



INTI

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Argentine technology and innovation



SUSTAINABLE MOBILITY



INSTITUTIONAL RELATIONS AND COMMUNICATIONS OPERATIONAL MANAGEMENT

Institutional Relations Deputy Management



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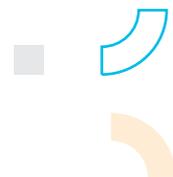
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Editorial



INTI is a noble institution with more than 65 years of experience; created to assist the national industry, it was born with the creation of technological centers aimed at traditional sectors.

However, the world is dynamic, ergo, so is INTI. We accompany the industry in strengthening the trust of its clients and in itself, in its processes, its personnel and even in other cultures.

In that sense, we adapt tests to adjust to new regulations and new vehicles, we work side by side with manufacturers in the innovation of more sustainable materials; we accompany Argentine companies with new forms of mobility, which adjust to current requirements and we apply those that reinforce passenger safety. The notes that follow are a sample of what we do. And this is only in the area of mobility.

Mobility is today a concept that opens a door of opportunities to various industries, which generate a contribution of knowledge and that knowledge is put at the service of the person: in this case of movement to meet someone else or something. And, in addition, it must not only be safe but also must minimize the impact on the environment.

INTI has projects in biofuels, taking advantage of the available biomass, and studies its performance in different engines, in the use of drones for industrial applications and in inspection techniques, in techniques for converting cars to electric motors, in different forms of micro mobility, in the development, performance, second life and disposal of lithium batteries and the new way of energizing, hydrogen.

In all these aspects, INTI stands out: for its role as a public institution, for its approach to the industry through its executive committees, for having a Certification Body and being the National Metrology Institute. It has the recognition of institutions from other parts of the world that, like us, generate and transfer technologies searching a better quality of life.

Proud to be part of INTI.

Eng. Liliana Molina Tirado

**Deputy Manager of Energy and Mobility
Technological Development and Innovation Management**



RFG GROUP S.R.L.



Customized and more resistant synthetic railway sleepers



In a global context where sustainability and environmental care are fundamental axes for the productive sector, the circular economy has become a tool to minimize the negative impact of economic activity on the planet. More and more companies are joining this trend, seeking to modify their production processes to reduce, reuse and recycle resources, betting on a more sustainable model.

In this scenario, in Argentina the work of RFG Group S.R.L., known by its commercial name **Circularis, stands out: the only company in the country that produces railway sleepers from recycled plastic and tires.** This innovative product not only contributes to the reduction of waste, but also significantly improves the quality of the tracks, and reduces the carbon footprint of railways. This company is an example of how the circular economy can generate positive impacts, both on the environment and the economy.



For every million recycled plastic sleepers placed, 90,000 tons of plastic are prevented from being deposited in landfills.

Source: Union Pacific – Building

In Argentina, the percentage of waste recovery is still very low. In this case, the company located in the city of Córdoba establishes agreements with SMEs (Small and medium enterprises) in the region to obtain their waste while promoting dissemination campaigns and the installation of recovery islands for the general population.

When the plastic waste reaches the plant, it is classified into tires, polyethylenes and propylenes, which are then mixed in different proportions. Depending on the characteristics of the material - which can be rigid or flexible - it is ground, washed and introduced into the mixture for its plasticization process and, finally, the plastic is cast into the molds and the sleeper is formed.

Circularis developed this product with the support of INTI. Julio Sánchez, member of the Materials department at the INTI Center in Córdoba, explains that two important interventions were carried out in the work requested by the company. The first stage consisted of the development of the plastic sleeper, for which work was done on fine-tuning the manufacturing process. Then a control instance was carried out, in which compliance tests with the specifications required by the IRAM 1610 Standard were carried out, to obtain approval from the National Center for Railway Development and Innovation (CENADIF).

For his part, the company's managing partner, Franco Frola, highlights Circularis' unique ability to produce synthetic sleepers tailored to each user. In this sense, he explains that "since in Argentina there are three types of tracks and an important variety of sleepers, this production system allows us to manufacture synthetic sleepers with the measurements that each railway operator requests".

"For the company, INTI was the technical support that we didn't know we could have available and that allowed us to achieve the project throughout its development process, in the search for solutions to the challenges, of a new product, unique in the country. In addition, it helped us obtain the information to develop alternatives with high added value for our users", adds Franco Frola.

