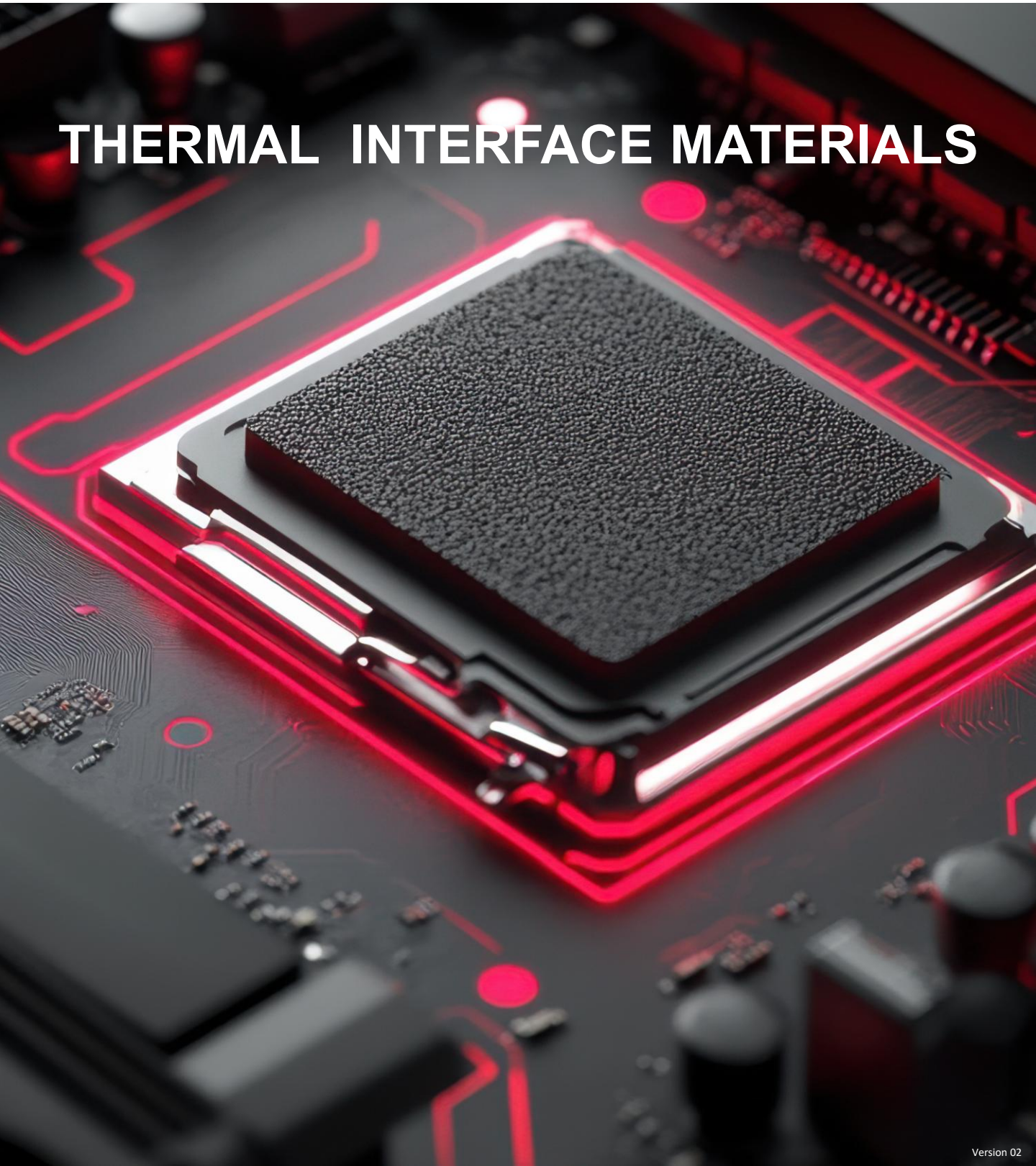
abatek
CREATING HMI & RUBBER SOLUTIONS

OPTIMAL ©

Safe Thermal Solutions



THERMAL INTERFACE MATERIALS

Version 02

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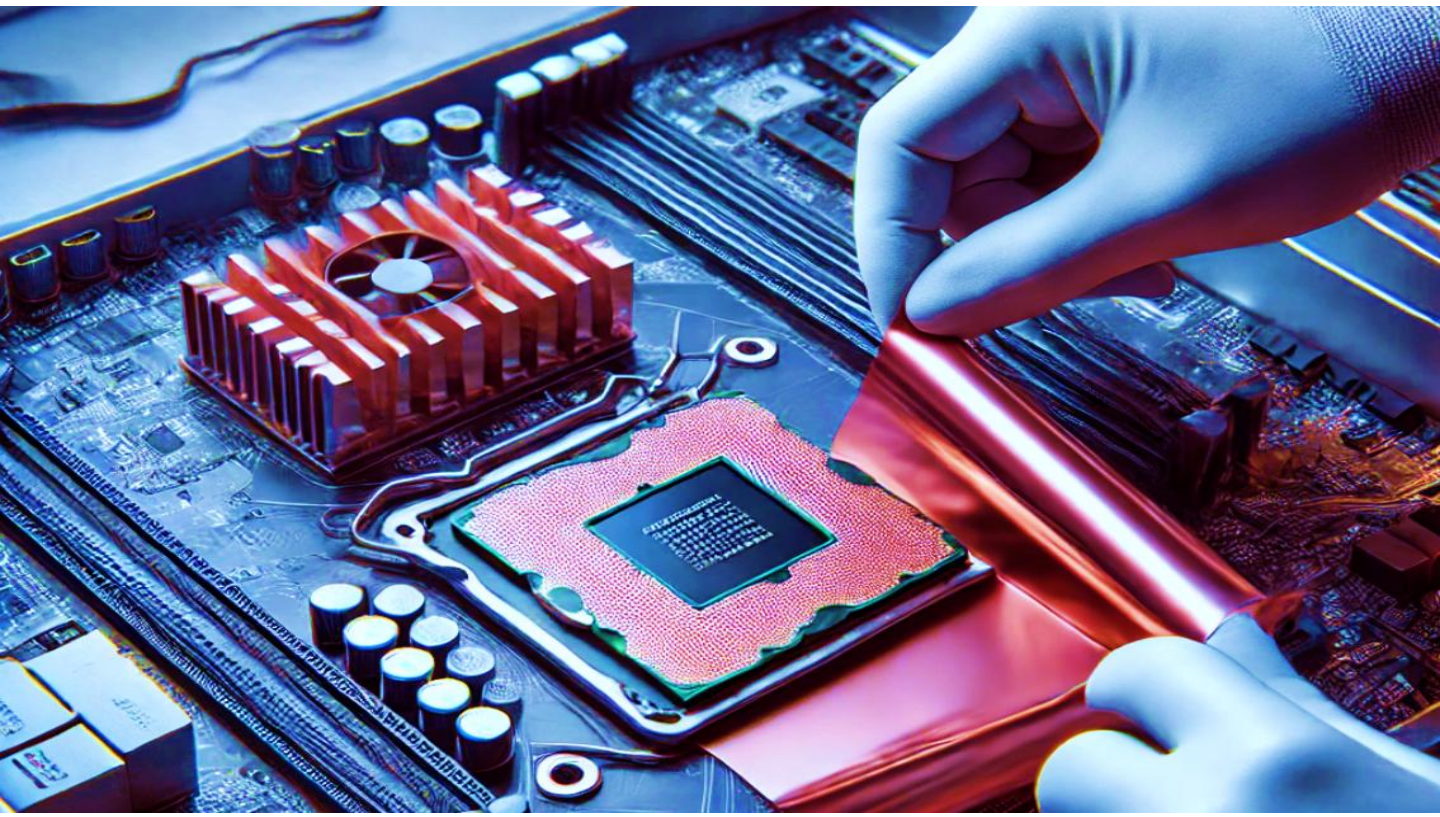


