





We are not just about work.

For us this is a passion we cultivate day by day. Each project gives us the awareness of having created something that did not exist before, and will testify to the fact that we did.

Massimo Gaido C.E.O. SAET srl





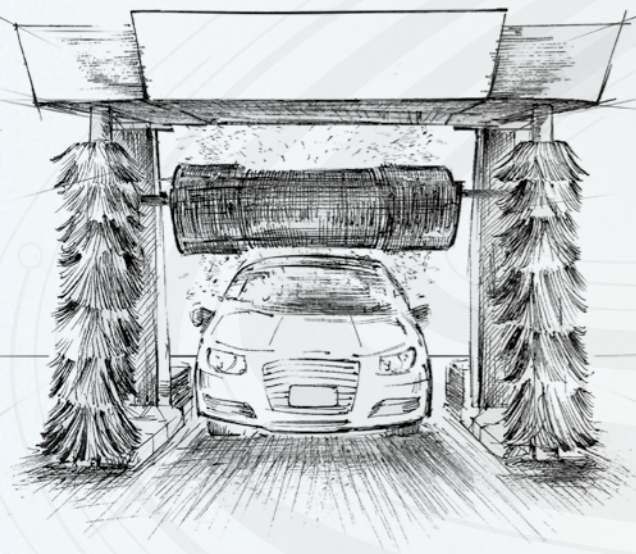
Every object that lives our daily lives beneath its surface has a technological engine capable of bringing it to life.

The generations before us have seen metal hearts with cores and bodies of heavy steel. Today we touch objects that are increasingly lightweight and ergonomically shaped, but with enormously more power than in the past. Functionality, practicality and design are the prerequisites for every new product that has to come onto the market. Reliable, flexible, powerful, economical and versatile is its technological driving force.

We listen, propose and together with our Customers create a technological heart capable of providing the safe and effective answer to your needs.

The solutions we adopt are aimed at achieving your objectives through careful planning of material and production costs, meeting specifications, and improving the performance and competitiveness of your products on the market.