The synthetic sleeper is relatively more expensive than the conventional wooden one, but when the replacement is analyzed for the next 50 years, the synthetic one is renewed only once while the quebracho one requires an average of 3 changes, in addition to the complexity to achieve it and the high cost of labor.



Another important benefit of the new sleepers is their resistance to climatic changes (cold, heat, humidity), and to organic agents such as, for example, insects and fungi, among others, which don't affect their composition.

“We are interested in expanding our reach in the Latin American market, because we want to contribute to developing the region’s rail transportation system as well as installing in each country a plastic recovery system that allows us to reduce landfills and landfills open sky. We not only sell the sleepers, also seek the growth of recycling in each of the destinations where they are installed”, emphasizes the head of the company.

**RFG GROUP S.R.L.****Montecristo, Córdoba**

Manufacture of synthetic sleepers.

-Production plant: 6,000 m²

Annual productive capacity 20,000. Currently with investments to project 40,000

• HS CODE (NCM):

-3926.90.90 PA / Others



CORADIR S.A.



Innovative electric mobility available to everyone



The transition towards electric mobility is a growing global trend, with vehicles with increasing evolution, autonomy and practicality. In a scenario where many countries encourage its use and invest in infrastructure, the Argentine company Coradir S.A. is making a difference in the region.

The firm Coradir S.A. stands out for the manufacture of two innovative models of electric mobility: the “Tito” car, a vehicle designed for efficient and sustainable urban transportation; and the “Tita” truck, a light utility vehicle that offers an economical and sustainable solution for workers in different industries.

With these models, Coradir positions itself as a leader in the region to produce electric vehicles, thus contributing to the mitigation of climate change and promoting a healthier urban lifestyle.

Tito is the best-selling electric car in Argentina because it represents a solution for mobility in cities and is 40 times more economical than combustion cars. It has all the equipment of a standard car: remote control, screen, Bluetooth, and lithium ferro phosphate battery with a minimum durability of 2,000 charge cycles (5 to 8 years). In addition, it has a steel chassis and a sheet metal body, a highly sought-after appearance in Latin American markets, and it connects to the “Contactito” cloud from which the loading and geopositioning of the vehicle can be monitored.



On the other hand, the 100% electric Tita van represents the trend in its field because, in addition to having the same features as the previous model, it offers an important solution both economically and at work for companies.

The president of the firm, Juan Manuel Baretto, adds: “the models can be configured and customized according to the needs of each client from the company’s website. You can choose, for example, between a single or double cabin, for two or four people; charging box or extended battery of up to 300 km in 8 hours of charging, among other possibilities”.

The company approached INTI to obtain the Model Configuration License (LCM), a document granted by the Secretary of Industry and Productive Development based on a technical report prepared by the Institute based on different aspects of the vehicle. Regarding this process, Diego Marino, head of the Development Department for the Mobility Industry at INTI, points out that the first requirement is compliance with the safety requirements established by the regulations of the regulatory decrees of the Traffic Law. “Beyond this assistance, we maintain a close working relationship with the company that aims to strengthen the sustainable mobility sector in the country and the region”, says Marino.

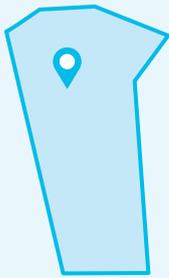
To facilitate access to electric vehicles, the company offers attractive prices and financial strategies, such as financing and leasing programs. **User experience includes customer support services such as remote software updates and cloud connection; features that improve driver comfort and convenience.**

On the other hand, the charging network is one of the biggest challenges for the development of electromobility worldwide, and at CORADIR all its mobility is manufactured in a way that is compatible with the home electrical network.

“In South and Central America, there is no local production of vehicles like our models, for this reason we find a significant demand not only for the product but also for the infrastructure for its manufacturing. In this sense, we have an excellent industrial model available to replicate in all countries in the region and satisfy the local production of electric cars in the L7 category through workshops abroad, with technology transfer and adequate technical and mechanical support”, Baretto declares.



In this sense, the company implements a development program for a network of approved workshops, through which technology, training and other service tools are transferred to ensure the proper functioning and service of its customers.



CORADIR S.A.

San Luis, San Luis

Electric mobility manufacturers.

-Production plants: 2 in San Luis, 1 of 5,000 m² and another of 3,000 m², In Buenos Aires 2,200 m², in Ushuaia 1,250 m².

-ISO 9001 and ISO 14001

-Certification Annual productive capacity: 750 units

• HS CODE (NCM):

-8703.80.00.900H / Tito

-8704.90.00.910U / Tita



MASTER BUS S.A.



