	Grey
Thickness	mm	0.5	1.0	2.0
Hardness	Shore 00	55	55	55
UL Flammability (Equivalent)	UL 94	V0	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes
Thermal				
Resistance ¹ @ 60 PSI @ Thickness	°C-inch ² /W (mm)	0.16 (0.41)	0.30 (0.75)	0.41 (1.32)
Resistance ¹ @ 30 PSI @ Thickness	°C-inch ² /W (mm)	0.18 (0.46)	0.32 (0.85)	0.49 (1.59)
Resistance ¹ @ 10 PSI @ Thickness	°C-inch ² /W (mm)	0.19 (0.48)	0.36 (0.93)	0.56 (1.80)
Thermal Conductivity	W/mK	5.5	5.5	5.5
Operating Temperature Range	°C	- 60 to + 180	- 60 to + 180	- 60 to + 180
Electrical				
Dielectric Strength	kV / mm	10	10	10
Volume Resistivity	Ohm - cm	1.0 x 10 ¹³	1.0 x 10 ¹³	1.0 x 10 ¹³

Measurement technique according to: ¹ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 0.5 mm / 1.0 mm / 2.0 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



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SILICONE GAP FILLER TGF-DXS-SI-GF

ultra soft, with fibreglass reinforcement



TGF-DXS-SI-GF is an electrically insulating thermally conductive silicone gap filler. It is ideal for use in applications where thermal transfer over large gaps caused e.g. by big tolerances or different stack up heights must be achieved. Due to the specific formulation and filling with ceramic particles the silicone elastomer has a good thermal conductivity. Through its ultra softness and flexibility the material perfectly mates to irregular surfaces thus filling gaps at minimum pressure. By its use the total thermal resistance is minimised. The natural tackiness of the material allows for an easy and reliable pre-assembly. The conductive fibreglass reinforced silicone laminate on one side provides for a high mechanic stability and strength.



Release 09 / 2019

PROPERTIES

- Ultra soft and compliant
- Thermal conductivity: 1.3 W/mK
- Operates at minimum pressure
- Extraordinary chemical resistance and longterm stability
- Shock absorbing
- Easy mounting through self tackiness
- One side self-tacky

AVAILABILITY

- Sheet 200 x 400 mm
- Tacky on one side by fibreglass reinforced laminate (TGF-DXSXXX-SI-GF)
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

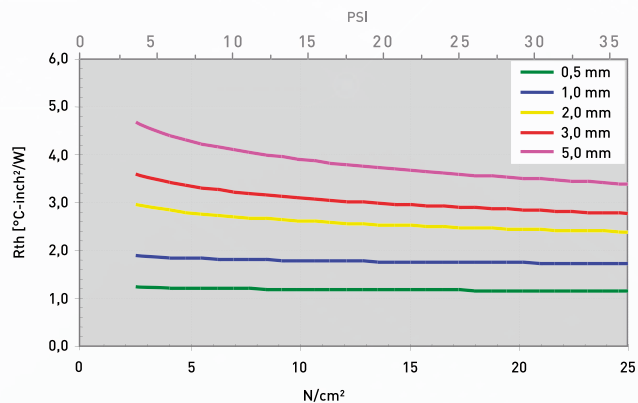
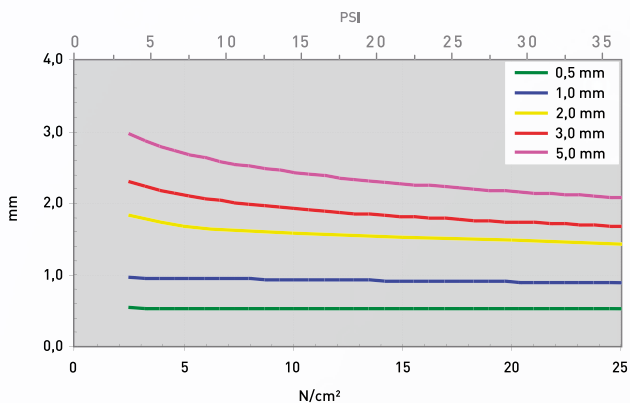
- Thermal link of:
- SMD packages
 - Through-hole vias
 - Capacitors
 - Electronic parts to heat pipes
- For use in Automotive applications / Laptops / Medicine engineering / Industrial PCs

Property	Unit	TGF-DXS1000-SI-GF	TGF-DXS2000-SI-GF	TGF-DXS3000-SI-GF	TGF-DXS5000-SI-GF
Material		Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone
Colour		White / Pink	White / Pink	White / Pink	White / Pink
Reinforcement		Fibreglass laminate	Fibreglass laminate	Fibreglass laminate	Fibreglass laminate
Thickness	mm	1.0	2.0	3.0	5.0
Hardness	Shore 00	5	5	5	5
UL Flammability	UL 94	V0	V0	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes	Yes
Thermal					
Resistance ¹ @ 35 PSI @ Thickness	°C-inch ² /W (mm)	1.77 (0.94)	2.43 (1.40)	2.80 (1.65)	3.40 (2.10)
Resistance ¹ @ 15 PSI @ Thickness	°C-inch ² /W (mm)	1.85 (0.95)	2.70 (1.60)	3.10 (1.95)	3.95 (2.55)
Resistance ¹ @ 7 PSI @ Thickness	°C-inch ² /W (mm)	1.86 (0.97)	2.80 (1.70)	3.30 (2.20)	4.40 (2.70)
Thermal Conductivity	W/mK	1.3	1.3	1.3	1.3
Operating Temperature Range	°C	- 40 to + 180	- 40 to + 180	- 40 to + 180	- 40 to + 180
Electrical					
Dielectric Strength	kV / mm	6	6	6	6
Volume Resistivity	Ohm - cm	6.2 x 10 ¹⁵	6.2 x 10 ¹⁵	6.2 x 10 ¹⁵	6.2 x 10 ¹⁵
Dielectric Constant	@ 1 MHz	5.27	5.27	5.27	5.27

Measurement technique according to: *ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 0.5 mm / 1.0 mm / 2.0 mm / 3.0 mm / 4.0 mm / 5.0 mm / 6.0 mm / 7.0 mm / 8.0 mm / 9.0 mm / 10.0 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



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SILICONE GAP FILLER TGF-EXS-SI-GF

ultra soft, flexible



TGF-EXS-SI-GF is an electrically insulating thermally conductive silicone gap filler. It is ideal for use in applications where thermal transfer over large gaps caused e.g. by big tolerances or different stack up heights must be achieved. Due to the specific formulation and filling with ceramic particles the silicone elastomer has a high thermal conductivity. Through its ultra softness and flexibility the material perfectly mates to irregular surfaces thus filling gaps at minimum pressure. By its use the total thermal resistance is minimised. The natural tackiness of the material allows for an easy and reliable pre-assembly. The conductive fiberglass reinforced silicone laminate on one side allows for a high mechanic stability and strength.



Release 09 / 2019

PROPERTIES

- Ultra soft and compliant
- Thermal conductivity: 1.4 W/mK
- Operates at minimum pressure
- Extraordinary chemical resistance and long-term stability
- Shock absorbing
- Easy mounting through self tackiness
- One-side self-tacky

AVAILABILITY

- Sheet 300 x 400 mm
- Tacky on one side by fibreglass reinforced laminate (TGF-EXSXXX-SI-GF)
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

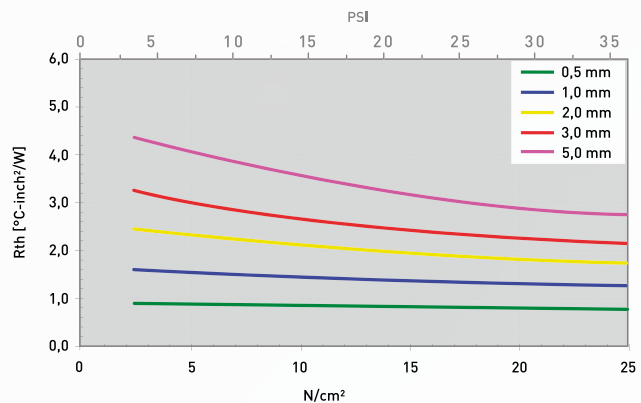
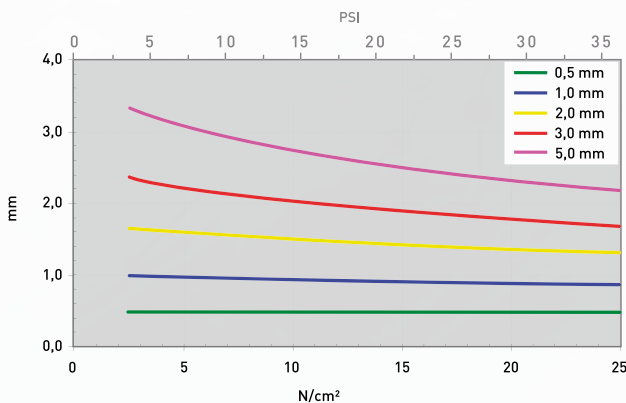
- Thermal link of:
- SMD packages
 - Through-hole vias
 - RDRAMs Smemory modules
 - Flip Chips, DSPs, BGAs, PPGAs
- For use in Automotive applications / Laptops / Medicine engineering / Embedded boards

Property	Unit	TGF-EXS0500-SI-GF	TGF-EXS1000-SI-GF	TGF-EXS2000-SI-GF	TGF-EXS3000-SI-GF	TGF-EXS5000-SI-GF
Material		Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone
Colour		Reddish brown / Grey	Reddish brown / Grey	Reddish brown / Grey	Reddish brown / Grey	Reddish brown / Grey
Reinforcement		Fibreglass laminate	Fibreglass laminate	Fibreglass laminate	Fibreglass laminate	Fibreglass laminate
Thickness	mm	0.5	1.0	2.0	3.0	5.0
Hardness	Shore 00	10	10	10	10	10
UL Flammability	UL 94	V0	V0	V0	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes	Yes	Yes
Thermal						
Resistance ¹ @ 35 PSI @ Thickness	°C-inch ² /W (mm)	0.76 [0.46]	1.26 [0.86]	1.73 [1.30]	2.14 [1.68]	2.73 [2.17]
Resistance ¹ @ 15 PSI @ Thickness	°C-inch ² /W (mm)	0.85 [0.47]	1.44 [0.92]	2.07 [1.50]	2.63 [2.03]	3.58 [2.72]
Resistance ¹ @ 7 PSI @ Thickness	°C-inch ² /W (mm)	0.89 [0.48]	1.54 [0.95]	2.31 [1.58]	3.00 [2.20]	4.08 [3.06]
Thermal Conductivity ¹	W/mK	1.4	1.4	1.4	1.4	1.4
Operating Temperature Range	°C	- 40 to + 180	- 40 to + 180	- 40 to + 180	- 40 to + 180	- 40 to + 180
Electrically						
Dielectric Strength	kV / mm	20	20	20	20	20

Measurement technique according to: ¹ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 0.5 mm / 1.0 mm / 1.5 mm / 2.0 mm / 3.0 mm / 4.0 mm / 5.0 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



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SILICONE GAP FILLER TGF-YP-SI

plastic

TGF-YP-SI is an electrically insulating thermally conductive very high performance silicone gap filler. It is ideal for use in applications where a very good thermal transfer over large gaps caused e.g. by big tolerances or different stack up heights must be achieved. Due to the specific formulation and filling with ceramic particles the silicone elastomer has an outstandingly high thermal conductivity. Through its softness and plasticity the material perfectly mates to irregular surfaces thus filling gaps at low pressure. By its use the total thermal resistance is minimised. The natural tackiness of the material allows for an easy and reliable pre-assembly.



Release 09 / 2019

PROPERTIES

- Plastic putty
- Soft and compliant
- Thermal conductivity: 7.0 W/mK
- Extraordinary chemical resistance and long-term stability
- Two-side self-tacky

AVAILABILITY

- Sheet 460 x 100 mm
- Tacky on both sides (TGF-YPXXX-SI)
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

Thermal link of:

- SMD packages
- Through-hole vias
- Capacitors
- Electronic parts to heat pipes

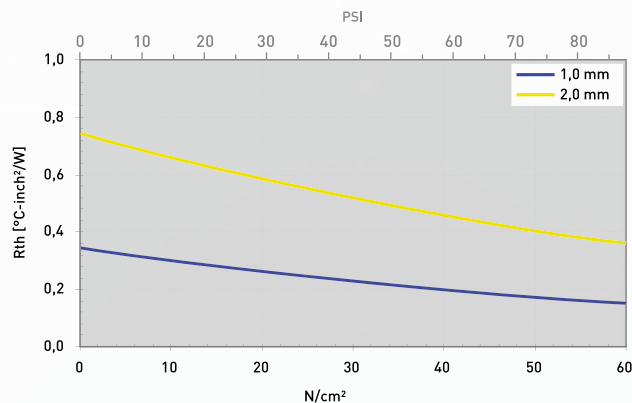
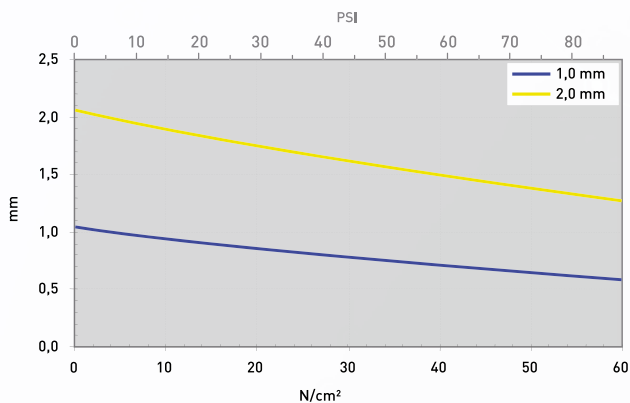
For use in Automotive applications / Laptops / Medicine engineering / Industrial PCs

Property	Unit	TGF-YP1000-SI	TGF-YP2000-SI
Material		Ceramic filled silicone	Ceramic filled silicone
Colour		Grey	Grey
Thickness	mm	1.0	2.0
Hardness	Shore 00	55	55
UL Flammability (Equivalent)	UL 94	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes
Thermal			
Resistance ¹ @ 60 PSI @ Thickness	°C-inch ² /W (mm)	0.20 (0.75)	0.45 (1.50)
Resistance ¹ @ 30 PSI @ Thickness	°C-inch ² /W (mm)	0.27 (0.90)	0.59 (1.75)
Resistance ¹ @ 10 PSI @ Thickness	°C-inch ² /W (mm)	0.32 (0.95)	0.67 (1.90)
Thermal Conductivity	W/mK	7.0	7.0
Operating Temperature Range	°C	- 40 to + 150	- 40 to + 150
Electrically			
Dielectric Strength	kV / mm	>10	>10
Volume Resistivity	Ohm - cm	> 1.0 x 10 ¹²	> 1.0 x 10 ¹²
Dielectric Constant	@ 1 MHz	7	7

Measurement technique according to: ¹ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 1.0 mm / 2.0 mm / 3.0 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



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SILICONE GAP FILLER TGF-ZP-SI

plastic

TGF-ZP-SI is an electrically insulating thermally conductive silicone gap filler. It is ideal for use in applications where thermal transfer over large gaps caused e.g. by big tolerances or different stack up heights must be achieved. Due to the specific formulation and filling with ceramic particles the silicone elastomer has an extremely high thermal conductivity. Through its extreme softness and plasticity the material perfectly mates to irregular surfaces thus filling gaps at almost zero pressure. By its use the total thermal resistance is minimised. The natural tackiness of the material allows for an easy and reliable pre-assembly.



Release 09 / 2019

PROPERTIES

- Plastic putty
- Extremely soft and compliant
- Thermal conductivity: 11 W/mK
- Operates at almost zero pressure
- For minimal gaps
- Extraordinary chemical resistance and longterm stability
- Easy mounting through self tackiness

AVAILABILITY

- Sheet 300 x 200 mm
- Tacky on both sides (TGF-ZPXXX-SI)
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

Thermal link of:

- SMD packages
- Through-hole vias
- RDRAMs memory modules
- Capacitors

For use in Automotive applications / Laptops / Medicine engineering / Embedded boards

Property	Unit	TGF-ZP1500-SI	TGF-ZP2000-SI
Material		Ceramic filled silicone	Ceramic filled silicone
Colour		Light grey	Light grey
Reinforcement		None	None
Thickness	mm	1.5	2.0
Density	g/cm ³	3.3	3.3
UL Flammability	UL 94	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes
Thermal			
Resistance ¹ @ 1.5 mm	°C-inch ² /W	---	0.24
Resistance ¹ @ 0.8 mm	°C-inch ² /W	0.14	0.14
Resistance ¹ @ 0.5 mm	°C-inch ² /W	0.10	0.10
Resistance ¹ @ 0.2 mm	°C-inch ² /W	0.06	0.06
Thermal Conductivity	W/mK	11	11
Operating Temperature Range	°C	- 50 to + 180	-50 to + 180
Electrical			
Dielectric Strength	kV / mm	11	11
Dielectric Constant	@ 1 MHz	7.5	7.5
Volume Resistivity	Ohm-cm	7.0 x 10 ⁷	7.0 x 10 ⁷

Measurement technique according to: ¹ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 1.5 mm / 2.0 mm

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dispensable

TGL-W-SI is an electrically insulating thermally conductive, highly viscous dispensable form-in-place gap filler. It is ideal for use in applications where thermal transfer over large gaps caused e.g. by big tolerances or different stack up heights must be achieved. The ready-made compound does not require an additional curing process. Due to the specific formulation and filling with ceramic particles the material has a very high thermal conductivity. After dispensing the viscoplastic material leads to an optimum thermal contact at no pressure. By its use the total thermal resistance is minimised.



Release 09 / 2019

PROPERTIESEN

- Dispensable
- Almost zero pressure at assembly due to viscoplasticity
- Thermal conductivity: 5.5 W/mK
- Ready-made, no additional curing required

AVAILABILITY

- Cartridge 30 ml
- Tube 250 g
- Pail 2 kg
- Others on request

APPLICATION EXAMPLES

Thermal link of:

- SMD packages
 - Through-hole vias
 - RDRAMs memory modules
 - Flip Chips, DSPs, BGAs, PPGAs
- For use in Automotive applications
/ Laptops / Medicine engineering /
Industrial PCs

Property	Unit	TGL-W-SI
Material		Ceramic filled silicone compound
Colour		Grey
Density	g/cm ³	3.1
Penetration	mm/10	290
RoHS Conformity	2011 / 65 / EU	Yes
Thermal		
Thermal Conductivity	W/mK	5.5
Operating Temperature Range	°C	- 40 to + 150
Electrical		
Dielectric Strength	kV / mm	10
Volume Resistance	Ohm - cm	1.0 x 10 ¹³

All data without warranty and subject to change. Please contact us for further data and information.

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2-PART SILICONE GAP FILLER TDG-L-SI-2C-Y HALA

dispensable / 2 parts / Low Volatile Siloxanes (LV) / Form-in-Place

TDG-L-SI-2C-Y is a 2-part dispensable low volatile silicone gap filler which is filled with thermally conductive fillers. After curing under heat the system remains elastic. It is characterised by very good dielectric and mechanic properties and is suited for compensating extreme tolerances and spaces at non-coplanar systems. Its thixotropic behaviour allows for a definite placement and cure-in-place. It has a natural low level tack that enhances a good thermal contact. Due to its negligible and controlled volatile content it is suited for environments where volatile silicones and paint wetting impairment are critical.



Release 09 / 2019

PROPERTIES

- Dispensable 2-part silicone
- Low volatile siloxane content (LV)
- No paint wetting impairment
- Thermal conductivity: 2.0 W/mK
- Remains elastic after polymerisation
- Zero stress on components
- Heat accelerated curing
- Shock absorbing

AVAILABILITY

- Optional in blue colour: TDG-L-SI-2C
- Cartridges 50 ml (2 x 25 ml)
- Cartridges 2 x 600 ml
- Pails 20 or 25 kg
- On request

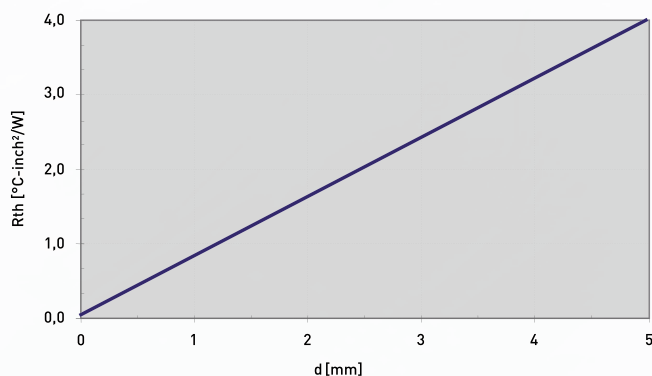
APPLICATION EXAMPLES

Thermal link of:

- FPBGA
 - Capacitors
 - Heat Pipes
 - BGA
- For use in Automotive applications
/ Telecommunication / Multimedia / Industrial PCs

Property	Unit	A Part	B Part
Material		Silicone	Silicone
Colour		Yellow	White
Density @ 25 °C	g/cm ³	1.9	1.9
Mixing Ratio	Weight or Volume	1 : 1	1 : 1
Hardness	Shore 00	52	52
Viscosity (Brookfield @ 10 rpm, 25 °C)	Pas	260	260
Viscosity (mixed) (Brookfield @ 10 rpm, 25 °C)	Pas	260	260
Pot Life @ 25 °C and 65 % RH (Time for viscosity to double)	min	> 120	> 120
Curing Time @ 25 °C / 100 °C		< 24h / 15 - 30 min	< 24h / 15 - 30 min
Shelf Life (from Date of Manufacturing, unopened, @ < 35 °C)	Months	6	6
No Paint Wetting Impairment Substances (PWIS) ¹		Passed	Passed
Flammability	UL 94	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes
Technical			
Thermal Conductivity ²	W/mK	2.0	2.0
Operating Temperature	°C	- 50 to + 150	- 50 to + 150
Dielectric Strength	kV/mm	> 10	> 10
Volume Resistivity	Ohm-cm	1 x 10 ¹⁰	1 x 10 ¹⁰

Measurement technique according to: ¹P-VW 3-10.7 57650 Temp. Test, ²ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.



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2-PART SILICONE GAP FILLER TDG-T-SI-2C HALA

dispensable / 2 parts / Low Volatile Siloxanes (LV) / Form-in-Place

TDG-T-SI-2C is a 2-part dispensable low volatile silicone gap filler which is filled with thermally conductive fillers. After curing under heat the system remains elastic. It is characterised by very good dielectric and mechanic properties and is suited for compensating extreme tolerances and spaces at non-coplanar systems. Its thixotropic behaviour allows for a definite placement and cure-in-place. It has a natural low level tack that enhances a good thermal contact. Due to its negligible and controlled volatile content it is suited for environments where volatile silicones and paint wetting impairment are critical.



Release 09 / 2019

PROPERTIES

- Dispensable 2-part silicone
- Low volatile siloxane content (LV)
- No paint wetting impairment
- Thermal conductivity: 3.0 W/mK
- Remains elastic after polymerisation
- Zero stress on components
- Heat accelerated curing
- Shock absorbing

AVAILABILITY

- Cartridges 50 ml (2 x 25 ml)
- Cartridges 2 x 600 ml
- Pails 20 or 25 kg
- On request

APPLICATION EXAMPLES

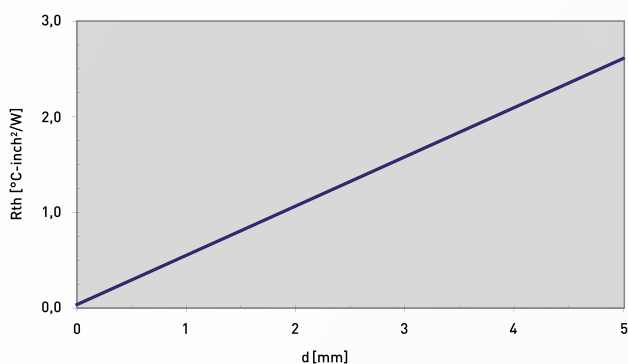
Thermal link of:

- FPBGA
- Capacitors
- Heat Pipes
- BGA

For use in Automotive applications
/ Telecommunication / Multimedia /
Industrial PCs

Property	Unit	A Part	B Part
Material		Silicone	Silicone
Colour		Blue	White
Density @ 25 °C	g/cm ³	2.75	2.75
Mixing Ratio	Weight or Volume	1 : 1	1 : 1
Hardness	Shore 00	55	55
Viscosity (Brookfield @ 10 rpm, 25 °C)	Pas	290	260
Viscosity (mixed) (Brookfield @ 10 rpm, 25 °C)	Pas	275	275
Pot Life @ 25 °C and 65 % RH (Time for viscosity to double)	min	> 120	> 120
Curing Time @ 25 °C / 100 °C		< 15h / 15 - 30 min	< 15h / 15 - 30 min
Shelf Life (from Date of Manu- facturing, unopened, @ < 35 °C)	Months	6	6
No Paint Wetting Impairment Substances (PWIS) ¹		Passed	Passed
Flammability	UL 94	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes
Technical			
Thermal Conductivity ²	W/mK	3.0	3.0
Operating Temperature	°C	- 50 to + 150	- 50 to + 150
Dielectric Strength	kV/mm	> 10	> 10
Volume Resistivity	Ohm-cm	1 x 10 ¹⁰	1 x 10 ¹⁰

Measurement technique according to: ¹P-VW 3-10.7 57650 Temp. Test, ²ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.



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2-PART SILICONE GAP FILLER TDG-U-SI-2C HALA

dispensable / 2 parts / Low Volatile Siloxanes (LV) / Form-in-Place

TDG-U-SI-2C is a 2-part dispensable low volatile silicone gap filler which is filled with thermally conductive fillers. After curing under heat the system remains elastic. It is characterised by very good dielectric and mechanic properties and is suited for compensating extreme tolerances and spaces at non-coplanar systems. Its thixotropic behaviour allows for a definite placement and cure-in-place. It has a natural low level tack that enhances a good thermal contact. Due to its negligible and controlled volatile content it is suited for environments where volatile silicones and paint wetting impairment are critical.



