





GETELEC Advanced industry Customized realization Personalized support R&D Laboratory ISO 9001/EN 9100 certifications Expertise Design office

DEDICATED SUPPORT & QUALIFIED EXPERTISE

Listening to your needs is an essential part of our trade policy. The entire design and development of your product is based on trust and working with our customers. This mutual transparency allows us to support you in all points in the development of this one and thus to offer you turnkey solutions for all your projects.

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

Our historical expertise allows you to benefit from expertise recognized and certified by many demanding standards such as ISO 9001, EN 9100, AIRBUS ABD0031 and BOEING FAR25.8523. The trust that major actors such as SAFRAN, AIRBUS and DASSAULT place in us shows our commitment to quality.

A UNIQUE BESPOKE SOLUTION

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

Your most specific requirements are at the heart of our approach. At Getelec, we work closely with you to shape the aeronautics of tomorrow. The synergy between our design office and our R&D laboratory Getelec Lab allows us to design innovative products, specially adapted to the aeronautics industry.

From low-density products to soft-touch finishes and specific developments, our expertise is at your service to meet your most precise needs.

A rigorous **know-how, a passion for innovation** and **an expertise** that anticipates your needs.

About us







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

Getelec designs and manufactures custom solutions for technical sealing, electromagnetic protection (EMC), microwave absorption and heat dissipation. Getelec's products are particularly suitable for the protection of high-tech equipment under severe environmental constraints.

Our technological advance allows us to continuously develop innovative and tailor-made strategic products to meet the complex specifications and the multi-sectoral demand of our customers.

At Getelec, we share your vision for a more sustainable future. That's why we continually rethink our innovations, putting the environment and sustainability at the heart of our developments.

We design our products with a clear vision: to combine state-of-the-art performance with respect for the environment. By integrating bio-sourced and recyclable materials, we are redefining the standards of innovation tomorrow.

Discover our dedicated product range:



CONDUCTIVE ELASTOMERS



ANTI-CORROSIVE BI-MATERIAL SOLUTIONS



ENVIRONMENTAL
SEALING SOLUTIONS &
AIRCRAFT INTERIOR



MICROWAVE ABSORBERS



THERMAL GAP

Performance at the heart of your equipment

At GETELEC we understand the vital importance of uncompromising reliability in the aviation industry. That's why our solutions for embedded electronics are designed to deliver optimal performance even in the most demanding environments and over extended periods of time.

Our electromagnetic compatibility (EMC) control allows seamless integration from the design stage, eliminating any risk of interference and ensuring the optimal operation of each component and module.

Thanks to our expertise in advanced thermal management, we ensure a controlled operating temperature, synonymous with stability, safety and sustainable performance.

NAVIGATION AND CONTROL

Modern aircraft rely on advanced electronic systems to navigate, communicate and anticipate risks. To ensure reliability, every component matters. Our microwave shielding gaskets offer a lightweight, efficient and compact solution, ideal for display systems, control units, antennas and IFF devices.

And because performance tolerates no compromise, we also offer thermal dissipation and technical sealing solutions, designed to withstand the most extreme environments.

AIRCRAFT INTERIOR CABIN

The new generation of on-board multimedia systems (IFEs) used in commercial flights includes many services such as touch screens, audio and video services, internet access and telephone. However, these systems require special treatment in the management of problems related to the emission/reception of electromagnetic interference and in the management of heat dissipation.

Designed for EMC protection, stability, performance and durability, our conductive elastomers ensure your equipment works optimally even in the most demanding environments.

STRUCTURE AND ENGINE

Electromagnetic seals (EMC) built into aircraft structures must meet strict normative requirements for reliability, functional safety and durability in harsh environments (extreme temperatures, humidity, salt spray, vibration).

The concept of corrosion resistance is a subject on which GETELEC responds with a range of bi-material conductive gaskets specifically designed to meet these constraints.

Microwave absorbers

Microwave absorbers integrated on a radar antenna to attenuate the electromagnetic waves on a given frequency.



