



GETELEC

We protect your electronics

PRESENTATION OF OUR THERMAL RANGE

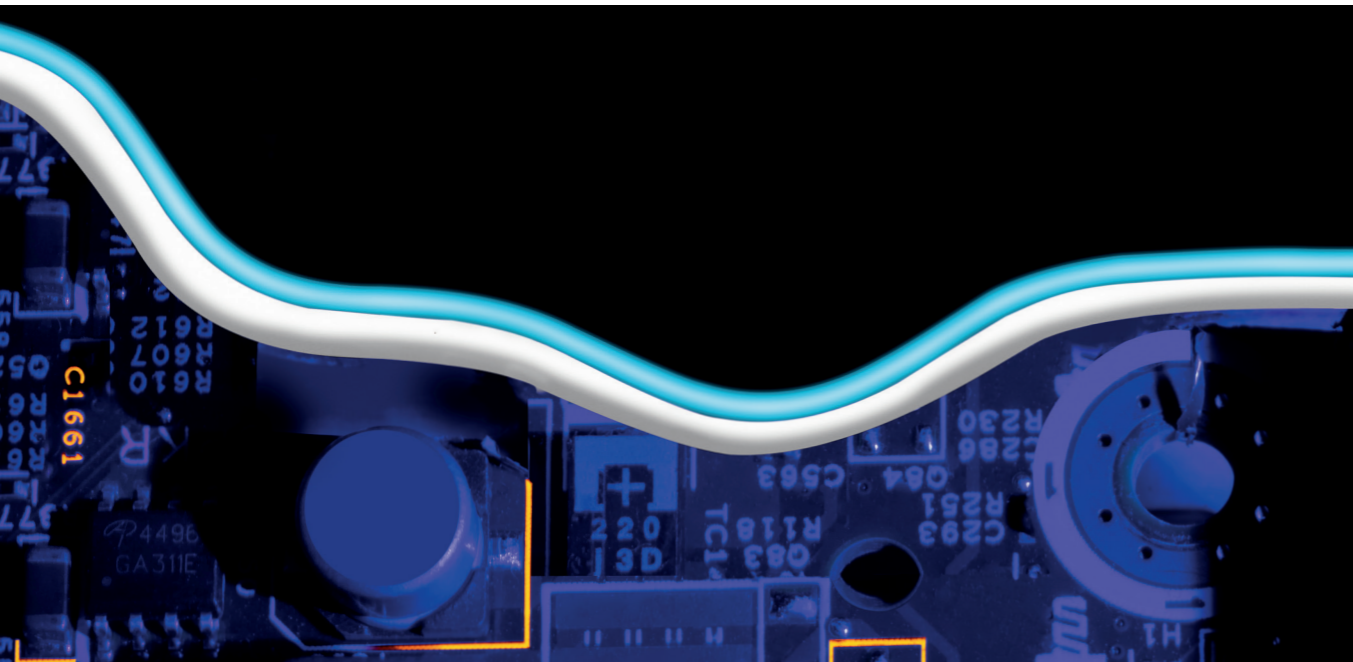
INNOVATIVE BESPOKE SOLUTIONS

Our technological advancements allow us to continually develop innovative and strategic customised products to meet the complex specifications and multi-sectoral demands of our clients.

Innovative EMC solutions

GETELEC SAS
375 Avenue Morane Saulnier
78530 - Buc | France
Tel : +331 39 20 42 42
E-mail: info@getelec.com
www.getelec.com

ABOUT US



GETELEC, YOUR INNOVATION PARTNER

We operate in standardized and cutting-edge technology markets such as: defense, aeronautics, space, medical, automotive, energy and industrial electronics..

An independent French company with unique know-how since 1968, Getelec has become a mondial specialist in EMC shielding and a key partner for major clients in many industrial sectors.

For 50 years, Getelec has been designing and manufacturing customised solutions for technical sealing, electromagnetic protection (EMC), microwave absorption and thermal dissipation. Getelec's products are particularly well suited to the protection of high-tech equipment placed under severe environmental constraints.

Our technological advancements allow us to continually develop innovative and strategic customised products to meet the complex specifications and multi-sectoral demands of our clients

Our EMC expertise at the service of your projects

Our R&D laboratory, Getelec Lab' is at your disposal for all material characterization, formulation and deformation services.