Release 09 / 2019

PROPERTIES

- Dispensable 2-part silicone
- Low volatile siloxane content (LV)
- No paint wetting impairment
- Thermal conductivity: 3.6 W/mK
- Remains elastic after polymerisation
- Zero stress on components
- Heat accelerated curing
- Shock absorbing

AVAILABILITY

- Cartridges 50 ml (2 x 25 ml)
- Cartridges 2 x 600 ml
- Pails 20 or 25 kg
- On request

APPLICATION EXAMPLES

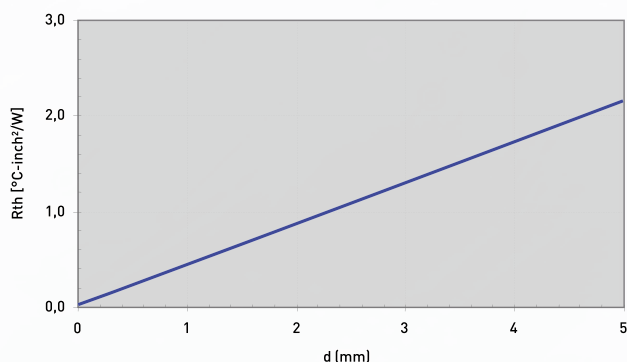
Thermal link of:

- FPBGA
- Capacitors
- Heat Pipes
- BGA

For use in Automotive applications
/ Telecommunication / Multimedia /
Industrial PCs

Property	Unit	A Part	B Part
Material		Silicone	Silicone
Colour		Light Blue	White
Density @ 25 °C	g/cm ³	2.85	2.85
Mixing Ratio	Weight or Volume	1 : 1	1 : 1
Hardness	Shore 00	38	38
Viscosity (Brookfield @ 10 rpm, 25 °C)	Pas	220	190
Viscosity (mixed (Brookfield @ 10 rpm, 25 °C))	Pas	260	260
Pot Life @ 25 °C and 65 % RH (Time for viscosity to double)	min	> 100	> 100
Curing Time @ 25 °C / 100 °C		< 15h / 15 - 30 min	< 15h / 15 - 30 min
Shelf Life (from Date of Manufacturing, unopened, @ < 35 °C)	Months	6	6
No Paint Wetting Impairment Substances (PWIS) ¹		Passed	Passed
Flammability	UL 94	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes
Technical			
Thermal Conductivity ²	W/mK	3.6	3.6
Operating Temperature	°C	- 50 to + 150	- 50 to + 150
Dielectric Strength	kV/mm	> 10	> 10
Volume Resistivity	Ohm-cm	1 x 10 ¹⁰	1 x 10 ¹⁰

Measurement technique according to: ¹P-VW 3-10.7 57650 Temp. Test, ²ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.



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2-PART SILICONE GAP FILLER TDG-W-SI-2C HALA

dispensable / 2 parts / Low Volatile Siloxanes (LV) / Form-in-Place

TDG-W-SI-2C is a 2-part dispensable low volatile silicone gap filler which is filled with thermally conductive fillers. After curing under heat the system remains elastic. It is characterised by very good dielectric and mechanic properties and is suited for compensating extreme tolerances and spaces at non-coplanar systems. Its thixotropic behaviour allows for a definite placement and cure-in-place. It has a natural low level tack that enhances a good thermal contact. Due to its negligible and controlled volatile content it is suited for environments where volatile silicones and paint wetting impairment are critical.



Release 09 / 2019

PROPERTIES

- Dispensable 2-part silicone
- Low volatile siloxane content (LV)
- No paint wetting impairment
- Thermal conductivity: 4.5 W/mK
- Remains elastic after polymerisation
- Zero stress on components
- Heat accelerated curing
- Shock absorbing

AVAILABILITY

- Cartridges 50 ml (2 x 25 ml)
- Cartridges 2 x 600 ml
- Pails 20 or 25 kg
- On request

APPLICATION EXAMPLES

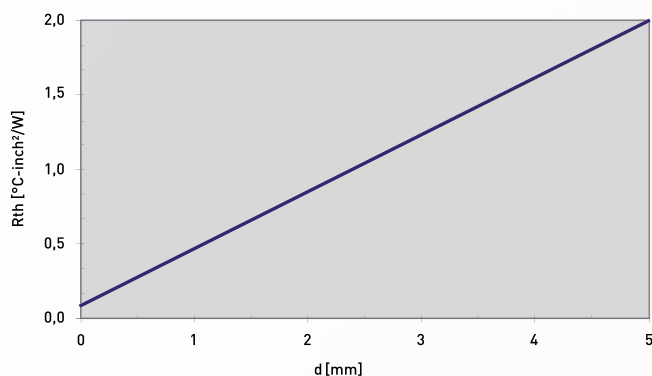
Thermal link of:

- FPBGA
- Capacitors
- Heat Pipes
- BGA

For use in Automotive applications
/ Telecommunication / Multimedia /
Industrial PCs

Property	Unit	A Part	B Part
Material		Silicone	Silicone
Colour		Pink	White
Density @ 25 °C	g/cm ³	3.1	3.1
Mixing Ratio	Weight or Volume	1 : 1	1 : 1
Hardness	Shore 00	60	60
Viscosity (Brookfield @ 10 rpm, 25 °C)	Pas	330	300
Viscosity (mixed (Brookfield @ 10 rpm, 25 °C))	Pas	310	310
Pot Life @ 25 °C and 65 % RH (Time for viscosity to double)	min	> 100	> 100
Curing Time @ 25 °C / 100 °C		< 15h / 30 - 60 min	< 15h / 30 - 60 min
Shelf Life (from Date of Manufacturing, unopened, @ < 35 °C)	Months	6	6
No Paint Wetting Impairment Substances (PWIS) ¹		Passed	Passed
Flammability (Equivalent)	UL 94	V1	V1
RoHS Conformity	2011 / 65 / EU	Yes	Yes
Technical			
Thermal Conductivity ²	W/mK	4.5	4.5
Operating Temperature	°C	- 50 to + 150	- 50 to + 150
Dielectric Strength	kV/mm	> 10	> 10
Volume Resistivity	Ohm-cm	1 x 10 ¹⁰	1 x 10 ¹⁰

Measurement technique according to: ¹P-VW 3-10.7 57650 Temp. Test, ²ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.



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SILICONE-FREE GAP FILLER TGF-G-NS



siloxane-free, elastic TPE

TGF-G-NS is an electrically insulating thermally conductive silicone-free gap filler. It is ideal for use in applications where thermal transfer over large gaps caused e.g. by big tolerances or different stack up heights must be achieved. The TPE polymer based elastomer does not contain any volatile siloxanes which are inevitably emitted by silicones. Due to the specific formulation and filling with ceramic particles the material has a high thermal conductivity. Through its high softness the material perfectly mates to irregular surfaces thus filling gaps and operates at low pressure. By its use the total thermal resistance is minimised. The natural tackiness of the material allows for an easy and reliable pre-assembly.



Release 09 / 2019

PROPERTIES

- Silicone-free TPE polymer
- Soft and compliant
- Thermal conductivity: 1.5 W/mK
- Operates at low pressure
- Shock absorbing
- Easy mounting through self tackiness
- Two-side self-tacky

AVAILABILITY

- Sheet 300 x 200 mm
- Tacky on both sides (TGF-GXXXX-NS)
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

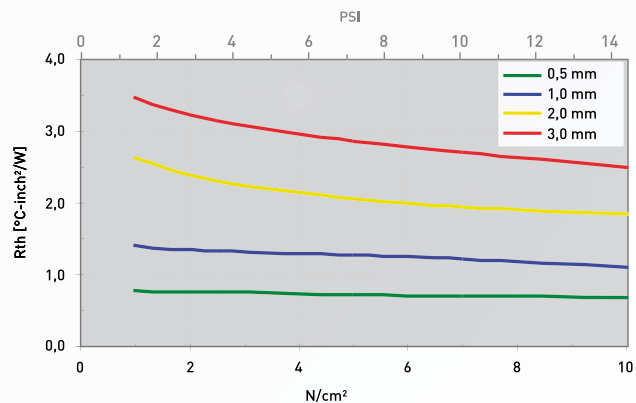
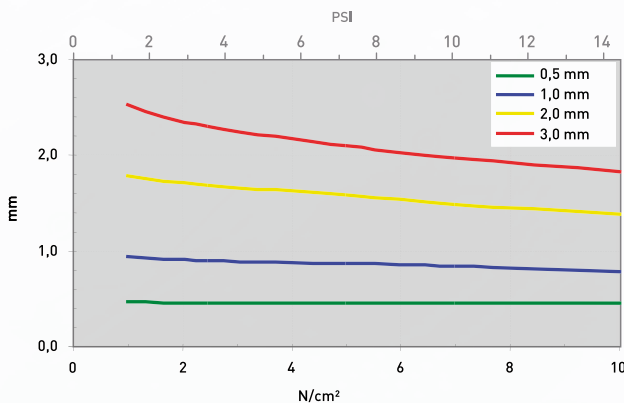
- Thermal link of:
- SMD packages
 - Through-hole vias
 - RDRAMs memory modules
 - Electronic parts to heat pipes
- For use in Automotive applications / Laptops / Medicine engineering / Industrial PCs

Property	Unit	TGF-G0500-NS	TGF-G1000-NS	TGF-G2000-NS
Material		Ceramic filled silicone-free TPE elastomer	Ceramic filled silicone-free TPE elastomer	Ceramic filled silicone-free TPE elastomer
Colour		Brick Red	Brick Red	Brick Red
Thickness	mm	0.5	1.0	2.0
Specific Gravity	g/cm ³	1.7	1.7	1.7
Hardness	Shore 00	55	55	55
UL Flammability [Equivalent]	UL 94	VO	VO	VO
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes
Thermal				
Resistance ¹ @ 15 PSI @ Thickness	°C-inch ² /W (mm)	0.69 [0.46]	1.11 [0.79]	1.84 [1.40]
Resistance ¹ @ 7 PSI @ Thickness	°C-inch ² /W (mm)	0.72 [0.47]	1.27 [0.88]	2.05 [1.60]
Resistance ¹ @ 3 PSI @ Thickness	°C-inch ² /W (mm)	0.77 [0.48]	1.36 [0.93]	2.41 [1.73]
Thermal Conductivity	W/mK	1.5	1.5	1.5
Operating Temperature Range	°C	- 40 to + 120	- 40 to + 120	- 40 to + 120
Electrical				
Dielectric Strength	kV / mm	> 10	> 10	> 10
Volume Resistivity	Ohm - cm	1.0 x 10 ¹⁰	1.0 x 10 ¹⁰	1.0 x 10 ¹⁰

Measurement technique according to: ¹ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 0.5 mm / 1.0 mm / 1.5 mm / 2.0 mm / 2.5 mm / 3.0 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



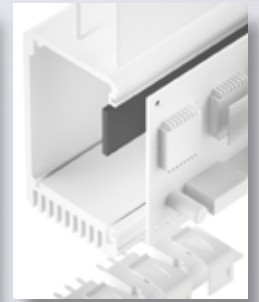
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SILICONE-FREE GAP FILLER TGF-GUS-NS



siloxane-free, extremely elastic TPE

TGF-GUS-NS is an electrically insulating thermally conductive silicone-free gap filler. It is ideal for use in applications where thermal transfer over large gaps caused e.g. by big tolerances or different stack up heights must be achieved. The TPE polymer based elastomer does not contain any volatile siloxanes which are inevitably emitted by silicones. Due to the specific formulation and filling with ceramic particles the material has a high thermal conductivity. Through its extreme softness the material perfectly mates to irregular surfaces thus filling gaps and operates at very low pressure. By its use the total thermal resistance is minimised. The natural tackiness of the material allows for an easy and reliable pre-assembly.



Release 09 / 2019

PROPERTIES

- Silicone-free TPE polymer
- Extremely soft and compliant
- Thermal conductivity: 1.5 W/mK
- Operates at very low pressure
- Shock absorbing
- Easy mounting through self tackiness
- Two-side self-tacky

AVAILABILITY

- Sheet 300 x 200 mm
- Tacky on both sides (TGF-GUSXXX-NS)
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

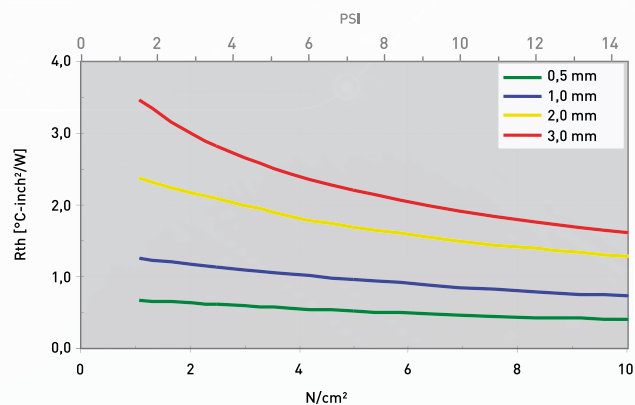
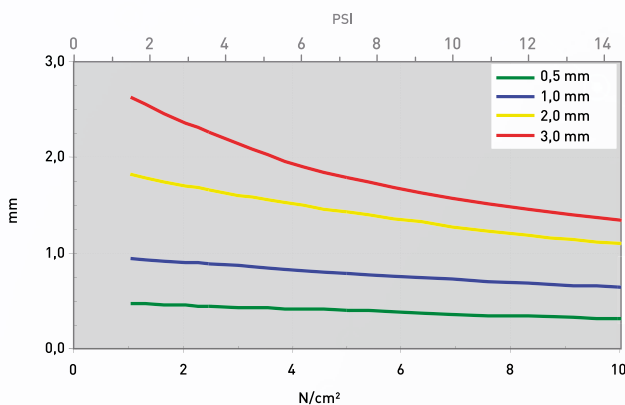
- Thermal link of:
- SMD packages
 - Through-hole vias
 - RDRAMs memory modules
 - Electronic parts to heat pipes
- For use in Automotive applications / Laptops / Medicine engineering / Industrial PCs

Property	Unit	TGF-GUS0500-NS	TGF-GUS1000-NS	TGF-GUS2000-NS
Material		Ceramic filled silicone-free TPE elastomer	Ceramic filled silicone-free TPE elastomer	Ceramic filled silicone-free TPE elastomer
Colour		Black	Black	Black
Thickness	mm	0.5	1.0	2.0
Specific Gravity	g/cm ³	1.7	1.7	1.7
Hardness	Shore 00	25	25	25
UL Flammability [Equivalent]	UL 94	V0	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes
Thermal				
Resistance ¹ @ 15 PSI @ Thickness	°C-inch ² /W (mm)	0.42 [0.32]	0.74 [0.63]	1.30 [1.11]
Resistance ¹ @ 7 PSI @ Thickness	°C-inch ² /W (mm)	0.54 [0.39]	0.98 [0.78]	1.70 [1.44]
Resistance ¹ @ 3 PSI @ Thickness	°C-inch ² /W (mm)	0.64 [0.45]	1.19 [0.90]	2.20 [1.72]
Thermal Conductivity	W/mK	1.5	1.5	1.5
Operating Temperature Range	°C	- 40 to + 120	- 40 to + 120	- 40 to + 120
Electrical				
Dielectric Strength	kV / mm	> 10	> 10	> 10
Volume Resistivity	Ohm - cm	1.0 x 10 ¹⁰	1.0 x 10 ¹⁰	> 1.0 x 10 ¹⁰

Measurement technique according to: ¹ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 0.5 mm / 1.0 mm / 1.5 mm / 2.0 mm / 2.5 mm / 3.0 mm / 3.5 mm / 4.0 mm / 4.5 mm / 5.0 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



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SILICONE-FREE GAP FILLER TGF-HSS-NS



siloxane-free, very elastic

TGF-HSS-NS is an electrically insulating thermally conductive silicone-free gap filler. It is ideal for use in applications where thermal transfer over large gaps caused e.g. by big tolerances or different stack up heights must be achieved. The olefin based elastomer does not contain any volatile siloxanes which are inevitably emitted by silicones. Due to the specific formulation and filling with ceramic particles the material has a high thermal conductivity. Through its extraordinary softness the material perfectly mates to irregular surfaces thus filling gaps and operates at very low pressure. By its use the total thermal resistance is minimised. The natural tackiness of the material allows for an easy and reliable pre-assembly. The material is double-side tacky or alternatively one-side tacky through lamination with a thermally conductive film.



Release 09 / 2019

PROPERTIES

- Silicone-free
- No siloxanes through silicone-freeness
- Extraordinary soft and compliable
- Thermal conductivity: 2.0 W/mK
- Operates at very low pressure
- Shock absorbing
- Easy mounting through self tackiness
- One or two-side self-tacky

AVAILABILITY

- Sheet 420 x 210 mm (0.5 – 2.0 mm)
- Sheet 200 x 200 mm (2.5 – 3.0 mm)
- Tacky on both sides (TGF-HSSXXX-NS)
- Tacky on one side by film laminate (TGF-HSSXXX-NS-A1)
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

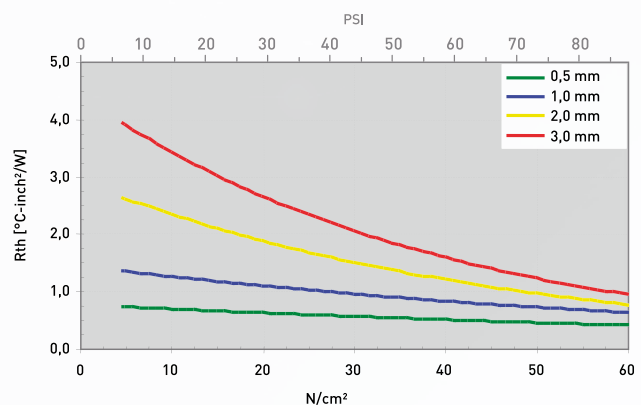
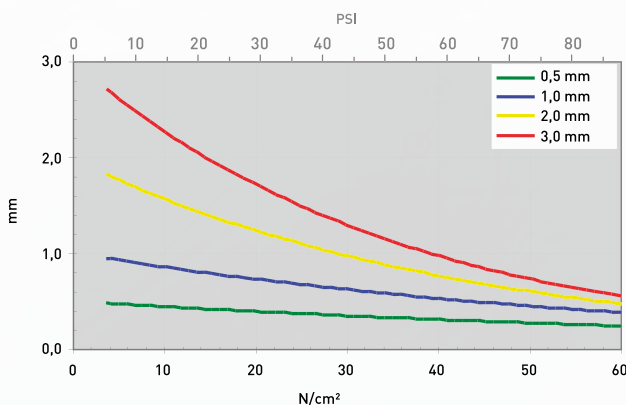
- Thermal link of:
- SMD packages
 - Through-hole vias
 - RDRAMs memory modules
 - Electronic parts to heat pipes
- For use in Automotive applications / Laptops / Medicine engineering / Industrial PCs

Property	Unit	TGF-HSS0500-NS	TGF-HSS1000-NS	TGF-HSS2000-NS	TGF-HSS3000-NS
Material		Ceramic filled silicone-free elastomer	Ceramic filled silicone-free elastomer	Ceramic filled silicone-free elastomer	Ceramic filled silicone-free elastomer
Colour		Brick-red	Brick-red	Brick-red	Brick-red
Thickness	mm	0.5	1.0	2.0	3.0
Specific Gravity	g/cm³	1.75	1.75	1.75	1.75
Hardness	Shore 00	45	45	45	45
UL Flammability	UL 94	V0	V0	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes	Yes
Thermal					
Resistance¹ @ 60 PSI @ Thickness	°C-inch²/W (mm)	0.54 (0.33)	0.86 (0.55)	1.27 (0.80)	1.68 (1.03)
Resistance¹ @ 30 PSI @ Thickness	°C-inch²/W (mm)	0.65 (0.42)	1.11 (0.76)	1.89 (1.27)	2.66 (1.74)
Resistance¹ @ 10 PSI @ Thickness	°C-inch²/W (mm)	0.74 (0.48)	1.33 (0.92)	2.48 (1.70)	3.67 (2.51)
Thermal Conductivity	W/mK	2.0	2.0	2.0	2.0
Operating Temperature Range	°C	- 40 to + 120	- 40 to + 120	- 40 to + 120	- 40 to + 120
Electrical					
Dielectric Strength	kV / mm	> 10	> 10	> 10	> 10
Volume Resistivity	Ohm · cm	1.0 x 10 ¹⁰	1.0 x 10 ¹⁰	1.0 x 10 ¹⁰	1.0 x 10 ¹⁰

Measurement technique according to: ¹ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 0.5 mm / 1.0 mm / 2.0 mm / 3.0 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



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SILICONE-FREE GAP FILLER TGF-Z-NS



siloxane-free, elastic

TGF-Z-NS is a low dielectric insulating extremely thermally conductive silicone-free gap filler. It is ideal for use in applications where thermal transfer over large gaps caused e.g. by big tolerances or different stack up heights must be achieved. The olefin based elastomer does not contain any volatile siloxanes which are inevitably emitted by silicones. Due to the specific formulation and filling with ceramic particles the material has an extremely high thermal conductivity. Through its softness the material perfectly mates to irregular surfaces thus filling gaps and operates at low pressure. By its use the total thermal resistance is minimised. The natural tackiness of the material allows for an easy and reliable pre-assembly.



Release 09 / 2019

PROPERTIES

- Silicone-free
- No emission of siloxanes through silicone-freeness
- Soft and compliant
- Thermal conductivity: 15 W/mK
- Low dielectric
- Operates at low pressure
- Shock absorbing
- Easy mounting through self tackiness
- One or two-side self-tacky

AVAILABILITY

- Sheet 150 x 150 mm (Thickness 0.5 – 1.5 mm)
- Sheet 140 x 140 mm (Thickness 2.0 mm)
- Double-side tacky (TGF-ZXXXX-NS)
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

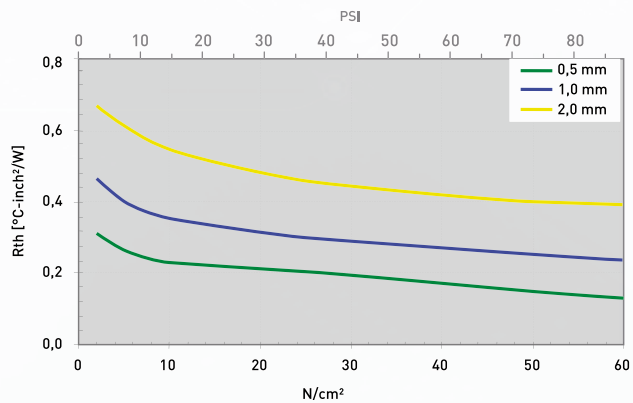
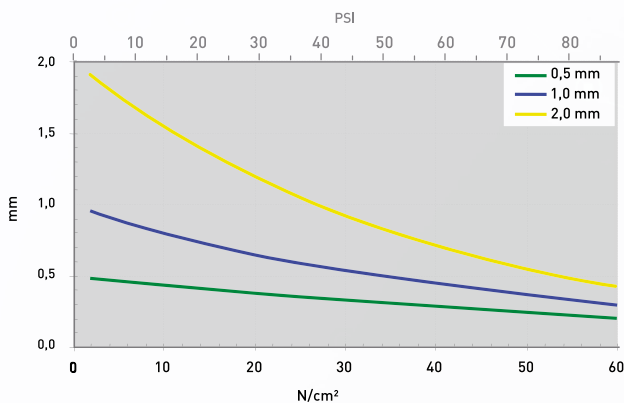
- Thermal link of:
- SMD packages
 - Through-hole vias
 - RDRAMs memory modules
 - Electronic parts to heat pipes
- For use in Automotive applications / Laptops / Medicine engineering / Industrial PCs

PROPERTIES	Unit	TGF-Z0500-NS	TGF-Z1000-NS	TGF-Z2000-NS
Material		Ceramic filled silicone-free elastomer	Ceramic filled silicone-free elastomer	Ceramic filled silicone-free elastomer
Colour		Dark Brown	Dark Brown	Dark Brown
Thickness	mm	0.5	1.0	2.0
Hardness	Shore 00	70	70	70
Flammability (Equivalent)	UL 94	V0	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes
Thermal				
Resistance ¹ @ 60 PSI @ Thickness	°C-inch ² /W (mm)	0.17 (0.28)	0.27 (0.45)	0.42 (0.74)
Resistance ¹ @ 30 PSI @ Thickness	°C-inch ² /W (mm)	0.21 (0.38)	0.32 (0.63)	0.49 (1.20)
Resistance ¹ @ 10 PSI @ Thickness	°C-inch ² /W (mm)	0.25 (0.45)	0.38 (0.84)	0.59 (1.68)
Thermal Conductivity	W/mK	15	15	15
Operating Temperature Range	°C	- 50 to + 110	- 50 to + 110	- 50 to + 110
Electrical				
Dielectric Strength	kV / mm	0.7	0.7	0.7
Volume Resistivity	Ohm - cm	≥ 1 x 10 ¹²	≥ 1 x 10 ¹²	≥ 1 x 10 ¹²

Measurement technique according to: ¹ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 0.5 mm / 1.0 mm / 1.5 mm / 2.0 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



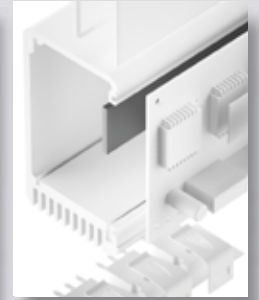
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SILICONE GAP FILLER TEL-R-SI

highly thermally conductive elastomer



TEL-R-SI is a low dielectric, high performance thermally conductive gap filler for an optimised thermal coupling between electronic packages and heat sinks even over large gaps or big tolerances. Through the specific formulation and filling with highly thermally conductive particles an extraordinary high anisotropic thermal conductivity is reached. Its conformal surface structure and extreme softness guarantee a very good compliance to the contact surfaces at very low pressure. Thus the total thermal resistance is minimised. The elastomer shows a low dielectric strength.