Welcome to your **performance-oriented** partner with own production at your side!

Abatek is a worldwide specialist for HMI and individual material compounds since 1987.
In ALL confidentiality: USA – Europe – Asia
the world is our home!

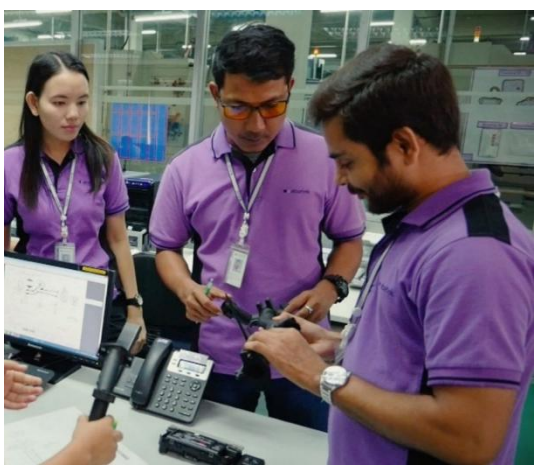
Abatek services automotive, medical, telecom, white goods and other industries worldwide.

We take pride in providing superior solutions combining technology with outstanding materials. Constant highest quality and cost advantages consequently result with this process.

Safe Thermal Solutions

Efficient heat management has many aspects. This proven and cost-efficient technology needs to be integrated into every application where performance generates heat.

Beside cooling there is a lot more to it! Damping, insulation, noise reduction, compression, jointing materials etc.



Abatek is your preferred partner for all questions around thermal management.

Thermal Interface Material

OPTIMAL©
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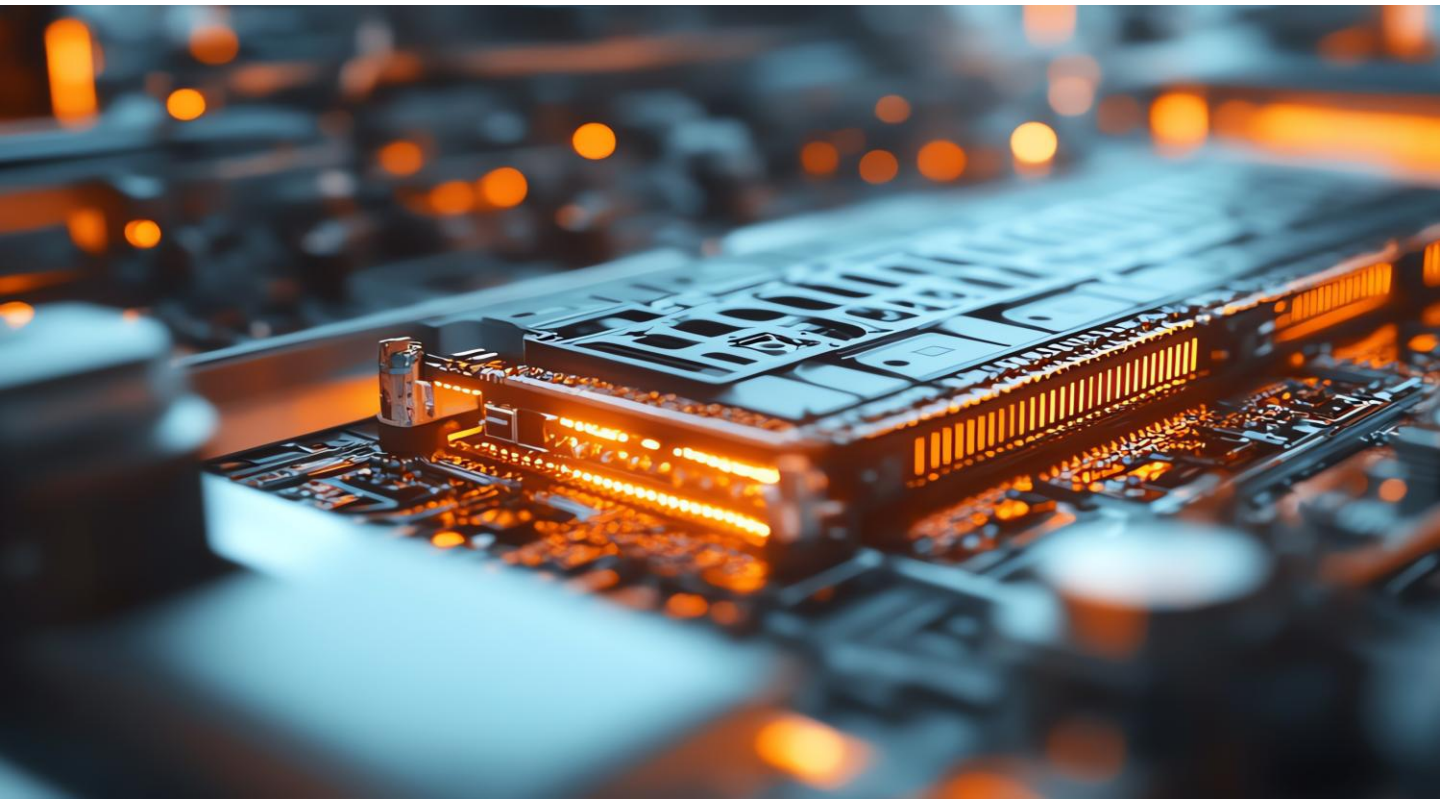