Our shielded windows provide electromagnetic protection for the front of display screens. They maintain light transmission of up to 90%.

Flight recorders

Nickel graphite conductive gasket

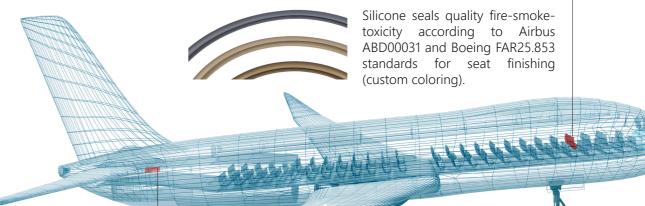
for flight recorders, providing EMC shielding and anti-corrosion protection

in saline environment.



Cockpit solutions

Finished of business and first class seats



Our conductive elastomers ensure the protection of the transmission/ reception equipment against electromagnetic interference.



Electronic module

Our heat sinks stabilize the temperature of components to ensure



optimal performance.





Overmolded on a treated aluminum plate, this silicone stop absorbs shocks when opening the engine hatches.

Sealing o-ring gaskets



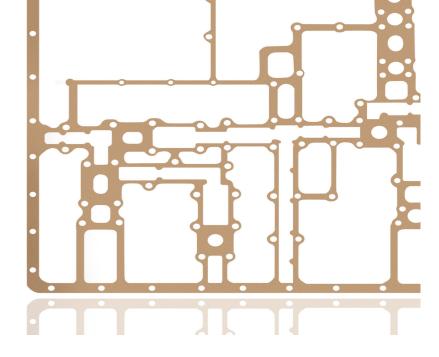
From our wide range of aircraft grade elastomers, these o-rings guarantee an optimal seal for an application in a severe environment.



Our conductive elastomers are developed in every way by our chemical engineers. From the selection of raw materials to the final processing, they produce formulations specific to each application and master all the processes of development. The conductive particles (10 to 40 microns) that form the charge of our conductive mixtures (between 60 and 80% of the charge rate) allow you to acquire optimal EMC shielding.

The three guarantees of our electrically conductive elastomers:

- Electrical continuity performance
- Mechanical performance
- Extreme temperature resistance



Properties Tests	GT 1000	GT 1000 FLEX	GT 5000	GT 5000 FLEX	GT 5007	GT 3100
Type MIL G 83528	Туре К	-	В	-	D	-
Elastomer	Silicone	Silicone	Silicone	Silicone	Fluorosilicone	Silicone
Filler	Silver-plated copper	Silver-plated copper	Silver-plated aluminum	Silver-plated aluminum	Silver-plated aluminum	Nickel Graphite
Volume resistivity (Ω.cm)	< 0.005	< 0.005	< 0.0054	< 0.0040	< 0.0029	< 0.10
Hardness (shore A) [ASTM D 2240]	82	40	65	30 ± 5	71	65
Density (g/cm³) [ASTM D 792 Method A]	3.40	2.67	1.90	1.67	2	2
Break resistance (Mpa) [ASTM D 412 Method AC]	2.80	0.81	1.89	1.02	1.85	1.37
Elongation at break (%) [ASTM D 412 Method AC]	250	250	286	260	260	150
Tear strength (N/mm) [ASTM D 624 C]	13.44	3.89	8.43	2.01	7.36	8.73
Residual deformation after compression 70 hours at 100°C (%) [ASTM D 395 Method B]	17.50	6.3	17.30	10.20	21	40
Continuous operating temperature (°C)	-55°C to +125°C	-55°C to +125°C	-55°C to +160°C	-55°C to +160°C	-55°C to +160°C	-55°C to +150°C
Shielding efficiency: 20MHz 100 MHz 500MHz 2GHz 10GHz	130 dB 140 dB 120 dB 120 dB 120 dB	66 dB 86 dB 100 dB 80 dB 87 dB	118 dB 131 dB 138 dB 132 dB 112 dB	79 dB 90 dB 104 dB 86 dB 106 dB	128 dB 137 dB 133 dB 122 dB 104 dB	100 dB 100 dB 100 dB 100 dB 100 dB
ESA-ECSS-Q-ST-70-02C qualification [TML,RML(<1%) et CVCM (<0.1%)]	Compliant	Compliant	Non-Compliant	Compliant	Non-Compliant	Non-Compliant
Color	Grey / Beige	Grey / Beige	Grey / Beige	Grey / Beige	Blue / Grey	Dark Grey

Find all our conductive materials on our website.