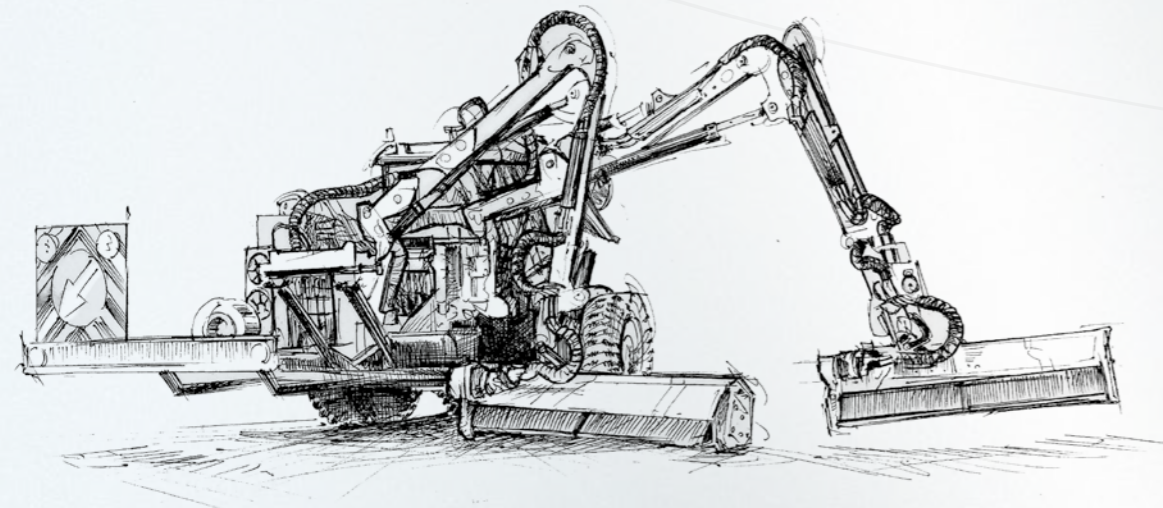
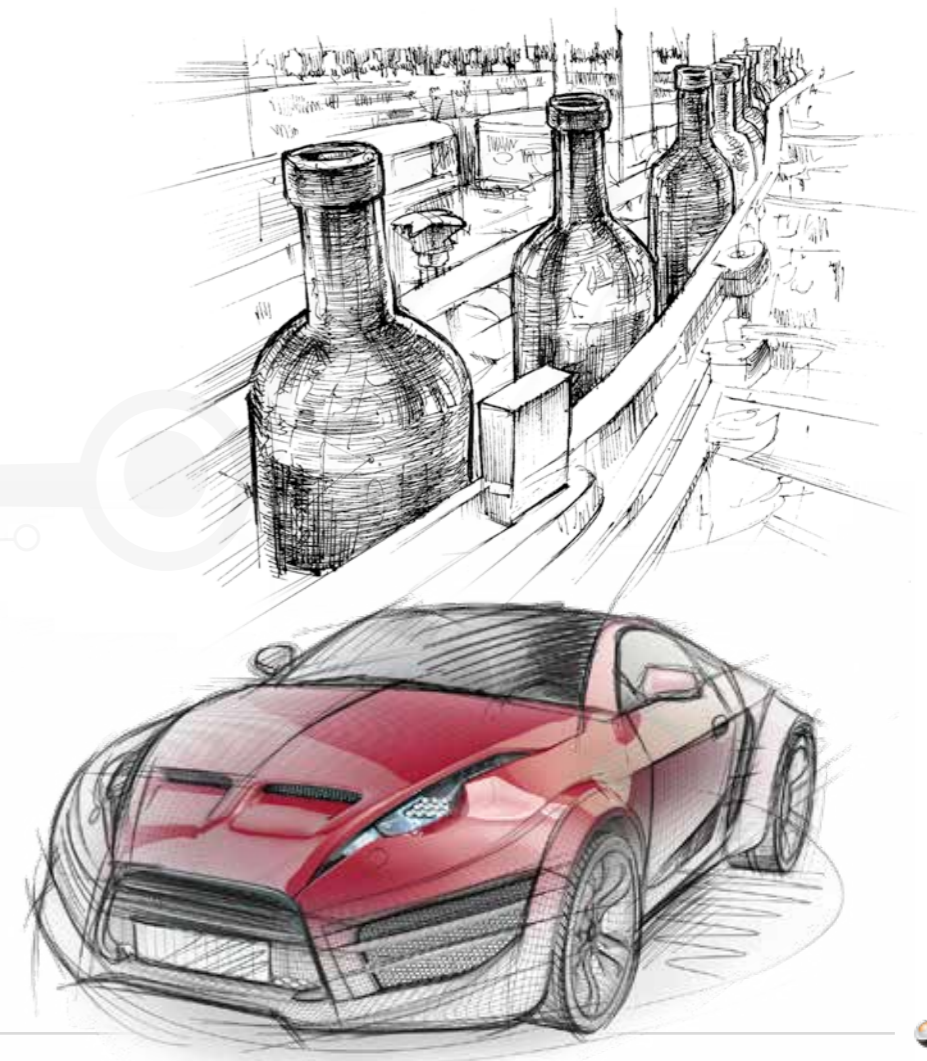
Discover with us how to bring the most innovative, reliable and cost-effective science to the heart of your products and reap all the benefits that new technologies make available to those who know them and apply them effectively.



The SAET world is everywhere your gaze may rest.

For example, what do a car, a production plant, a vending machine or a car wash have in common?

Simple, our electronics, our wiring, in other words our technology.