Engineered for maximum efficiency

The cutting-edge performance of Abatek **OPTIMAL** thermal interface materials stand for superior heat management in electronics and industrial applications. Abatek TIM solutions enhance conductivity, reducing thermal resistance and extend device lifespan. Upgrade your technology with this high-performance materials. No doubt: precision cooling makes all the difference!

Whatever industry you are in

- More power means more heat! Abatek is specialized in making your road to solutions a highway. Integral features and designs which make THE difference.
- More power and less material used, means less cost in any industry

Electrical performance is heat

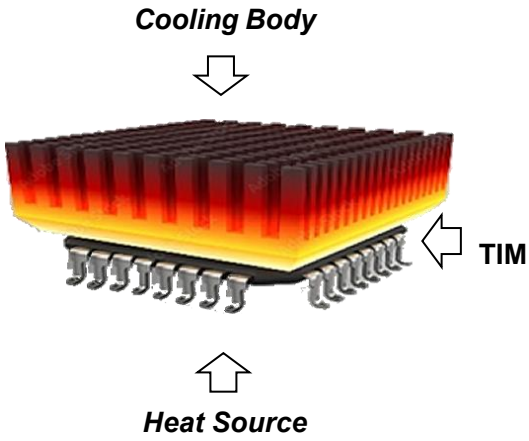
- Thermal management applications is all about protecting any application. Silicone and rubber-based materials offer more SAFETY than many traditional setups.

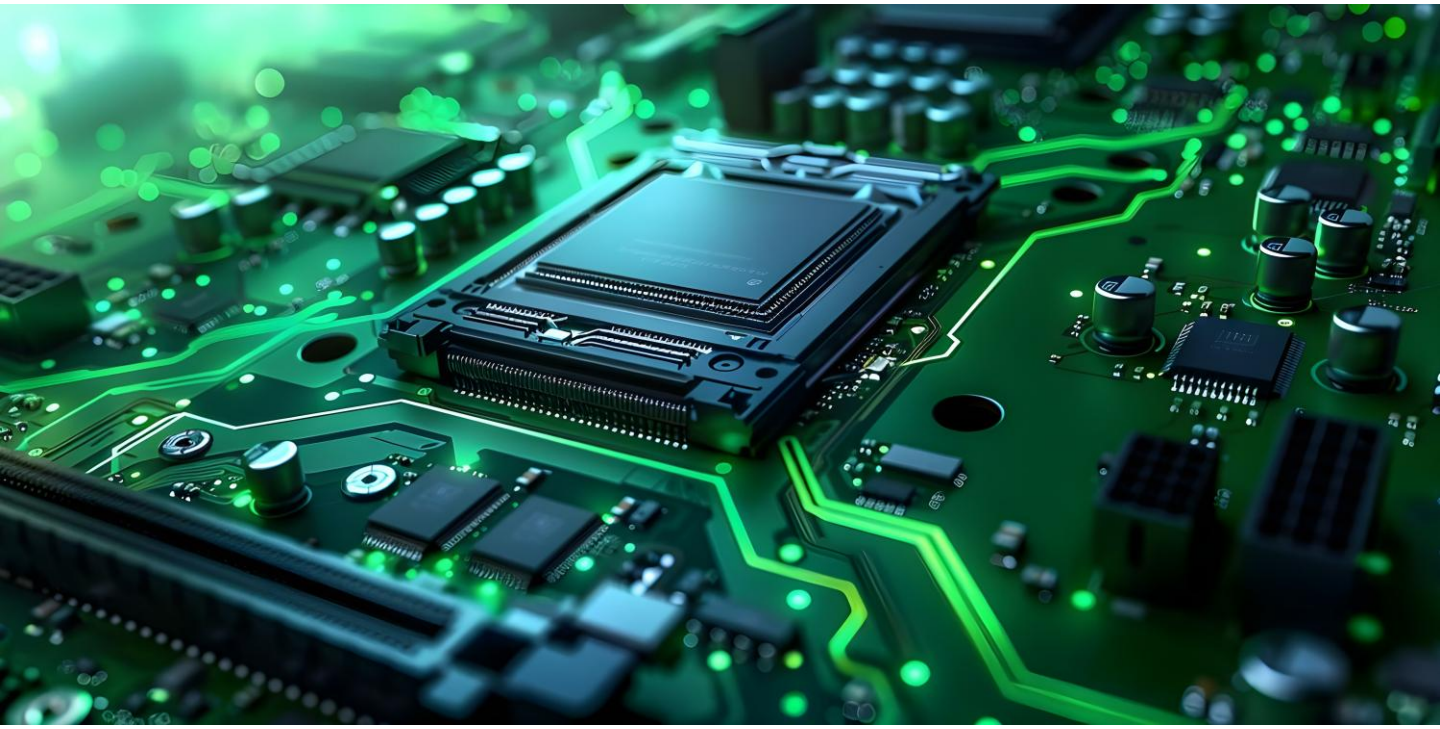
More performance = less space

- Take advantage of inherent silicone rubber properties! Conductivity with long safe life cycles and unlimited configuration possibilities. Proven technology at low cost.

