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## Thermal management

### Experts in cooling electronics, prolonging their useful life and optimizing their performance.

The expansion of technology into every aspect of our lives requires proper thermal management of integrated electronic components to achieve higher performance and efficiency. These days, industry, as is the case with the automotive sector, is promoting electronic solutions while abandoning mechanical ones. At Aismalibar, we are experts in cooling electronics. Our goal is to reduce the operating temperature of electronic components, thereby prolonging their useful life and optimizing their performance. Using our materials ensures the quality and reliability of products that incorporate them and even minimizes the use of supplementary fans or heat sinks, thus reducing production costs.



## History

Walter L. Ankli founded Aismalibar in 1934. Soon after, production began on his flagship product, the copper clad wire, eventually making Aismalibar the largest European company in the sector and an international point of reference. More than fifty years ago, in 1958, well before the technological boom, we began producing copper clad laminates for printed circuit boards.

In 1965 Aismalibar opened its copper laminate plant for the production of XPC, FR2 and FR4. In today's completely digitized world, our IMS/CCL metal-based laminates are essential in the electronics industry, where our base materials are integrated into electronic products.

In 2011 Aismalibar became part of Benmayor S.A. The combination of knowledge and structure has enabled us to become the only European manufacturer specializing in thermal clad insulated metal substrate (IMS).

Our laminates provide exceptional thermal management. We are pioneers, highly creative and very competitive.

## The Gabriel Benmayor Group



The company was founded in 1967 by Gabriel Benmayor Lombroso focusing on manufacturing machinery and consumables for the jewelry and watch industry.

Forty-five years of experience as manufacturers of its own products have made the Gabriel Benmayor Group leader in Spain in both sectors. Through an extensive network of distributors it has also expanded abroad: USA, North Africa, the Middle and Far East and the European Union.

In 1969, the company expanded and entered the electronics market in order to serve the European PCB industry. The Group has also made some steps into the solar energy industry, where it has already achieved an important presence.

Also, considering the great synergies that exist between the dental prosthetic laboratories and the jewellery workshops, it used its knowledge and technology of the manufacturing of small and medium jewellery machines and created a Dental Division, approaching this new field with the perspective of an experienced manufacturer.

Finally, at the beginning of 2011 Gabriel Benmayor SA acquired the productive unit of Aismalibar SA and incorporated an important part of its technical personnel. With this corporate acquisition,

Gabriel Benmayor SA consolidates as a leader in the electronic laminate supplies market and becomes the only European manufacturer.

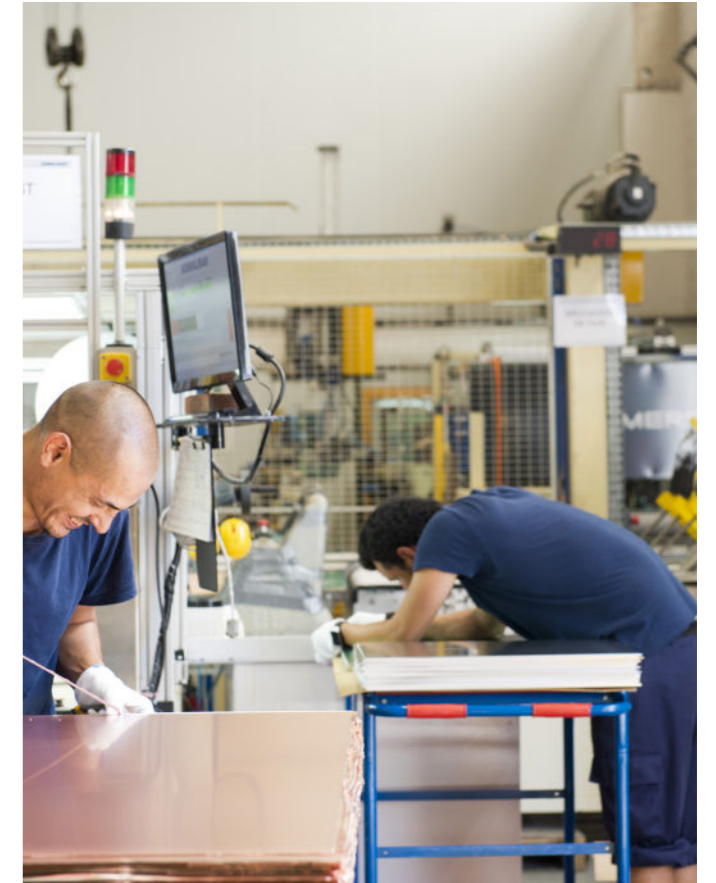
**Our creativity is reflected in the continuous introduction of technological innovations into the global marketplace.**



This acquired commitment by the company is achieved through our own R+D+I, which is fully involved in all manufacturing and marketing processes. To this end, we have a department whose laboratory is fitted out with the latest-generation equipment such as TMA, DSC, TGA, GC, SEM and PSA.