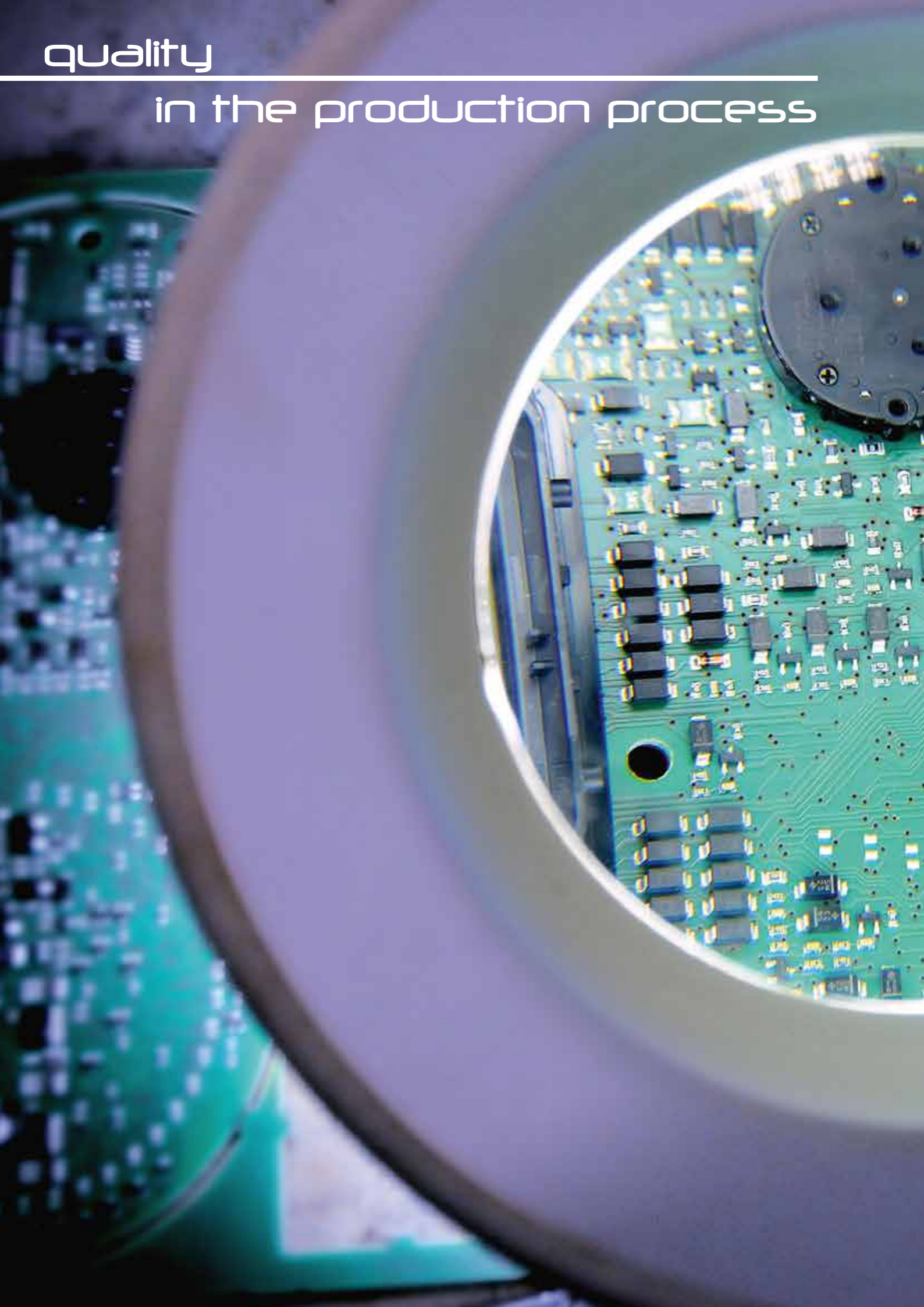
SAET was founded in 1990 as a company for the design of electronic systems, hardware and software. The combination of many years' experience in the industrial automation and automotive sectors and highly specialised personnel soon led the company's activities to focus on the development of custom microcontroller and microprocessor systems.