→ DEDICATED SUPPORT

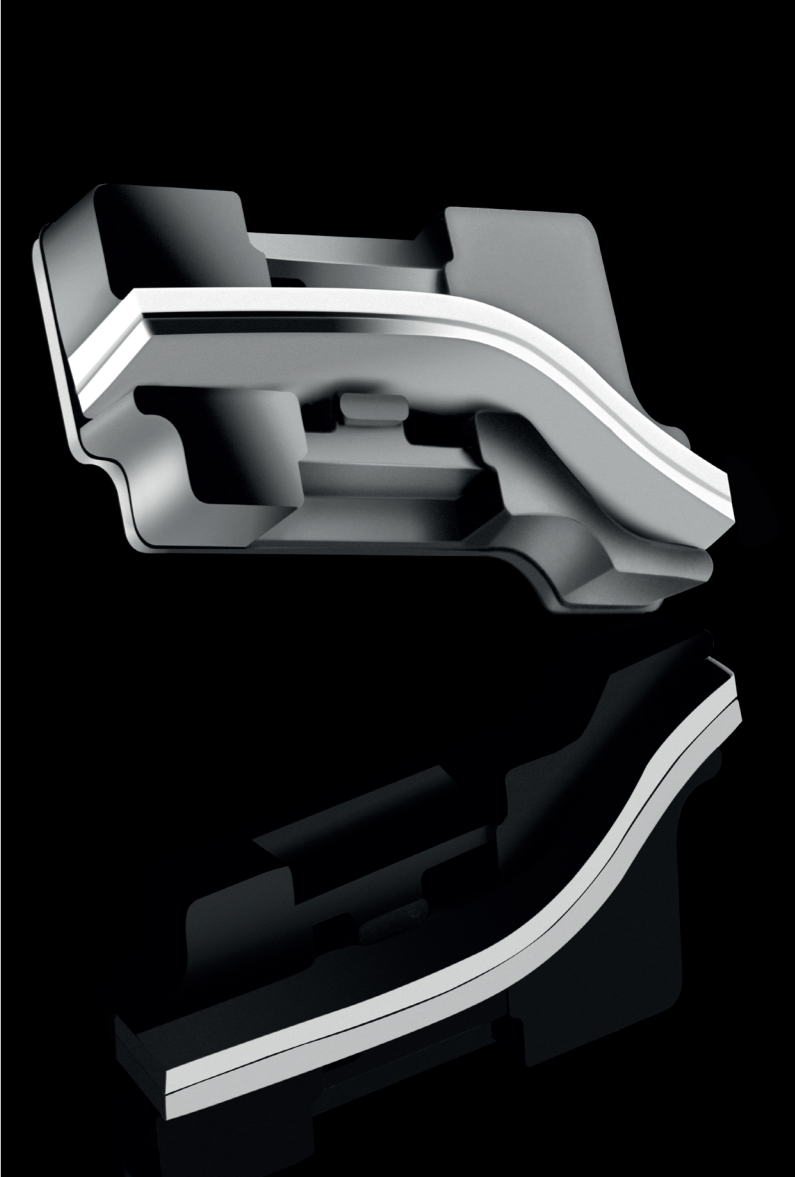
Listening to your needs is an essential part of our business policy. The entire design and development of your product is based on trust and collaboration with our clients. This mutual transparency allows us to assist you in all aspects of your development and to offer you turnkey solutions for all your project.

Our highly qualified teams will assist you in defining your needs and are at your disposal throughout your project. From choosing the material to the final production of your product, they will advise and guide you to ensure your technological success..

→ A BESPOKE RESPONSE

Our historical know-how allows you to benefit from the most efficient and innovative products on the market, adapted to all your mechanical, electrical and environmental constraints.

Our engineers are equipped with the latest generation of equipment enabling us to design all your products, from prototypes to large-scale production runs, within a short timeframe.



→ A WIDE RANGE OF PRODUCTS

Our continuous innovation approach allows us to offer you a complete range of products and solutions capable of responding to all your problems.

Our electrically conductive elastomers, environmental and anti-corrosion technical sealing solutions, microwave absorbers, heat sinks and metal shielding will ensure the longevity and performance of your equipment, with innovative technology tailored to your project.



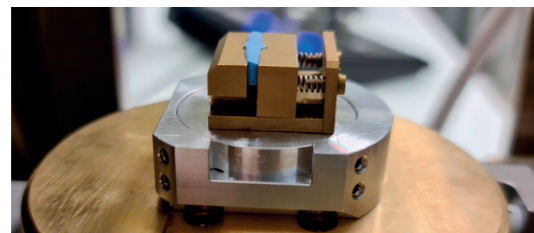
Expertise, innovation and customer satisfaction are the driving forces behind Getelec's general policy.