TIM, Thermal Interface Materials

- Enjoy design freedom
- Resolve the problem
- Inexpensive and safe
- Clean and reliable





The Benefits of Acrylic (ABA) Thermal Pads

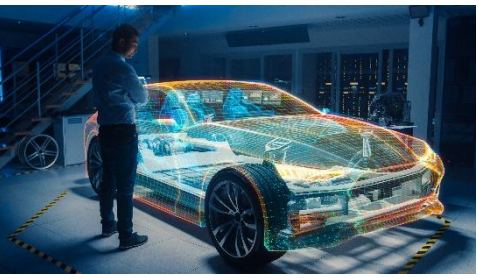
- For thermal gap pads that are cost-friendly, acrylic is a solid option. Here are the benefits of acyclic thermal pads:
- Heat Resistance: Acrylic pads excel in heat resistance, which is essential for helping devices maintain peak performance and longevity.
- Cost-Effective: This type of material is an excellent money-saving option.
- Thermal Conductivity: The thermal conductivity of acrylic material is up to 8 W/m-K.
- Dielectric Strength: The dielectric strength of acrylic thermal pads is exceptional, with strength values ranging from 5 kV/mm to 10 kV/mm.
- Flame Retardancy: Acrylic pads have good flame retardancy.
- Conformability: Acrylic pads offer flexibility in conformability and softness, making them ideal for application on uneven or irregular surfaces.

The Benefits of Silicone (ABS) Thermal Pads

- Silicone thermal gap pads have many benefits and advantages, check out these ones.
- Heat Resistance: Silicone pads offer reliable heat resistance, effectively withstanding high temperatures.
- Thermal Conductivity: This type of material has a thermal conductivity of up to 8 W/m-K. Depending on the quality of the silicone, it can be higher.
- Dielectric Strength: Silicone thermal pads possess a dielectric strength of between 10 kV/mm and 20 kV/mm.
- Flame Retardancy: Silicone pads exhibit strong flame retardancy, effectively resisting the spread of flames in case of fire.
- Conformability: Silicone thermal pads have excellent softness and conformability, making them ideal for use in irregular spaces and to fill microscopic gaps.

Product Application



TIMs plays a crucial role managing heat across a wide range of high-performance applications!

TIM solutions are mostly used in the form of pads, greases, gels and phase-change materials.
The correct choice of TIM ensures thermal stability, mechanical integrity and long-term reliability.

Each **industry** require specific material characteristics based on operational environment, thermal load, and regulatory standards.

Automotive:
- TIMs ensures optimal thermal conductivity in electric vehicle batteries, inverters and onboard chargers thus enhancing safety and performance.
- TIM is used in engine control units (ECUs), power management systems and other electronic components to ensure reliable performance and durability.

Consumer electronics:
- Proven and best materials to dissipate heat from processors and power components in compact devices like smartphones, tablets and laptops. Millions of units can't be wrong!

Aerospace:
- TIMs provide reliable thermal management under extreme conditions. Even safeguarding sensitive avionics and control systems.

Medical:
- Use TIMs in diagnostic and therapeutic devices to maintain operational precision. Doing so protects patient safety with a solution where no second try is allowed.

White and brown goods:
- Refrigerators, washing machines and microwave ovens - use TIMs to improve the longevity and efficiency of embedded electronic components. Hassle-free sustainability without complications.

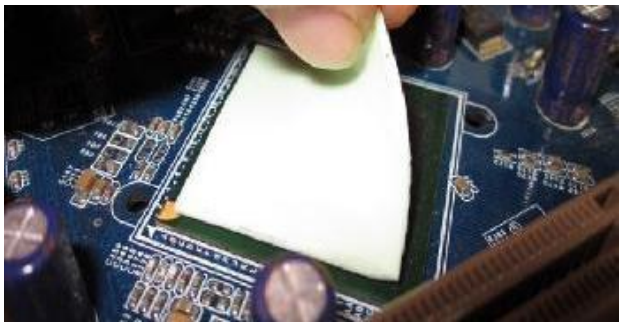
As devices become more compact and powerful:
- Demand for efficient thermal management constantly increases. As a producer be prepared: TIMs help to bridge microscopic surface gaps between components enhancing heat transfer and reducing thermal resistance.

Ultimately TIMs are foundational and advancing innovation while maintaining safety and performance across critical functions.

AcrylicThermal Pad (ABA)

OPTIMAL Safe Thermal Solutions ©

OPTIMAL Acrylic Thermal Pad is a heat-conductive material made from acrylic-based compounds. It's primarily designed to transfer heat between electronic components and heat sinks.



However these robust and durable pads also provide electrical insulation and mechanical cushioning.

Application:

- Power battery pack
- Vehicle navigator
- Optical precision and camera equipment
- Notebook computer
- Mobile and communication
- Automotive engine control equipment
- High end industrial control and medical electronics

Advantages:

- No silane volatilization
- No silicone oil precipitation
- Excellent flame retardance
- Good electrical insulation
- High tensile strength, high elongation
- Medical Industry 'non-silicone

This product is non-toxic and transported as regular freight.

Package:

- Customized packaging according to customer requirements

Storability:

- Up to 12 months if cool, dry and ventilated.

Safety:

- Refer to Material Safety Performance Data (MSDS).

Note:
The ABATEK-**OPTIMAL** products of course takes parameters and much more into consideration.

- Deflection
- Contact pressure
- Thermal impedance

However, due to very big differences in MESH structures no stacking of different pads is advised!

Cooling:
- Any crucial application – if constantly in use or not - needs indirect cooling.
- Robots, smart home systems, energy storage or whatever makes the appliance better.

Sustainability:
- This solution is long lived.
- Sustainability is also given since pads are easy to change, update or replace.