More than twenty years of activity and continuous growth supported by the trust placed in it by customers have given SAET the experience and competence required to develop projects of considerable complexity with high technological content.

Elasticity, dynamism, reliability and fast project development times now distinguish us, allowing us to analyse, propose and apply the most advantageous technologies in terms of cost and performance, positioning us as a preferential partner of major companies of all sizes operating in the most diverse sectors, industrial, civil, medical and the very strict automotive.





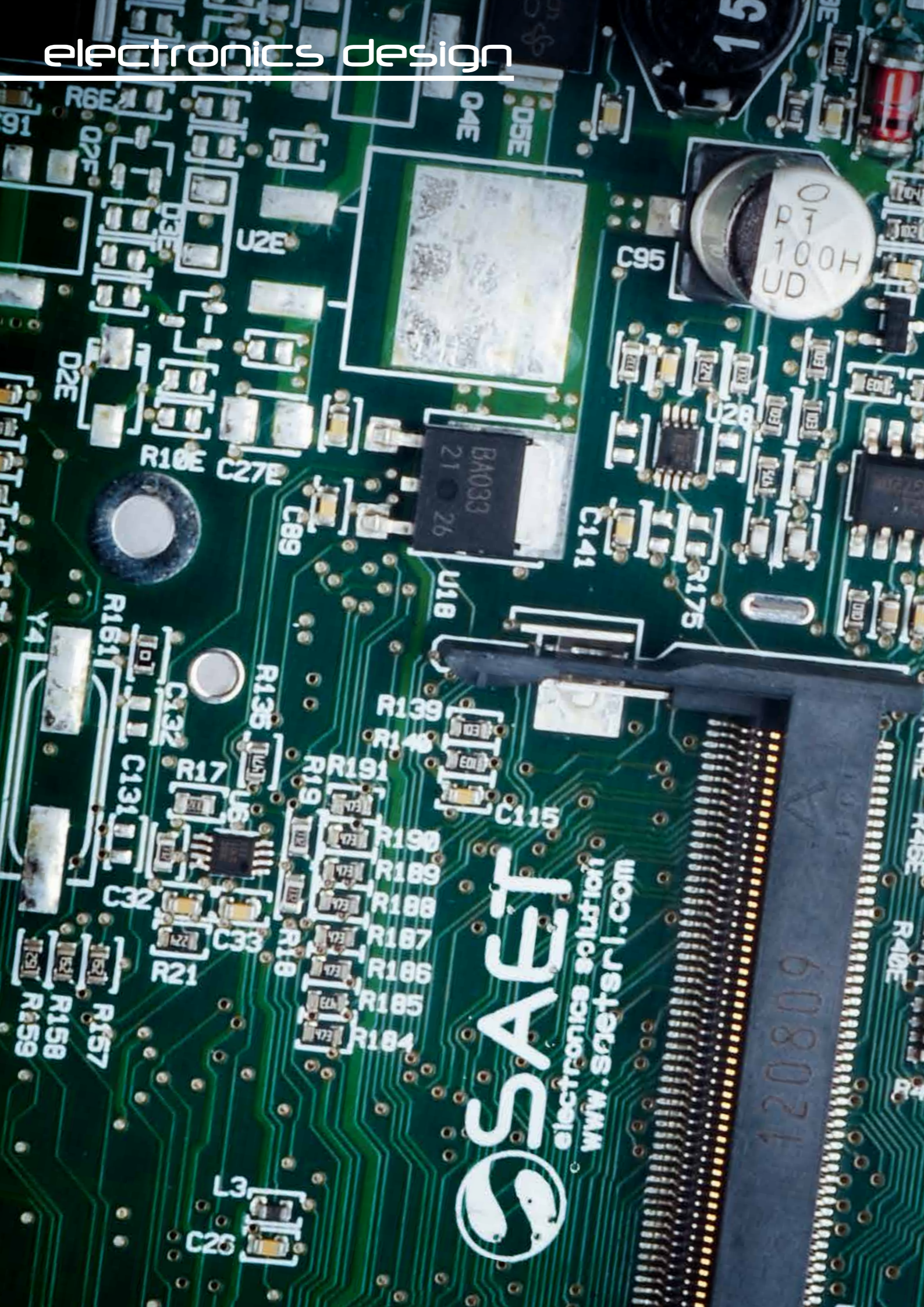
QUALITY first and foremost



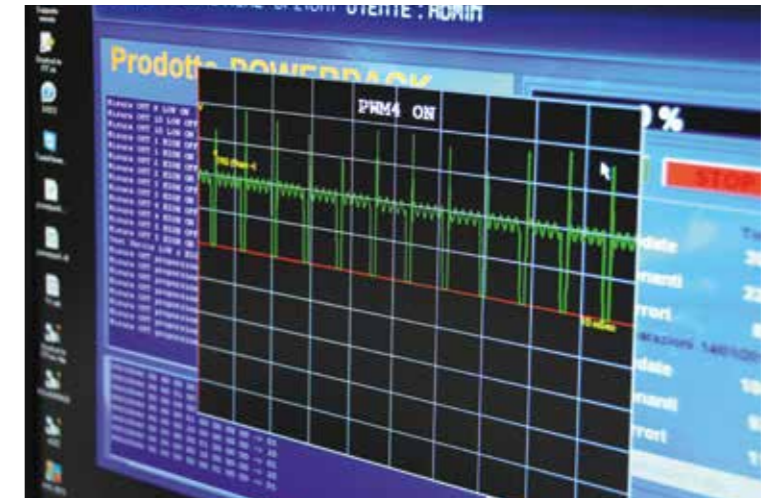
Our quality system has been certified according to UNI EN ISO 9001 since 2009. But our desire for professional growth is continuous and always pushes us towards new challenges.

In fact, we have recently started procedures to obtain two new certifications, the environmental certification according to ISO EN14000 and the safety at work certification according to ISO EN45001. Particular attention is paid to the continuous training of all our employees by means of refresher courses held by teachers both inside and outside the company.





HARDWARE design



We take care of all hardware design phases down to the smallest detail and our technicians carry them rigorously out in our laboratories.