LAB'

INNOVATION AT THE HEART OF OUR DEVELOPMENT

Discover our Getelec Lab' R&D laboratory and our measurement techniques.

Presentation of our R&D laboratory



Since 2020, we have been offering a complete characterisation and deformation service to support you in your innovations and developments of polymer, thermoplastic and thermoset products. Thanks to our latest-generation equipment, our material experts will be able to assist you in your research and problems and provide you with a detailed expert appraisal report within 4 to 5 weeks.

The latest generation of equipment

Our laboratory is equipped with around twenty latest-generation devices, including a Scanning Electron Microscope (SEM-EDS) that allows non-destructive inspection of the structure and chemical composition of materials.

In particular, EDS allows for qualitative and quantitative elementary analysis: all elements are detectable (except H and He, Li and Be) with an average detection threshold of 0.5 atomic%.

The SEM allows for topographical images of samples to be produced, providing information on the physical structure of the sample analyzed. This coupling of the two measurements has enabled us to develop numerous product innovations, such as the development of our range of thermal gap pad.



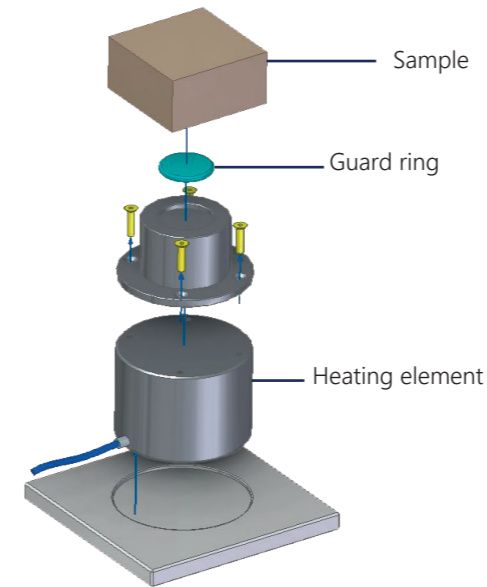
A LABORATORY AT YOUR DISPOSAL

Characterisation, material deformation, comparative chemical analysis, research and development... our laboratory can meet all your requirements.

Thermal conductivity measurements

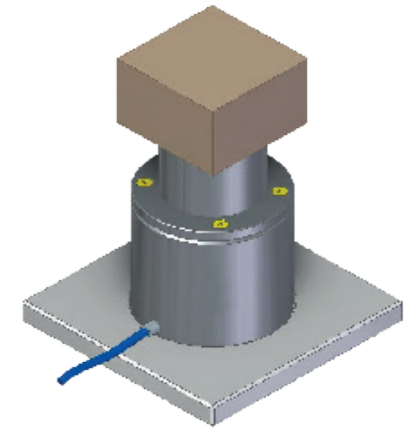
MTPS (MODIFIED TRANSIENT PLANE SOURCE) METHOD

The conductivity of our thermal gap pad range is measured using two different techniques. The first technique, "Modified Transient Plane Source" (MTPS), characterizes the thermal conductivity and effusivity of materials according to ASTM D 7984. The latter consists of using a unilateral interfacial thermal reflectance sensor that applies a constant heat source to the sample. The instantaneousness of the thermal conduction measurement ensures a detailed overview of the heat transfer properties of our samples.



The sample is placed on a guard ring that surrounds the primary sensor coil to support one-dimensional heat transfer into the sample.

An electric current is passed to the heating element, which subsequently results in an increase in the temperature of the interface between the sensor and the sample, which induces a variation in the voltage drop of the sensor element.



METHOD OF THE GUARDED HOT PLATE

The second technique, known as 'guarded hot plates' (ASTM 5470), is also used to measure the thermal conductivity and thermal resistance of our products. A flow of heat is generated, by the Joule effect, in the centre of a guarded hot plate (see illustration 1). The perimeter of the heating zone is surrounded by an electrical resistance: the guard. A control system maintains a zero temperature difference between the guard and the heating zone. The flow through a pair of test tubes, placed on either side of the hot plate, is therefore one-dimensional. Two cold plates placed against the outer faces of the test specimens are used to impose their temperature. By measuring the temperatures on both sides of each sample, once steady state has been reached, it is possible to calculate the thermal conductivity (λ) and deduce the thermal resistance (R) - $R=e/\lambda$ where e is the thickness of the sample measured. This method provides an absolute measurement of thermal conductivity.