Release 09 / 2019

PROPERTIES

- High surface compliance and extremely soft
- Thermal conductivity: 15 W/mK (anisotropic)
- Low dielectric
- Extraordinary chemical resistance and longterm stability
- Shock absorbing

AVAILABILITY

- Sheet 150 x 150 mm (Thickness 0.25 - 1.5 mm)
- Sheet 140 x 140 mm (Thickness 2.0- 3.0 mm)
- Double-side self tacky (TEL-RXXXX-SI)
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

Thermal link of:

- MOSFETs und IGBTs
- Power diodes or AC/DC converters
- Power modules
- CPUs

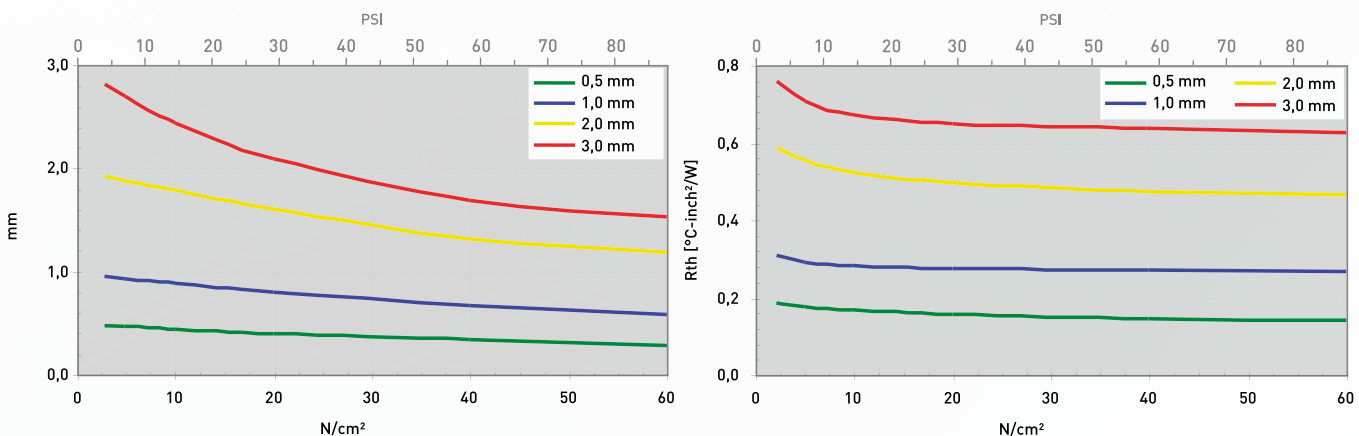
For use in Switch mode power supplies / Motor control units / Automotive engine management systems / UPS units / Solar systems

Property	Unit	TEL-R0500-SI	TEL-R1000-SI	TEL-R2000-SI
Material		Silicone with highly thermally conductive fillers	Silicone with highly thermally conductive fillers	Silicone with highly thermally conductive fillers
Colour		Black	Black	Black
Thickness	mm	0.50	1.0	2.0
Hardness	Shore 00	55	55	55
Flammability (Equivalent)	UL 94	V0	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes
Thermal				
Resistance ¹ @ 90 PSI @ Thickness	°C-inch ² /W (mm)	0.15 (0.30)	0.27 (0.60)	0.47 (1.20)
Resistance ¹ @ 30 PSI @ Thickness	°C-inch ² /W (mm)	0.16 (0.41)	0.28 (0.81)	0.50 (1.61)
Resistance ¹ @ 10 PSI @ Thickness	°C-inch ² /W (mm)	0.18 (0.47)	0.29 (0.93)	0.54 (1.85)
Thermal Conductivity	W/mK	15	15	15
Operating Temperature Range	°C	- 50 to + 180	- 50 to + 180	- 50 to + 180
Electrical				
Dielectric Strength	kV/mm	1.0	1.0	1.0
Volume Resistivity	Ohm - cm	≥ 1 x 10 ¹²	≥ 1 x 10 ¹²	≥ 1 x 10 ¹²

Measurement technique according to: 'ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 0.25 mm / 0.5 mm / 1.5 mm / 1.0 mm / 2.0 mm / 3.0 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



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SILICONE GAP FILLER TEL-X-SI

highly thermally conductive elastomer

TEL-X-SI is a low dielectric, high performance thermally conductive gap filler for an optimised thermal coupling between electronic packages and heat sinks even over large gaps or big tolerances. Through the specific formulation and filling with highly thermally and electrically conductive particles an extraordinary high anisotropic thermal conductivity is reached. Its conformal surface structure and high softness guarantee a very good compliance to the contact surfaces at low pressure. Thus the total thermal resistance is minimised.



Release 09 / 2019

PROPERTIES

- High surface compliance and softness
- Thermal conductivity: 20 W/mK (anisotropic)
- Low dielectric
- Extraordinary chemical resistance and longterm stability
- Shock absorbing

AVAILABILITY

- Sheet 150 x 150 mm
- Double-side self tacky (TEL-XXXX-SI)
- Die cut parts
- Kiss cut parts on sheet
- Optional dielectric with PET film (TEL-XXXX-SI-PET)

APPLICATION EXAMPLES

Thermal link of:

- MOSFETs und IGBTs
- Power diodes or AC/DC converters
- Power modules

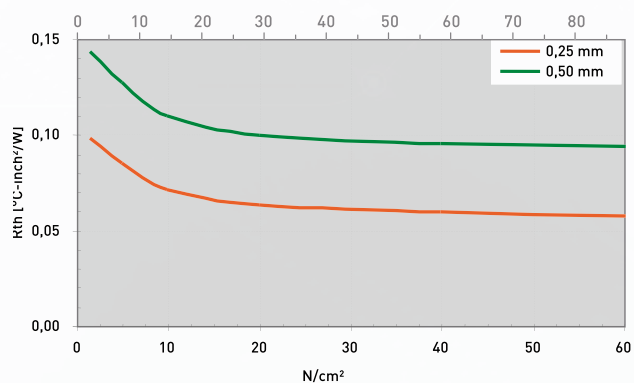
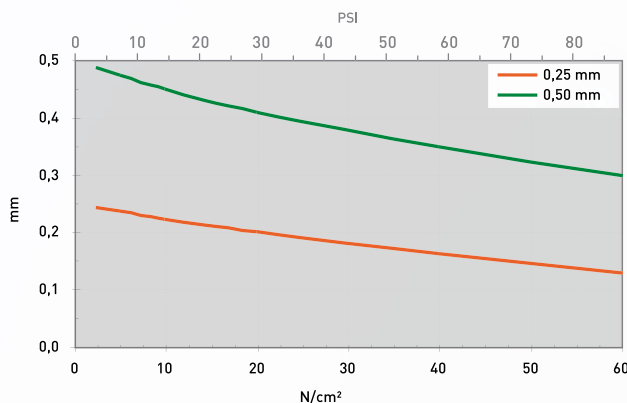
For use in Switch mode power supplies / Motor control units / Automotive engine management systems / UPS units / Solar systems

Property	Unit	TEL-X0250-SI	TEL-X0500-SI
Material		Silicone with highly thermally conductive fillers	Silicone with highly thermally conductive fillers
Colour		Dark Grey	Dark Grey
Thickness	mm	0.25	0.50
Hardness	Shore 00	55	55
UL Flammability	UL 94	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes
Thermal			
Resistance ¹ @ 90 PSI @ Thickness	°C-inch ² /W (mm)	0.05 (0.13)	0.09 (0.30)
Resistance ¹ @ 30 PSI @ Thickness	°C-inch ² /W (mm)	0.06 (0.20)	0.10 (0.41)
Resistance ¹ @ 10 PSI @ Thickness	°C-inch ² /W (mm)	0.08 (0.23)	0.12 (0.47)
Thermal Conductivity	W/mK	20	20
Operating Temperature Range	°C	- 50 to + 180	- 50 to + 180
Electrical			
Dielectric Strength	kV/mm	0.9	0.9
Volume Resistivity	Ohm - cm	$\geq 1 \times 10^{12}$	$\geq 1 \times 10^{12}$

Measurement technique according to: ¹ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 0.25 mm / 0.5 mm / 0.75 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



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SILICONE GAP FILLER TEL-Z-SI

highly thermally conductive elastomer



TEL-Z-SI is a non dielectric high performance thermally conductive silicone foil for an optimised thermal coupling between electronic packages and heat sinks even over large gaps or big tolerances. Through the specific formulation and filling an extraordinary high anisotropic thermal conductivity is reached. Its conformal surface structure and high softness guarantee a very good compliance to the contact surfaces at low pressure. Thus the total thermal resistance is minimised.



Release 09 / 2019

PROPERTIES

- High surface compliance and softness
- Non dielectric
- Thermal conductivity: 50 W/mK (anisotropic)
- Extraordinary chemical resistance and longterm stability
- Shock absorbing

AVAILABILITY

- Sheet 140 x 140 mm (TEL-ZXXXX-SI)
- Die cut parts
- Optional with adhesive stripes or dots (TEL-ZXXXX-SI-A1)

APPLICATION EXAMPLES

Thermal link of:

- MOSFETs or IGBTs
- Power diodes or AC/DC converters
- Power modules

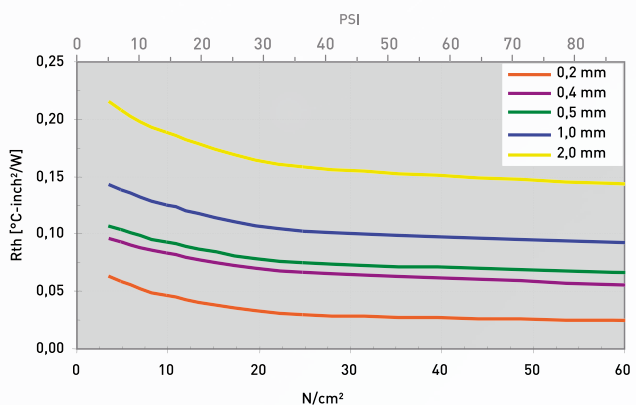
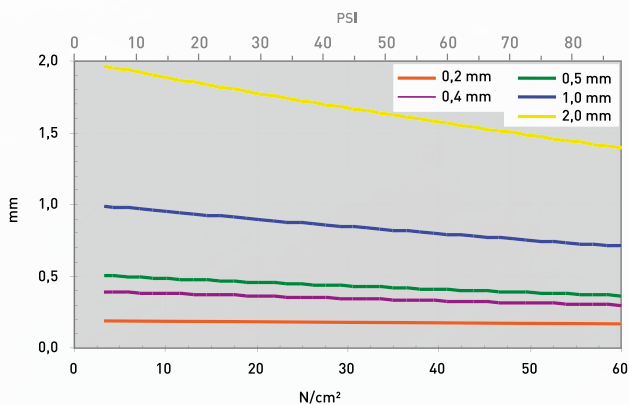
For use in Switch mode power supplies / Motor control units / Automotive engine management systems / UPS units / Solar systems

Property	Unit	TEL-Z0200-SI	TEL-Z0500-SI	TEL-Z1000-SI
Material		Graphite filled silicone elastomere	Graphite filled silicone elastomere	Graphite filled silicone elastomere
Colour		Black	Black	Black
Thickness	mm	0.2	0.5	1.0
Hardness	Shore 00	75	75	75
Flammability	UL 94	V0	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes
Thermal				
Resistance ¹ @ 90 PSI @ Thickness	°C-inch ² /W (mm)	0.020 (0.16)	0.060 (0.33)	0.09 (0.70)
Resistance ¹ @ 30 PSI @ Thickness	°C-inch ² /W (mm)	0.027 (0.18)	0.075 (0.48)	0.11 (0.91)
Resistance ¹ @ 10 PSI @ Thickness	°C-inch ² /W (mm)	0.050 (0.19)	0.095 (0.49)	0.13 (0.97)
Thermal Conductivity	W/mK	50	50	50
Operating Temperature Range	°C	- 50 to + 180	- 50 to + 180	- 50 to + 180
Electrical				
Volume Resistivity	Ohm - cm	< 50.000	< 50.000	< 50.000

Measurement technique according to: 'ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.
Shelf life adhesive: 6 months when stored in original packaging at room temperature and 50% relative humidity.

Thicknesses: 0.2 mm / 0.4 mm / 0.5 mm / 1.0 mm / 2.0 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



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SILICONE GAP FILLER TEL-YSS-SI

very soft, highly thermally conductive elastomer



TEL-YSS-SI is a non dielectric high performance thermally conductive gap filler for an optimised thermal coupling between electronic packages and heat sinks even over large gaps or big tolerances. Through the specific formulation and filling an extraordinary high anisotropic thermal conductivity is reached. Its conformal surface structure and extraordinary softness guarantee a very good compliance to the contact surfaces at low pressure. Thus the total thermal resistance is minimised.



Release 09 / 2019

PROPERTIES

- High surface compliance and extraordinary softness
- Non dielectric
- Thermal conductivity: 16 W/mK (anisotropic)
- Extraordinary chemical resistance and longterm stability
- Shock absorbing

AVAILABILITY

- Sheet 130 x 130 mm (TEL-YSSXXX-SI)
- Die cut parts
- Optional with adhesive stripes or dots (TEL-YSSXXX-SI-A1)

APPLICATION EXAMPLES

Thermal link of:

- MOSFETs or IGBTs
- Power diodes or AC/DC converters
- Power modules

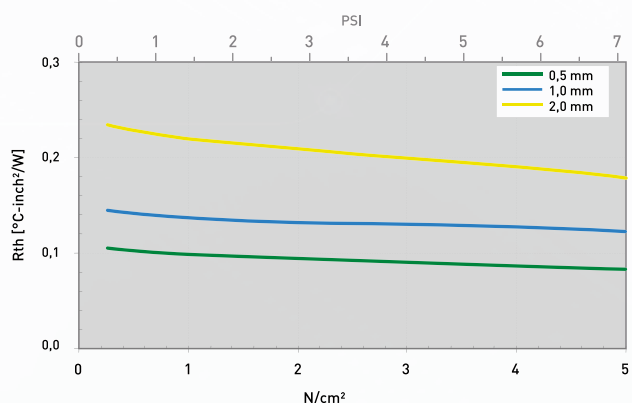
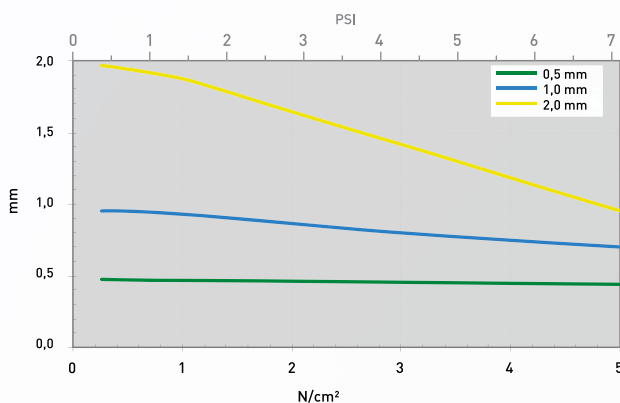
For use in Switch mode power supplies / Motor control units / Automotive engine management systems / UPS units / Solar systems

Property	Unit	TEL-YSS0500-SI	TEL-YSS1000-SI	TEL-YSS2000-SI
Material		Graphite filled silicone elastomere	Graphite filled silicone elastomere	Graphite filled silicone elastomere
Colour		Black	Black	Black
Thickness	mm	0.5	1.0	2.0
Hardness	Shore 00	40	40	40
Flammability	UL 94	V0	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes
Thermal				
Resistance ¹ @ 7.5 PSI @ Thickness	°C-inch ² /W (mm)	0.083 (0.42)	0.124 (0.700)	0.180 (0.954)
Resistance ¹ @ 3.5 PSI @ Thickness	°C-inch ² /W (mm)	0.089 (0.45)	0.129 (0.785)	0.205 (1.550)
Resistance ¹ @ 1.5 PSI @ Thickness	°C-inch ² /W (mm)	0.100 (0.47)	0.137 (0.934)	0.220 (1.874)
Thermal Conductivity ¹	W/mK	16	16	16
Operating Temperature Range	°C	- 50 to + 180	- 50 to + 180	- 50 to + 180
Electrical				
Volume Resistivity	Ohm - cm	< 50.000	< 50.000	< 50.000

Measurement technique according to: 'ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 0.5 mm / 1.0 mm / 1.5 mm / 2.0 mm / 3.0 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



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SILICONE GAP FILLER TEL-ZS-SI

soft, highly thermally conductive elastomer



TEL-ZS-SI is a non dielectric high performance thermally conductive silicone foil for an optimised thermal coupling between electronic packages and heat sinks even over large gaps or big tolerances. Through the specific formulation and filling an extraordinary high anisotropic thermal conductivity is reached. Its conformal surface structure and high softness guarantee a very good compliance to the contact surfaces at low pressure. Thus the total thermal resistance is minimised.



Release 09 / 2019

PROPERTIES

- High surface compliance and softness
- Non dielectric
- Thermal conductivity: 25 W/mK (anisotropic)
- Extraordinary chemical resistance and longterm stability
- Shock absorbing

AVAILABILITY

- Sheet 120 x 120 mm (TEL-ZSXXXX-SI)
- Die cut parts
- Optional with adhesive stripes or dots (TEL-ZSXXXX-SI-A1)

APPLICATION EXAMPLES

Thermal link of:

- MOSFETs or IGBTs
- Power diodes or AC/DC converters
- Power modules

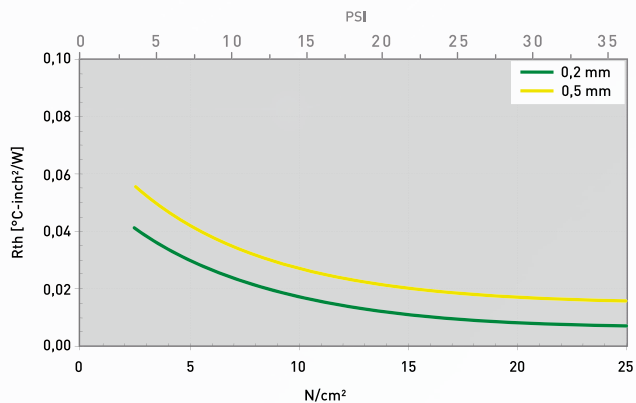
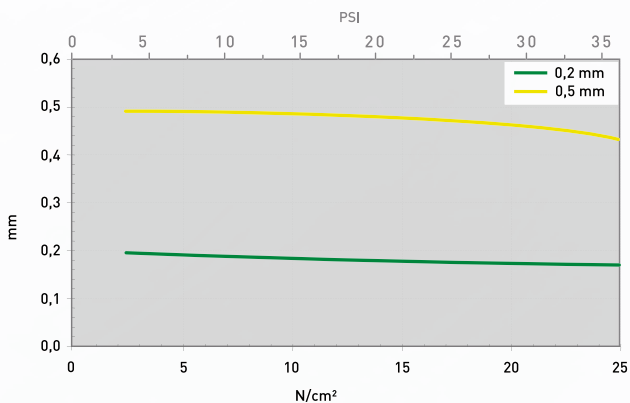
For use in Switch mode power supplies / Motor control units / Automotive engine management systems / UPS units / Solar systems

Property	Unit	TEL-ZS0200-SI	TEL-ZS0500-SI
Material		Carbon filled silicone elastomere	Carbon filled silicone elastomere
Colour		Black	Black
Thickness	mm	0.2	0.5
Hardness	Shore 00	60	60
Flammability (Equivalent)	UL 94	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes
Thermal			
Resistance ¹ @ 35 PSI @ Thickness	°C-inch ² /W (mm)	0.007 (0.17)	0.018 (0.44)
Resistance ¹ @ 15 PSI @ Thickness	°C-inch ² /W (mm)	0.017 (0.18)	0.027 (0.48)
Resistance ¹ @ 7 PSI @ Thickness	°C-inch ² /W (mm)	0.030 (0.19)	0.042 (0.49)
Thermal Conductivity ¹	W/mK	25	25
Operating Temperature Range	°C	- 40 to + 150	- 40 to + 150
Electrical			
Volume Resistivity	Ohm - cm	< 50,000	< 50,000

Test Methods: ¹ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 0.2 mm / 0.3 mm / 0.5 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



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SILICONE-FREE GAP FILLER TAG-L-AC



Acrylate adhesive, thermally conductive

TAG-L-AC is a thermally conductive electrically insulating acrylate PSA tape. Through the thermally conductive adhesive the thermal contact is highly improved even at low pressures. Convex and concave surface structures and stack up tolerances are effectively compensated. Materials with different expansion coefficients can easily be bonded. Thus the total thermal resistance is minimised. The tape works well for realizing an effective and cost efficient thermal coupling in a broad field of applications. Above all it is used in applications having little space only and where the permitted weight is limited. Using screws, springs, clips as mechanic fasteners thus becomes superfluous. Its wide thickness range allows for the use as gap filler.



Release 09 / 2019

PROPERTIES

- Low thermal resistance
- Thermal conductivity: 1.0 W/mK
- Use as gap filler due to wide thickness range
- Reliable strong adherence on uneven or hardly machineable surfaces
- Silicone-free
- Neither mixing of components nor curing processes
- Replacement of fasteners e.g. screws, clips, etc.

AVAILABILITY

- Sheet (on request)
- Roll 900 mm x 33 m (Thickness 0.25 / 0.5 / 1.0 mm)
- Roll 900 mm x 16.5 m (Thickness 2.0 mm)
- TAG-LXXXX-AC
- Shaped parts
- Optional soft type TAG-LXSXXX-AC

APPLICATION EXAMPLES

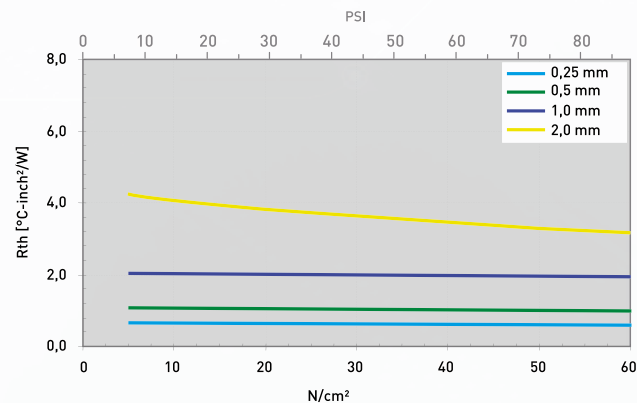
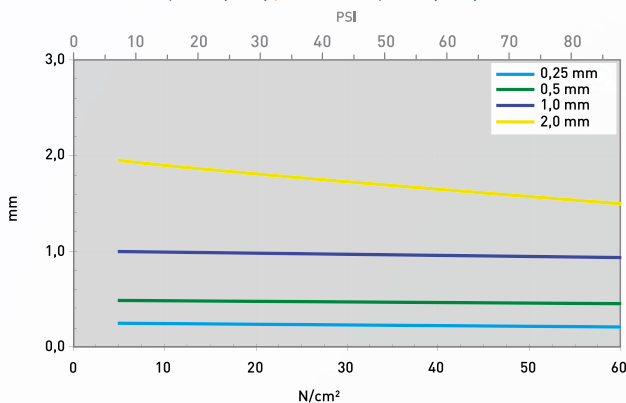
- Thermal link of:
- LEDs
 - CPUs
 - RDRAM memory modules
 - Flip Chips, DSPs, BGAs, PPGAs
 - MOSFETs to heat sinks
- For use in Power supplies / PCs / Telecom engineering / Automotive applications / LED arrays

Property	Unit	TAG-L0250-AC	TAG-L0500-AC	TAG-L1000-AC	TAG-L2000-AC
Material		Ceramic filled acrylate PSA adhesive	Ceramic filled acrylate PSA adhesive	Ceramic filled acrylate PSA adhesive	Ceramic filled acrylate PSA adhesive
Colour		White	White	White	White
Tape Thickness	mm	0.25	0.50	1.0	2.0
Liner Thickness ¹ : Dual liner (Base / Top) or Single liner	mm	0.05 / 0.05	0.05 / 0.05	0.05 / 0.05	0.05 / 0.05
	mm	0.14	0.14	0.14	0.14
Peel Off Strength (@ RT, Aluminum) ²	N/cm	12	12	12	12
UL Flammability (Equivalent)	UL 94	V0	V0	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes	Yes
Thermal					
Resistance ³ @ 60 PSI @ Thickness	°C-inch ² /W (mm)	0.59 (0.23)	1.00 (0.49)	1.95 (0.90)	3.50 (1.60)
Resistance ³ @ 30 PSI @ Thickness	°C-inch ² /W (mm)	0.62 (0.24)	1.05 (0.49)	2.00 (0.95)	3.90 (1.80)
Resistance ³ @ 10 PSI @ Thickness	°C-inch ² /W (mm)	0.65 (0.25)	1.10 (0.50)	2.05 (0.98)	4.25 (1.90)
Thermal Conductivity	W/mK	0.8 ³ / 1.0 ⁴	0.8 ³ / 1.0 ⁴	0.8 ³ / 1.0 ⁴	0.8 ³ / 1.0 ⁴
Operating Temperature Range	°C	- 40 to + 130	- 40 to + 130	- 40 to + 130	- 40 to + 130
Electrical					
Breakdown Voltage ⁵	kV AC	3.6	> 5.5	> 5.5	> 5.5

¹ Liner: **Dual liner:** BOPET bottom release liner (0.05 mm, transparent, siliconized) + LDPE top release liner (0.05 mm, white, siliconized) / **Single liner:** PE liner (0.14 mm, red).
 Test Methods: ² ASTM D 3330, ³ ASTM D 5470, ⁴ MTPS, ⁵ ASTM D 149. All data without warranty and subject to change. Please contact us for further data and information.
 Shelf life adhesive: 6 months when stored in original packaging at room temperature and 50% relative humidity.