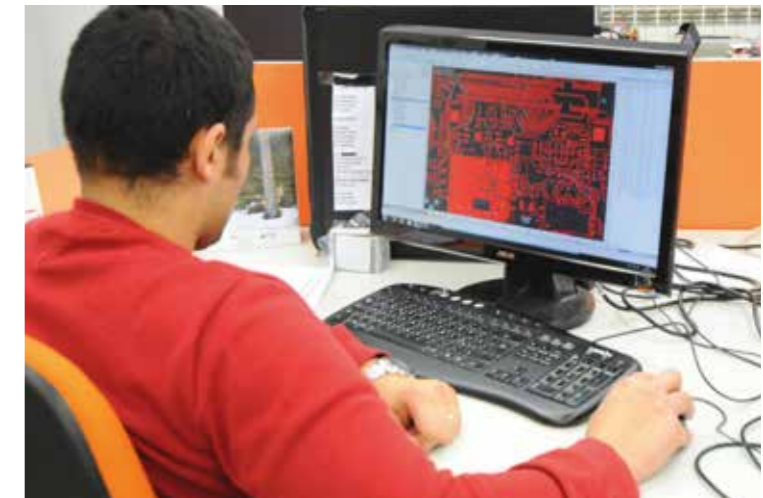
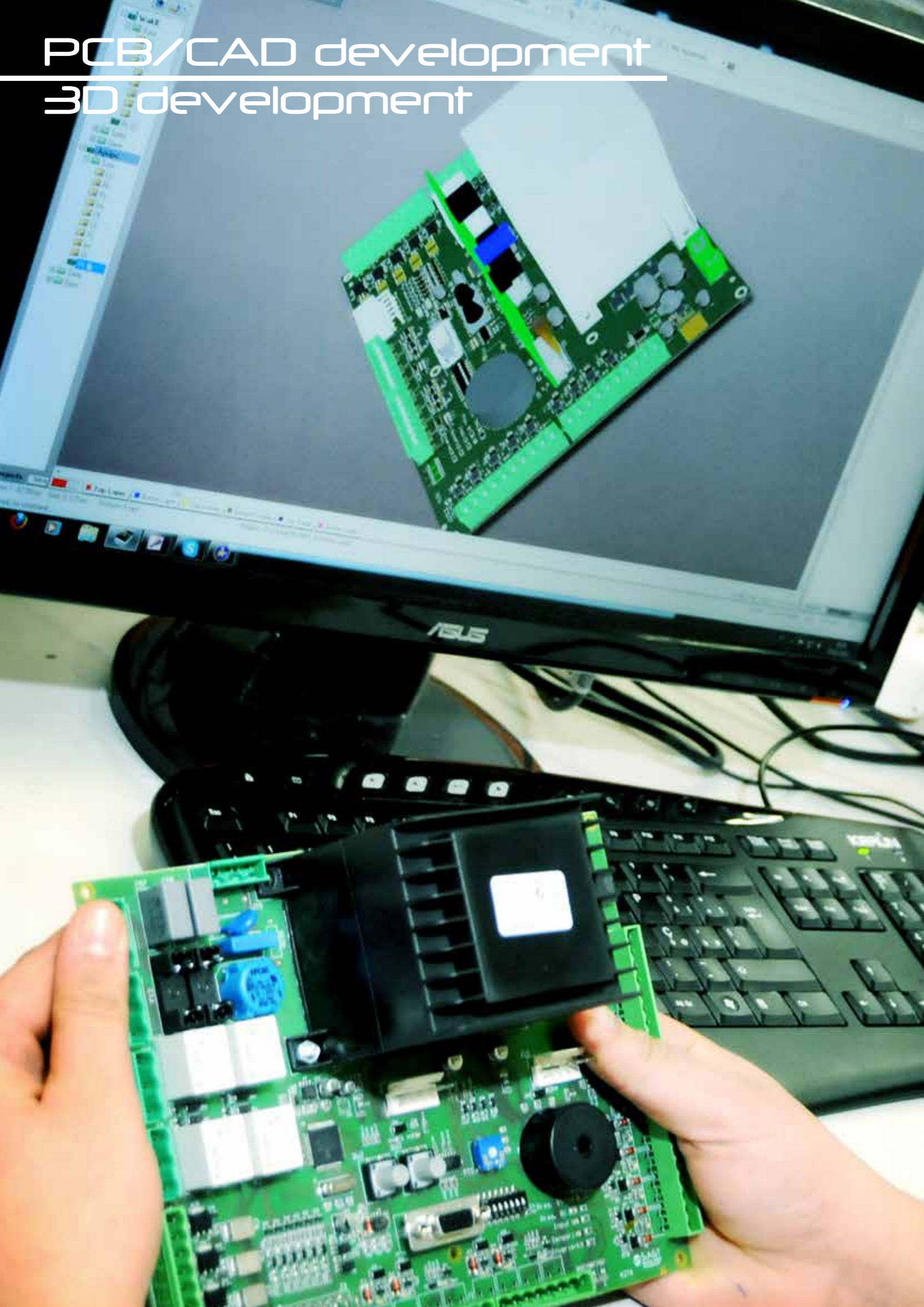
From the drafting of specification documents, drawn up in collaboration with the customer, to the validation of field tests, you will be followed step by step by our staff. In addition to the specifications, the reference standards to be applied, the environmental working conditions and the peculiarities of the application field of the device to be realised will be shared.

Using the most modern design and simulation tools, we offer microcontroller and microprocessor solutions, from the small 8-bit single chip to the most powerful

32-bit multicore. Our hardware expertise is particularly broad, but in addition to digital applications, we can also address projects involving power devices such as DC/AC drives, RF data transmission systems, GPRS-LTE modems, GPS systems, as well as particularly complex distributed I/O systems with Can, IsoBus, Ethernet and Profibus networks.