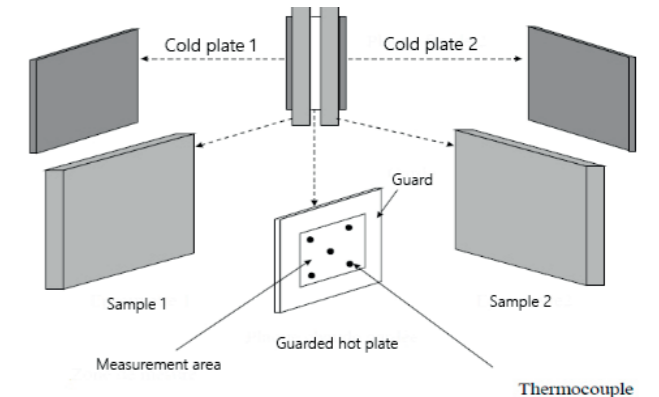


Illustration 1 - Diagram of the Hot Plate method

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OUR THERMALLY CONDUCTIVE SOLUTIONS

Continuous development

Entirely developed by our R&D laboratory, our complete range of heat sinks includes more than fifty references divided into five distinct ranges.

The GTG range: composed of around thirty references ranging from 1W/m.K to 10 W/m.K. Allow you to benefit from flexible products that will ensure that all surface roughness is taken into account during their compression and will thus ensure optimal operation of your equipment at both low and high temperatures.

The GTC range: Our silicone-free solutions are developed from a specific polymer base perfectly suited to applications requiring no release of silicone-based product (siloxane type). Our GTCs have performances equivalent to our GTG thermal range.

The GTD range: Available in the form of 180 to 900 cc cartridges, our GTDs are ready to be deposited. Easy to apply and work thanks to a unique formulation, our removable heat sinks have been developed to facilitate the filling of all complex geometries while reducing thermal resistance phenomena due to their low viscosity at the time of deposit.

The GTS range: Thanks to their low degassing rate and their qualifications according to the ESA ECSS-Q-ST-70-02C standard, our GTS thermal mattresses have been developed to meet specific applications such as aeronautics or space.

The GTR range: Thanks to a Nylon reinforcement, our thermal mattresses allow the production of very low thicknesses (from 0.5 mm).

Discover our complete range

All our solutions are available in sheet, compression-molded, injection-molded or die-cut form.

→ A RESPONSE TO YOUR NEEDS

The miniaturization of electronic components has made the electrical conduction and insulation of equipment more complex. That's why we've developed a range of tailor-made, ready-to-use thermal products.

Our range of thermal gap pad includes highly conductive products ideal for applications requiring high thermal conductivity. Their specific formulations, developed by our laboratory, give these silicone elastomers exceptional thermal conductivity.

Thanks to their great flexibility and ease of installation, they adapt to surface irregularities between the power component and the cooler, helping to dissipate heat and protect your equipment.