Acrylic Thermal Pad (ABA)

OPTIMAL© Safe Thermal Solutions

Characteristic Parameter ABA 100 - 800						
Product code		ABA 100	ABA300	ABA600	ABA800	
	Unit					Test Method
Thickness	mm	0.5 - 5.0	0.5 - 5.0	0.5 - 5.0	0.5 - 5.0	ASTM D374
Specific Gravity	g/cm^3	1.9	2.5	3.1	3.4	ASTM D792
Thermal Conductivity	W/(m*K)	1.0	3.0	6.0	8.0	ASTM D5470
Hardness	(Shore 00)	40-80	40 – 80	40 – 80	40 - 80	ASTM D2240
Elongation	%	100	70	50	30	ASTM D412
Tensile Strength	psi	75	55	30	30	ASTM D412
Dielectric Breakdown Voltage@AC	V/mm	>8000	>8000	>8000	>8000	ASTM D149
Flammability Rating		UL94 V-0	UL94 V-0	UL94 V-0	UL94 V-0	UL
Volume Resistivity	Ω.cm	1*10^{13}	1*10^{13}	1*10^{13}	1*10^{13}	ASTM D257
Operating Temperature	℃	-40 to 125	-40 to 125	-40 to 125	-40 to 125	***
Thermal Resistance (1mm,@30psi)	℃*in^2/W	1.10	0.8	0.3	0.2	ASTM D5470
Compression Ratio (1mm,@30psi)	%	35	30	20	20	***
Construction		1	1	1	1	
RoHS		PASS	PASS	PASS	PASS	IEC 62321
Halogen		PASS	PASS	PASS	PASS	EN14582
REACH		PASS	PASS	PASS	PASS	EN14372

Sheet size: 300 x 400 mm or according to customer requirements or die cut products.

Versatility:

The **ABA Acrylic Series** has excellent mechanical and physical characteristics – as shown above. Enjoy design freedom for various other applications. Even jointing applications are possible.

Note:

- Many parameters decrease in function and performance when pressure becomes too high!
- Especially when the substrate is porous safety must come first!

Sustainability:

- As sustainable as possible: Abatek strictly offers solutions following the conductive path!

The **ABATEK-OPTIMAL** products will take you further with their exceptional thermal conductivity and insulation properties. Undoubtedly, we lay the groundwork for success!

AAA	BB	CC	DD
T1	T2	T3	T4
Product Type	Thermal Conductivity	Construction	Thickness

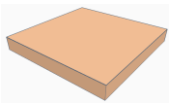
Example: **ABA300-01-25**

ABA	Material	Acrylic
300	Thermal Conductivity	3.0 W/m-K
01	Construction	Plain Type
25	Thickness	2.5mm

T1 - Product Type / T2 - Thermal Conductivity

Item	Material	Order code	Thermal Conductivity		Item	Material	Order code	Thermal Conductivity
1	Acrylic Thermal Pad	ABA100	1.0 W/m-K		**3**	Acrylic Thermal Pad	ABA600	6.0 W/m-K
2	Acrylic Thermal Pad	ABA300	3.0 W/m-K		**4**	Acrylic Thermal Pad	ABA800	8.0 W/m-K

T3 – Construction

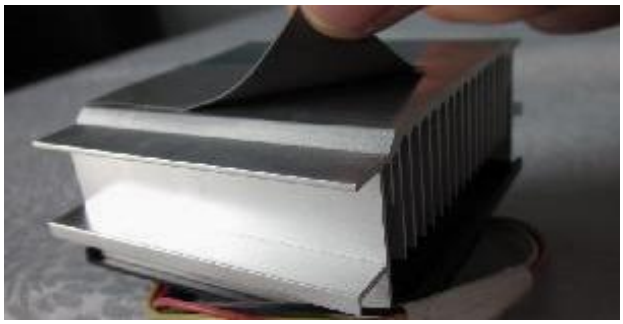


01 . Plain Type

T4 – Thickness

- As Thermal Pads can also have other functions such as damping, spacing etc., we offer different thicknesses.

Silicone Thermal Pad (ABS)



OPTIMAL ABS Silicone Thermal Pad are used for filling both contact surfaces.

Consequently the pads are ultra soft and have great resilience!
Important: the pads very effectively exclude air from the crucial contact interface.

Application:

- Semiconductor heat sink
- Vehicle navigator
- Communication & power equipment
- Graphics card, memory module
- Graphics card, memory module
- LED lighting equipment
- LCD and plasma TV

Advantages:

- Excellent flame retardant
- High electrical insulation performance
- Great flexibility
- Great pression ratio

This product is non-toxic and transported as regular freight.

Package:

- Customized packaging according to customer requirements

Storability:

- Up to 12 months if cool, dry and ventilated.

Safety:

- Refer to Material Safety Performance Data (MSDS).

Notes

- The thermal conductivity can reach up to 8.0 W/m-K and support more.
- Even if temporarily overheated thermal pads are very resistant.
- These products naturally tack and can be die-cut into various forms and shapes.
- Design liberty is guaranteed to a large extent.

Life cycle:

- Thermal pads are long lived. Production wise there is a wide range of methods and possibilities. Contact our local experts for your best solution.

Sustainability:

- Although Thermal Pads are durable and easy to exchange there are logical and economical limits to any product. But this proven and safe technology made by Abatek guarantees proven safety at low cost!

All considerations taken care of in advance to ensure less problems for the future.