Available format:

Our know-how and our support policy also includes taking into account your constraints and tolerances, which is why all of our solutions can be made to measure according to your specific plans and manufacturing processes within a short time-frame.

OUR CORROSION-RESISTANT ELASTOMERS







Bi-material EMC seals are an effective solution to the corrosion problems encountered when using conductive seals in contact with various electrolytic agents, salt spray and other acidic media. Our solutions are based on a bi-material seal consisting of a conductive part and an insulating part, combined into a single seal by means of a co-extrusion principle. By separating the microwave shielding function from the environmental sealing function, the seal is more resistant to extreme environments, while the life of a single-material seal would be shorter.

Focus on the functions of bi-material gaskets:

Water and pressure resistant, our bi-material seals ensure electromagnetic shielding and optimal sealing of your equipment.

Using a single groove, this solution makes it easier to machine your mechanical parts by optimizing the space requirement.



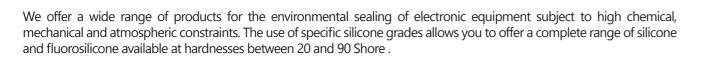
Properties Conductive part	GT 1067	GT 3160	GT 5040	GT 5047	GT 5060	GT 5067		
Elastomer	Fluorosilicone	Silicone	Silicone	Fluorosilicone	Silicone	Fluorosilicone		
Filler	Silver-plated Copper	Nickel Graphite	Silver-plated Aluminum					
Volume resistivity (Ω.cm) [MIL G 83528]	< 0.005	< 0.10		< 0.00	054			
Hardness (shore A ± 7) [ASTM D 2240]	82	65		65	i			
Density (g/cm³) [ASTM D 792 Method A]	3.40	2		1.9	0			
Break resistance (Mpa) [ASTM D 412 Method AC]	2.20	1.37		1.8	9			
Elongation at break (%) [ASTM D 412 Method AC]	250	150		280	6			
Tear strength (kg/cm) [ASTM D 624 C]	13.70	8.9		8.6	0			
Residual deformation after compression 70 hours at 100°C (%) [ASTM D 395 Method B]	17.50	40	17.30					
Shielding efficiency: 20MHz 100 MHz 500MHz 2GHz 10GHz	130 dB 140 dB 120 dB 120 dB 120 dB	100 dB 100 dB 100 dB 100 dB 100 dB		128 137 133 122 104	dB dB dB			
Continuous operating temperature (°C)	-55 to +125	-55 to +150		-55 to	+160			
Color	Beige	Dark grey		Beig	ge			
Properties Insulating part								
Specific mass at 25°C [ASTM D792]	1.27	1.27	1.40	1.43	1.27	1.46		
Hardness (Shore A ±5) [ASTM D 2240]	60	60	40	40	60	60		
Tensile strength Psi Mpa [ASTM D 412]	950 6.55	950 6.55	1000 6.80	1250 8.60	950 6.55	1200 8.30		
Elongation (%) [ASTM D 412]	300	300	500	400	300	300		
Residual deformation after compression 22 hours at 177°C (%) [ASTM D 395 method B]	33	33	30	20	33	25		
Color	Blue	Blue	Orange	Blue	Blue	Light Blue		
Available format		Molded	Extruded Cut /	Adhered by vulcaniza	tion			

Find all our conductive bi-material elastomers on our website.