A modern, well-equipped laboratory supports designers for preliminary tests concerning electromagnetic compatibility and climatic conditions as well as validation tests that can be performed with automatic or semi-automatic equipment.





PCB/CAD and 3D development

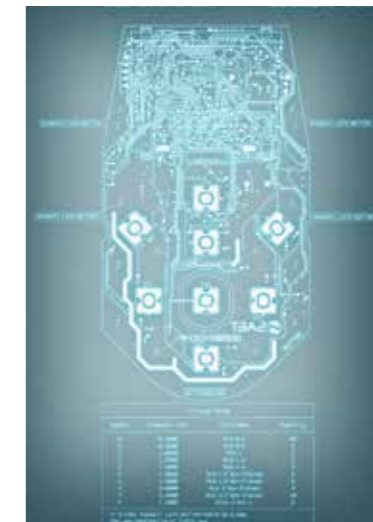
The development of masters represents a fundamental step for the success of a project.

Its perfect realisation avoids many problems concerning electromagnetic compatibility and more. Making the master having a perfect knowledge of the problems relating to assembly facilitates the subsequent production phase, simplifying it or at least making it more sustainable.

Our CAD allows us to carry out component placement from 3D mathematical models, thus enabling us to easily integrate our drawing into the mechanical CAD in order, for example, to produce the casing of the complete device.

Where necessary, we can realise the mathematics for the manufacture of enclosures, plastic with injection or thermoforming moulds, metal with die-casting or blanking moulds.

For the layout drafting of masters and for schematic entry we use Altium, for mathematics concerning mechanics we use SolidWorks.





FIRMWARE development

Firmware development is a crucial step in the success of a new project. Our engineers will listen to your needs and will be able to synthesise them into the right technological solution to bring your device to life.

Our developers have many years of experience in different sectors which are though united by one common factor: tough applications where reliability is paramount. We develop our firmware in C, C++ and Assembler, with or without the use of Windows, Linux or third-party RTOS depending on the application.

The code is written and developed in compliance with Misra guidelines, and where necessary according to EN ISO 13849-1 and EN 62061 provisions or referring to any other applicable product standards.

Our tools include both static and dynamic code verification and simulation tools, communication protocol simulators and some other high-level debugging and analysis tools.

Programming according to IEC 61131-3 deserves a special mention: specifically trained dedicated personnel are engaged in the development of programs according to this standard used in programmable logic devices (PLCs), whether they are systems developed by SAET using LogicLab, or third-party systems operating according to the same standard.





SMT assembly

The SMT assembly department has been included in the Company since the early 2000s; the decision to bring production in-house, which was anachronistic when it was made, is one of the keys to our success; in this way we can offer our Customers a finished product where from idea to assembly everything is under our control and management.

Not depending on subcontractors we can not only guarantee the quality of all production processes but we can also plan production according to the needs of our Customers, make room for small productions, prototyping or absorbing peaks of product demand in perfect autonomy.