Silicone Thermal Pad (ABS)

OPTIMAL© Safe Thermal Solutions

Characteristic Parameter ABS 100 - 800						
Product code		ABS100	ABS300	ABS600	ABS800	
	Unit					Test Method
Thickness	mm	0.5 - 5.0	0.5 - 5.0	0.5 - 5.0	0.5 - 1.5	ASTM D374
Specific Gravity	g/cm^3	2.2	2.9	3.1	3.1	ASTM D792
Thermal Conductivity	W/(m*K)	1.0	3.0	6.0	8.0	ASTM D5470
Hardness	(Shore 00)	30 – 70	30 – 70	30 - 70	70	ASTM D2240
Elongation	%	50	40	30	15	ASTM D412
Tensile Strength	psi	40	30	30	20	ASTM D412
Dielectric Breakdown Voltage@AC	V/mm	>8000	>8000	>8000	>6000	ASTM D149
Flammability Rating		UL94 V-0	UL94 V-0	UL94 V-0	UL94 V-0	UL
Volume Resistivity	Ω.cm	$1*10^{13}$	$1*10^{13}$	$1*10^{13}$	$1*10^{13}$	ASTM D257
Operating Temperature	℃	-40 - 200	-40 – 200	-40 – 200	-40 - 200	***
Thermal Resistance (1mm,@30psi)	$℃*in^2/W$	0.9	0.45	0.3	0.22	ASTM D5470
Compression Ratio (1mm,@30psi)	%	40	30	25	25	***
Construction		1	1	1	1	
RoHS		PASS	PASS	PASS	PASS	IEC 62321
Halogen		PASS	PASS	PASS	PASS	EN14582
REACH		PASS	PASS	PASS	PASS	EN14372

Sheet size: 300 x 400 mm or according to customer requirements or die cut products.

Versatility:

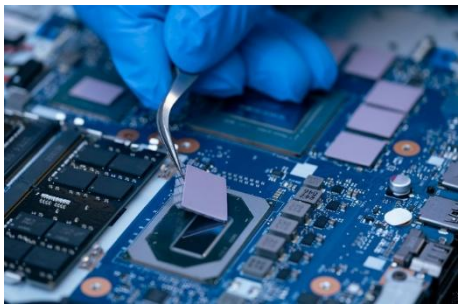
- The **ABS Silicone Series** has excellent mechanical and physical characteristics – as shown above.
- Enjoy design freedom for various other applications. Even jointing applications are possible.

Note:

- Many parameters decrease in function and performance when pressure becomes too high!
- Especially when the substrate is porous safety must come first!

Sustainability:

- As sustainable as possible: Abatek strictly offers solutions following the conductive path!



The **ABATEK-OPTIMAL** products will take you further with their exceptional thermal conductivity and insulation properties. Undoubtedly, we lay the groundwork for success!

Silicone Thermal Pad (ABS)

AAA	BB	CC	DD	EE
T1	T2	T3	T4	T5
Product Type	Thermal Conductivity	Construction	Thickness	Hardness

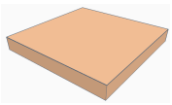
Example: **ABS100-03-30-S**

ABS	Material	Silicone
100	Thermal Conductivity	1.0 W/m-K
01	Construction	Plain
30	Thickness	3.0mm
S	Hardness	Soft

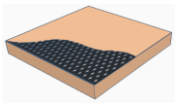
T1 - Product Type / T2 - Thermal Conductivity

Item	Material	Order code	Thermal Conductivity		Item	Material	Order code	Thermal Conductivity
1	Silicone Thermal Pad	ABS100	1.0 W/m-K		**3**	Silicone Thermal Pad	ABS600	6.0 W/m-K
2	Silicone Thermal Pad	ABS300	3.0 W/m-K		**4**	Silicone Thermal Pad	ABS800	8.0 W/m-K

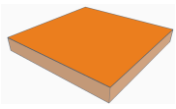
T3 – Construction



01 . Plain Type



02 Glass fibre reinforced



03. Hardened Surface

T4 – Thickness

- As Thermal Pads can also have other functions such as damping, spacing etc., we offer different thicknesses.

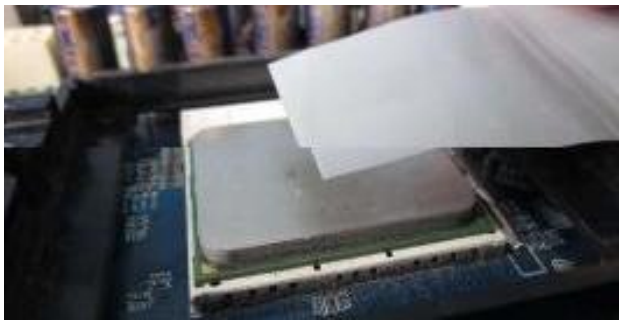
T5 – Hardness

- U = Ultra Soft – 30 until 45 Shore 00
- S = Soft – 45 until 70 Shore 00

Phase Change (ABP)

OPTIMAL ABP softens at 50-55℃.
Once in a liquid viscous state, ABP fills and covers gaps and pits between contact interfaces more efficiently than thermal pads.

Important:
OPTIMAL ABP is solid at room temperature!
Assemble and use accordingly.



Application:

- Integrated chip LED lighting products
- High frequency microprocessor
- Stationary or mobile computer
- Computer server and storage

Advantages:

- Strong interface wetting ability
- Long-term reliable thermal conductivity
- Fills the gap between given interface
- Removes air between given interface
- Sustainable over life cycle
- Makes phase transition temperature controllable

Package:

- Sheet sizes: 300 x 400 mm or according to customer requirements or die cutted products.

Storability:

This product is non-toxic and transported as regular freight. Store cool, dry and ventilated.

Safety:

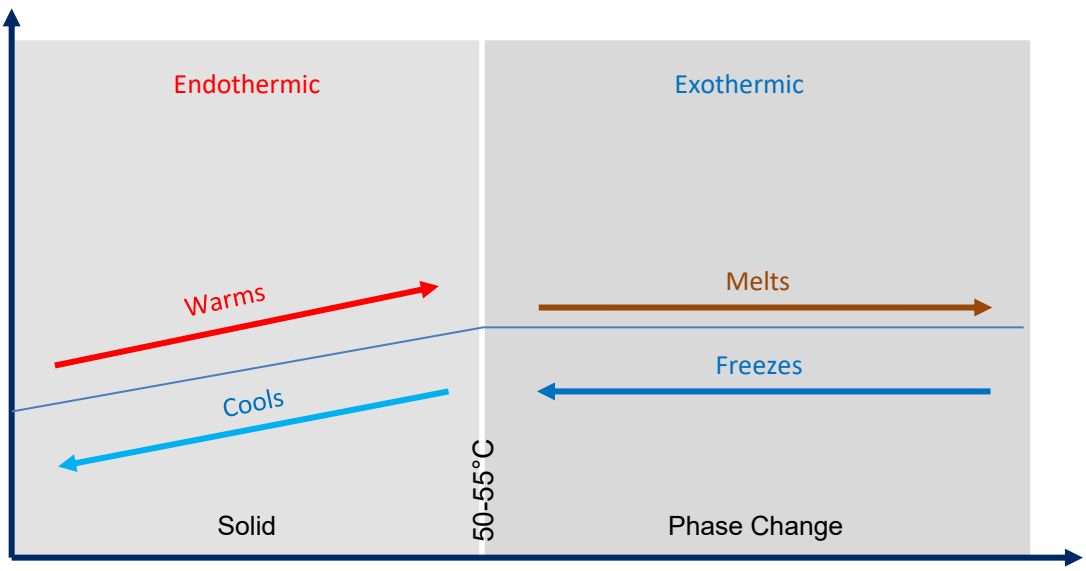
- Refer to Material Safety Performance Data (MSDS).