The advantages of our bi-material elastomers

- Dual IP/EMC protection
- Small footprint
- Customized realization
- Longer life than a single-material gasket





ISO 9001 = AS/EN/JISQ 9100

Aeronautical grade silicone

Our range of elastomers with a hardness of 70 Shore A has been specifically designed to meet applications requiring excellent fire resistance and to comply with **BOEING FAR 25.853 & AIRBUS ABD0031 aeronautical standards.**

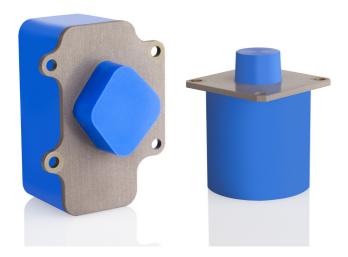
COMPLIANCE WITH AERONAUTICAL STANDARDS

- Low flame propagation
- 2 Low smoke emission
- **3** Low emission of toxic gases

APPLICATIONS

- Finishing of business and first class seats
- 2 Hardened computer
- **3** Electronics and embedded systems
- **4** Electronic control management of brake controls

Properties	Standards - Tests	GT 70 E RF-2	GT 70 M RF-2	GT 70 E RF-4
Density (g/cm³)	ASTM D 792	1.35 ± 0.05	1.35 ± 0.05	1.39
Hardness (shore A)	ASTM D 2240	70 ± 5	70 ± 5	71
Break resistance (MPa)	ASTM D 412	> 6	> 6	8.2
Tear strength (kN/m)	ASTM D 624	> 10	> 10	34.1
Elongation at break (%)	ASTM D 412	> 180	> 180	376
Residual deformation after compression 70 hours at 150 °C (%)	ASTM D 395	< 50	< 50	< 50
Continuous operating temperature		-60°C to +200°C (peak at +230°C)	-60°C to +200°C (peak at +230°C)	-60°c to +200° (peak at 230)
Color	-	On request	On request	On request
Available format			••••	••••
Available format	■ Molded ■ Ex	ctruded Cut	Adherized by vulcar	nization



The quality of our environmental sealing elastomers:

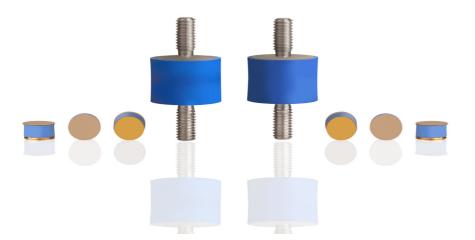
- Flame retardant UL94 HB, V0
- Aeronautical grade silicone
- Low degassing rate
- Soft-touch finish

Properties Tests	GT 21	GT 30	GT 50	GT 60	GT 67	GT 70
Elastomer	Expanded silicone Closed cell	Silicone	Silicone	Silicone	Fluorosilicone	Silicone
Hardness (shore A ± 5) [ASTM D 2240]	20	30	50	60	60	70
Specific mass at 25°C (g/cm³) [ASTM D 792]	0.60	1.11	1.19	1.27	1.46	1.35
Tensile strength Psi MPa [ASTM D 412]	-	980 6.75	980 6.75	950 6.55	1200 8.30	1000 6.89
Elongation (%) [ASTM D 412]	-	850	380	300	300	180
Residual deformation after compression 22 hours at 177°C (%) [ASTM D 395 Method B]	-	20	32	33	25	34
Continuous operating temperature (°C)	-55°C to +200°C (Peak at 250°C)	-73°C to +232°C	-73°C to +232°C	-73°C to +232°C	-60°C to +230°C	-73°C to +232°C
Color	Off-white	White	Red	Blue	Blue	Red

Find all our environmental sealing solutions on our website.