Our creativity is reflected in the continuous introduction of technological innovations into the global marketplace. Aismalibar's involvement in its industrial environment has made it an unquestionable European leader, and some of our products are recognized as such universally. Your needs are our challenges.

Our Moncada i Reixac plant can produce half a million square meters of Cobrithem and almost one million square meters of Thermal Pre Peg while our plant in China has a production capacity of two million square meters of CEM1 Cobrisol. In addition, at Aismalibar we have preserved the modernizing spirit of the company's founder. It is for this reason that our capital investment portion has combined capital flow between the R+D+I department and constant modernization of our production plant.



At our production plant in Barcelona – a strategic technological hub – we develop, manufacture and market the latest advances in laminates for the production of printed circuit boards in order to offer our customers a global and personalized service, guaranteed through our subsidiaries in Germany, China, Taiwan, the United States and Canada.

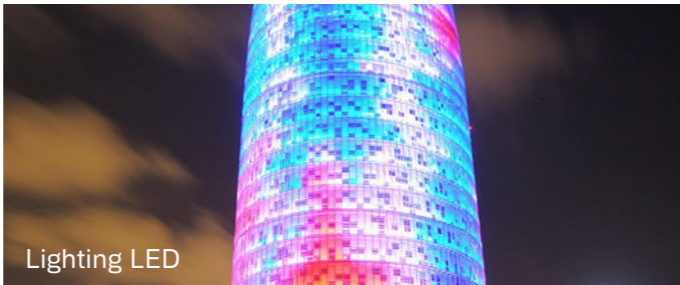
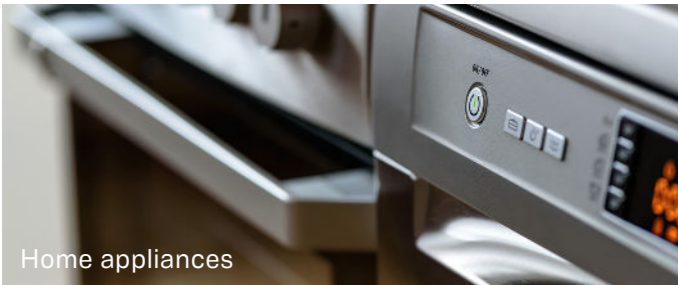
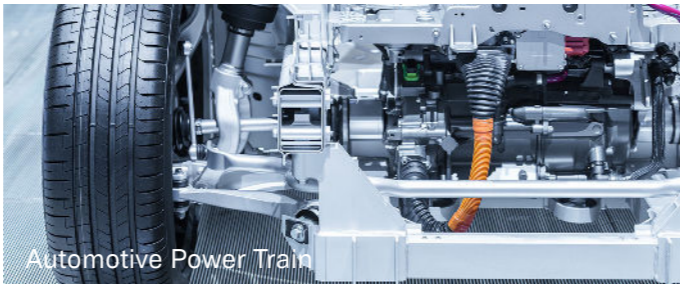
At Aismalibar, engineers and chemists work alongside the sales department developing new proposals for a market in a constant state of evolution.

Our production capacity increases every year, and we tenaciously persevere in the search for the most productive alliances between our customers and government and academic institutions. The innovation cycle at Aismalibar is constant.



Markets

**AISMALIBAR are implemented in many different areas and environments**



The products of a leading manufacturer such as Aismalibar are implemented in many different areas and environments. Aismalibar manufactures its PCB laminates for the electronics sector and its markets: LED lighting, telecommunications, the automotive sector, renewable energies, home appliances, railway transport, aerospace research and energy storage and industrial management.