Special characteristics:

- Phase Change Thermal Interface Materials (PCMs) offer excellent thermal conductivity by transitioning from solid to semi-liquid at operating temperatures ensuring minimal thermal resistance.
- The phase change specific characteristics allows PSMs to meet microscopic surface irregularities, optimizing contact and heat transfer. Unlike greases PCMs are stable without pump-out or migration ensuring long-term performance and reliability.
- They are easy to handle and apply often provided in pre-formed sheets that simplify assembly.
- PCMs offer consistent thickness control making them ideal for automated manufacturing processes.
- Their clean application and rework ability make them especially attractive for high-reliability sectors like automotive, aerospace, and electronics.

Characteristic Parameter ABP 100 - 500

Product code		ABP100	ABP300	ABP500	
	Unit				Test Method
Thickness	mm	0.2 - 0.5	0.2 - 0.5	0.2	ASTM D751
Thickness tolerance	±0.015	±0.015	±0.015	±0.02	ASTM D751
Density	g / cm3	2.8	2.8	2.9	ASTM D297
Temperature Range	℃	- 40 to + 125	- 40 to + 125	- 40 to + 125	
Phase Change Temperature	℃	50 - 55	50 - 55	45-55	
Volume Resistance	Ω.cm	2.0 X 10^{10}	2.0 X 10^{10}	2.0 X 10^{10}	ASTM D257
Thermal Conductivity	W / (m*K)	1.0	3.0	5.0	ASTM D5470
Dielectric constant	(1MHZ)	3.0	3.0	4.0	ASTM D150
Thermal impedance@10psi	℃ xin2/W	0.05	0.05	0.03	ASTM D5470
RoHS		PASS	PASS	PASS	IEC 62321
Halogen		PASS	PASS	PASS	EN14582
REACH		PASS	PASS	PASS	EN14372
Sheet size: 300 x 400 mm or according to customer requirements or die cut products.					



Endothermic:
- Heat energy is absorbed from the environment

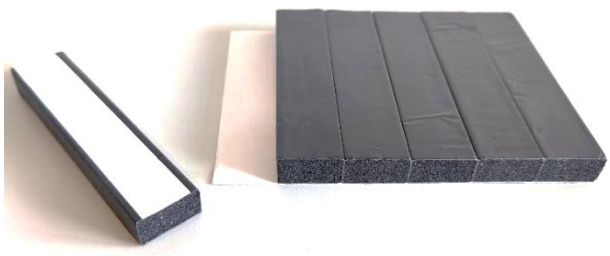
Exothermic:
- Heat energy is released to the environment

Acrylic:
- What makes this material really special: it is very consistent in shape regardless frames or gaps.
- However acrylic sealants dry very fast which is convenient whatever production method is chosen.

Note:
- Acrylic sealants don't expand much once applied. For covering or filling up space there are other methods available.

Graphite Foam (ABG)

OPTIMAL Graphite Foam is a lightweight, flexible material designed to efficiently dissipate heat in various electronic devices.
Composed of expanded graphite the material offers high thermal conductivity while maintaining electrical insulation.
The compressible structure bridges and bonds uneven surfaces. For reliable thermal contact under extreme conditions, consider ABG



Application:

- Carbon foams have great potential as catalyst supports, energy storage electrodes, insulation materials and adsorbents.

Advantages:

- Efficient thermal transfer bridging large gaps
- High deflection capability
- Repeatable compression and rebound cycles
- Lightweight
- Low force thermal interface
- Abrasion resistant exterior
- No bleed of silicone oil or other materials
- resistant to constant high temperatures.

Package:

- If not otherwise agreed upon all parts are packed into PE plastic bags. ESD Plastic bag can alternatively be used upon special request at added cost. Packing size per unit is determined by respective part size.
- The maximum weight cannot exceed 15 Kgs/box - excluding packaging materials

Storability:

- The standard storage location should meet the following standards:
  - Relative humidity below 50%RH
  - Temperature in the range of 15 – 27 degrees Celsius.
  - Clean air-circulation
  - Protected from sunlight

  Note: All special materials must strictly be stored according to specification

Safety:

Please refer to the company's Material Safety Data Sheet (MSDS)

Characteristic Parameter ABG 300 - 700

Thickness at length & width	Unit	Tolerance	Thickness	Tolerance
<30	mm	+/- 0.3	<0.4	+/- 04
>30	Mm	+/- 0.5	0.4-6.0	+/- 10%
>120	Mm	+/- 1.0	>6.0	+/- 10%
>250	Mm	+/- 1.5		
>400	mm	+/- 2.0		
		ABG300	**ABG700**	
Thermal Conductivity	W / (m*K)	3.0	7.0	ASTM D5470
Compression Force	N/cm2	>6	>6	
Density	g / cm3	1.7	2.0	ASTM D297
Temperature Range	℃	- 40 to + 80	- 40 to + 80	
RoHS		PASS		IEC 62321
REACH		PASS		EN14372

Other technical parameters are available on request based on selected pad type, thermal conductivity, hardness and respective options.