Available format

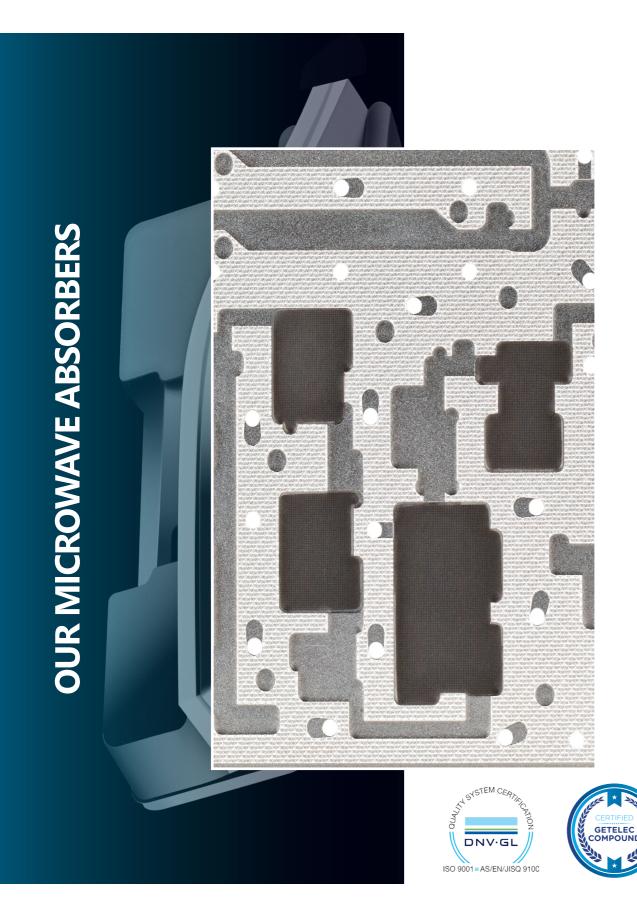
Our know-how and our support policy also includes taking into account your constraints and tolerances, which is why all of our solutions can be made to measure according to your specific plans and manufacturing processes within a short time-frame.



Aeronautical quality formulations

	BUTADIENNE – NITRILE - ACR	YLIC (NBR – Perbunan – Krynac - Hy	vcar)	
Material reference	Standards	Hardness (shore A)	Extreme temperature of use	
20 A5		50		
20A6	NFL17-120 NFL17-120 NFL17-121 NFL17-121 NFL17-123 NFL17-124 FLUOROCARBONS NFL17-160 NFL17-161 SILICONE (VMP – INTERPRETED NO NECONSTRUCT NO NECONST	60	-30°C to +140°C	
20A7	INFL17-120	70	-30 C to +140 C	
20A8		80		
20 B5		50		
20 B6	NEL 17, 100	60	50°C to +120°C	
20 B7	INFL17-120	70	-50°C to +120°C	
20 B8		80		
21 A6	NIEL 17, 101	60	20%C + 140%C	
21 A7	NFL17-121	70	-20°C to+140°C	
21 B4		40		
21 B6	NFL17-121	60	-40°C to +120°C	
21 B8		80		
23 B7	NFL17-123	70	-50°C to +120°C	
24 B7	NFL17-124	70	-50°C to +120°C	
	FLUOROCARBONS	(Viton, Fluorel, Technoflon)		
60 C7	NEI 17-160	75	-20°C to +260°C	
60 C9	NFL17-160	90	-15°C to +260°C	
64 C6	NIFI 17 164	60	-20°C to +260°C	
64 C8	INFL17-104	80	-20 C (0 +260 C	
	FLUOROSILIO	CONE (FMVQ, Silastic)		
61 D6	NIFI 17 161	60	E0°C to 1200°C	
61 D8	NFL17-161	80	-50°C to +200°C	
	SILICONE (VMP – I	PVMQ – Silastic – Rhodorsil)		
50 D5		50		
50 D6	NFL17-150	60	-55°C to +260°C	
50 D7		70		
53 D5	NFL17-153	50	-70°C to +225°C	
	ETHYLENE -	PROPYLENE - EPDM		
41 B8	NFL17-141	80	-55°C to +140°C	
	POLYCHLOR	OPRENE - NEOPRENE		
31 B3		30		
31 B4		40		
31 B5	NICI 17 131	50	40°C + 120°C	
31 B6	NFL1/-131	60	-40°C to +120°C	
31 B7		70		
31 B8		80		