Safety technology in medium and long distance transportation

Concepts such as telemetry, on-board tracking, route system with navigation, predictive arrival, blockchain and dynamic routes, among others, are expressions that until recently were not recognized and that are related to transportation safety and accident prevention in the routes, through new technological developments that are considered essential today. **In Argentina, the company Master Bus S.A. manufactures devices for the control of medium and long distance transport, which provide real-time information on fleets en route.** This is possible through certain sensors that communicate, for example, the driving behavior of drivers, or alerts of technical and mechanical failures that allow accidents to be prevented and offer hundreds of other applications.

The specialist Alex Lozano, in charge of the Technical Directorate of Micro and Nanotechnologies of the institute, explains that the company Master Bus approached the INTI (National Institute of Industrial Technology), after having learned of a development carried out by its team of work, called INTI Vehicle Analysis Device (DAVI). It is a system for cars and other transport vehicles with multiple applications that, through the use of its own sensors and the vehicle itself, collects information and sends it in real time to a cloud application, thus allowing it to monitor its journey and



the vehicle condition in order to improve efficiency, anticipate technical failures and prevent accidents. In short, this device works similar to that of the “black box” of an airplane.

Unlike other commercial devices, this development has the particularity of having a direct connection to the on-board computer. This allows information from all the vehicle's sensors to be collected, through the standard OBDII connector that newer vehicles have. The DAVI adds to this information process the Global Positioning System (GPS), accelerometer, memory and connectivity through a cellular telephone network in order to store and transmit variables in real time and display them in the cloud for the control of vehicles in route, its route, compliance with traffic regulations, fuel consumption and the driver's driving behavior, among other variables that aim to prevent accidents. Based on the information collected, the DAVI can send an alarm signal in the case of an incident and then initiate the necessary actions to address it.

Its original design was developed for light vehicles, so the device had to be small and versatile, adaptable to the standard OBDII connector of any vehicle on the market. In the case of Master Bus, to adapt it to its passenger transports which have more space, the device was placed in a larger box with more functionalities, by adding other modules, also allowing greater versatility in changes. future technologies.

As mentioned previously, this development adapted to heavy vehicles allows a direct connection to the on-board computer network, from which the indicators that until now were derived by traditional GPS are obtained. This information is protected by methods such as blockchain, which constitutes a true paradigm shift by remotely obtaining all the information that can be consulted without the possibility of manipulation by the transportation authority, clients, or insurance companies, among other interested parties.

“The DAVI BOX is the only device of its kind completely designed and manufactured in the country thanks to the advice of INTI. Having this technology allows us to complement the transportation service with an enormous competitive advantage over our competitors”, says Mario Boitier, general manager of the company, and adds: “the success was such that we decided to organize a technology company dedicated to marketing the product and develop different customized solutions, which, due to their low cost, can be used by a large number of companies in Latin America”.

In addition, **the entrepreneur highlights the importance of working together with INTI that allowed them, in addition to knowing the status of their bus fleet on the routes in real time, to develop the DAVI BOX and begin to produce, assemble, and fully assemble it in Argentina.**





Regarding the transfer of this technology, the reference in Nanotechnology, Alex Lozano, points out: “The novelty of DAVI is that it is a basic platform that adapts to the requirements of each SME. In addition, it is transferred to the company with all the information so that it can continue advancing in its development, updating and customization, based on the hardware developed at INTI, and incorporate new functionalities to its service platform. This marks a difference compared to the canned options available on the market”.

Master Bus - which already has ISO 9000 Quality Management, 39000 Road Safety and 14000 Environment certificates - is currently working to enter the Latin American markets with the DAVI device.

“We have experience in the use of this unique platform in the country, which is increasingly in demand due to the data it collects in real time, which contributes to safety in both transportation and cities and routes. It is a versatile control tool that adapts to the client’s needs. Being part of a company with constant technological innovation gives us unique attributes that are difficult to match in the country”, concludes Boitier.



MASTER BUS S.A.

Zárate, Buenos Aires

Safety technology in medium and long-distance transportation.

- Annual production capacity: 10,000 DAVI BOX devices
- Production plant: 5 ha

• HS CODE (NCM):

-8526.91.00.100Z / DAVI BOX device with firmware to obtain parameters issued by the Can Network of heavy vehicles; trucks, buses, road machines, etc.



CICARÉ S.A.