Thicknesses: 0.25 mm / 0.50 mm / 1.0 mm / 2.0 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



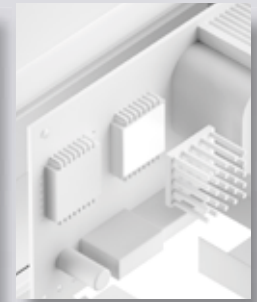
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SILICONE-FREE GAP FILLER TAG-Q-AC



Acrylate adhesive, thermally conductive

TAG-Q-AC is a thermally conductive electrically insulating acrylate PSA tape. Through the thermally conductive adhesive the thermal contact is highly improved even at low pressures. Convex and concave surface structures and stack up tolerances are effectively compensated. Materials with different expansion coefficients can easily be bonded. Thus the total thermal resistance is minimised. The tape works well for realizing an effective and cost efficient thermal coupling in a broad field of applications. Above all it is used in applications having little space only and where the permitted weight is limited. Its wide thickness range allows for the use as gap filler.



Release 09 / 2019

PROPERTIES

- Low thermal resistance
- Thermal conductivity: 2.0 W/mK
- Silicone-free
- Neither mixing of components nor curing processes

AVAILABILITY

- Sheet
- TAG-QXXXX-AC
- Shaped parts
- Optional soft type TAG-QXSXXXX-AC

APPLICATION EXAMPLES

Thermal link of:

- LEDs
- CPUs
- RDRAM memory modules
- Flip Chips, DSPs, BGAs, PPGAs
- MOSFETs to heat sinks

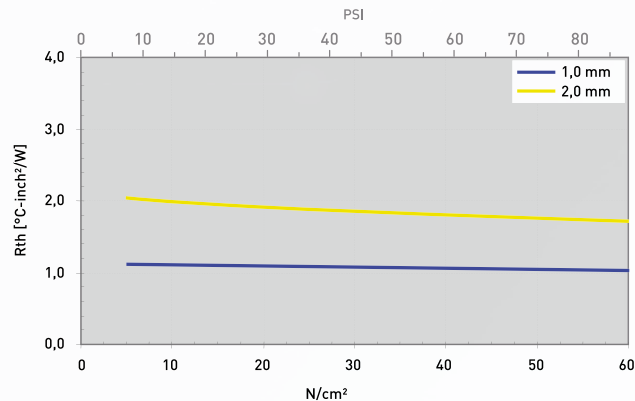
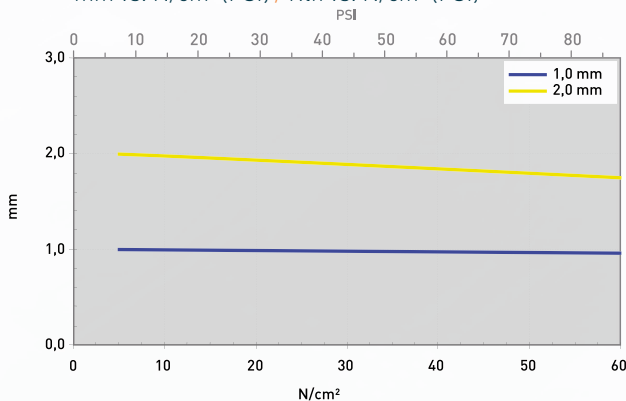
For use in Power supplies / PCs / Telecom engineering / Automotive applications / LED arrays

Property	Unit	TAG-Q1000-AC	TAG-Q2000-AC
Material		Ceramic filled acrylate PSA adhesive	Ceramic filled acrylate PSA adhesive
Colour		White	White
Tape Thickness	mm	1.0	2.0
Liner Thickness ¹ : Dual liner (Base / Top) or Single liner	mm	0.05 / 0.05	0.05 / 0.05
	mm	0.14	0.14
Peel Off Strength (@ RT, Aluminum) ²	N/cm	7.9	7.9
UL Flammability (Equivalent)	UL 94	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes
Thermal			
Resistance ³ @ 60 PSI @ Thickness	°C-inch ² /W (mm)	1.05 [0.97]	1.79 [1.82]
Resistance ³ @ 30 PSI @ Thickness	°C-inch ² /W (mm)	1.07 [0.98]	1.92 [1.91]
Resistance ³ @ 10 PSI @ Thickness	°C-inch ² /W (mm)	1.10 [0.99]	2.01 [1.98]
Thermal Conductivity	W/mK	1.6 ³ / 2.0 ⁴	1.6 ³ / 2.0 ⁴
Operating Temperature Range	°C	- 40 to + 130	- 40 to + 130
Electrical			
Breakdown Voltage ⁵	kV AC	> 5.5	> 5.5

¹ Liner: **Dual liner:** BOPET bottom release liner (0.05 mm, transparent, siliconized) + LDPE top release liner (0.05 mm, white, siliconized) / **Single liner:** PE liner (0.14 mm, red).
 Test Methods: ² ASTM D 3330, ³ ASTM D 5470, ⁴ MTPS, ⁵ ASTM D 149. All data without warranty and subject to change. Please contact us for further data and information.
 Shelf life adhesive: 6 months when stored in original packaging at room temperature and 50% relative humidity.

Thicknesses: 1.0 mm / 2.0 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



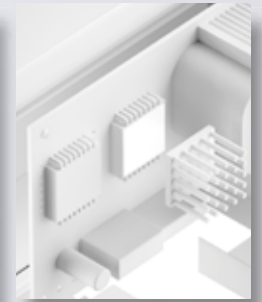
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SILICONE-FREE GAP FILLER TAG-T-AC



Acrylate adhesive, thermally conductive

TAG-T-AC is a thermally conductive electrically insulating acrylate PSA tape. Through the thermally conductive adhesive the thermal contact is highly improved even at low pressures. Convex and concave surface structures and stack up tolerances are effectively compensated. Materials with different expansion coefficients can easily be bonded. Thus the total thermal resistance is minimised. The tape works well for realizing an effective and cost efficient thermal coupling in a broad field of applications. Above all it is used in applications having little space only and where the permitted weight is limited. Its wide thickness range allows for the use as gap filler.



Release 09 / 2019

PROPERTIES

- Low thermal resistance
- Thermal conductivity: 3.0 W/mK
- Use as gap filler due to wide thickness range
- Silicone-free
- Neither mixing of components nor curing processes

AVAILABILITY

- Sheet
- TAG-TXXXX-AC
- Shaped parts
- Optional soft type TAG-TXSXXX-AC

APPLICATION EXAMPLES

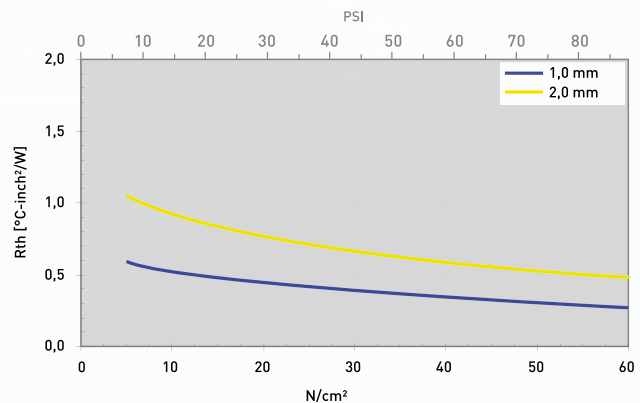
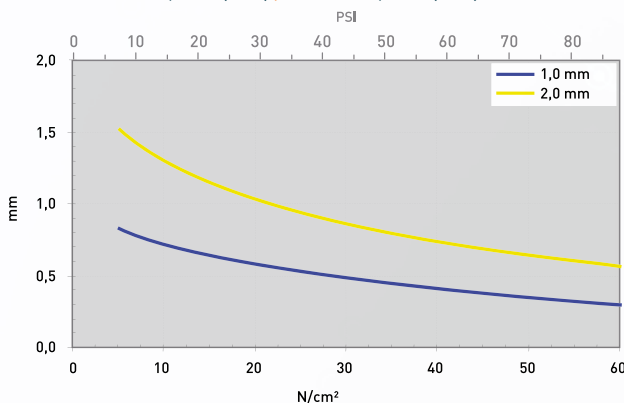
- Thermal link of:
- LEDs
 - CPUs
 - RDRAM memory modules
 - Flip Chips, DSPs, BGAs, PPGAs
 - MOSFETs to heat sinks
- For use in Power supplies / PCs / Telecom engineering / Automotive applications / LED arrays

Property	Unit	TAG-T1000-AC	TAG-T2000-AC
Material		Ceramic filled acrylate PSA adhesive	Ceramic filled acrylate PSA adhesive
Colour		White	White
Tape Thickness	mm	1.0	2.0
Liner Thickness ¹ : Dual liner (Base / Top) or Single liner	mm	0.05 / 0.05 0.14	0.05 / 0.05 0.14
Peel Off Strength (@ RT, Aluminum) ²	N/cm	5.9	5.9
UL Flammability (Equivalent)	UL 94	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes
Thermal			
Resistance ³ @ 60 PSI @ Thickness	°C-inch ² /W (mm)	0.34 (0.41)	0.60 (0.75)
Resistance ³ @ 30 PSI @ Thickness	°C-inch ² /W (mm)	0.45 (0.58)	0.78 (1.03)
Resistance ³ @ 10 PSI @ Thickness	°C-inch ² /W (mm)	0.56 (0.77)	1.00 (1.43)
Thermal Conductivity	W/mK	2.5 ³ / 3.0 ⁴	2.5 ³ / 3.0 ⁴
Operating Temperature Range	°C	- 40 to + 130	- 40 to + 130
Electrical			
Breakdown Voltage ⁵	kV AC	> 5.5	> 5.5

¹ Liner: **Dual liner:** BOPET bottom release liner (0.05 mm, transparent, siliconized) + LDPE top release liner (0.05 mm, white, siliconized) / **Single liner:** PE liner (0.14 mm, red).
 Test Methods: ² ASTM D 3330, ³ ASTM D 5470, ⁴ MTPS, ⁵ ASTM D 149. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 1.0 mm / 2.0 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



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2 FOILS & FILMS

/ SILICONE FOILS / INSULATING FILM
SILICONE COATED



SILICONE FOIL TFO-D-SI

fibreglass reinforced, highly dielectric



TFO-D-SI is an electrically insulating thermally conductive silicone foil for an optimised thermal coupling between electronic packages and heat sinks. Through the specific formulation and filling with thermally conductive ceramic particles a high thermal conductivity is reached. Under pressure the total thermal resistance is minimised. The material is characterised by its very high dielectric properties. The fibreglass reinforcement provides for an outstanding mechanic stability and cut-through resistance as well as easy handling. For an easy and reliable pre-assembly the interface material is available with self tackiness on one side with no need for an additional adhesive coating or with a one side adhesive coating.



Release 09 / 2019

PROPERTIES

- Thermal conductivity: 1.2 W/mK
- High thermal contact
- Outstanding mechanic stability through fibreglass reinforcement
- Very high dielectric strength
- Extraordinary chemical resistance and longterm stability
- Residue-free removal after use

AVAILABILITY

- Sheet 300 x 1000 mm
- Roll 300 mm x 50 m
- Non tacky (TFO-DXXX-SI)
- Self tacky on one side without adhesive coating (TFO-DXXX-SI-A0)
- One side adhesive (TFO-DXXX-SI-A1)
- Die cut parts
- Kiss cut parts on roll
- Kiss cut parts on sheet

APPLICATION EXAMPLES

Thermal link of:

- MOSFETs or IGBTs
- Power diodes or AC/DC converters
- Power modules

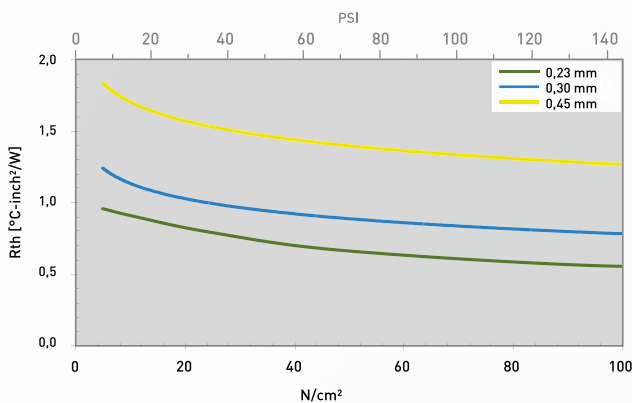
For use in Switch mode power supplies / Motor control units / Automotive engine management systems / UPS units / Solar systems

PROPERTIES	Unit	TFO-D230-SI	TFO-D300-SI	TFO-D450-SI
Material		Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone
Colour		Grey	Grey	Grey
Reinforcement		Fibreglass	Fibreglass	Fibreglass
Thickness	mm	0.23	0.3	0.45
Tensile Strength ¹	kpsi	5.0	4.1	2.9
UL Flammability	UL 94	VO	VO	VO
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes
Thermal				
Resistance ² @ 150 PSI	°C-inch ² /W	0.55	0.75	1.25
Resistance ² @ 30 PSI	°C-inch ² /W	0.79	1.05	1.55
Thermal Conductivity	W/mK	1.2	1.2	1.2
Operating Temperature Range	°C	- 50 to + 180	- 50 to + 180	- 50 to + 180
Electrical				
Breakdown Voltage ³	kV AC	5.5	> 6.0	> 6.0
Volume Resistivity	Ohm - cm	> 1.0 x 10 ¹¹	> 1.0 x 10 ¹¹	> 1.0 x 10 ¹¹
Dielectric Constant	@ 1 MHz	6.0	6.0	6.0

Measurement technique according to: ¹ ASTM D 412, ² ASTM D 5470, ³ ASTM D 149. All data without warranty and subject to change. Please contact us for further data and information. Shelf life adhesive: 6 months when stored in original packaging at room temperature and 50% relative humidity.

Thicknesses: 0.23 mm / 0.30 mm / 0.45 mm

Rth vs. N/cm² (PSI)



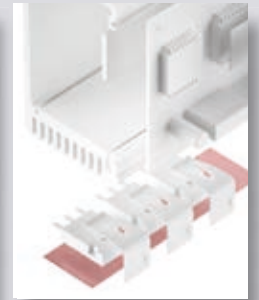
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SILICONE FOIL TFO-G-SI

fibreglass reinforced, highly dielectric



TFO-G-SI is an electrically insulating thermally conductive silicone foil for an optimised thermal coupling between electronic packages and heat sinks. Through the specific formulation and filling with thermally conductive ceramic particles a high thermal conductivity is reached. Under pressure the total thermal resistance is minimised. The material is characterised by its very high dielectric properties. The fibreglass reinforcement provides for an outstanding mechanic stability and cut-through resistance as well as easy handling. For an easy and reliable pre-assembly the interface material is available with low tack pressure sensitive adhesive on one side.



Release 09 / 2019

PROPERTIES

- Thermal conductivity: 1.6 W/mK
- High thermal contact
- Outstanding mechanic stability through fibreglass reinforcement
- Very high dielectric strength
- Extraordinary chemical resistance and longterm stability
- Residue-free removal after use

AVAILABILITY

- Sheet
- Roll 290 mm x 50 m
- Non tacky
- Tacky on one side (TFO-GXXX-SI-A1)
- Die cut parts
- Kiss cut parts on sheet or roll

APPLICATION EXAMPLES

Thermal link of:

- MOSFETs or IGBTs
- Power diodes or AC/DC converters
- Power modules

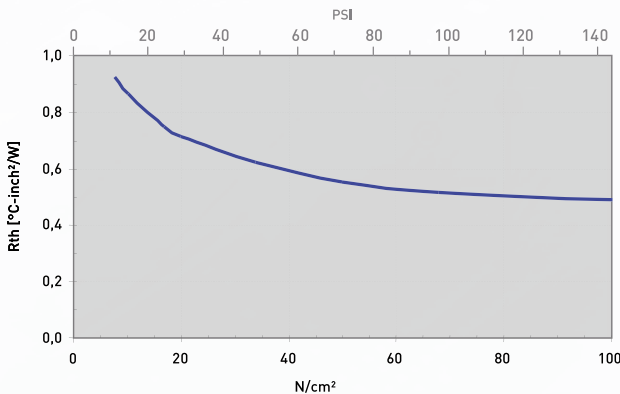
For use in Switch mode power supplies / Motor control units / High voltage hybrid automotive applications / PS units / Solar systems

Property	Unit	TFO-G230-SI
Material		Ceramic filled silicone
Colour		Pink
Reinforcement		Fibreglass
Thickness	mm	0.23
Tensile Strength ¹	kpsi	2.9
UL Flammability	UL 94	V0
RoHS Conformity	2011 / 65 / EU	Yes
Thermal		
Resistance ² @ 150 PSI	°C-inch ² /W	0.49
Resistance ² @ 30 PSI	°C-inch ² /W	0.71
Thermal Conductivity	W/mK	1.6
Operating Temperature Range	°C	- 50 to + 180
Electrical		
Breakdown Voltage ³	kV AC	5.5
Volume Resistivity	Ohm - cm	1.0 x 10 ¹¹

Measurement technique according to: ¹ ASTM D 412, ² ASTM D 5470, ³ ASTM D 149. All data without warranty and subject to change. Please contact us for further data and information. Shelf life adhesive: 6 months when stored in original packaging at room temperature and 50% relative humidity.

Thicknesses: 0.23 mm

Rth vs. N/cm² (PSI)



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SILICONE FOIL TFO-H-SI

fibreglass reinforced



TFO-H-SI is a high performance electrically insulating thermally conductive silicone foil for an optimised thermal coupling between electronic packages and heat sinks. Through the specific formulation and filling with highly thermally conductive ceramic particles a high thermal conductivity is reached. Its conformal surface structure guarantees a very good compliance to the contact surfaces. Thus the total thermal resistance is minimised. The fibreglass reinforcement provides for an outstanding mechanic stability and cut-through resistance as well as easy handling. For an easy and reliable pre-assembly the interface material is available with self tackiness on one side with no need for an additional adhesive coating or with a one side adhesive coating.



Release 09 / 2019

PROPERTIES

- Thermal conductivity: 1.8 W/mK
- High thermal contact
- Outstanding mechanic stability through fibreglass reinforcement
- Extraordinary chemical resistance and longterm stability
- Residue-free removal after use
- Optional one side self tacky without adhesive coating

AVAILABILITY

- Sheet 300 x 1000 mm
- Roll 300 mm x 50 m
- Non tacky (TFO-HXXX-SI)
- Self tacky on one side without adhesive coating (TFO-HXXX-SI-A0)
- One side adhesive (TFO-HXXX-SI-A1)
- Die cut parts
- Kiss cut parts on roll or sheet

APPLICATION EXAMPLES

Thermal link of:

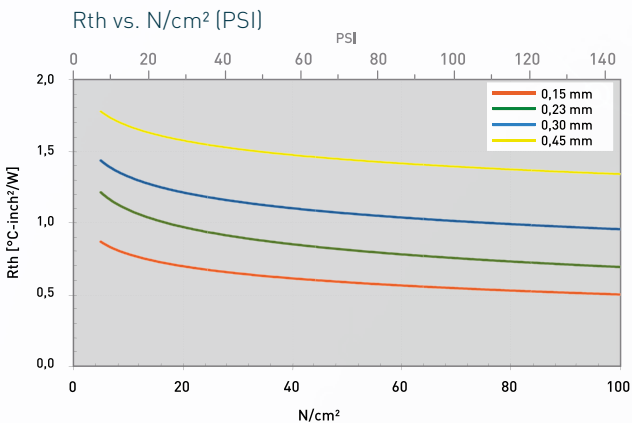
- MOSFETs or IGBTs
- Power diodes or AC/DC converters
- Power modules

For use in Switch mode power supplies / Motor control units / Automotive engine management systems / UPS units / Solar systems

Property	Unit	TFO-H150-SI	TFO-H230-SI	TFO-H300-SI	TFO-H450-SI
Material		Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone
Colour		Green	Green	Green	Green
Reinforcement		Fibreglass	Fibreglass	Fibreglass	Fibreglass
Thickness	mm	0.15	0.23	0.30	0.45
Tensile Strength ¹	kpsi	2.9	3.5	4.3	3.6
Hardness	Shore A	80	80	80	80
UL Flammability	UL 94	VO	VO	VO	VO
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes	Yes
Thermal					
Resistance ² @ 150 PSI	°C-inch ² /W	0.50	0.67	0.93	1.34
Resistance ² @ 30 PSI	°C-inch ² /W	0.68	0.95	1.22	1.58
Thermal Conductivity	W/mK	1.8	1.8	1.8	1.8
Operating Temperature Range	°C	- 50 to + 200	- 50 to + 200	- 50 to + 200	- 50 to + 200
Electrical					
Breakdown Voltage ³	kV AC	1.3	2.5	3.4	5.4
Volume Resistivity	Ohm - cm	> 10 ¹¹	> 10 ¹¹	> 10 ¹¹	> 10 ¹¹
Dielectric Constant		6.0	6.0	6.0	6.0

Measurement technique according to: ¹ ASTM D 412, ² ASTM D 5470, ³ ASTM D 149. All data without warranty and subject to change. Please contact us for further data and information. Shelf life adhesive: 6 months when stored in original packaging at room temperature and 50% relative humidity.

Thicknesses: 0.15 mm / 0.23 mm / 0.30 mm / 0.45 mm



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SILICONE FOIL TFO-J-SI

fibreglass reinforced, highly dielectric

TFO-J-SI is an electrically insulating thermally conductive silicone foil for an optimised thermal coupling between electronic packages and heat sinks. Through the specific formulation and filling with thermally conductive ceramic particles a high thermal conductivity is reached. Under pressure the total thermal resistance is minimised. The material is characterised by its very high dielectric properties. The fibreglass reinforcement provides for an outstanding mechanic stability and cut-through resistance as well as easy handling. For an easy and reliable pre-assembly the interface material is available with low tack pressure sensitive adhesive on one side.



Release 09 / 2019

PROPERTIES

- Thermal conductivity: 2.0 W/mK
- High thermal contact
- Outstanding mechanic stability through fibreglass reinforcement
- Very high dielectric strength
- Extraordinary chemical resistance and longterm stability
- Residue-free removal after use

AVAILABILITY

- Sheet
- Roll 300 mm x 50 m (0.20 / 0.30 mm)
- Roll 300 mm x 25 m (0.45 mm)
- Non tacky (TFO-JXXX-SI)
- Tacky on one side (TFO-JXXX-SI-A1)
- Die cut parts
- Kiss cut parts on roll
- Kiss cut parts on sheet

APPLICATION EXAMPLES

Thermal link of:

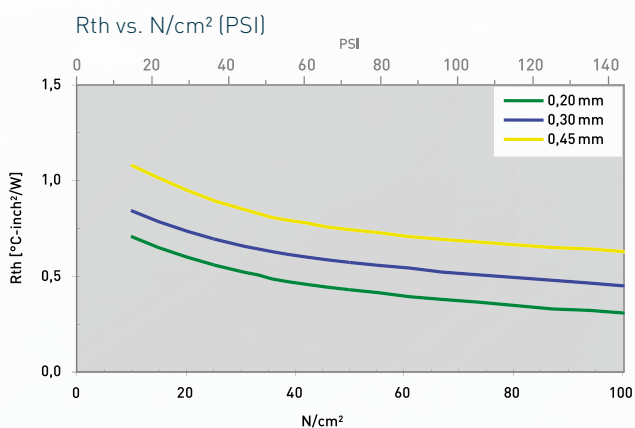
- MOSFETs or IGBTs
- Power diodes or AC/DC converters
- Power modules

For use in Switch mode power supplies / Motor control units / High voltage hybrid automotive applications / PS units / Solar systems

Property	Unit	TFO-J200-SI	TFO-J300-SI	TFO-J450-SI
Material		Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone
Colour		Dark Brown	Dark Brown	Dark Brown
Reinforcement		Fibreglass	Fibreglass	Fibreglass
Thickness	mm	0.20	0.30	0.45
Tensile Strength ¹	kpsi	5.8	4.0	2.9
UL Flammability	UL 94	V0	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes
Thermal				
Resistance ² @ 150 PSI	°C-inch ² /W	0.31	0.45	0.63
Resistance ² @ 30 PSI	°C-inch ² /W	0.61	0.74	0.96
Thermal Conductivity	W/mK	2.0	2.0	2.0
Operating Temperature Range	°C	-40 to +180	-40 to +180	-40 to +180
Electrical				
Breakdown Voltage ³	kV AC	5.0	7.0	10.0
Volume Resistivity	Ohm - cm	4.2 x 10 ¹⁴	3.5 x 10 ¹⁴	3.8 x 10 ¹⁴
Dielectric Constant	@ 1 MHz	3.8	4.2	4.3

Measurement technique according to: ¹ ASTM D 412, ² ASTM D 5470, ³ ASTM D 149. All data without warranty and subject to change. Please contact us for further data and information. Shelf life adhesive: 6 months when stored in original packaging at room temperature and 50% relative humidity.

Thicknesses: 0.20 mm / 0.30 mm / 0.45 mm / 0.80 mm



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SILICONE FOIL TFO-K-SI

fibreglass reinforced



TFO-K-SI is an electrically insulating thermally conductive silicone foil for an optimised thermal coupling between electronic packages and heat sinks. Through the specific formulation and filling with thermally conductive ceramic particles a very high thermal conductivity is reached. Under pressure the total thermal resistance is minimised. The fibreglass reinforcement provides for an outstanding mechanic stability and cut-through resistance as well as easy handling. For an easy and reliable pre-assembly the interface material is available with low tack pressure sensitive adhesive on one side.