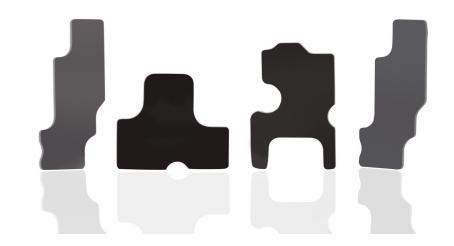
Available format: Molded Cut Sheet Extruded



The main objective of microwave absorbers is to solve problems related to the isolation and absorption of electromagnetic emissions such as cavity resonances in order to preserve the proper functioning of your equipment. Our range of microwave absorbers will allow you to benefit from the best passive components for your technologies. Easily integrated thanks to a tailor-made design and the adhesive option, our absorbers will protect your electronic equipment in the K, Ku and Ka frequency bands, in addition to the L, S, C and X bands.

Overview of our microwave absorbers range:

Formulated in-house by our R&D laboratory Getelec Lab, our range of ESA-standard microwave absorbers will ensure optimum performance of your electrical equipment. With an absorption capacity of more than 20 dB of incidence and a temperature resistance ranging from -160°C to +200°C, our microwave absorbers are compatible with the new generation of electronic equipment.



ATTENUATION GUIDE

Attenuation	Percentage absorbed
- 5 dB	68.38 %
-10 dB	90.00 %
-15 dB	96.84 %
-20 dB	99.00 %
- 40 dB	99.99 %

GETELEC material reference	Thickness (mm)	Resonance frequency
GT602 R90	4.5	1 GHz
GT602 R90	3.2	2 GHz
GT602 R90	2.4	3 GHz
GT602 R90	2.2	4 GHz
GT602 R88	2	5 GHz
GT602 R85	2	6 GHz
GT602 R85	1.8	7 GHz
GT602 R85	1.6	8 GHz
GT602 R85	1.5	9 GHz
GT602 R85	1.3	10 GHz
GT602 R74	1.7	11 GHz
GT602 R71	1.6	12 GHz
GT602 R71	1.5	13 GHz
GT602 R71	1.45	14 GHz
GT602 R71	1.4	15 GHz
GT602 R71	1.3	16 GHz
GT602 R65	1.2	17 GHz
GT602 R65	1.15	18 GHz
GT602 R64	1.1	24 GHz
GT602 R63	0.95	28 GHz
GT602 R62	1.1	35 GHz

Our flexible microwave absorbers :

Our GT602 range of microwave absorbers have narrow-band performance but also high power-density performance (>1 W/cm2) allowing them to be positioned on high-power antennas or equipment. Thanks to its low outgassing properties, our GT602 range is suitable for space applications.



Our rigid microwave absorbers :

Our GT502 products are high-frequency absorbing materials developed by our laboratory. An Epoxy- or polyurethane-based compound with small-diameter carbonyl iron spheres dispersed in a suitable resin, the homogeneity of the mixture is ensured by a complex system developed by Getelec.

Properties	Standards	GT 502
Material		Ероху
Hardness (Shore D)	ASTM D 2240	95
Density (g/cm³)	ASTM D 792 Method A	4.57
Tensile strength (Mpa)	NF EN ISO 527-1	56
Elongation at break (%)	NF EN ISO 527-1	2.4
Operating temperature (°C)		-180 to +200

Find all our microwave absorbers on our website.



GTG Series overview





Fully developed by our R&D laboratory, our complete range of heat sinks brings together more than fifty references divided into five different ranges.

The GTG range: composed of about thirty references ranging from 1W/m.K to 10 W/m.K. Benefit from flexible products that will ensure that all surface roughnesses are taken into account when they are compressed and thus ensure optimal operation of your equipment at 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).

The GTD range: Available in cartridges of 180 to 900 cc, our GTDs are ready to be dropped off.