Pioneer manufacturer of ultralight helicopters



Ultralight helicopters have gained popularity in recent years for their versatility and ease of use. Within this market, the Argentine company Cicaré S.A. has stood out as a leader in the manufacture and sale of this equipment.

Considered one of the pioneers in the ultralight helicopter industry, the company was founded by Augusto Cicaré, known as the father of aviation in this segment, who revolutionized the way in which this equipment is designed and manufactured, with innovative and high-quality models. With more than 60 years of experience in the field, Cicaré has become a global benchmark and has managed to position itself as a renowned company in the aerospace industry.

To enter the certified market in Germany, the company had to comply with demanding regulations requested by the German Ultralight Flight Association (DULV). To this end, the company requested the carrying out of tests established in Standard 995221, which is required by the DULV to export helicopters of the ULH Ultralight category to that destination. The specialist of the Non-Destructive Testing Laboratory of the INTI Mechanics Department, Alejandro Ferenz, details that the Institute's work consisted of adapting the equipment to comply with the test required according to mentioned standard.

This practice simulates an emergency landing or a fall from a set height, for which the seats were gradually loaded to a maximum load and the corresponding measurements were made. With the results obtained, the company continued with the certification. mediciones correspondientes. Con los resultados obtenidos la empresa continuó con la certificación.



The global ultralight and light aircraft market is expected to reach an estimated \$21.3 billion by 2030, with a CAGR of 13.6% between 2024 and 2030.

Source: Forefront Media News

Its products include the single-seater Cicaré 7, the two-seater Cicaré 8 and the SVH4 flight trainer, which has a full invention patent and is a unique training device in the world.

The Single-seat Cicaré 7 is an ultralight single and two-seat tandem helicopter for sports use, powered by Rotax 912 and 914. The morphology of the cabin is of pure shapes and high aerodynamic efficiency.

The Cicaré 8, ultralight, two-seater side by side, is the most powerful in its segment. It is characterized by being maneuverable and efficient, with engine alternatives that make it an extremely agile helicopter. Its semi-rigid rotor allows sharp maneuvers at very low vibrations even at maximum power.

It is worth mentioning that the Direction Generale de Aviation Civile (DGAC) of France granted the ULM (Ultralight Machine) class 6 certificate for both the Cicaré 7 and the Cicaré 8.

“Very few companies in the world manufacture this category of aircraft. We are the only one in Latin America that design, develop and produce this type of helicopters. Regarding direct competition, the great difference is having achieved the DULV certification”, says Juan Manuel Cicaré.

The Cicaré Trainer SVH3 is a captive helicopter on a mobile platform, which allows all movements to be carried out with total control and safety. A compressed air system with pneumatic cylinders allows the ascent and descent of the aircraft, grading the difficulty in learning.



It has a low operating cost, simplicity of maintenance and is safe. More than 20 years operating in Argentina, Chile, Brazil, the United States, Australia, Asia, Europe, and the Middle East prove it.

On the other hand, the Federal Aviation Administration of the United States, like the National Civil Aviation Agency (ANAC) of Argentina, granted the device the recognition of 10 hours compared to the 40 hours required by the official course to be a helicopter pilot.

“Achieving DULV certification constitutes a precedent, since it’s the first time that this association certifies an aircraft in the 600 kilo category”, highlights the head of the company, Juan Manuel Cicaré. “With the support of INTI and other local institutions, we were able to meet the requirements to obtain the certification that today makes us unique in the world in a position to be recognized in this case by Germany and know that we meet the requirements to advance in new markets. external. We export more than a product, we export our technology, innovation, and technical capabilities. **There are very few companies like Cicaré, with more than 60 years of experience, something highly valued in aeronautics as a seal of quality and seriousness. In the world, it is an already established brand**”, reflects the president of the company.

The company has significant export experience to all five continents. Today it focuses on the civil market in Germany and the United States.



CICARE S.A.

Saladillo, Buenos Aires

Design, development and production of helicopters.

-Annual productive capacity: 12 units.

• HS CODE (NCM):

-8802.11.00.000K / Aircraft with an empty weight less than or equal to 2,000 KG.

Single-seat Cicaré 7B and two-seat Cicaré 7T and C8 helicopters

-8803.10.00.000R / Propellers, rotors and parts. Parts or spare parts of these helicopters: P.A.

-8805.29.00.100F / Ground flight training apparatus and parts thereof. SVH-4

Flight Trainer: P.A.





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E-mail: boletin_pymesexportan@inti.gov.ar

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