Release 09 / 2019

PROPERTIES

- Thermal conductivity: 2.5 W/mK
- High thermal contact
- Outstanding mechanic stability through fibreglass reinforcement
- Extraordinary chemical resistance and longterm stability
- Residue-free removal after use

AVAILABILITY

- Sheet 320 x 1000 mm
- Roll 320 mm x 50 m
- Non tacky (TFO-K200-SI)
- Tacky on one side (TFO-K200-SI-A1)
- Die cut parts
- Kiss cut parts on roll
- Kiss cut parts on sheet

APPLICATION EXAMPLES

Thermal link of:

- MOSFETs or IGBTs
- Power diodes or AC/DC converters
- Power modules

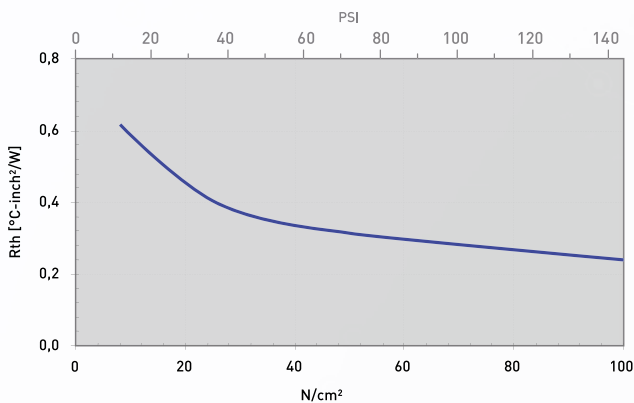
For use in Switch mode power supplies / Motor control units / Automotive engine management systems / UPS units / Solar systems

PROPERTIES	Unit	TFO-K200-SI
Material		Ceramic filled silicone
Colour		Grey
Reinforcement		Fibreglass
Thickness	mm	0.23
Tensile Strength ¹	kpsi	2.9
UL Flammability	UL 94	V0
RoHS Conformity	2011 / 65 / EU	Yes
Thermal		
Resistance ² @ 150 PSI	°C-inch ² /W	0.24
Resistance ² @ 30 PSI	°C-inch ² /W	0.47
Thermal Conductivity	W/mK	2.5
Operating Temperature Range	°C	- 50 to + 200
Electrical		
Breakdown Voltage ³	kV AC	2.0
Volume Resistivity	Ohm - cm	2.0 x 10 ¹⁴
Dielectric Constant	@ 1 MHz	4.0

Measurement technique according to: ¹ ASTM D 412, ² ASTM D 5470, ³ ASTM D 149. All data without warranty and subject to change. Please contact us for further data and information. Shelf life adhesive: 6 months when stored in original packaging at room temperature and 50% relative humidity.

Thickness: 0.23 mm

Rth vs. N/cm² (PSI)



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SILICONE FOIL TFO-0-SI

fibreglass reinforced, highly dielectric

TFO-0-SI is an electrically insulating thermally conductive silicone foil for an optimised thermal coupling between electronic packages and heat sinks. Through the specific formulation and filling with thermally conductive ceramic particles a very high thermal conductivity is reached. Under pressure the total thermal resistance is minimised. The material is characterised by its very high dielectric properties. The fibreglass reinforcement provides for an outstanding mechanic stability and cut-through resistance as well as easy handling. For an easy and reliable pre-assembly the interface material is available with low tack pressure sensitive adhesive on one side.



Release 09 / 2019

PROPERTIES

- Thermal conductivity: 3.0 W/mK
- High thermal contact
- Outstanding mechanic stability through fibreglass reinforcement
- Very high dielectric strength
- Extraordinary chemical resistance and longterm stability
- Residue-free removal after use

AVAILABILITY

- Sheet
- Roll 300 mm x 50 m (0.20 / 0.30 mm)
- Roll 300 mm x 25 m (0.45 mm)
- Non tacky (TFO-OXXX-SI)
- Tacky on one side (TFO-OXXX-SI-A1)
- Die cut parts
- Kiss cut parts on roll
- Kiss cut parts on sheet

APPLICATION EXAMPLES

Thermal link of:

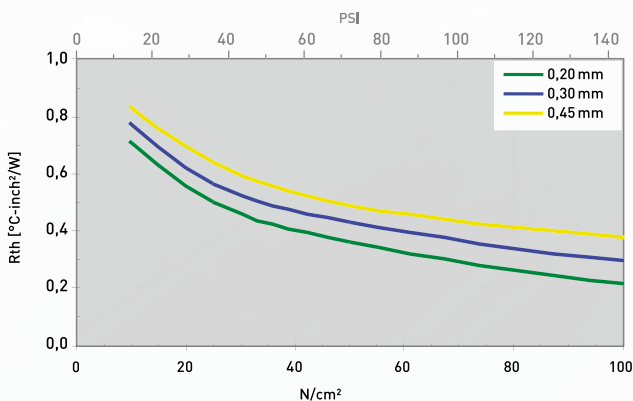
- MOSFETs or IGBTs
 - Power diodes or AC/DC converters
 - Power modules
- For use in Switch mode power supplies / Motor control units / High voltage hybrid automotive applications / PS units / Solar systems

Property	Unit	TFO-0200-SI	TFO-0300-SI	TFO-0450-SI
Material		Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone
Colour		Grey	Grey	Grey
Reinforcement		Fibreglass	Fibreglass	Fibreglass
Thickness	mm	0.20	0.30	0.45
Tensile Strength ¹	kpsi	3.3	2.3	1.6
UL Flammability	UL 94	V0	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes
Thermal				
Resistance ² @ 150 PSI	°C-inch ² /W	0.22	0.30	0.38
Resistance ² @ 30 PSI	°C-inch ² /W	0.55	0.60	0.70
Thermal Conductivity	W/mK	3.0	3.0	3.0
Operating Temperature Range	°C	-40 to +180	-40 to +180	-40 to +180
Electrical				
Breakdown Voltage ³	kV AC	5.0	7.0	8.0
Volume Resistivity	Ohm - cm	9,2 x 10 ¹³	8,8 x 10 ¹³	3,4 x 10 ¹²
Dielectric Constant	@ 1 MHz	4.8	5.6	6.2

Measurement technique according to: ¹ ASTM D 412, ² ASTM D 5470, ³ ASTM D 149. All data without warranty and subject to change. Please contact us for further data and information. Shelf life adhesive: 6 months when stored in original packaging at room temperature and 50% relative humidity.

Thicknesses: 0.20 mm / 0.30 mm / 0.45 mm

Rth vs. N/cm² (PSI)



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SILICONE FOIL TFO-T-SI

fibreglass reinforced

TFO-T-SI is a high performance electrically insulating thermally conductive silicone foil for an optimised thermal coupling between electronic packages and heat sinks. Through the specific formulation and filling with highly thermally conductive ceramic particles a very high thermal conductivity is reached. Its conformal surface structure guarantees a very good compliance to the contact surfaces. Thus the total thermal resistance is minimised. The fibreglass reinforcement provides for an outstanding mechanic stability and cutthrough resistance as well as easy handling. For an easy and reliable preassembly the interface material is available with low tack pressure sensitive adhesive on one side.



Release 09 / 2019

PROPERTIES

- Thermal conductivity: 4.1 W/mK
- High surface compliance
- Excellent thermal contact
- Outstanding mechanic stability through fibreglass reinforcement
- Extraordinary chemical resistance and longterm stability
- Residue-free removal after use

AVAILABILITY

- Sheet 440 x 510 mm
- Non tacky (TFO-TXXX-SI)
- Tacky on one side (TFO-TXXX-SI-A1)
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

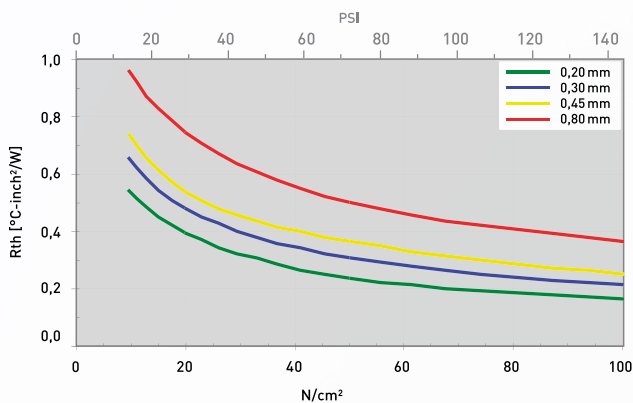
Thermal link of:

- MOSFETs or IGBTs
 - Power diodes or AC/DC converters
 - Power modules
- For use in Switch mode power supplies / Motor control units / Automotive engine management systems / UPS units / Solar systems

Property	Unit	TFO-T200-SI	TFO-T300-SI	TFO-T450-SI	TFO-T800-SI
Material		Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone
Colour		Light green	White	White	White
Reinforcement		Fibreglass	Fibreglass	Fibreglass	Fibreglass
Thickness	mm	0.20	0.30	0.45	0.80
Tensile Strength ¹	kpsi	3.6	2.9	2.0	1.3
UL Flammability	UL 94	VO	VO	VO	VO
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes	Yes
Thermal					
Resistance ² @ 150 PSI	°C-inch ² /W	0.16	0.21	0.24	0.36
Resistance ² @ 30 PSI	°C-inch ² /W	0.39	0.47	0.53	0.74
Thermal Conductivity	W/mK	4.1	4.1	4.1	4.1
Operating Temperature Range	°C	- 50 to + 200	- 50 to + 200	- 50 to + 200	- 50 to + 200
Electrical					
Breakdown Voltage ³	kV AC	3.0	6.5	9.0	> 10
Volume Resistivity	Ohm - cm	1.9 x 10 ¹⁵	2.4 x 10 ¹⁵	3.3 x 10 ¹⁵	4.1 x 10 ¹⁵
Dielectric Constant	@ 1 MHz	3.6	3.6	3.6	3.6

Measurement technique according to: ¹ ASTM D 412, ² ASTM D 5470, ³ ASTM D 149. All data without warranty and subject to change. Please contact us for further data and information. Shelf life adhesive: 6 months when stored in original packaging at room temperature and 50% relative humidity.

Thicknesses: 0.20 mm / 0.30 mm / 0.45 mm / 0.80 mm

R_{th} vs. N/cm² (PSI)

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SILICONE FOIL TFO-X-SI

fibreglass reinforced

TFO-X-SI is a high performance electrically insulating thermally conductive silicone foil for an optimised thermal coupling between electronic packages and heat sinks. Through the specific formulation and filling with highly thermally conductive ceramic particles an excellent thermal conductivity is reached. Its conformal surface structure guarantees a very good compliance to the contact surfaces. Thus the total thermal resistance is minimised. The fibreglass reinforcement provides for an outstanding mechanic stability and cutthrough resistance as well as easy handling. For an easy and reliable preassembly the interface material is available with low tack pressure sensitive adhesive on one side.



Release 09 / 2019

PROPERTIES

- Thermal conductivity: 5.0 W/mK
- High surface compliance
- Excellent thermal contact
- Outstanding mechanic stability through fibreglass reinforcement
- Extraordinary chemical resistance and longterm stability
- Residue-free removal after use

AVAILABILITY

- Sheet 440 x 510 mm
- Non tacky (TFO-XXXX-SI)
- Tacky on one side (TFO-XXXX-SI-A1)
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

Thermal link of:

- MOSFETs or IGBTs
- Power diodes or AC/DC converters
- Power modules

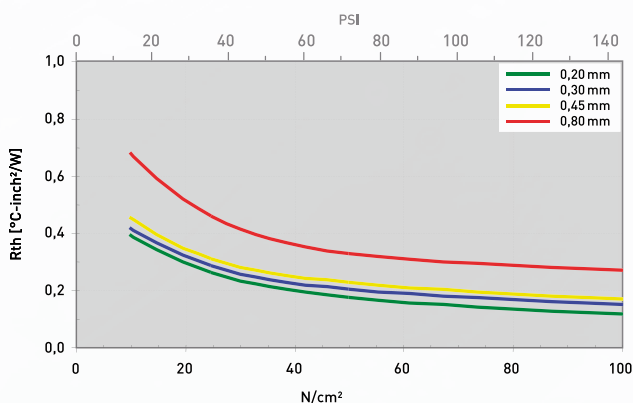
For use in Switch mode power supplies / Motor control units / Automotive engine management systems / UPS units / Solar systems

Property	Unit	TFO-X200-SI	TFO-X300-SI	TFO-X450-SI	TFO-X800-SI
Material		Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone
Colour		White	White	White	White
Reinforcement		Fibreglass	Fibreglass	Fibreglass	Fibreglass
Thickness	mm	0.20	0.30	0.45	0.80
Tensile Strength ¹	kpsi	1.3	1.2	0.7	0.6
UL Flammability	UL 94	VO	VO	VO	VO
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes	Yes
Thermal					
Resistance ² @ 150 PSI	°C-inch ² /W	0.11	0.15	0.17	0.27
Resistance ² @ 30 PSI	°C-inch ² /W	0.29	0.32	0.35	0.52
Thermal Conductivity	W/mK	5.0	5.0	5.0	5.0
Operating Temperature Range	°C	- 50 to + 200	- 50 to + 200	- 50 to + 200	- 50 to + 200
Electrical					
Breakdown Voltage ³	kV AC	3.0	6.0	9.0	> 10
Volume Resistivity	Ohm - cm	1.7 x 10 ¹⁵	7.9 x 10 ¹⁵	9.2 x 10 ¹⁵	8.9 x 10 ¹⁵
Dielectric Constant	@ 1 MHz	3.3	3.3	3.3	3.3

Measurement technique according to: ¹ ASTM D 412, ² ASTM D 5470, ³ ASTM D 149. All data without warranty and subject to change. Please contact us for further data and information. Shelf life adhesive: 6 months when stored in original packaging at room temperature and 50% relative humidity.

Thicknesses: 0.08 mm / 0.20 mm / 0.30 mm / 0.45 mm / 0.80 mm

R_{th} vs. N/cm² (PSI)



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SILICONE FOIL TFO-ZS-SI

fibreglass reinforced

TFO-ZS-SI is a high performance electrically insulating thermally conductive silicone foil for an optimised thermal coupling between electronic packages and heat sinks. Through the specific formulation and filling with highly thermally conductive ceramic particles an extremely high thermal conductivity is reached. Its conformal surface structure and flexibility guarantees a very good compliance to the contact surfaces. Thus the total thermal resistance is minimised. The fibreglass reinforcement provides for an outstanding mechanic stability and cutthrough resistance as well as easy handling.



Release 09 / 2019

PROPERTIES

- Thermal conductivity: 8.0 W/mK
- High surface compliance and flexibility
- Excellent thermal contact
- Outstanding mechanic stability through fibreglass reinforcement
- Extraordinary chemical resistance and longterm stability
- Residue-free removal after use

AVAILABILITY

- Sheet 440 x 510 mm
- Non tacky (TFO-ZSXXX-SI)
- Die cut parts

APPLICATION EXAMPLES

Thermal link of:

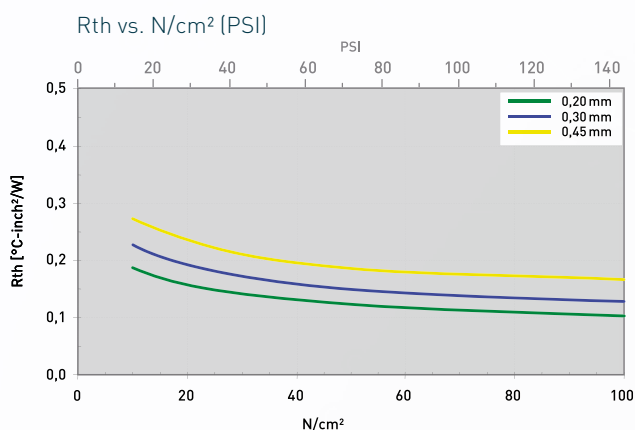
- MOSFETs or IGBTs
- Power diodes or AC/DC converters
- Power modules

For use in Switch mode power supplies / Motor control units / Automotive engine management systems / UPS units / Solar systems

Property	Unit	TFO-ZS0200-SI	TFO-ZS0300-SI	TFO-ZS0450-SI
Material		Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone
Colour		White	White	White
Reinforcement		Fibreglass	Fibreglass	Fibreglass
Thickness	mm	0.20	0.30	0.45
Tensile Strength ¹	kpsi	1.32	0.97	0.67
UL Flammability (Equivalent)	UL 94	VO	VO	VO
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes
Thermal				
Resistance ² @ 150 PSI	°C-inch ² /W	0.10	0.13	0.17
Resistance ² @ 30 PSI	°C-inch ² /W	0.15	0.19	0.24
Thermal Conductivity	W/mK	8.0	8.0	8.0
Operating Temperature Range	°C	-40 to +180	-40 to +180	-40 to +180
Electrical				
Breakdown Voltage ³	kV AC	3.6	4.5	5.0

Measurement technique according to: ¹ ASTM D 412, ² ASTM D 5470, ³ ASTM D 149. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 0.20 mm / 0.30 mm / 0.45 mm



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SILICONE FOIL TFO-L-SI

not reinforced

TFO-L-SI is an electrically insulating thermally conductive silicone foil for an optimised thermal coupling between electronic packages and heat sinks. Through the specific formulation and filling with thermally conductive ceramic particles a high thermal conductivity is reached. Its conformal surface structure guarantees a very good compliance to the contact surfaces even at low pressure. Thus the total thermal resistance is minimised. The material can be applied in a broad field of applications.



Release 09 / 2019

PROPERTIES

- Thermal conductivity: 2.1 W/mK
- Very good surface compliance
- Very low thermal resistance
- Extraordinary chemical resistance and longterm stability
- Residue-free removal after use

AVAILABILITY

- Sheet 440 x 480 mm
- Non tacky (TFO-LXXX-SI)
- Die cut parts

APPLICATION EXAMPLES

Thermal link of:

- MOSFETs or IGBTs
- Power diodes or AC/DC converters
- Power modules

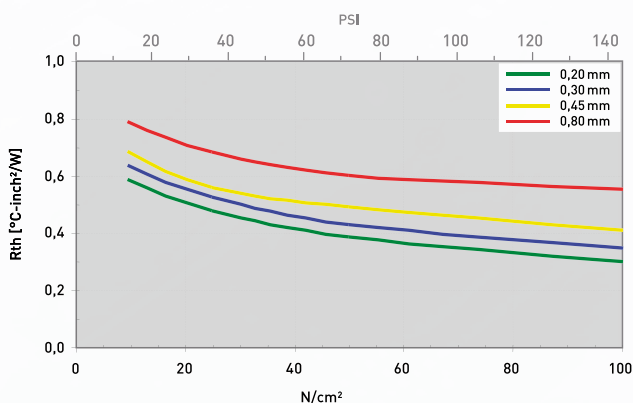
For use in Switch mode power supplies / Motor control units / Automotive engine management systems / UPS units / Solar systems

Property	Unit	TFO-L200-SI	TFO-L300-SI	TFO-L450-SI	TFO-L800-SI
Material		Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone
Colour		Grey	Grey	Grey	Grey
Reinforcement		None	None	None	None
Thickness	mm	0.20	0.30	0.45	0.80
Tensile Strength ¹	kpsi	0.45	0.45	0.45	0.45
UL Flammability	UL 94	VO	VO	VO	VO
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes	Yes
Thermal					
Resistance ² @ 1 MPa	°C-inch ² /W	0.30	0.35	0.41	0.55
Resistance ² @ 200 kPa	°C-inch ² /W	0.50	0.56	0.59	0.71
Thermal Conductivity	W/mK	2.1	2.1	2.1	2.1
Operating Temperature Range	°C	- 50 to + 200	- 50 to + 200	- 50 to + 200	- 50 to + 200
Electrical					
Breakdown Voltage ³	kV AC	3	5	8	9
Volume Resistivity	Ohm - cm	1.5 x 10 ¹³	6.0 x 10 ¹³	5.4 x 10 ¹³	7.7 x 10 ¹³
Dielectric Constant	@ 1 MHz	5.5	5.5	5.5	5.5

Measurement technique according to: ¹ ASTM D 412, ² ASTM D 5470, ³ ASTM D 149. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 0.20 mm / 0.30 mm / 0.45 mm / 0.80 mm

R_{th} vs. N/cm² (PSI)



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INSULATING FILM TFO-M-SI-PI

silicone coated, highly dielectric



TFO-M-SI-PI is an electrically insulating thermally conductive foil made of a high voltage resistant Polyimide film with thermally conductive silicone coating on both sides for an optimised thermal coupling between electronic packages and heat sinks. Through the specific formulation and filling with thermally conductive ceramic particles a very high thermal conductivity is reached. Under pressure the total thermal resistance is minimised. The material is characterised by its very high dielectric properties. The substrate film provides for an outstanding mechanic stability and cutthrough resistance as well as easy handling.



Release 09 / 2019

PROPERTIES

- High thermal contact
- Very high dielectric strength
- Outstanding mechanic stability through substrate film
- Extraordinary chemical resistance and longterm stability
- Residue-free removal after use

AVAILABILITY

- Sheet 320 x 400 mm
Others on request
- Roll 320 mm x 50 m
- Non tacky (TFO-MXXX-SI-PI)
- Die cut parts

APPLICATION EXAMPLES

Thermal link of:

- MOSFETs or IGBTs
- Power diodes or AC/DC converters
- Power modules

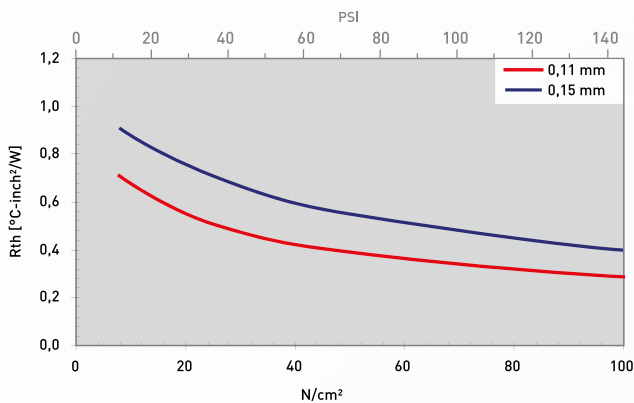
For use in Switch mode power supplies / Motor control units / Automotive engine management systems / UPS units / Solar systems

Property	Unit	TFO-M110-SI-PI	TFO-M150-SI-PI
Material		Insulating film coated with ceramic filled silicone	Insulating film coated with ceramic filled silicone
Colour		Light brown	Light brown
Reinforcement		Polyimide film	Polyimide film
Thickness	mm	0.11	0.15
UL Flammability	UL 94	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes
Thermal			
Resistance ¹ @ 150 PSI	°C-inch ² /W	0.29	0.40
Resistance ¹ @ 30 PSI	°C-inch ² /W	0.55	0.75
Operating Temperature Range	°C	- 40 to + 180	- 40 to + 180
Electrical			
Breakdown Voltage ²	kV AC	6	> 6

Measurement technique according to: ¹ ASTM D 5470, ² ASTM D 149. All data without warranty and subject to change. Please contact us for further data and information.

Thickness: 0.11 / 0.15 mm

R_{th} vs. N/cm² (PSI)



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INSULATING FILM TFO-Q-SI-PI

silicone coated, highly dielectric



TFO-Q-SI-PI is an electrically insulating thermally conductive foil made of a high voltage resistant Polyimide film with thermally conductive silicone coating on both sides for an optimised thermal coupling between electronic packages and heat sinks. Through the specific formulation and filling with thermally conductive ceramic particles a very high thermal conductivity is reached. Under pressure the total thermal resistance is minimised. The material is characterised by its very high dielectric properties. The substrate film provides for an outstanding mechanic stability and cutthrough resistance as well as easy handling.



Release 09 / 2019

PROPERTIES

- High thermal contact
- Very high dielectric strength
- Outstanding mechanic stability through substrate film
- Extraordinary chemical resistance and longterm stability
- Residue-free removal after use

AVAILABILITY

- Sheet 320 x 400 mm
Others on request
- Roll 320 mm x 50 m
- Non tacky (TFO-Q150-SI-PI)
- Die cut parts

APPLICATION EXAMPLES

Thermal link of:

- MOSFETs or IGBTs
- Power diodes or AC/DC converters
- Power modules

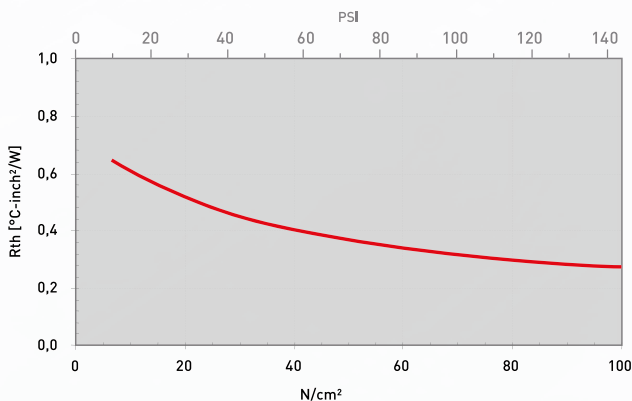
For use in Switch mode power supplies / Motor control units / Automotive engine management systems / UPS units / Solar systems

Property	Unit	TFO-Q150-SI-PI
Material		Insulating film coated with ceramic filled silicone
Colour		Dark grey
Reinforcement		Polyimide film
Thickness	mm	0.15
UL Flammability	UL 94	V0
RoHS Conformity	2011 / 65 / EU	Yes
Thermal		
Resistance ¹ @ 150 PSI	°C-inch ² /W	0.28
Resistance ¹ @ 30 PSI	°C-inch ² /W	0.50
Operating Temperature Range	°C	- 40 to + 180
Electrical		
Breakdown Voltage ²	kV AC	> 6

Measurement technique according to: ¹ ASTM D 5470, ² ASTM D 149. All data without warranty and subject to change. Please contact us for further data and information.

Thickness: 0.15 mm

Rth vs. N/cm² (PSI)



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3 SILICONE CAPS



Release 11 / 2018

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SILICONE CAP TCP-C-SI

all around dielectric



TCP-C-SI is a thermally conductive silicone cap for an optimised thermal coupling between electronic packages and heat sinks which provides for a reliable electrical all-around insulation. Through the specific formulation and filling with thermally conductive ceramic particles a good thermal conductivity is reached. Its conformal surface structure guarantees a very good compliance to the contact surfaces. Thus the total thermal resistance is minimised.