→ UNIQUE FORMULATIONS

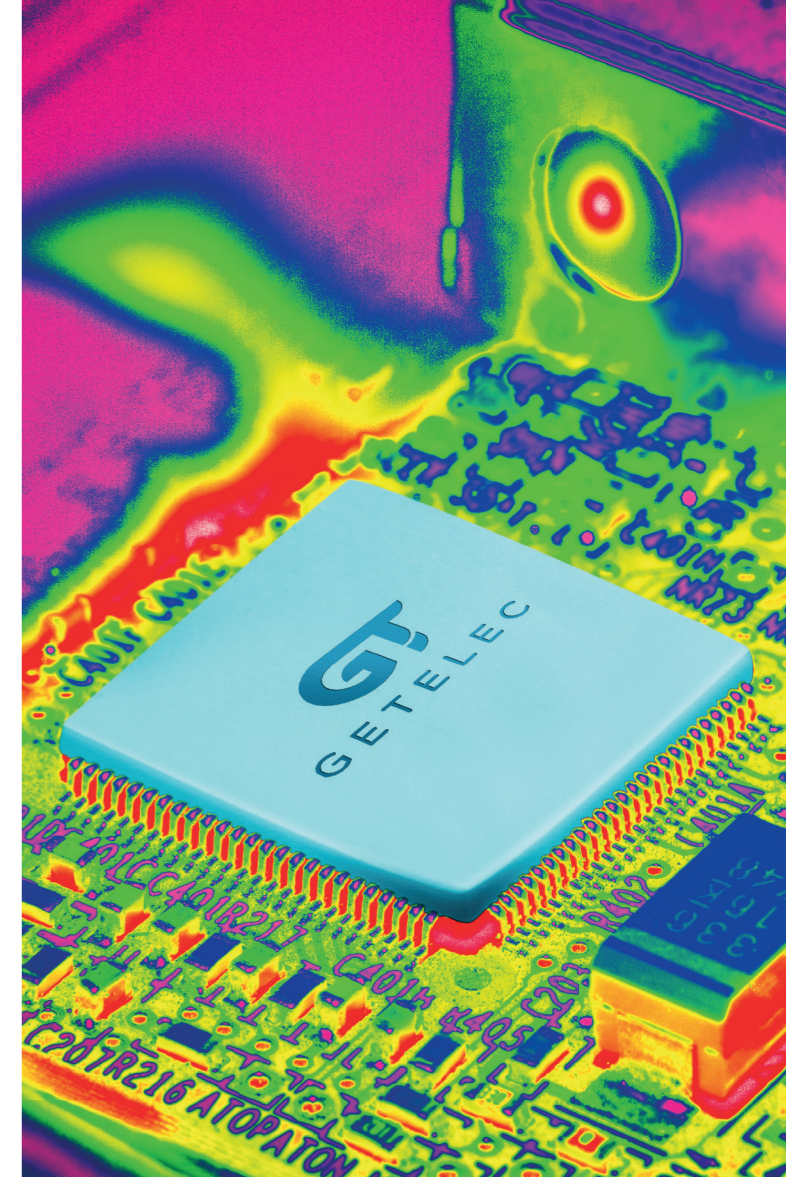
Our Getelec Lab R&D laboratory develops all the formulations of our thermal solutions. This mastery allows us to guarantee you a unique, innovative and non-obsolete solution. In addition, all of our thermal solutions comply with ROHS regulations.



→ AREAS OF APPLICATIONS

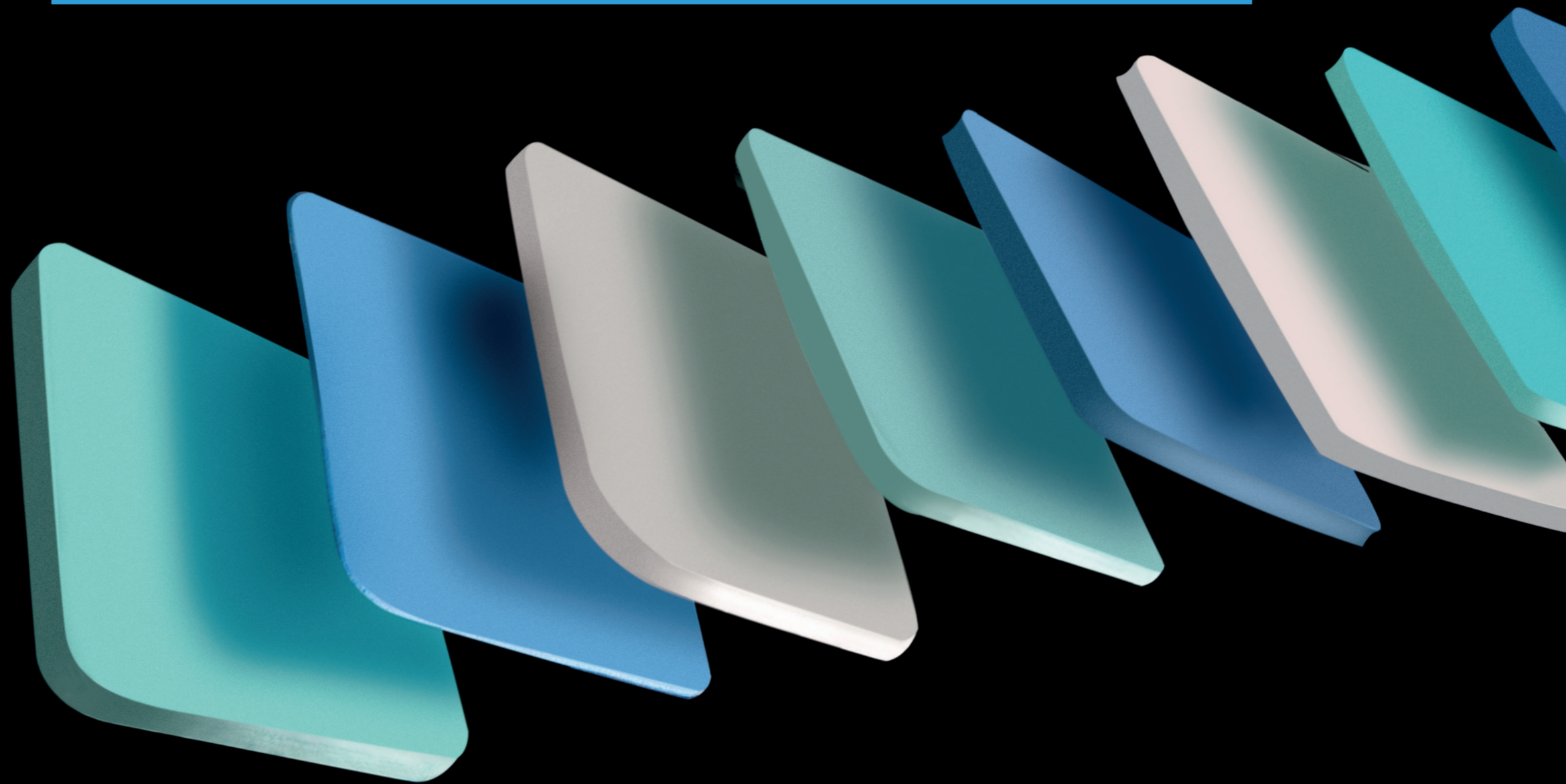
Our thermal gap pad have been developed to meet all of your multi-sector demands. The compliance of our blends with different standards allows us to cover all of your sectors with the strictest requirements such as :