Thermal conductivity In z direction

- The assembly of graphite film with PU foam is not a homogeneous material and therefore thermal conductivity is not a constant value valid for all different configurations and sizes.

Compression Force

- Depends on foam thickness and dimensions.
- Force can be adjusted by selection from different foam types.

Demo Samples

- Demo samples are available upon request.

AAA	BB	CC
T1	T2	T3
Product Type	Thermal Conductivity	Construction

T1 - Product Type / T2 - Thermal Conductivity

Item	Material	Order code	Thermal Conductivity		Item	Material	Order code	Thermal Conductivity
1	Graphit Foam Thermal Pad	ABG300	3.0 W/m-K		**2**	Graphit Foam Thermal Pad	ABG700	7.0 W/m-K

Example: **ABG700-A1**

ABG	Material	Graphite Foam
700	Thermal Conductivity	7.0 W/m-K
A1	Construction	One side adhesive tape

T3 – Construction for item 12 / 13

- A1 = One side adhesive tape
- A2 = Double side adhesive tape
- AP = One side adhesive tape on paper liner
- N/A = Not applicable

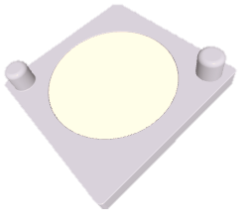
Conductive Rubber (ABC)

OPTIMAL Conductive Rubber is a versatile material that combines the flexibility and durability of rubber with electrical conductivity. It offers several unique capabilities:

Electrical Conductivity:
- Conductive rubber is used as a flexible electrical conductor in applications where rigid materials should not be used.
- Conductive rubber can provide consistent electrical contact making it useful for keypads, switches and touch-sensitive surfaces.

EMI/RFI Shielding:
- Used for electronic enclosures to block electromagnetic interference (EMI) and radio-frequency interference (RFI).
- Often made with embedded conductive particles like carbon, silver or nickel.

Pressure-Sensitive Conductivity:
- Some conductive rubber materials exhibit pressure-sensitive resistance meaning the electrical resistance changes based on pressure applied.
- Used in force-sensitive resistors (FSRs) for touch sensors, gaming controllers and medical devices.



Anti-Static and ESD Protection
- Conductive rubber can dissipate static electricity preventing electrostatic discharge (ESD) that might damage sensitive electronics.
- Used in ESD-safe mats, gloves and footwear in electronic manufacturing environments.

Thermal Conductivity
- Certain conductive rubber formulations have high thermal conductivity allowing heat dissipation in electronic components.
- Conductive rubber is used in specific thermal interface materials for heat sinks and circuit boards.

Flexibility & Durability
- Unlike metal conductors conductive rubber maintains flexibility thus making it ideal for applications like wearable electronics, stretchable circuits and flexible displays.
- Resistant to environmental factors like moisture, temperature changes and chemicals.

Biomedical Applications
- Used in medical electrodes, biosensors, and wearable health monitoring devices due to its skin-safe and flexible properties.

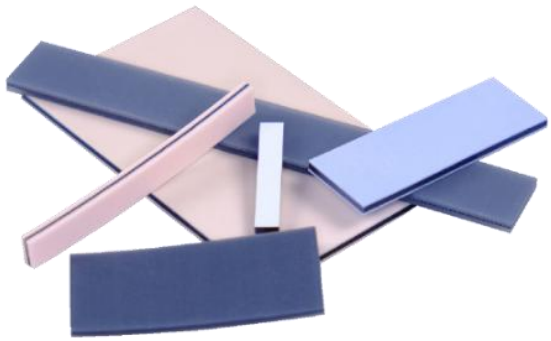
Customizable Resistance & Composition
- Conductivity can be adjusted via the concentration and type of conductive filler e.g., carbon black, silver, or graphene.
- Available in sheets, tubes and molded components.

Zebra-Connector (ABZ)

OPTIMAL ABZ Zebra Silicone Connectors are prized for providing reliable, high-density electrical connections between adjacent components like LCDs and PCBs.

The biggest USP is the alternating conductive and non-conductive layers of silicone which allow precise signal routing with excellent electrical isolation.

- Superior flexibility
- Compressible making them ideal for shock and vibration-prone environments.
- Customizable pitch and profile options.
- Supports fine-pitch connections without soldering or adhesives.



Zebra connectors also provide excellent thermal stability and chemical resistance thus ensuring long-term durability in harsh environments.

OPTIMAL ABZ Zebra Silicone Connectors are both known and appreciated for their reliable simplicity.

Ideal for applications in medical devices, consumer electronics, automotive and industrial displays.

T(R*) Type

Resistance isolator [Ω]	10^{12}
Pitch [mm]	0.05; 0.1; 0.18; 0.25
Max. current [mA/mm2]	1 (Type R = 20)
Compression assembly	8%
Contact resistance [Ω]	30 x H / (W x S) (Type R=15)

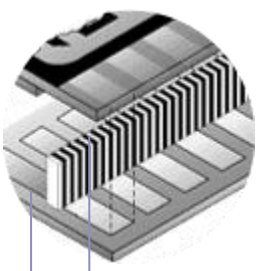
TS(R*) Type

Resistance isolator [Ω]	10^{12}
Pitch [mm]	0.05; 0.1; 0.18; 0.25
Max. current [mA/mm2]	1 (Type R = 20)
Compression assembly	10%
Contact resistance [Ω]	30 x H / (W x S) (Type R=15)

TG(R*) Type

Resistance isolator [Ω]	Centre 10^{12} ; Side 10^{15}
Pitch [mm]	0.05; 0.1; 0.18; 0.25
Max. current [mA/mm2]	1 (Type R = 20)
Compression assembly	10-12%
Contact resistance [Ω]	30 x H / (W x S) (Type R=15)

***R = Low resistance version that can replace Silver or Gold Connectors**



Absorbs vibration

Electrical connectivity

bonding two parallel, flat surfaces without soldering or gluing

Abatek is your global partner,

Right there at your side. Regardless if there is a specific challenge to solve or a complex solution. What counts is solutions you and your customers can rely on.

You are welcome to contact us while our skilled team members are looking forward to making your next project a success!

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