Release 11 / 2018

PROPERTIES

- Very good surface compliance
- High thermal contact
- Extraordinary chemical resistance and longterm stability
- Residue-free removal after use

AVAILABILITY

- Thicknesses: 0.5 mm and 0.8 mm
- Different sizes available

APPLICATION EXAMPLES

Thermal link of:

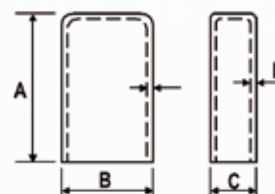
- MOSFETs or IGBTs
- Power diodes or AC/DC converters

For use in Switch mode power supplies / Motor control units / Automotive engine management systems / UPS units / Solar systems

Property	Unit	TCP-C250-SI	TCP-C280-SI
Material		Ceramic filled silicone	Ceramic filled silicone
Colour		Grey	Grey
Thickness	mm	0.50	0.80
Tensile Strength ¹	kpsi	0.5	0.5
Tear Strength	kN/m	6.0	6.0
UL Flammability	UL 94	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes
Thermal			
Resistance @ 30 PSI	°C-inch ² /W	0.48	0.58
Thermal Conductivity	W/mK	0.8	0.8
Operating Temperature Range	°C	- 40 to + 155	- 40 to + 155
Electrical			
Breakdown Voltage ²	kV AC	4	10
Volume Resistivity	Ohm - cm	2.6 x 10 ¹⁵	2.6 x 10 ¹⁵
Dielectric Constant	@ 1 MHz	4.85	4.85

Measurement technique according to: ¹ ASTM D 412, ² ASTM D 149. All data without warranty and subject to change. Please contact us for further data and information.

Sizes in mm	A	B	C	D
TCP-C150-SI	16.0 ± 0.1	11.5 ± 0.1	5.9 ± 0.1	0.5 ± 0.1
TCP-C250-SI	21.5 ± 0.1	11.5 ± 0.1	5.9 ± 0.1	0.5 ± 0.1
TCP-C280-SI	21.8 ± 0.1	12.1 ± 0.1	6.5 ± 0.1	0.8 ± 0.1
TCP-C450-SI	28.5 ± 0.1	17.5 ± 0.1	5.9 ± 0.1	0.5 ± 0.1
TCP-C480-SI	28.8 ± 0.1	18.2 ± 0.1	6.6 ± 0.1	0.8 ± 0.1



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SILICONE CAP TCP-J-SI

all around dielectric



TCP-J-SI is a thermally conductive silicone cap for an optimised thermal coupling between electronic packages and heat sinks which provides for a reliable electrical all-around insulation. Through the specific formulation and filling with thermally conductive ceramic particles a high thermal conductivity is reached. Its conformal surface structure guarantees a very good compliance to the contact surfaces. Thus the total thermal resistance is minimised.



Release 11 / 2018

PROPERTIES

- Very good surface compliance
- High thermal contact
- Extraordinary chemical resistance and longterm stability
- Residue-free removal after use

AVAILABILITY

- Thicknesses: 0.30 mm / 0.45 mm / 0.80 mm
- Different sizes available (See table Sizes)

APPLICATION EXAMPLES

Thermal link of:

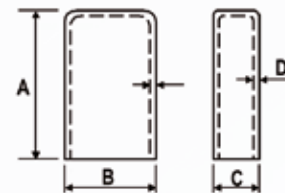
- MOSFETs or IGBTs
- Power diodes or AC/DC converters

For use in Switch mode power supplies / Motor control units / Automotive engine management systems / UPS units / Solar systems

Property	Unit	TCP-J300-SI	TCP-J450-SI	TCP-J800-CP
Material		Ceramic filled silicone	Ceramic filled silicone	Ceramic filled silicone
Colour		Reddish	Reddish	Reddish
Thickness	mm	0.30	0.45	0.80
Tensile Strength	kpsi	0.5	0.5	0.5
Tear Strength	kN/m	9.8	9.8	9.8
UL Flammability	UL 94	V0	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes
Thermal				
Resistance (@ TO-3P)	°C/W	0.68	0.95	1.60
Thermal Conductivity ¹	W/mK	1.5	1.5	1.5
Operating Temperature Range	°C	- 50 to + 200	- 50 to + 200	- 50 to + 200
Electrical				
Breakdown Voltage	kV AC	10	13	18
Volume Resistivity	Ohm - cm	3.2×10^{14}	3.2×10^{14}	3.2×10^{14}
Dielectric Constant	@ 1 MHz	6.0	6.0	6.0

Measurement technique according to: ¹ ASTM E 1530. All data without warranty and subject to change. Please contact us for further data and information.

Sizes in mm	A	B	C	D
TCP-J300-SI (for TO-220)	21.5 ± 1.0	11.4 ± 0.5	5.8 ± 0.3	0.30 + 0.15 / -0.0
TCP-J300-SI (for TO-3P)	28.5 ± 1.0	17.5 ± 0.5	5.8 ± 0.3	0.30 + 0.15 / -0.0
TCP-J450-SI (for TO-220)	21.5 ± 1.0	11.4 ± 0.5	5.8 ± 0.3	0.45 + 0.10 / -0.05
TCP-J450-SI (for TO-3P)	28.5 ± 1.0	17.5 ± 0.5	5.9 ± 0.3	0.45 + 0.10 / -0.05
TCP-J800-SI (for TO-220)	21.8 ± 1.0	12.1 ± 0.5	6.5 ± 0.3	0.80 + 0.15 / -0.0
TCP-J800-SI (for TO-3P)	28.8 ± 1.0	18.2 ± 0.5	6.6 ± 0.3	0.80 + 0.15 / -0.0



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4 PHASE CHANGE MATERIAL

/ POLYIMIDE FILM COATED /
ALUMINUM FILM COATED /
FILM



POLYIMIDE FILM/PHASE CHANGE TPC-N-PI HALA

phase change coating, highly dielectric

TPC-N-PI is a thermally conductive film with an electrically insulator made of Devinal TH Polyimide which is coated with a thermally conductive phase changing compound on both sides thus optimising the thermal path e.g. between electronic packages and heat sinks. During warm-up the phase change coating starts filling up surface-specific roughnesses and unevenesses and expels any air enclosures from micro structures even at low pressure. The wettening of the contact areas is further on improved by volumetric material expansion of approximately 10 to 15% at increasing temperature. Thus the total thermal resistance is minimised. The material is characterised by its very high dielectric properties.



Release 11 / 2018

PROPERTIES

- Optimal thermal contact
- High dielectric strength
- Silicone-free
- No dry up, pump-out migration
- No run-out through thixotropic properties
- Process reliable coating thickness
- Ideal replacement of messy thermal grease

AVAILABILITY

- Sheet 305 x 495 / 610 x 495 mm
- Roll 495 mm x 152 m
- Non tacky (TPC-NXXX-PI)
- Tacky on one side with PSA (TPC-NXXX-PI-A1)
- With adhesive strips on request
- Thicker phase coating (25 µm)
- Die cut parts
- Kiss cut parts

APPLICATION EXAMPLES

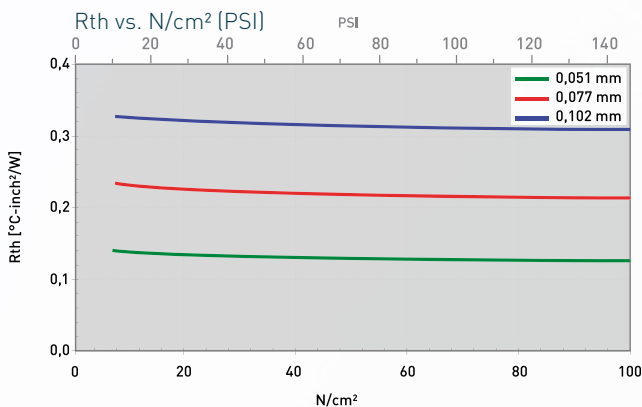
- Thermal link of:
- MOSFETs or IGBTs
 - Diodes
 - A.C. converter
 - Uninsulated power modules
- For use in Automotive motor control units / Power supplies / Traction drives / Telecom appliances

Property	Unit	TPC-N051-PI	TPC-N077-PI	TPC-N102-PI
Material		Devinal TH Polyimide film with phase change coating on both sides	Devinal TH Polyimide film with phase change coating on both sides	Devinal TH Polyimide film with phase change coating on both sides
Colour		Light orange	Light orange	Light orange
Thickness Devinal TH	µm	25	51	76
Thickness Phase Change (per side)	µm	13	13	13
Total Thickness	µm	51	77	102
Tensile Strength	kpsi	19.7	19.7	19.7
UL Flammability Devinal TH (Equivalent)	UL 94	V0	V0	V0
RoHS Conformity	2011/65/EU	Yes	Yes	Yes
Thermal				
Resistance ¹ @ 150 PSI	°C-inch ² /W	0.126	0.215	0.311
Resistance ¹ @ 30 PSI	°C-inch ² /W	0.130	0.220	0.315
Resistance ¹ @ 10 PSI	°C-inch ² /W	0.143	0.237	0.332
Thermal Conductivity Devinal TH	W/mK	0.36	0.36	0.36
Phase Change Temperature	°C	ca. 60	ca. 60	ca. 60
Electrical				
Breakdown Voltage	kV AC	5.4	9.0	13.5
Volume Resistivity	Ohm - cm	1.0 x 10 ¹⁶	1.0 x 10 ¹⁶	1.0 x 10 ¹⁶
Dielectric Constant	@ 25°C	4.0	4.0	4.0

Measurement technique according to: ¹ ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Shelf life adhesive: 6 months when stored in original packaging at room temperature and 50% relative humidity.

Thicknesses: Devinal TH Polyimide: 25 µm / 51 µm / 76 µm. Total Thicknesses: 51 µm / 77 µm / 102 µm



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POLYIMIDE/PHASE CHANGE TPC-P-KA



phase change coating, highly dielectric

TPC-P-KA is a thermally conductive film with an electrically insulator made of Kapton®MT which is coated with a thermally conductive phase changing compound on both sides thus optimising the thermal path e.g. between electronic packages and heat sinks. During warm-up the phase change coating starts filling up surface-specific roughnesses and unevennesses and expels any air enclosures from micro structures even at low pressure. The wetting of the contact areas is further on improved by volumetric material expansion of approximately 10 to 15% at increasing temperature. Thus the total thermal resistance is minimised. The material is characterised by its very high dielectric properties.



Release 11 / 2018

PROPERTIES

- Optimal thermal contact
- High dielectric strength
- Silicone-free
- No dry up, pump-out migration
- No run-out through thixotropic properties
- Process reliable coating thickness
- Ideal replacement of messy thermal grease

AVAILABILITY

- Sheet 305 x 394 / 610 x 394 mm
- Roll 394 mm x 152 m
- Non tacky (TPC-PXXX-KA)
- Tacky on one side with PSA (TPC-PXXX-KA-A1)
- With adhesive strips on request
- Thicker phase coating (25 µm)
- Die cut parts
- Kiss cut parts

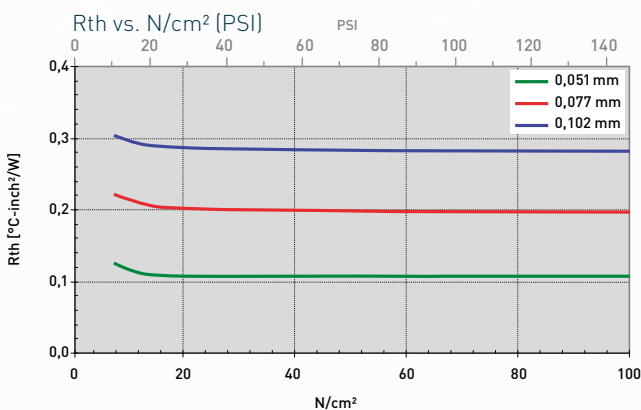
APPLICATION EXAMPLES

- Thermal link of:
- MOSFETs or IGBTs
 - Diodes
 - A.C. converter
 - Uninsulated power modules
- For use in Automotive motor control units / Power supplies / Traction drives / Telecom appliances

Property	Unit	TPC-P051-KA	TPC-P077-KA	TPC-P102-KA
Material		Kapton®MT with phase change coating on both sides	Kapton®MT with phase change coating on both sides	Kapton®MT with phase change coating on both sides
Colour		Light orange	Light orange	Light orange
Thickness Kapton®MT	µm	25	51	76
Thickness Phase Change (per side)	µm	13	13	13
Total Thickness	µm	51	77	102
Tensile Strength ¹	kpsi	20	22	23
UL Flammability Kapton®MT	UL 94	V0	V0	V0
RoHS Conformity	2011/65/EU	Yes	Yes	Yes
Thermal				
Resistance ² @ 150 PSI	°C-inch ² /W	0.110	0.195	0.285
Resistance ² @ 30 PSI	°C-inch ² /W	0.113	0.200	0.290
Resistance ² @ 10 PSI	°C-inch ² /W	0.125	0.213	0.300
Thermal Conductivity Kapton®MT	W/mK	0.45	0.45	0.45
Phase Change Temperatur	°C	ca. 60	ca. 60	ca. 60
Electrical				
Breakdown Voltage ³	kV AC	5.5	9.2	12.3
Volume Resistivity	Ohm - cm	1.0 x 10 ¹⁴	1.0 x 10 ¹⁴	1.0 x 10 ¹⁴
Dielectric Constant	@ 1 MHz	4.2	4.2	4.2

Measurement technique according to: ¹ ASTM D 412, ² ASTM D 5470, ³ ASTM D 149. All data without warranty and subject to change. Please contact us for further data and information. Shelf life adhesive: 6 months when stored in original packaging at room temperature and 50% relative humidity.

Thicknesses: Kapton® MT 25 µm / 51 µm / 76 µm. Total Thicknesses: 51 µm / 77 µm / 102 µm



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PHASE CHANGE TPC-W-PC

as stand alone or with substrate



TPC-W-PC is thermally conductive phase changing film optimising the thermal path e.g. between electronic packages and heat sinks. During warm-up the phase change compound starts filling up surface-specific roughnesses and unevennesses and expels any air enclosures from micro structures even at very low pressure. The particular formulation and the thixotropic nature prevents from run-out as well as migration. The material is available as TPC-W-PC as free standing film or with different substrates thus reworkability is improved since no compound residues remain on one side.



Release 11 / 2018

PROPERTIES

- Optimal thermal contact
- Thermal conductivity: 3.5 W/mK
- Silicone-free
- No migrating, pump-out or run out due to thixotropic properties
- Ideal alternative and replacement of messy thermal grease
- Different optional substrates allow for one-side residue-freeness and improved reworkability

AVAILABILITY

- Sheet 356 x 305 mm
- Roll 356 mm (Liner 394 mm) x L (up to 150 m)
- TPC-WXXX-PC: Die cut parts between 2 release liners
- One-side coated substrates:
Aluminum TPC-WXXX-PC-ALYYY
Copper TPC-WXXX-PC-CUYYY

APPLICATION EXAMPLES

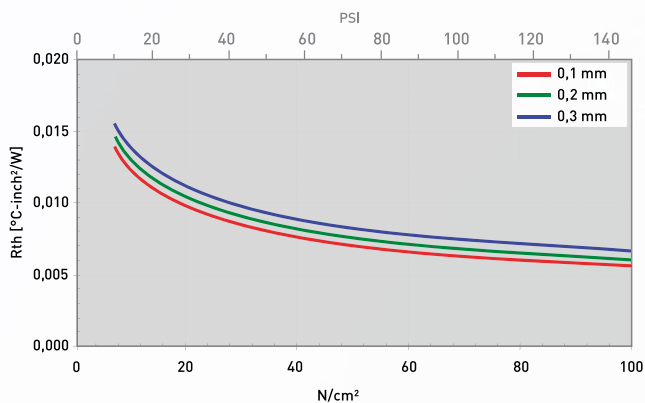
- Thermal link of:
- MOSFETs or IGBTs
 - Memory modules
 - Power modules
 - CPUs
- For use in Servo drive control units / Computers / Automation appliances / Microelectronics

Property	Unit	TPC-W100-PC	TPC-W200-PC	TPC-W300-PC
Material		Phase Change Film	Phase Change Film	Phase Change Film
Colour		Grey	Grey	Grey
Total Thickness	mm	0.1	0.2	0.3
Specific Density	g/cm ³	2.0	2.0	2.0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes
Thermal				
Resistance ¹ @ 150 PSI	°C-inch ² /W	0.0056	0.0061	0.0067
Resistance ¹ @ 30 PSI	°C-inch ² /W	0.0097	0.0103	0.0111
Resistance ¹ @ 10 PSI	°C-inch ² /W	0.0138	0.0148	0.0158
Thermal Conductivity	W/mK	3.5	3.5	3.5
Phase Change Temperature	°C	ca. 45	ca. 45	ca. 45
Storage	Months	24	24	24
Max. Storage Temperature	°C	27	27	27

Measurement technique according to: 1ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 0.1 mm / 0.2 mm / 0.3 mm / 0.4 mm

Rth vs. N/cm² (PSI)



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ALUMINUM FILM/PHASE CHANGE TPC-R-AL HALA

phase change coating

TPC-R-AL is an aluminum film which is coated with a thermally conductive phase changing compound on both sides thus optimising the thermal path e.g. between electronic packages and heat sinks. During warm-up the phase change coating starts filling up surface-specific roughnesses and unevennesses and expels any air enclosures from micro structures even at low pressure. The wetting of the contact areas is further on improved by volumetric material expansion at increasing temperature. Thus the total thermal resistance is minimised. The particular formulation and the thixotropic nature prevents from run-out, dry-up as well as migration. The aluminum carrier effects high mechanical stability and easy handling.



Release 11 / 2018

PROPERTIES

- Optimal thermal contact
- Silicone-free
- No migrating, run out or pump-out due to thixotropic properties
- Process reliable coating thickness
- Ideal alternative and replacement of messy thermal grease

AVAILABILITY

- Sheet 305 x 610 mm or 457 x 610 mm
- Roll 292 or 445 mm x 152 m
- Non tacky (TPC-RXXX-AL)
- Tacky on one side with PSA (TPC-RXXX-AL-A1)
- With adhesive strips on request
- Optional AL (25 / 51 / 76 / 127 / 254 µm), phase change coating (13 / 25 / 51 µm)
- Die cut or kiss cut parts

APPLICATION EXAMPLES

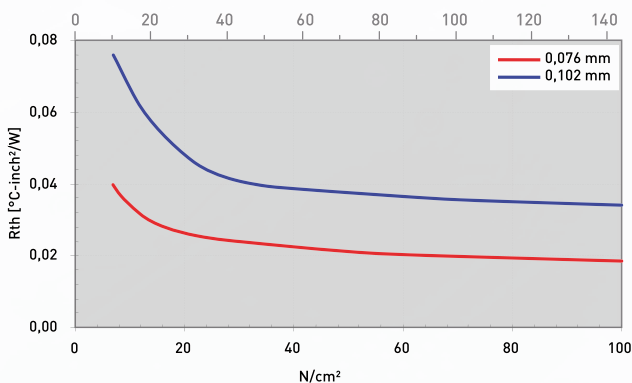
- Thermal link of:
- MOSFETs or IGBTs
 - Insulated diodes
 - Power modules
 - CPUs
- For use in Servo drive control units / Traction drives / Automation appliances / Microelectronics

Property	Unit	TPC-R076-AL	TPC-R102-AL
Material		Aluminum with phase change coating on both sides	Aluminum with phase change coating on both sides
Colour		White	White
Thickness Aluminum	µm	51	51
Thickness Phase Change (per side)	µm	13	25
Total Thickness	µm	76	102
RoHS Conformity	2011 / 65 / EU	Yes	Yes
Thermal			
Resistance ¹ @ 150 PSI	°C-inch ² /W	0.019	0.034
Resistance ¹ @ 30 PSI	°C-inch ² /W	0.026	0.047
Resistance ¹ @ 10 PSI	°C-inch ² /W	0.040	0.076
Phase Change Temperature	°C	ca. 60	ca. 60

Measurement technique according to: ¹ ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Thicknesses: 51 µm / 76 µm / 102 µm / 127 µm / 152 µm / 177 µm / 279 µm / 304 µm

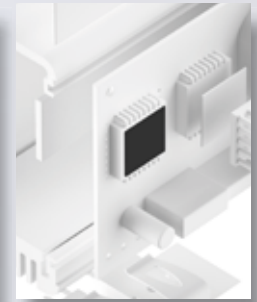
Rth vs. N/cm² (PSI)



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phase change coating

TPC-T-AL-CB is an aluminum film which is coated with a thermally conductive phase changing compound on both sides thus optimising the thermal path e.g. between electronic packages and heat sinks. During warm-up the phase change coating starts filling up surface-specific roughnesses and unevennesses and expels any air enclosures from micro structures even at low pressure. The wetting of the contact areas is further on improved by volumetric material expansion at increasing temperature. Thus the total thermal resistance is minimised. The particular formulation and the thixotropic nature prevents from run-out, dry-up as well as migration. The aluminum carrier effects high mechanical stability and easy handling.



Release 11 / 2018

PROPERTIES

- Optimal thermal contact
- Silicone-free
- No migrating, run out, pump-out due to thixotropic properties
- Process reliable coating thickness
- Ideal alternative and replacement of messy thermal grease

AVAILABILITY

- Sheet 445 x 500 mm
- Roll 445 mm x 152 m
- Non tacky (TPC-TXXX-AL-CB)
- Die cut parts

APPLICATION EXAMPLES

Thermal link of:

- MOSFETs or IGBTs
- Insulated diodes
- Power modules
- CPUs

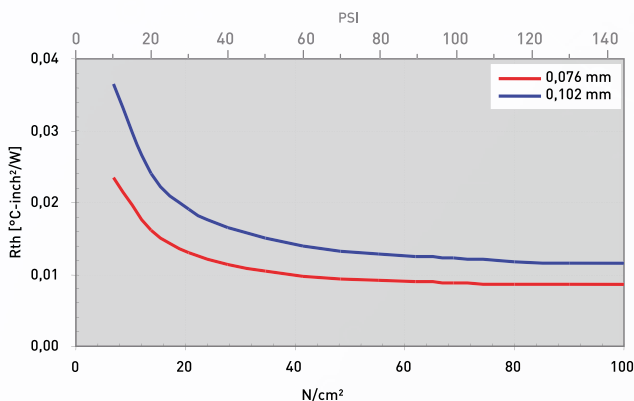
For use in Servo drive control units / Traction drives / Automation appliances / Microelectronics

Property	Unit	TPC-T076-AL-CB	TPC-T102-AL-CB
Material		Aluminum with graphite filled phase change coating on both sides	Aluminum with graphite filled phase change coating on both sides
Colour		Black	Black
Thickness Aluminum	µm	51	51
Thickness Phase Change (per side)	µm	12.5	25.5
Total Thickness	µm	76	102
RoHS Conformity	2011 / 65 / EU	Yes	Yes
Thermal			
Resistance ¹ @ 150 PSI	°C-inch ² /W	0.009	0.011
Resistance ¹ @ 30 PSI	°C-inch ² /W	0.013	0.019
Resistance ¹ @ 10 PSI	°C-inch ² /W	0.022	0.037
Phase Change Temperature	°C	ca. 52	ca. 52

Measurement technique according to: ¹ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Phase Change coatings per side: 12.5 µm / 25.5 µm
 Total Thicknesses: 76 µm / 102 µm

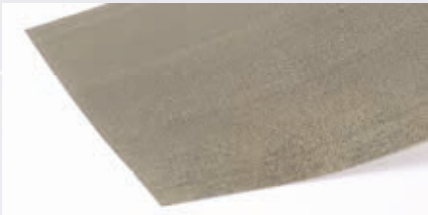
Rth vs. N/cm² (PSI)



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5 GRAPHITE FOILS

/ ANISOTROPIC / PYROLYTIC



Release 11 / 2018

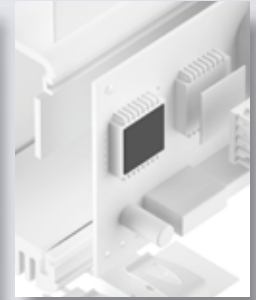
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GRAPHITE FOIL TFO-S-CB

anisotropic



TFO-S-CB consists of more than 98% pure natural graphite. Due to the flake-like shape they show anisotropic thermal conductivities in-plane (x-y-plane) and in through direction (z-direction). Their softness allows for a good compliance to the contact surfaces. Thus the total thermal resistance is minimised. Their low densities compared to copper (15%) or aluminum (50%) make them ideal for applications where low weight is required. The very high temperature resistance allows for the use in extreme hot environments.



Release 11 / 2018

PROPERTIES

- Maximum contact through good surface compliance
- Very low weight
- Silicone-free
- Very high temperature resistance
- EMI-shielding through high electrical conductivity

AVAILABILITY

- Sheet 300 x 500 mm
- Roll 300 mm x 50 m
- Die cut parts
- Non adhesive (TFO-SXXX-CB)
- Adhesive on one side (TFO-SXXX-CB-A1)

APPLICATION EXAMPLES

Thermal link of:

- CPUs to heat sinks
- Power modules
- Semiconductors
- IGBTs

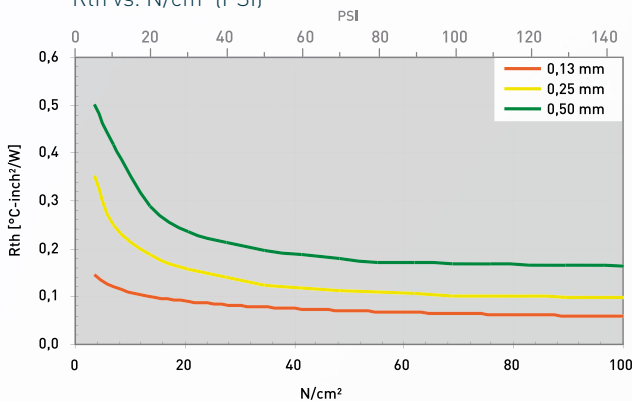
For use in Power inverters / Laptops / Automotive power supplies / Industrial PCs

Property	Unit	TFO-S130-CB	TFO-S250-CB	TFO-S510-CB
Material		Natural Graphite 98%	Natural Graphite 98%	Natural Graphite 98%
Colour		Grey	Grey	Grey
Thickness	mm	0.13	0.25	0.5
Hardness	Shore A	85	85	85
UL Flammability	UL 94	V0	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes
Thermal				
Resistance ¹ @ 150 PSI	°C-inch ² /W	0.06	0.10	0.16
Resistance ¹ @ 30 PSI	°C-inch ² /W	0.09	0.16	0.23
Resistance ¹ @ 10 PSI	°C-inch ² /W	0.12	0.24	0.40
Thermal Conductivity (Z Direction)	W/mK	8	8	8
Thermal Conductivity (X-Y Direction)	W/mK	140	140	140
Operating Temperature Range	°C	- 250 to + 400	- 250 to + 400	- 250 to + 400
Electrical				
Volume Resistivity	Ohm - cm	11.0 x 10 ⁻⁴	11.0 x 10 ⁻⁴	11.0 x 10 ⁻⁴
Dielectric Constant	@ 1 MHz	< 0.001	< 0.001	< 0.001

Measurement technique according to: ¹ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information. Shelf life adhesive: 6 months when stored in original packaging at room temperature and 50% relative humidity.