The GTS range : 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 realization of very small thicknesses

Product range	Hardness (Shore 00)	Thermal conductivity (W/m.K)	Density (g/cm³)	Elongation at break (%)	Dielectric strength (kV/mm)	Breakdown voltage (kV/mm)	Volume resistivity $(\Omega.m)$	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			
GTG 1 W/m.K	From 40 to 85 ± 5	1 à 1.3	2.6	< 200 to 200	5 to 11	17 à 18	1013	4	0.006	-60°C to +200°C	From 0.5 to 20 mm	Grey
GTG 2 W/m.K	From 40 to 85 ± 5	2 to 2.5	2.7 to 2.75	< 100 to 100	14 to 18	16 to 17	10 ¹²	4.2	0.005	-45°C to +200°C	From 0.5 to 20 mm	Blue
GTG 3 W/m.K	From 35 to 85 ± 5	3 to 3.5	2.9 to 2.95	< 100 to 100	11	15	1011	5.5	0.005	-40°C to +200°C	From 0.5 to 20 mm	Light blue
GTG 4 W/m.K	From 40 to 85 ± 5	4	3.09	< 100 to 100	16	18	1011	7	0.008	-40°C to +200°C	From 0.5 to 20 mm	Green
GTG 5 W/m.K	From 40 to 85 ± 5	5	3.12	< 50 to 50	15	18	1011	7.5	0.006	-40°C to +200°C	From 0.5 to 20 mm	Green
GTG 6 W/m.K	From 40 to 85 ± 5	6	3.23	<50 to 50	14	17	1011	8.1	0.007	-40°C to +200°C	From 0.8 to 20 mm	Green
GTG 7 W/m.K	From 35 to 60	7.5	3.23	< 40	10	16	1011	7.9	0.013	-40°C to +200°C	From 0.8 to 20 mm	Green
GTG 8 W/m.K	65 ± 5	8	3.3	< 30	8	14	1011	7	0.02	-40°C to +150°C	From 1 to 20 mm	Light grey
	80 ± 5	8.6	3.02	> 20	11	17	1011	8.1	0.014	-40°C to +150°C	From 1.5 to 20 mm	Light grey
GTG 9 W/m.K	80 ± 5	9.1 ± 0.2	3.35	> 20	11	16	1011	8	0.010	-40°C to +160°C	From 1 to 20 mm	Grey
GTG 10 W/m.K	50 ± 5	10.01 ± 0.2	3.44	> 20	7	6	1010	3	0.006	-40°C to +160°C	From 1 to 20 mm	Light brown

Find all our thermal gap pad solutions on our website.

DISCOVER OUR DEDICATED SOLUTIONS FOR INTERIOR CABIN DESIGN



EQUIPMENT, ARTICLES AND SERVICE ACCESSORIES

Essential to improving the experience, equipment, articles and accessories for service and galleys must be robust, functional and durable. Thanks to our high-end custom-made silicone solutions, combining robustness, functionality and durability with aesthetics.

Luxury redefined by innovation

At GETELEC we understand the vital importance of uncompromising reliability in the aviation industry. That's why our solutions are designed to deliver optimal performance even in the most demanding environments and over long periods of time.

Our expertise in electromagnetic compatibility ensures a rigorous integration from the design stage, eliminating any risk of interference and ensuring the optimal operation of each component and module.

Thanks to advanced thermal management, our technologies maintain an ideal operating temperature, guaranteeing stability and constant performance.

Benefit from a dedicated team of engineers to support you in all stages of your project. Our production plant, based in our premises in Yvelines, is fully equipped with the latest generation machines in order to offer you a unique product quality in a short times.



FINISHING OF EQUIPMENT AND SEATS IN BUSINESS AND FIRST CLASSES

Demand the best for the finishing of your interior designs thanks to our tailor-made solutions adapted to all the equipment located in business and first class. Our products, qualified according to AIRBUS ABD0031 and BOEING FAR25.8523 standards, fully customizable, will enhance your concept and guarantee you a sustainable and high-end result, thanks to our soft-touch anti-scratch finishes and our custom colors treated against yellowing.



MULTIMEDIA & CONNECTED OBJECTS

The new generation of in-flight entertainment systems (IFEs) used in commercial flights includes many services such as touch screens, audio and video services, internet access and telephone. However, these systems require special treatment in the management of problems related to emissions/receptions of electromagnetic interference and in heat dissipation management. Discover all our ranges that address these issues.