- Defense
- Aeronautics
- Space
- Automotive
- Energy
- Telecommunication
- Medical
- Industrial electronics
- Railway



02

TECHNICAL DATA OF OUR THERMAL RANGE



PRODUCT RANGE OF OVER 50 REFERENCES WITH THERMAL CONDUCTIVITIES
RANGING FROM 1 TO 10W/M.K

OUR FINEST THERMAL GAP PADS

LOW THICKNESS | NYLON REINFORCEMENT & HIGH MECHANICAL PERFORMANCE

	Methods Tests	GTG 3-35R	GTG 3-70R	GTG 5-40R
Reinforcement used		Nylon		
Hardness ± 5 (Shore 00)	ASTM D 2240 Measured after 3 secondes	35	70	40
Thermal conductivity (W/m.K)		3.1 ± 0.2	3.1 ± 0.1	5 ± 0.2
Density (g/cm³)	ASTM D 792	2.65 ± 0.01	2.65 ± 0.01	3.12 ± 0.01
Break resistance (Mpa)	ASTM D 412	> 1	0.6	> 1
Elongation at break (%)	ASTM D 5470	> 100	200	> 100
Volume resistivity (Ω.m)		10 ¹¹	10 ¹¹	10 ¹⁰
Dielectric strength (kV.mm)		15		
Working temperature (°C)		-45°C to +200°C		
Available thickness (mm)		0.5 to 20 mm		
Color		Light blue	Light blue	Turquoise

OUR PRODUCTS DEDICATED TO SPACE APPLICATIONS

LOW OUTGASSING RATE | HIGH THERMAL CONDUCTIVITY

	Methods Tests	GTS 6-70R	GTS 8-65	GTS -9-80	GTS 10-50
Hardness ± 5 (Shore 00)	ASTM D 2240 Measured after 3 secondes	70	65	80	50
Thermal conductivity (w/m.K)	ASTM D 7984 Modified transient plane source (MTPS)	6 ± 0.2	8.1 ± 0.1	9.1 ± 0.2	10.01 ± 0.2
Density (g/cm³)	ASTM D 792	3.23 ± 0.01	3.3 ± 0.01	3.35 ± 0.05	3.44 ± 0.05
Elongation at break (%)	ASTM D 412	> 100	> 20	> 20	> 20
Dielectric strength (kV/mm)	ASTM D 149	15	10	11	7
Breakdown voltage (kV/mm)	ASTM D 149	-	16	16	6
Volume resistivity (Ω.m)	ASTM D 257	10 ¹¹	10 ¹¹	10 ¹¹	10 ¹⁰
Dielectric constant @1Mhz	ASTM D 150	-	7.9	8	3
Dissipation factor @1Mhz	ASTM D 150	-	0.013	0.010	0.006
TML (%)	ESA-ECSS-Q-ST-70-02C	0.09	0.07	0.07	0.08
RML (%)	ESA-ECSS-Q-ST-70-02C	0.04	0.07	0.06	0.07
CVCM (%)	ESA-ECSS-Q-ST-70-2C	0.03	0.02	0.01	0.03
Working temperature (°C)		-45°C to +200°C	-40°C to +150°C	-40°C to +160°C	-40°C to +160°C
Available thickness (mm)		from 0.8 to 10 mm	From 1.5 to 10 mm	From 1 to 20 mm	From 1 to 20 mm
Flame retardant	UL 94	-	V0	V0	-
RoHs		Yes			
Color		Light green	Light grey	Grey	Light brown