Thicknesses: 0.13 mm / 0.25 mm / 0.5 mm

Rth vs. N/cm² (PSI)



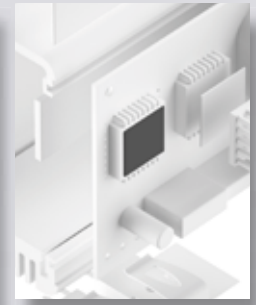
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PYROLYTIC GRAPHITE FOIL TFO-Y-PG

highly anisotropic conductive



TFO-Y-PG consists of pure pyrolytic graphite. Due to the synthetic structure it shows highly anisotropic heat spreading conductivities in-plane (x-y-plane) and in through direction (z-direction). Its softness allows for a good compliance to the contact surfaces. Thus the total thermal resistance is minimised. Their low densities make them ideal for applications where low weight is required. The very high temperature resistance allows for the use in extreme hot environments. Due to its flexibility it is bending-resistant. It can be used for curved surfaces and corners because its thermal conductivity will remain unchanged in the absence of sharp folds. Special configurations are dielectric with insulating films or laminated on flexible gap filler elastomers.



Release 11 / 2018

PROPERTIES

- Maximum contact through good surface compliance
- Very low weight
- Silicone-free
- Very high temperature resistance
- EMI-shielding through high electrical conductivity
- UL V0

AVAILABILITY

- Sheet 115 x 180 mm
- Sheet 180 x 230 mm (0.07 - 0.1 mm Thickness)
- Non adhesive (TFO-YXXX-PG)
- Adhesive (TFO-YXXX-PG-A1)
- Die cut parts

SPECIAL CONFIGURATIONS

- With PEEK Laminate (TFO-YXXX-PG-PKXXX)
- With Polyimide Laminate (TFO-YXXX-PG-PIXXX)
- With PET Laminate (TFO-YXXX-PG-PEXXX)
- As laminate on ultrasoft silicone gap filler elastomer (TFO-YXXX-PG-GFXXX)

APPLICATION EXAMPLES

Thermal link of:

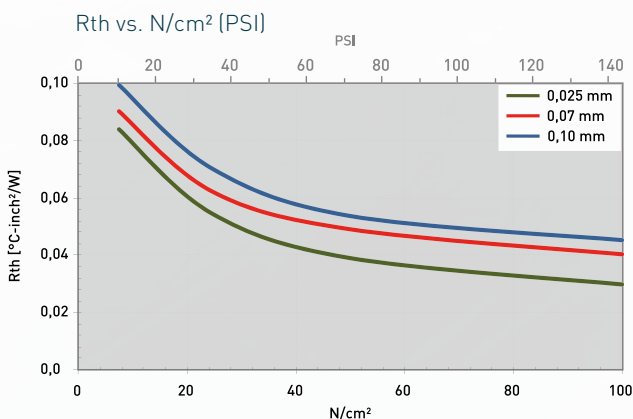
- CPUs to heat sinks
- Laser diodes
- TEC modules

For use in high end computers / Analyzers / Photonics

Property	Unit	TFO-Y025-PG	TFO-Y070-PG	TFO-Y100-PG
Material		Pyrolytic Graphite	Pyrolytic Graphite	Pyrolytic Graphite
Colour		Grey	Grey	Grey
Thickness	mm	0.025	0.07	0.10
Density	g/cm ³	1.9	1.21	0.85
UL Flammability	UL 94	V0	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes
Thermal				
Resistance ¹ @ 150 PSI	°C-inch ² /W	0.03	0.04	0,045
Resistance ¹ @ 30 PSI	°C-inch ² /W	0.06	0.07	0,078
Resistance ¹ @ 10 PSI	°C-inch ² /W	0.08	0.09	0,10
Thermal Conductivity (Z Direction)	W/mK	18	20	25
Thermal Conductivity (X-Y Direction)	W/mK	1,600	850	700
Operating Temperature Range	°C	- 250 to + 400	- 250 to + 400	- 250 to + 400
Electrical				
Electrical Conductivity	S/cm	20,000	10,000	10,000

Measurement technique according to: ¹ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information. Shelf life adhesive: 6 months when stored in original packaging at room temperature and 50% relative humidity.

Thicknesses: 0.025 mm / 0.04 mm / 0.05 mm / 0.07 mm / 0.10 mm



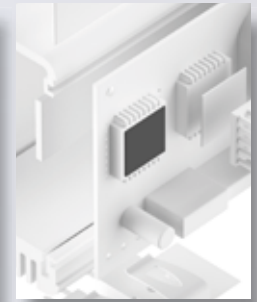
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PYROLYTIC GRAPHITE FOIL TFO-ZS-PG



soft, anisotropic highly conductive

TFO-ZS-PG consists of pure soft pyrolytic graphite. Due to the synthetic structure it shows a high anisotropic heat spreading conductivity in-plane (x-y-plane) and an outstanding thermal conductivity in through thickness direction (z-direction). Its flexibility and softness allow for a very good compliance to larger uneven contact surfaces such as IGBT base plates. Thus the total thermal resistance is minimized. Compared to copper or aluminum the material is ideal for applications where low weight is required. The very high temperature resistance allows for the use in extreme hot environments.



Release 11 / 2018

PROPERTIES

- Maximum contact through good surface compliance
- Very soft
- Very low weight
- Silicone-free
- Extremely temperature resistant
- EMI-shielding through high electrical conductivity

AVAILABILITY

- Sheet 90 x 90 mm
- Sheet 90 x 180 mm
- Die cut parts

APPLICATION EXAMPLES

Thermal link of:

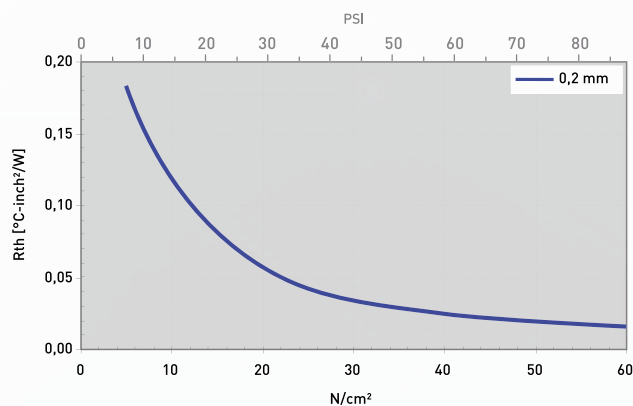
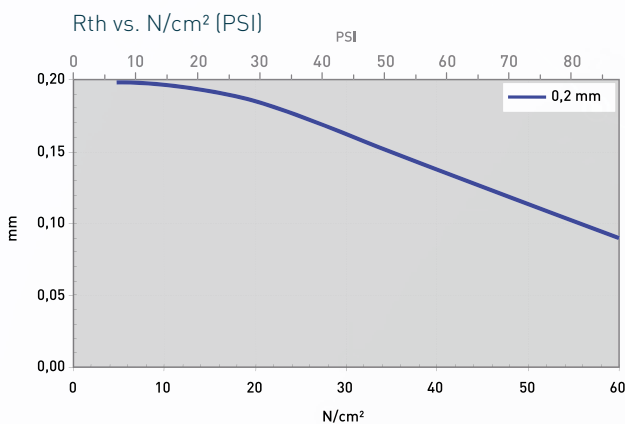
- IGBT modules
- Laser diodes
- TEC modules
- High flux LEDs

For use in liquid cold plates / high end computers / Analyzers / Photonics / LED arrays

Property	Unit	TFO-ZS200-PG
Material		
Material		Soft Pyrolytic Graphite
Colour		Grey
Thickness	mm	0.2 +/- 0.05
Density	g/cm ³	0.5
Flammability	UL 94	V0
RoHS Conformity	2011 / 65 / EU	Yes
Thermal		
Resistance ¹ @ 90 PSI @ Thickness	°C-inch ² /W (mm)	0.015 (0.09)
Resistance ¹ @ 30 PSI @ Thickness	°C-inch ² /W (mm)	0.055 (0.18)
Resistance ¹ @ 10 PSI @ Thickness	°C-inch ² /W (mm)	0.181 (0.19)
Thermal Conductivity (Z Direction)	W/mK	30
Thermal Conductivity (X-Y Direction)	W/mK	500
Operating Temperature Range	°C	- 250 to + 400
Electrical		
Electrical Conductivity	S/cm	10,000

Measurement technique according to: ¹ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information. Shelf life adhesive: 6 months when stored in original packaging at room temperature and 50% relative humidity.

Thicknesses: 0.20 mm



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6 PSA INSULATING TAPES

/ ACRYLATE / SILICONE



Release 11 / 2018

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PSA INSULATING TAPE TAT-J-PE

acrylate adhesive with polyester insulating film

TAT-J-PE is a thermally conductive PSA tape with an electrically insulating polyester film reinforcement. Through the thermally conductive acrylate adhesive coated on both sides of the polyester film the thermal contact is highly improved even at low pressures. Convex and concave surface structures and stack up tolerances are effectively compensated. Materials with different expansion coefficients can easily be bonded. Thus the total thermal resistance is minimised. The tape works well for realizing an effective and cost efficient thermal coupling in a broad field of applications. Above all it is used in applications having little space only and where the permitted weight is limited. Using screws, springs, clips as mechanic fasteners thus becomes superfluous.



Release 11 / 2018

PROPERTIES

- Low thermal resistance
- High dielectric strength
- Reliable strong adherence on uneven or hardly machineable surfaces
- Silicone-free
- Neither mixing of components nor curing processes
- High mechanical stability and an easy handling through polyester film
- Replacement of fasteners e.g. screws, clips, etc.

AVAILABILITY

- Sheet
- Roll 10 ~1,000 mm x 20 m
- Both side tacky [TAT-J200-PE]
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

Thermal link of:

- LEDs
 - CPUs
 - RDRAM memory modules
 - Flip Chips, DSPs, BGAs, PPGAs
 - MOSFETs to heat sinks
- For use in Power supplies / PCs / Telecom engineering / Automotive applications / LED arrays

Property	Unit	TAT-J200-PE
Material		Thermally conductive acrylate PSA tape with polyester film
Colour		White
Tape Thickness	mm	0.20
PE Film Thickness	µm	12
Peel Off Strength (@ Stainless Steel @ RT)	N/cm	5.6
Peel Off Strength (@ Al 6063, @ RT)	N/cm	6.1
UL Flammability	UL 94	V0
RoHS Conformity	2011 / 65 / EU	Yes
Thermal		
Thermal Conductivity	W/mK	0.7
Resistance ¹ @ 7 PSI	°C-inch ² /W	0.73
Resistance ¹ @ 70 PSI	°C-inch ² /W	0.50
Operating Temperature Range	°C	- 40 to + 125
Electrical		
Breakdown Voltage	kV AC	8.9

Measurement technique according to: ¹ ASTM D 5470. All data without warranty and subject to change. Please contact us for further data and information.

Shelf life adhesive: 6 months when stored in original packaging at room temperature and 50% relative humidity.

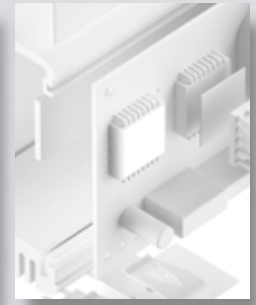
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PSA INSULATING TAPE TAT-N-AC

acrylate adhesive, thermally conductive



TAT-N-AC is a thermally conductive electrically insulating acrylate PSA transfer tape. Through the thermally conductive adhesive the thermal contact is highly improved even at low pressures. Convex and concave surface structures and stack up tolerances are effectively compensated. Materials with different expansion coefficients can easily be bonded. Thus the total thermal resistance is minimised. The tape works well for realizing an effective and cost efficient thermal coupling in a broad field of applications. Above all it is used in applications having little space only and where the permitted weight is limited. Using screws, springs, clips as mechanic fasteners thus becomes superfluous. Its wide thickness range allows the use as gap filler.



Release 11 / 2018

PROPERTIES

- Low thermal resistance
- Thermal conductivity: 1.0 W/mK
- Use as gap filler due to wide thickness range
- Reliable strong adherence on uneven or hardly machineable surfaces
- Silicone-free
- Neither mixing of components nor curing processes
- Replacement of fasteners e.g. screws, clips, etc.

AVAILABILITY

- Sheet (on request)
- Roll (on request)
- TAT-NXXXX-AC
- Die cut parts
- Kiss cut parts on sheet

APPLICATION EXAMPLES

Thermal link of:

- LEDs
- CPUs
- RDRAM memory modules
- Flip Chips, DSPs, BGAs, PPGAs
- MOSFETs to heat sinks

For use in Power supplies / PCs / Telecom engineering / Automotive applications / LED arrays

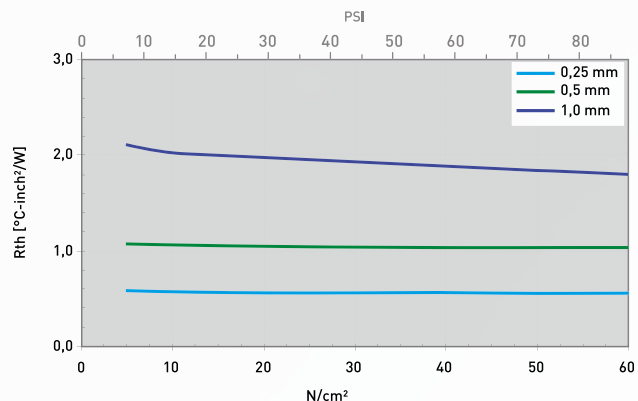
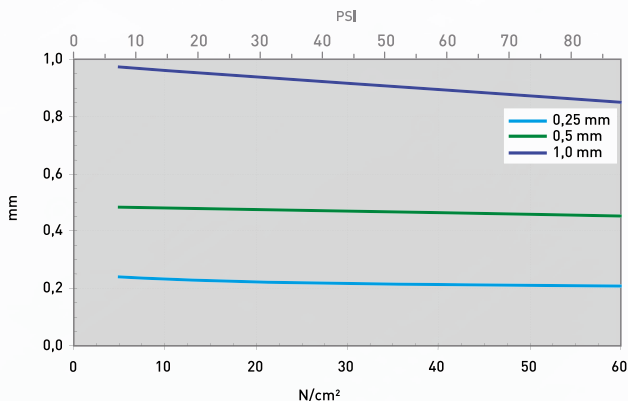
Property	Unit	TAT-N0250-AC	TAT-N0500-AC	TAT-N1000-AC
Material		Ceramic filled acrylate PSA adhesive	Ceramic filled acrylate PSA adhesive	Ceramic filled acrylate PSA adhesive
Colour		White	White	White
Tape Thickness	mm	0.25	0.50	1.0
Liner Thickness	mm	0.15	0.15	0.15
Tensile Strength ¹	N/cm	1.47	2.94	7.85
Elongation ¹	%	400	500	400
Peel Off Strength @ RT (30 min) ¹	N/2.5 cm	13.7	14.7	16.7
Shear Strength ²	PSI	49	49	64
UL Flammability (Equivalent)	UL 94	V0	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes	Yes
Thermal				
Resistance ³ @ 60 PSI @ Thickness	°C-inch ² /W (mm)	0.55 (0.22)	1.03 (0.46)	1.87 (0.89)
Resistance ³ @ 30 PSI @ Thickness	°C-inch ² /W (mm)	0.56 (0.23)	1.04 (0.48)	1.96 (0.94)
Resistance ³ @ 10 PSI @ Thickness	°C-inch ² /W (mm)	0.57 (0.24)	1.05 (0.49)	2.05 (0.96)
Thermal Conductivity	W/mK	0.8 ³ / 1.0 ⁴	0.8 ³ / 1.0 ⁴	0.8 ³ / 1.0 ⁴
Operating Temperature Range	°C	- 25 to + 130	- 25 to + 130	- 25 to + 130
Electrical				
Breakdown Voltage ⁵	kV AC	2.6	> 5.0	> 5.0

Test Methods: ¹ BS 3924, ² ASTM D 1002, ³ ASTM D 5470, ⁴ DIN V 54462, ⁵ ASTM D 149. All data without warranty and subject to change. Please contact us for further data and information.

Shelf life adhesive: 6 months when stored in original packaging at room temperature and 50% relative humidity.

Thicknesses: 0.25 mm / 0.50 mm / 1.0 mm

mm vs. N/cm² (PSI) / Rth vs. N/cm² (PSI)



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PSA TAPE TAT-M-SI

silicone adhesive, thermally conductive

TAT-M-SI is a thermally conductive electrically insulating silicone PSA transfer tape. Through the thermally conductive adhesive the thermal contact is highly improved even at low pressures. Convex and concave surface structures and stack up tolerances are effectively compensated. Materials with different expansion coefficients can easily be bonded. Thus the total thermal resistance is minimised. The tape works well for realizing an effective and cost efficient thermal coupling in a broad field of applications. Above all it is used in applications having little space only and where the permitted weight is limited. Using screws, springs, clips as mechanic fasteners thus becomes superfluous.



Release 11 / 2018

PROPERTIES

- Low thermal resistance
- Thermal conductivity: 1.0 W/mK
- High dielectric strength
- Reliable strong adherence on uneven or hardly machineable surfaces
- Neither mixing of components nor curing processes
- Replacement of fasteners e.g. screws clips, etc.

AVAILABILITY

- Sheet 300 mm x 400 mm
- Roll 300 mm x 50 m
- Both side tacky
- Die cut parts

APPLICATION EXAMPLES

Thermal link of:

- CPUs
- RDRAM memory modules
- Flip Chips, DSPs, BGAs, PPGAs
- MOSFETs to heat sinks
- LED

For use in Power supplies / PCs /
Telecom engineering / Automotive
applications / LED arrays

Property	Unit	TAT-M100-SI	TAT-M200-SI
Material		Ceramic filled silicone PSA adhesive	Ceramic filled silicone PSA adhesive
Colour		White	White
Thickness	mm	0.10	0.20
Peel Off Strength (@ 23 °C) @ Aluminum / @ Glass	N/cm	6.0 / 7.6	6.4 / 7.6
Shear Strength (@ 125 °C after 10,000 hrs.)	N/cm ²	> 200	> 200
RoHS Conformity	2011 / 65 / EU	Yes	Yes
UL Flammability	UL 94	V0	V0
Thermal			
Thermal Conductivity	W/mK	1.0	1.0
Resistance ¹	°C-inch ² /W	0.28	0.49
Electrical			
Breakdown Voltage ² (@ Initial Thickness, 25 °C)	kV AC	2.0	5.0

Measurement technique according to: ¹ASTM D 5470, ²ASTM D 149. All data without warranty and subject to change. Please contact us for further data and information.
Shelf life adhesive: 6 months when stored in original packaging at room temperature and 50% relative humidity.

Thicknesses: 0.1 mm / 0.20 mm

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7 THERMAL GREASE

/ SILICONE / SILICONE-FREE I



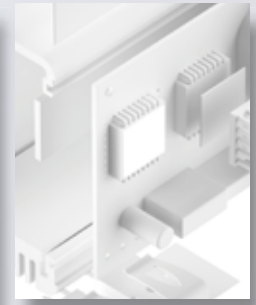
Release 11 / 2018

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SILICONE-FREE THERMAL GREASE TGR-J-NS HALA

highly thermally conductive

TGR-J-NS is high performing silicone-free thermal grease based on an ester oil matrix. It is ideal for use in applications where a very good and highly reliable thermal transfer must be achieved. Due to the specific formulation and filling with ceramic particles the material has a high thermal conductivity. By its use the thermal contact is maximised, hence the total thermal resistance is minimised.



Release 11 / 2018

PROPERTIES

- Thermal conductivity: 2.0 W/mK
- Silicone-free
- Dispensable
- Almost zero pressure at assembly
- Dielectric strength
- Operating temperature range: -40 to 150°C

AVAILABILITY

- Syringes
- Jars 1 kg
- On request

APPLICATION EXAMPLES

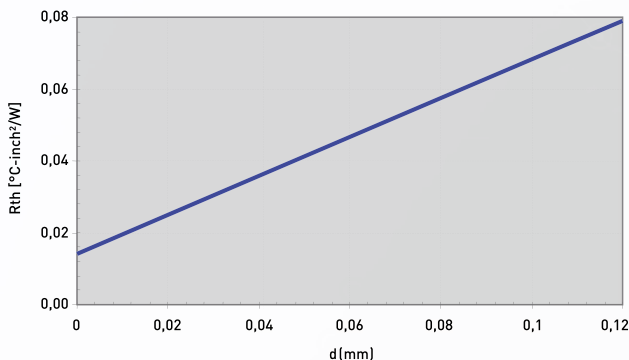
Thermal link of:

- LED Boards
- Power modules
- RDRAMs memory modules
- Flip Chips, DSPs , BGAs, PPGAs

For use in Automotive applications / Power electronics / Light technology / Industrial PCs

Property	Unit	TGR-J-NS
Material		Ceramic filled thermal grease
Colour		White
Density	g / cm ³	3.1
Viscosity @ 25°C (Brookfield @ 10 rpm, 25 °C)	Pas	170
RoHS Conformity	2011 / 65 / EU	Yes
Thermal		
Thermal Conductivity	W/mK	2.0
Operating Temperature Range	°C	- 40 to + 150
Storage Temperature	°C	< 35
Shelf Life (from Date of Manufacturing, unopened)	Months @ RT	12
Electric		
Dielectric Strength	kV / mm	5.0

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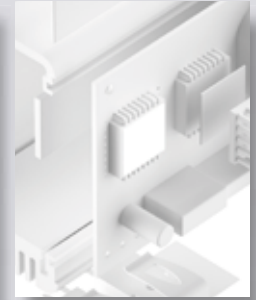


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SILICONE-FREE THERMAL GREASE TGR-M-NS HALA

highly thermally conductive

TGR-M-NS is high performing silicone-free thermal grease based on an ester oil matrix. It is ideal for use in applications where a very good and highly reliable thermal transfer must be achieved. Due to the specific formulation and filling with ceramic particles the material has a high thermal conductivity. By its use the thermal contact is maximised, hence the total thermal resistance is minimised.



Release 11 / 2018

PROPERTIES

- Thermal conductivity: 2.4 W/mK
- Silicone-free
- Dispensable
- Almost zero pressure at assembly
- Dielectric strength
- Operating temperature range: -40 to 150°C

AVAILABILITY

- Syringes
- Jars 1 kg
- On request

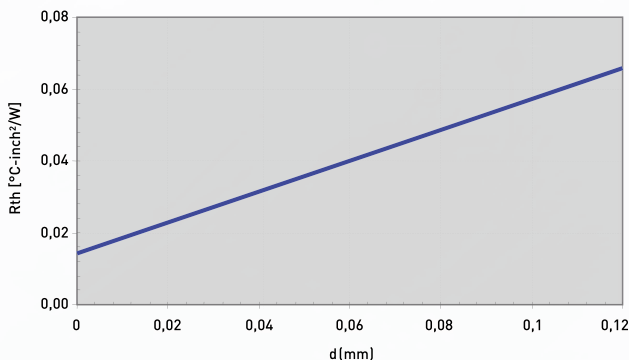
APPLICATION EXAMPLES

Thermal link of:

- LED Boards
 - Power modules
 - RDRAMs memory modules
 - Flip Chips, DSPs , BGAs, PPGAs
- For use in Automotive applications / Power electronics / Light technology / Industrial PCs

Property	Unit	TGR-M-NS
Material		Ceramic filled thermal grease
Colour		White
Density	g / cm ³	3.2
Viscosity @ 25°C (Brookfield @ 10 rpm, 25 °C)	Pas	110
RoHS Conformity	2011 / 65 / EU	Yes
Thermal		
Thermal Conductivity	W/mK	2.4
Operating Temperature Range	°C	- 40 to + 150
Storage Temperature	°C	< 35
Shelf Life (from Date of Manufacturing, unopened)	Months @ RT	12
Electric		
Dielectric Strength	kV / mm	4.5

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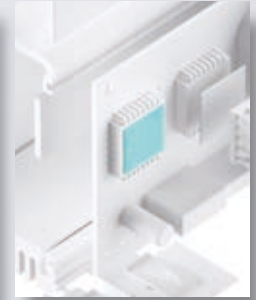
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SILICONE GREASE TGR-S-SI

highly thermally conductive



TGR-S-SI is high performing silicone grease. It is ideal for use in applications where a very good and highly reliable thermal transfer must be achieved. Due to the specific formulation and filling with ceramic particles the material has a very high thermal conductivity. By its use the thermal contact is maximised, hence the total thermal resistance is minimised.