Powered by Aismalibar

While our customers are companies from different areas and sectors they have one thing in common: the need for top-level thermal management, Powered by Aismalibar. These are some of them:

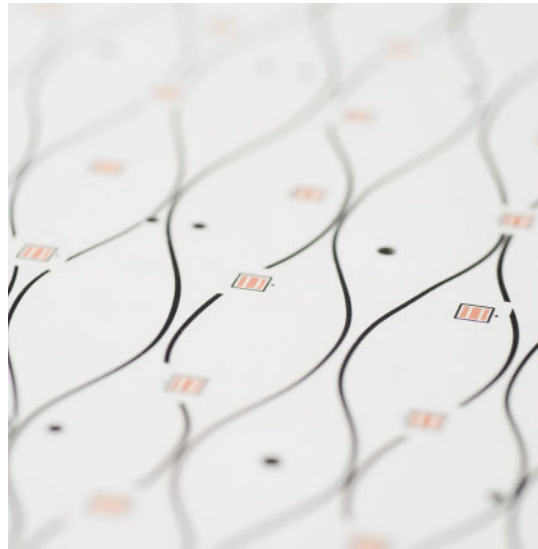


## Products

### AISMALIBAR offers the latest innovations in thermal management for the electronics industry

The objective of the company is to provide you with the best experience through the efficiency of our products, always striving to fully guarantee our business response capacity. At Aismalibar the most popular products are:

#### COBRITHERM



COBRITHERM is a highly thermally conductive Insulated Metal Substrate (IMS) consisting of an aluminum or copper base clad with copper foil on the opposite side. It has an epoxy-based insulation layer with high inorganic content allowing the material to achieve excellent thermal conductivity.

The substrate's goal is to minimize thermal impedance and effectively conduct heat from the electronic components into the metal core.

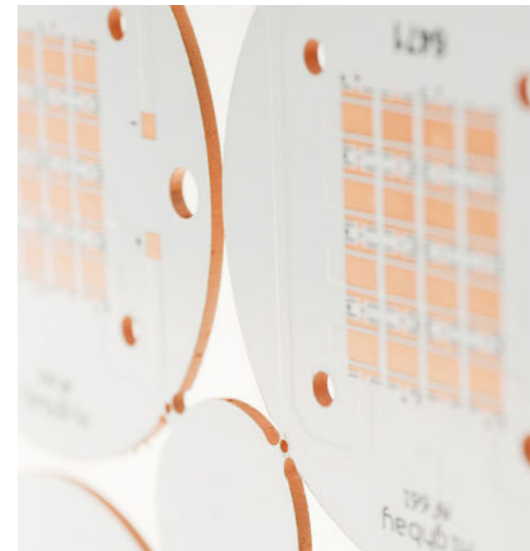
It is a high pressure and temperature substrate which can achieve excellent bonding strengths, much higher than standard thermal adhesives common in the thermal management industry.

#### COBRITHERM ULTRATHIN



COBRITHERM ULTRATHIN is a high thermal conductivity metal clad used for high power applications, AC-DC power converters, motor drivers and high power LEDs > 2W. Demand for higher dissipation rates and higher working temperatures is increasing rapidly. Due to this continued demand AISMALIBAR has developed a new Cobritherm with an innovative ultra-thin dielectric layer that provides higher thermal performance and excellent working temperature. With a thickness of only 35 microns, this new product reduces thermal resistance down to 0.11 Kcm<sup>2</sup>/W (0.017 K in<sup>2</sup>/W), which offers excellent thermal dissipation conditions for high power LEDs assembly.

#### FASTHERM



FASTHERM is a new technology developed by AISMALIBAR to achieve a faster thermal transition from the LED thermal pad into the heat sink. The aluminum layer possesses diffusive properties while the copper layer has a very thin dielectric for improving horizontal thermal dissipation. The bimetal also allows for solderability in surface mounting applications.

#### FLEXTHERM



FLEXTHERM is a high technology thermal insulated metal substrate, also known as a metal core copper clad laminate, for use in the production of conformable metal printed circuit boards. Its low thermal impedance allows the dissipation of temperature from the heating elements of a PCB into FLEXTHERM's metal core at an extremely efficient rate.