BESPOKE THERMAL GAP PADS

AVAILABLE IN SILICONE-FREE VERSION

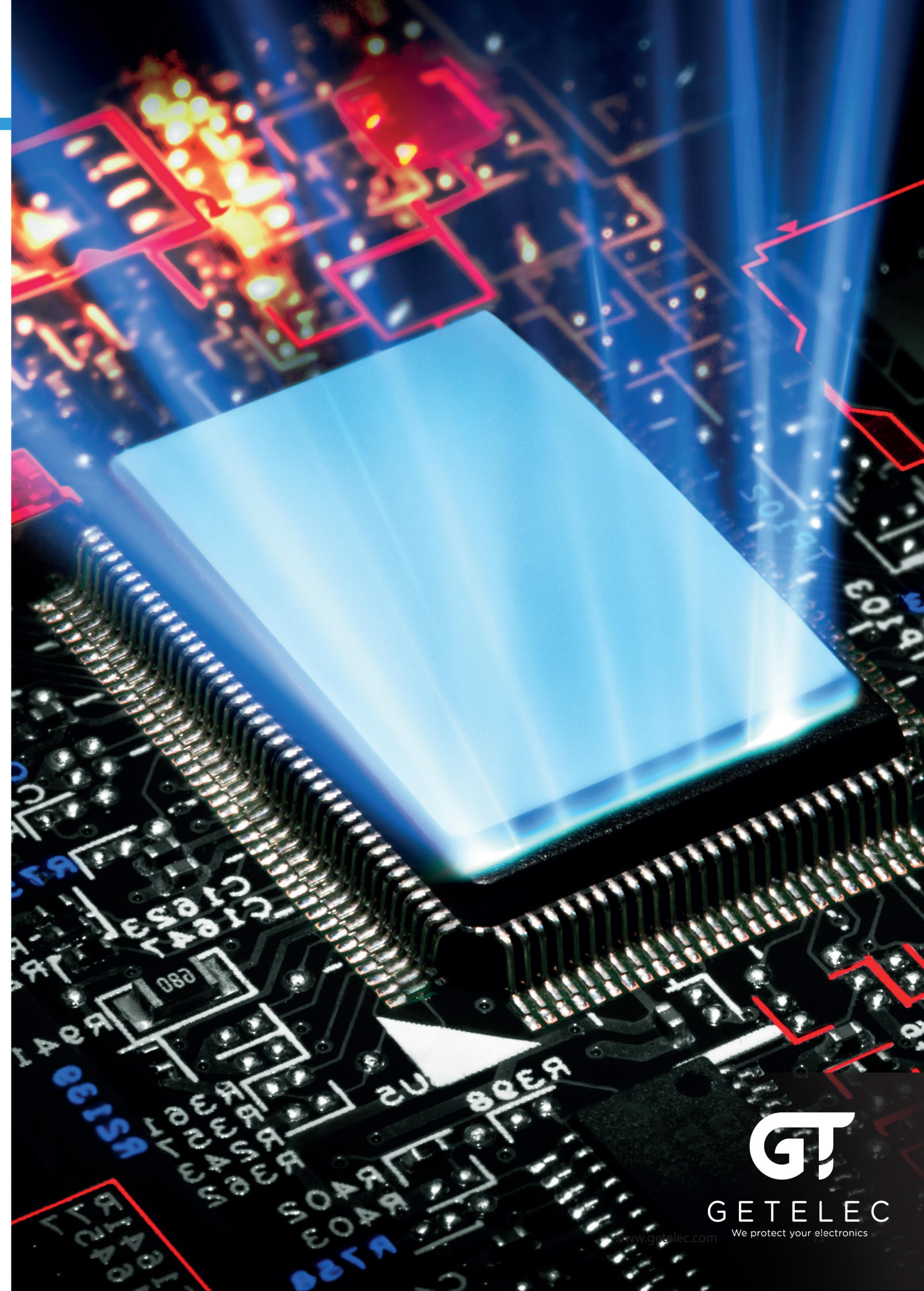
THERMAL CONDUCTIVITY UP TO 10 W/M.K | SOFT & FLEXIBLE | UL V0

Range of products	Hardness (Shore 00)	Thermal conductivity (W/m.K)	Density (g/cm ³)	Elongation at break (%)	Dielectric strength (kV/mm)	Breakdown voltage (kV/mm)	Volume resistivity (Ω.m)	Dielectric constant (@ 1Mhz)	Dissipation factor (@ 1Mhz)	Working temperature (°C)	Available thickness (mm)	Color
	ASTM D 2240 Measured after 3 sec	ASTM D 7984 MTPS (Modified Transient Plane Source)	ASTM D 792	ASTM D 412	ASTM D 149	ASTM D 149	ASTM D 257	ASTM D 150	ASTM D 150			
1 W/m.K	De 40 à 85 ± 5	1 à 1.3	2.6	< 200 à 200	5 à 11	17 à 18	10 ¹³	4	0.006	-60°C to +200°C	From 0.5 to 20 mm	Grey
2 W/m.K	De 40 à 85 ± 5	2 à 2.5	2.7 à 2.75	< 100 à 100	14 à 18	16 à 17	10 ¹²	4.2	0.005	-45°C to +200°C	From 0.5 to 20 mm	Blue
3 W/m.K	De 35 à 85 ± 5	3 à 3.5	2.9 à 2.95	< 100 à 100	11	15	10 ¹¹	5.5	0.005	-40°C to +200°C	From 0.5 to 20 mm	Light blue
4 W/m.K	De 40 à 85 ± 5	4	3.09	< 100 à 100	16	18	10 ¹¹	7	0.008	-40°C to +200°C	From 0.5 to 20 mm	Green
5 W/m.K	De 40 à 85 ± 5	5	3.12	< 50 à 50	15	18	10 ¹¹	7.5	0.006	-40°C to +200°C	From 0.5 to 20 mm	Green
6 W/m.K	De 40 à 85 ± 5	6	3.23	<50 à 50	14	17	10 ¹¹	8.1	0.007	-40°C to +200°C	From 0.8 to 20 mm	Green
7 W/m.K	De 35 à 60	7.5	3.23	< 40	10	16	10 ¹¹	7.9	0.013	-40°C to +200°C	From 0.8 to 20 mm	Green