Release 11 / 2018

PROPERTIES

- Thermal conductivity: 3.3 W/mK
- Dispensable
- Almost zero pressure at assembly
- High dielectric strength
- Operating temperature range: -40 to 200°C

AVAILABILITY

- Syringes
- Jars 0.5 kg / 5 kg
- On request

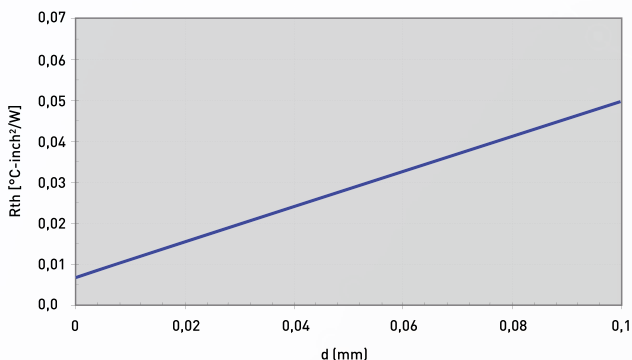
APPLICATION EXAMPLES

Thermal link of:

- LED Boards
 - Power modules
 - RDRAMs memory modules
 - Flip Chips, DSPs , BGAs, PPGAs
- For use in Automotive applications / Power electronics / Light technology / Industrial PCs

Property	Unit	TGR-S-SI
Material		Ceramic filled silicone grease
Colour		White
Density	g / cm ³	3.2
Viscosity @ 25°C	Pas	140
Volatile Content (@ 24 h @ 150°C)	%	0.1
Low Molecular Weight Siloxane Content Σ D ₃ -D ₁₀	ppm	< 100
RoHS Conformity	2011 / 65 / EU	Yes
Thermal		
Thermal Conductivity	W/mK	3.3
Operating Temperature Range	°C	- 40 to + 200
Storage Temperature	°C	< 40
Shelf Life (from Date of Manufacturing, unopened)	Months @ RT	12
Electric		
Dielectric Strength	kV / mm	12.5

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8 ADHESIVES

/ ADDITIONAL CURING /
CONDENSATIONAL CURING



Release 5 / 2019

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SILICONE ADHESIVE TAD-G-SI-1C

thermally conductive 1 part / addition cure

TAD-G-SI-1C is a liquid addition cure corrosion-free highly thermally conductive 1 part silicone adhesive. It cures at elevated temperature over 100°C to a strong but still elastic rubber and exhibits excellent primerless adhesion to most surfaces. The adhesive features good thermal conductivity. It allows for being operated at temperatures up to 260°C and does not corrode copper or its alloys when fully cured. It is characterised by high resistance to water, acids, bases and most organic solvents and is especially suitable for applications where high thermal conductivity, adhesion, fast curing and controlled, precision application are essential.



Release 5/2019

PROPERTIES

- Thermal conductivity: 1.38 W/mK
- High bonding properties
- Heat addition cure
- Non corrosive
- High operating temperatures up to 260°C
- Extraordinary chemical resistance and longterm stability

AVAILABILITY

- 1 kg jars
- 310 ml cartridges
- Bulk packaging options on request
- Optional with glass beads

APPLICATION EXAMPLES

- LED systems
- Processor cooling
- Memory chip assembly
- CPU board

Property	Unit	TAD-G-SI-1C
Material		Silicone
Colour		Grey
Specific Gravity	g/cm ³	2.06
Linear Shrinkage	%	2.0
Viscosity	Pas	43
Hardness	Shore A	67
Tensile Strength	MPa	3.1
Elongation at Break	%	70
Curing Time (@ 100°C)	min	30
Shelf Life (from Date of Manufacturing, unopened, @ < 15°C)	Months	6
RoHS Conformity	2011 / 65 / EU	Yes
Thermal		
Thermal Conductivity	W/mK	1.38
Coefficient of Thermal Expansion Volumetric	x 10 ⁻⁶ /K	562
Coefficient of Thermal Expansion linear	x 10 ⁻⁶ /K	187
Operating Temperature Range	°C	- 50 to + 260
Electrical		
Dielectric Strength	kV/mm	22.5
Volume Resistivity	Ohm - cm	7.7 x 10 ¹⁵
Surface Resistivity	Ohm - cm	1.3 x 10 ¹⁵

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SILICONE ADHESIVE TAD-I-SI-1C

thermally conductive 1 part / RTV condensation cure

TAD-I-SI-1C is a condensation curing, non-corrosive thermally conductive 1 part silicone adhesive. It vulcanises at room temperature (RTV) to a strong but still elastic rubber and exhibits excellent primer-less adhesion to most surfaces. Due to rapid acetone curing while being in contact with atmospheric moisture it is solvent free. The adhesive features good thermal conductivity and a thixotropic rheology that will prevent slumping or flow during the process. It allows for being operated at temperatures up to 220°C and does not corrode copper or its alloys when fully cured. It is characterised by high resistance to water, acids, bases and most organic solvents and is especially suitable for applications where good thermal conductivity, adhesion, fast curing and controlled, precision application are essential.



Release 5 / 2019

PROPERTIES

- Thermal conductivity: 1.55 W/mK
- High bonding properties
- Cures at room temperature (RTV condensation cure)
- Fast skinning
- Low linear shrinkage
- Non corrosive
- Thixotropic rheology preventing flow during the process
- High operating temperatures up to 220°C
- Extraordinary chemical resistance and longterm stability

AVAILABILITY

- 310 ml cartridge
- Bulk packaging options on request
- Optional with glass beads

APPLICATION EXAMPLES

- LED systems
- Processor cooling
- Memory chip assembly
- CPU boards

Property	Unit	TAD-I-SI-1C
Material		Silicone
Colour		White
Specific Gravity	g/cm ³	2.24
Linear Shrinkage	%	0.5
Viscosity	Pas	350
Hardness	Shore A	65
Tensile Strength	MPa	2.8
Elongation at Break	%	94
Tack Free Time (@ 23 °C and 65% RH)	min	4
Curing Time (3 mm @ 23 °C and 65% RH)	h	< 8
Full Cure	d	7
Overlap Shear Strength (Al / Cu / St 304)	kg/cm ²	6.0 / 3.0 / 2.6
Shelf Life (from Date of Manufacturing, unopened) Pails / Cartridges	Months	9 / 12
Max. Storage Temperature	°C	40
RoHS Conformity	2011 / 65 / EU	Yes
Thermal		
Thermal Conductivity	W/mK	1.55
Coefficient of Thermal Expansion Volumetric	x 10 ⁻⁶ /K	475
Coefficient of Thermal Expansion Linear	x 10 ⁻⁶ /K	198
Operating Temperature Range	°C	- 50 to + 220
Electrical		
Dielectric Strength	kV/mm	20
Volume Resistivity	Ohm - cm	1 x 10 ¹⁴
Dielectric Constant	@ 1 MHz	4.9

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SILICONE ADHESIVE TAD-O-SI-1C

thermally conductive 1 part / addition cure

TAD-O-SI-1C is an addition cure corrosion-free highly thermally conductive 1 part silicone adhesive. It cures at elevated temperature to a strong but still elastic rubber and exhibits excellent primerless adhesion to most surfaces. The adhesive features high thermal conductivity and a thixotropic rheology that will prevent slumping or flow during the process. It allows for being operated at temperatures up to 210°C and does not corrode copper or its alloys when fully cured. It is characterised by high resistance to water, acids, bases and most organic solvents and is especially suitable for applications where high thermal conductivity, adhesion, fast curing and controlled, precision application are essential.



Release 5 / 2019

PROPERTIES

- Thermal conductivity: 2.1 W/mK
- High bonding properties
- Heat cure
- Non corrosive
- Thixotropic rheology preventing flow during the process
- High operating temperatures up to 210°C
- Extraordinary chemical resistance and longterm stability

AVAILABILITY

- 1 kg jars
- 310 ml cartridges
- Bulk packaging options on request
- Optional with glass beads

APPLICATION EXAMPLES

- LED systems
- Processor cooling
- Memory chip assembly
- CPU boards

Property	Unit	TAD-O-SI-1C
Material		Silicone
Colour		Grey
Specific Gravity	g/cm ³	2.18
Viscosity	Pas	140
Hardness	Shore A	56
Tensile Strength	MPa	2.20
Elongation at Break	%	105
Curing Time (3 mm @ 125°C / @ 100°C)	min	10 / 16
Shelf Life (from Date of Manufacturing, unopened, @ 10 - 30°C / @ < 10°C)	Months	2 / 12
Flammability	UL 94	HB
RoHS Conformity	2011 / 65 / EU	Yes
Thermal		
Thermal Conductivity	W/mK	2.10
Coefficient of Thermal Expansion Volumetric	x 10 ⁻⁶ /K	586
Coefficient of Thermal Expansion Linear	x 10 ⁻⁶ /K	195
Operating Temperature Range	°C	- 50 to + 210
Electrical		
Dielectric Strength	kV/mm	> 18
Volume Resistivity	Ohm - cm	> 3.5 x 10 ¹³

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SILICONE ADHESIVE TAD-P-SI-1C

thermally conductive 1 part / RTV condensation cure

TAD-P-SI-1C is a condensation curing, non-corrosive highly thermally conductive 1 part silicone adhesive. It vulcanises at room temperature (RTV) to a strong but still elastic rubber and exhibits excellent primerless adhesion to most surfaces. Due to rapid acetone curing while being in contact with atmospheric moisture it is solvent free. The adhesive features good thermal conductivity and a thixotropic rheology that will prevent slumping or flow during the process. It allows for being operated at temperatures up to 220°C and does not corrode copper or its alloys when fully cured. It is characterised by high resistance to water, acids, bases and most organic solvents and is especially suitable for applications where high thermal conductivity, adhesion, fast curing and controlled, precision application are essential.



Release 5 / 2019

PROPERTIES

- Thermal conductivity: 2.3 W/mK
- High bonding properties
- Cures at room temperature (RTV condensation cure)
- Fast skinning
- Low linear shrinkage
- Non corrosive
- Thixotropic rheology preventing flow during the process
- High operating temperatures up to 220 °C
- Extraordinary chemical resistance and longterm stability

AVAILABILITY

- 310 ml cartridges
- Bulk packaging options on request
- Optional with glass beads

APPLICATION EXAMPLES

- LED systems
- Processor cooling
- Memory chip assembly
- CPU boards

Property	Unit	TAD-P-SI-1C
Material		Silicone
Colour		Grey
Specific Gravity	g/cm ³	2.11
Linear Shrinkage	%	0.5
Viscosity	Pas	350
Hardness	Shore A	67
Tensile Strength	MPa	3.9
Elongation at Break	%	103
Tack Free Time (at 23°C and 65% RH)	min	4
Curing Time (3 mm at 23°C and 65% RH)	h	< 8
Full Cure	d	7
Overlap Shear Strength (Al/Cu/St 304, PC)	kg/cm ²	7.15 / 3.6 / 2.98 / 4.62
Shelf Life (from Date of Manufacturing, unopened)	Months	12
Max. Storage Temperature	°C	40
RoHS Conformity	2011 / 65 / EU	Yes
Thermal		
Thermal Conductivity	W/mK	2.3
Coefficient of Thermal Expansion Volumetric	x 10 ⁻⁶ /K	493
Coefficient of Thermal Expansion Linear	x 10 ⁻⁶ /K	164
Operating Temperature Range	°C	- 50 to + 220
Electrical		
Dielectric Strength	kV/mm	> 20
Volume Resistivity	Ohm - cm	> 1 x 10 ¹⁴
Dielectric Constant	@ 1 MHz	4.9

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SILICONE ADHESIVE TAD-I-SI-2C

thermally conductive 2 part / RTV condensation cure

TAD-I-SI-2C is a condensation curing, non-corrosive thermally conductive 2 part silicone adhesive. It vulcanises very rapidly at room temperature (RTV) to a strong but still elastic rubber and exhibits excellent primerless adhesion to most surfaces. The adhesive features good thermal conductivity and a thixotropic rheology that will prevent slumping or flow during the process. It allows for being operated at temperatures up to 200°C and does not corrode copper or its alloys when fully cured. It is characterised by high resistance to water, acids, bases and most organic solvents and is especially suitable for applications where good thermal conductivity, adhesion, fast curing and controlled, precision application are essential.



Release 5 / 2019

PROPERTIES

- Thermal conductivity: 1.55 W/mK
- High bonding properties
- Very rapid condensation cure at room temperature (RTV)
- 10:1 (A:B Part) volumetric mixing ratio

AVAILABILITY

- 264 ml cartridges
- Bulk packaging options on request

APPLICATION EXAMPLES

- LED systems
- Processor cooling
- Memory chip assembly
- CPU boards

Property	Unit	TAD-I-SI-2C, Material Part A.	TAD-I-SI-2C, Material Part B
Material		Silicone	Condensation Fluid
Colour		Grey	Black
Specific Gravity	g/cm ³	2.31	1.0
Viscosity	Pas	500	64
Hardness	Shore A	65	65
Tensile Strength	MPa	1.93	1.93
Elongation at Break	%	80	80
Young Modulus	MPa	5.64	5.64
Tack Free Time (@ 23°C and 65% RH)	min	12	12
Mechanical Bond	min	50	50
Chemical Bond	h	24	24
Maximum Adhesion	d	5	5
Shelf Life (from Date of Manufacturing, unopened, @ < 30°C)	Months	12	12
RoHS Conformity	2011 / 65 / EU	Yes	Yes
Thermal			
Thermal Conductivity	W/mK	1.55	1.55
Coefficient of Thermal Expansion Volumetric	x 10 ⁻⁶ /K	372	372
Coefficient of Thermal Expansion Linear	x 10 ⁻⁶ /K	124	124
Operating Temperature Range	°C	- 50 to + 200	- 50 to + 200
Electrical			
Dielectric Strength	kV/mm	> 10	> 10
Volume Resistivity	Ohm - cm	2.0 x 10 ¹³	2.0 x 10 ¹³

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9 POTTING GEL



SILICONE POTTING GEL TCR-D-SI-2C

dispensable / 2 parts

TCR-D-SI-2C is a 2-part addition cure silicone potting compound which is filled with thermally conductive fillers of high temperature stability. After curing the system remains elastic. It is characterised by very good dielectric and mechanic properties and is suited for encapsulating electric and electronic parts such as transformers, capacitors, inductors, sensors, LEDs and can be moulded or dispensed at normal conditions at room temperature or in vacuum. Its rheologic behaviour allows for usage in geometries that are difficult to access.



Release 11 / 2018

PROPERTIES

- Silicone
- 2 part addition cure
- Thermal conductivity: 0.68 W/mK
- Remains elastic after curing
- Almost zero stress on components
- Dispensable or mouldable
- High resistivity against water and humidity
- Shock absorbing

AVAILABILITY

- 2 kg / 40 kg AB Kit
- Other containers on request
- MOQ: 40 kg

APPLICATION EXAMPLES

Thermal link of:

- Inductors
 - Capacitors
 - Heat Pipes
 - BGA
- For use in Automotive applications
/ Telecommunication / Controlling
units / Industrial PCs

Property	Unit	A Part	B Part
Material		Silicone	Hardener
Colour		Beige	Black
Density @ 23 °C	g/cm ³	1.6	1.6
Mixing Ratio	Weight or Volume	1 : 1	1 : 1
Hardness	Shore A	45	45
Viscosity (Brookfield)	Pas	6	6
Viscosity (Mixed) (Brookfield)	Pas	6	6
Tensile Strength (cured elastomer after 7 minutes @ 150 °C)	psi	252	252
Elongation at Break (cured elastomer after 7 minutes @ 150 °C)	%	240	240
Coefficient of Thermal Expansion (cured elastomer after 7 minutes @ 150 °C)			
Volumetric	1 x 10 ⁻⁶ /K	650	650
Linear	1 x 10 ⁻⁶ /K	217	217
Pot Life @ 23 °C, 65 % rel. H.	min	ca.100	ca. 100
Curing Time @ 25 °C / 100 °C		24 h / 7 min	24 h / 7 min
Shelf Life (from Date of Manufacturing, unopened, @ < 30 °C)	Months	24	24
Flammability	UL 94	V0	V0
RoHS Conformity	2011 / 65 / EU	Yes	Yes
Technical			
Thermal Conductivity	W/mK	0.68	0.68
Operating Temperature	°C	- 55 to + 260	- 55 to + 260
Dielectric Strength	kV/mm	> 18	> 18
Volume Resistivity	Ohm-cm	4.02 x 10 ¹⁴	4.02 x 10 ¹⁴
Dielectric Constant	@ 1 kHz	3.08	3.08
Dissipation Factor	@ 1 kHz	0.009	0.009

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SILICONE POTTING GEL TCR-G-SI-2C

dispensable / 2 parts

TCR-G-SI-2C is a 2-part addition cure silicone potting compound which is filled with thermally conductive fillers of high temperature stability. It is characterised by very good dielectric and mechanic properties and is suited for encapsulating electric and electronic parts such as transformers, capacitors, inductors, sensors, LEDs and can be moulded or dispensed under normal conditions at room temperature or in vacuum. Its rheologic behaviour allows for usage in geometries that are difficult to access.



Release 11 / 2018

PROPERTIES

- Silicone
- 2 part addition cure
- Thermal conductivity: 1.19 W/mK
- Almost zero stress on components
- Dispensable or mouldable
- Heat accelerated curing
- High resistivity against water and humidity
- Shock absorbing

AVAILABILITY

- 2 kg / 40 kg AB Kit
- Other containers on request
- MOQ: 40 kg

APPLICATION EXAMPLES

Thermal link of:

- Inductors
- Capacitors
- Heat Pipes
- BGA

For use in Automotive applications
/ Telecommunication / Controlling
units / Industrial PCs

Property	Unit	A Part	B Part
Material		Silicone	Hardener
Colour		White	Grey
Density @ 23 °C	g/cm ³	2.10	2.10
Mixing Ratio	Weight or Volume	1 : 1	1 : 1
Hardness (cured elastomer after 15 minutes @ 150 °C)	Shore A	65	65
Viscosity (Brookfield)	Pas	6	6
Viscosity (Mixed) (Brookfield)	Pas	6	6
Tensile Strength (cured elastomer after 15 minutes @ 150 °C)	psi	152	152
Elongation at Break (cured elastomer after 15 minutes @ 150 °C)	%	50	50
Coefficient of Thermal Expansion (cured elastomer after 15 minutes @ 150 °C)			
Volumetric	1 x 10 ⁻⁶ /K	465	465
Linear	1 x 10 ⁻⁶ /K	155	155
Pot Life @ 23 °C, 50 % rel. H.	min	ca. 180	ca. 180
Curing Time @ 25 °C / 80 °C / 110 °C / 150 °C		24 h / 60 min / 35 min / 15 min	24 h / 60 min / 35 min / 15 min
Shelf Life (from Date of Manufacturing, unopened, @ < 25 °C)	Months	24	24
Flammability (Expected Equivalent) @ 3 mm / 1.5 mm	UL 94	VO / V1	VO / V1
RoHS Conformity	2011 / 65 / EU	Yes	Yes
Technical			
Thermal Conductivity	W/mK	1.19	1.19
Operating Temperature	°C	- 50 to + 200	- 50 to + 200
Dielectric Strength	kV/mm	> 10	> 10
Volume Resistivity	Ohm-cm	5.06 x 10 ¹³	5.06 x 10 ¹³
Dielectric Constant	@ 1 kHz	4.92	4.92
Dissipation Factor	@ 1 kHz	0.005	0.005

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10 HALA CLIPS

/ SINGLE SCREWING CLIPS /
DOUBLE SCREWING CLIP /



Release 11 / 2018

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The single screwing clip HALA Clip TO 220-1 allows for a strong springy fixing of a semiconductor in a TO 220 or comparable package and exerts a reliable pressure onto heatsinks. It can be easily fastened by use of M4 screws. Due to its particular shape an optimum mechanic stress behaviour within a wide operating range is achieved thus avoiding any overstrains of the material at the load limits. Even in case of maximum TO 220 tolerances the forces still suffice to generate adequate pressures. Through the special clip geometry the forces operate concentrated on the semiconductor package plates thus maximizing the contact zone and minimizing the thermal resistance. Due to the special surface treatment the clip is protected against corrosion.



Release 11 / 2018

PROPERTIES

- Fixing by M4-screw
- FE-simulation optimised stress behaviour
- Mounting friendly design
- Sufficient pressure even at minimum package height (ca. 3.5 mm for TO 220)
- Anticorrosive by Delta Seal surface treatment
- Easy chip identification by apertures

OPERATING RANGE

- Force range: ca. 55...85 N
- Pressure range: ca. 35...55 N/cm² (50...80 PSI) for different types of TO 220 packages (Surface area TO 220 ca. 1.6 cm²)

APPLICATION EXAMPLES

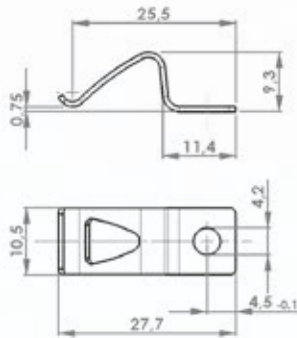
Fixing of semiconductors in TO 220 or comparable packages onto heatsinks:

- MOSFETs and IGBTs
- Diodes and rectifiers
- Electronic modules

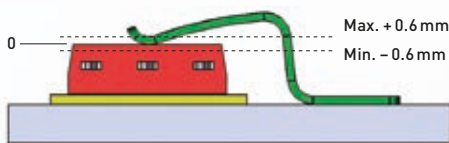
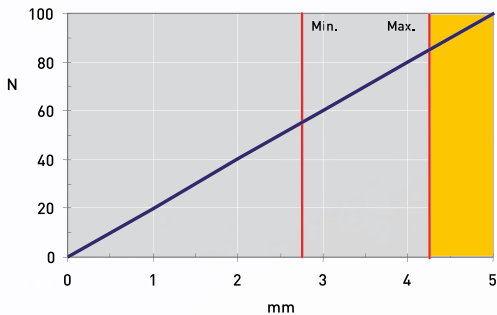
For use in switch mode power supplies / UPS units / Motor control units / Automotive applications / Solar technology



Dimensions



Force vs. Deflection



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The single screwing clip HALA Clip TO 247-1 allows for a strong springy fixing of a semiconductor in a TO 247 or comparable package and exerts a reliable pressure onto heatsinks. It can be easily fastened by use of M4-screws. Due to its particular shape an optimum mechanic stress behaviour within a wide operating range is achieved thus avoiding any overstrains of the material at the load limits. Even in case of maximum TO 247 tolerances the forces still suffice to generate adequate pressures. Through the special clip geometry the forces operate concentrated on the semiconductor package plates thus maximizing the contact zone and minimizing the thermal resistance. Due to the special surface treatment the clip is protected against corrosion.



Release 11 / 2018

PROPERTIES

- Fixing by M4-screw
- FE-simulation optimised stress behaviour
- Mounting friendly design
- Sufficient pressure even at minimum package height (ca. 4.7 mm for TO 247)
- Anticorrosive by Delta Seal surface treatment
- Easy chip identification by apertures

OPERATING RANGE

- Force range: ca. 95...110 N
- Pressure range: ca. 28...32 N/cm² (40...47 PSI) for different types of TO 247 packages (Surface area TO 247 ca. 3.4 cm²)

APPLICATION EXAMPLES

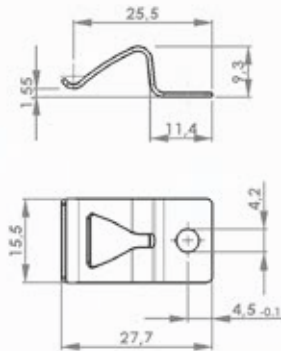
Fixing of semiconductors in TO 247 or comparable packages onto heatsinks:

- MOSFETs
- IGBTs
- Diodes

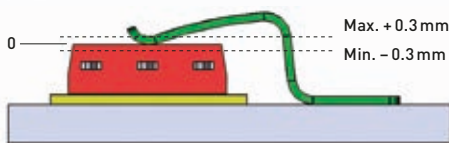
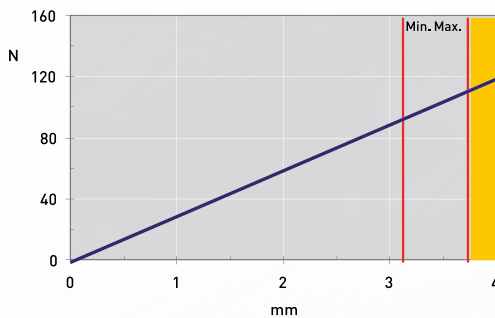
For use in switch mode power supplies / UPS units / Motor control units / Automotive applications



Dimensions



Force vs. Deflection



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The double screwing clip HALA Clip TO 264-2 allows for a strong springy fixing of a couple of semiconductors in TO 264 or comparable packages and exerts a reliable pressure onto heatsinks. It can easily be fastened by use of 2 M4 screws.



Release 11 / 2018

PROPERTIES

- Fixing by 2 M4 screws
- Sufficient pressure even at minimum package height
- Stainless steel 1.4310

OPERATING RANGE

- Force range: ca. 100...130 N
- Pressure range: ca. 20...26 N/cm² (30...38 PSI). Surface area TO 264 ca. 5 cm²

APPLICATION EXAMPLES

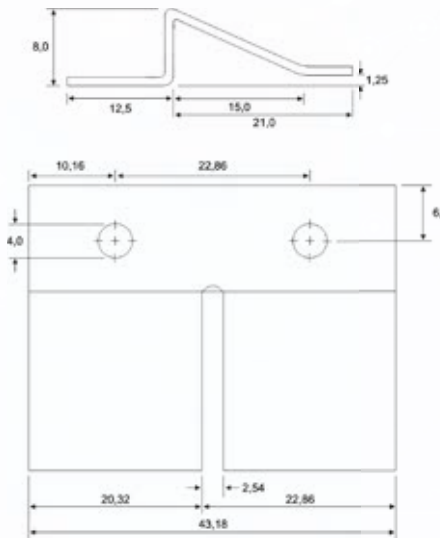
Fixing of semiconductors in TO 264 or comparable packages onto heatsinks:

- MOSFETs
- IGBTs
- Diodes

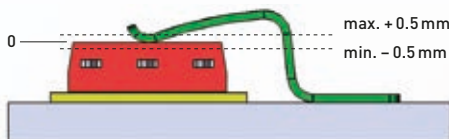
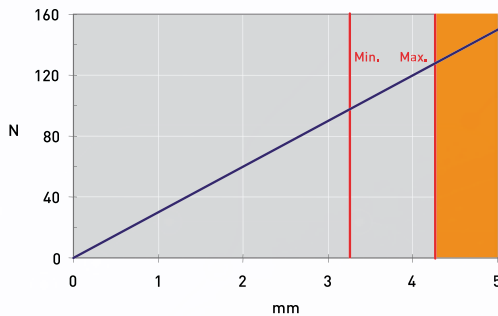
For use in Switch mode power supplies / UPS units / Motor control units / Automotive applications



Dimensions



Force vs. Deflection



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LEGAL INFORMATION

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PICTURE CREDITS

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Release 4 / 2019