#### MULTILAYER



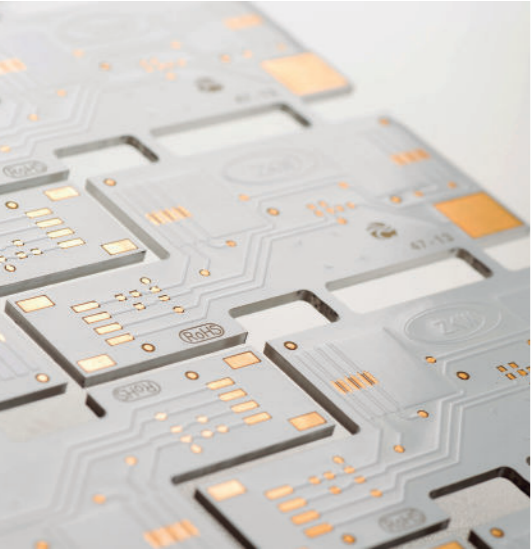
Multilayer PCBs are often requested in the case of complex boards with denser circuitry. This combination of multiple layers allows better functions and connections. AISMALIBAR offers different substrates that can be combined to offer unique solutions tailored to your electronic designs. AISMALIBAR offers a range of multi-layer products that can be combined to customize solutions for your electronic designs and applications. Some complex boards with denser circuitry need the combination of multiple layers to assure reliable and effective heat dissipation.

BOND SHEET, THIN LAM and AL PRIMER can be used in standard multilayer lamination processes to improve: resistance to thermal shocks, high thermal conductivity and high thermal dissipation.

Products

New products 2018

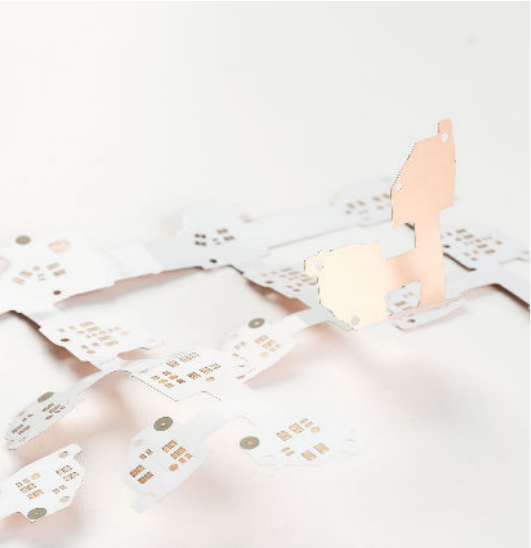
COBRITHERM ULTRATHIN 4W Tg180°C 150°C MOT



COBRITHERM ULTRA THIN 4W was developed to achieve high thermal conductivity, a Tg of 180°C by TMA and an 150°C MOT. The Ultra Thin 4W CTE Z axis is under 1.8% from 50 to 250°C.

Industry leading Thermal conductivity, strong MOT values, High Tg and Low CTE are the key elements for performance of MPCBs operating at high temperatures. AISMALIBAR ULTRA THIN 4W will be available for mass production beginning in November 2018.

THERMAL MULTILAYER



As thermal management becomes more challenging on multilayer PCBs, AISMALIBAR has developed a new technology capable of significantly reducing the operating temperature of the PCBA.

The new COBRITHERM 3.2W THIN LAM and BOND SHEETS have been developed to reduce thermal resistance on multilayer PCBs. The 150°C MOT, high Tg value (180°C), 3.2W thermal conductivity and Low CTE value under 1.8% (50 to 250°C) enhances the overall thermal performance. COBRITHERM 3.2W THIN LAM and BOND SHEETS will be available for all types of multilayer constructions and can be clad to standard FR4 or solid metal cores.

Certifications

Aismalibar and its mother company, Gabriel Benmayor, have received certifications which prove the high quality of its products and manufacturing processes:

**UL Approved QMTS2 QMTS8** File: E47820 IPC-4101

**RoHS 3 / REACH** Last updated compliance directive

**IATF 16949:2016** Design and manufacture of laminates for printed circuits and Policy making, Human resources, Information technologies

**ISO/TS 16949:2009** Certification for all of its insulated metal substrates products. This certificate guarantees the quality of the design and manufacture of the company's laminate for printed circuits boards.

This is an important step for the company as it continues to expand its technology capabilities, especially when it comes to thermal management solutions. Aismalibar's plant has been investing in thermal management technologies and also in its family of high thermal interface materials in order to meet its customers' demands.

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