8 W/m.K	65 ± 5	8	3.3	< 30	8	14	10 ¹¹	7	0.02	-40°C to +200°C	From 1 to 20 mm	Light Grey
	80 ± 5	8.6	3.02	> 20	11	17	10 ¹¹	8.1	0.014	-40°C to +150°C	From 1.5 to 10 mm	Light Grey
9 W/m.K	80 ± 5	9.1 ± 0.2	3.35	> 20	11	16	10 ¹¹	8	0.010	-40°C to +160°C	From 1 to 20 mm	Grey
10 W/m.K	50 ± 5	10.01 ± 0.2	3.44	> 20	7	6	10 ¹⁰	3	0.006	-40°C to +160°C	From 1 to 20 mm	Light brown

OUR READY-TO-USE SYRINGES

IDEAL FOR FILLING ALL COMPLEX GEOMETRIES

	Methods Tests	GTD 3-70	GTD 5-60
Mono or bi component		Bi component	Bi component
Mixture ratio A/B		1 for 1	1 for 1
Viscosity Part A, Part B, blended		7 000 / 8000 / 7 500 mPa.s	12 000 / 13 000 / 12 500 mPa.s
Working time if the blend product		4 hours	5 hours
Seeting time at 120°C		30 min	40 min
Seeting time at 150°C		15 min	20 min
Product with silicone oil		No	Yes (<1.5% in mass)
Density (g/cm³)	ASTM D 792	2.90 ± 0.02	3.12 ± 0.02
Hardness (Shore 00)	ASTM D 2240	70 ± 5	60 ± 5
Thermal conductivity (W/m.K)	ASTM D 7984	3 ± 0.1	5 ± 0.1
Break resistance (Mpa)	ASTM D 412	0.5	0.5
Elongation at break (Mpa)	ASTM D 412	45	35
Volume resistivity (Ω.cm)		10 ¹⁴	10 ¹⁴
Dielectric strength (kV/mm)		18	16
Working temperature		-45°C to +160°C	-45°C to +160°C
Blended product color		Blue	Green
Shelf life before use		12 months	12 months
Specific packaging		Syringe from 180 to 900 cc	





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