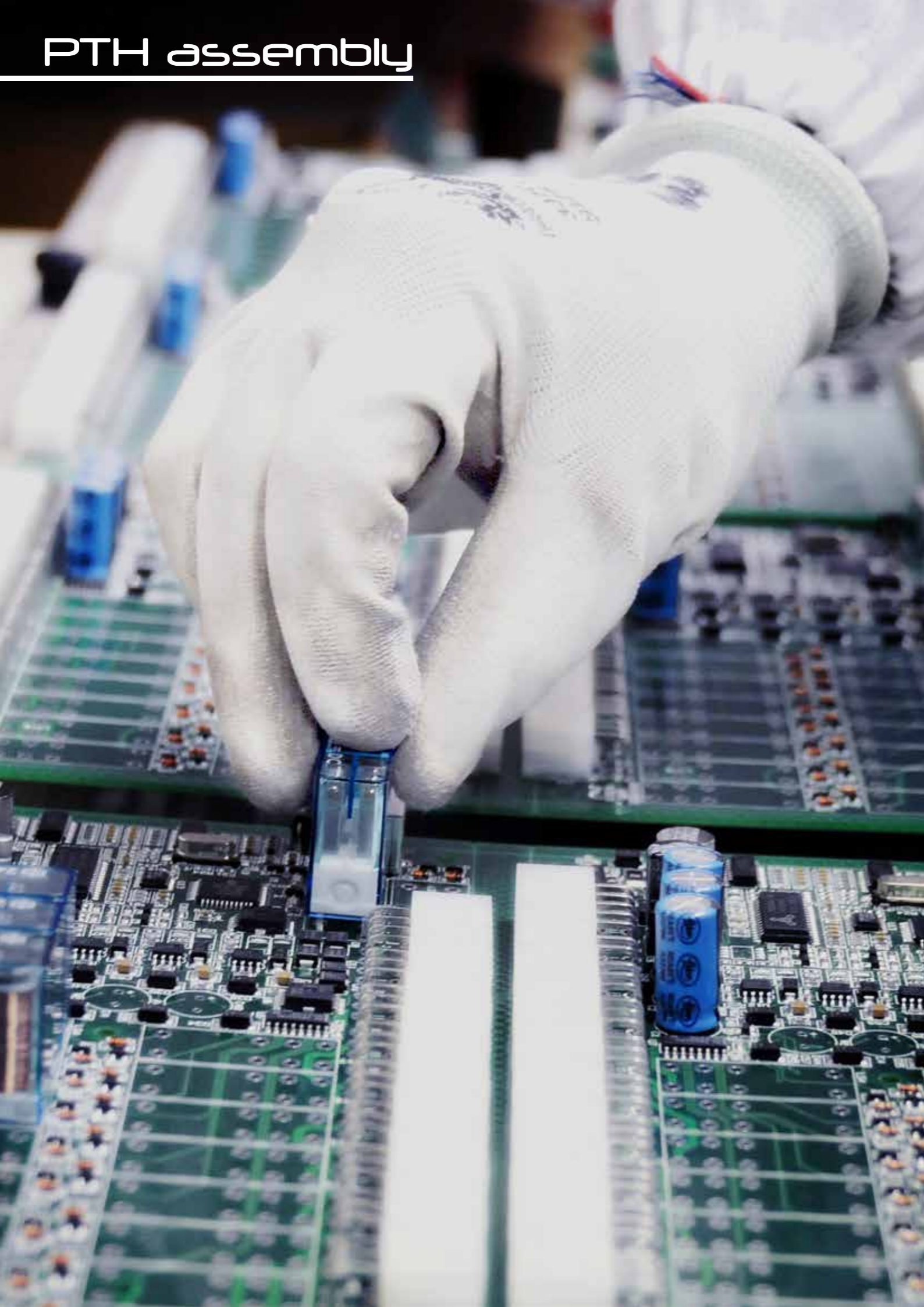
With an assembly capacity of about 60,000 chips/h, we can meet demanding

production needs while maintaining extreme flexibility thanks to some assembly machines installed off-line.

Two optical screen printers, six pick-and-place, a sixteen-zone reflow oven, and two AOI-3Ds represent the main equipment in the department. We assemble all the latest generation components such as μ BGA, Fine Pitch, 0402, and CSP.

The use of the lines dedicated to mass production also for making samples allows us to obtain prototypes corresponding to the final product from the very beginning not only in layout but also, and especially, in process.





PTH assembly



PTH (Pin Through Hole) component assembly has become significantly less in demand over time in favor of SMD components. Obviously, our designers tend to employ it only where strictly necessary, either because of mechanical problems or because the similar surface-mount component does not exist.

However, our department is capable of performing the assembly of any PTH component and performing its automatic wave or selective soldering.

Where the repetitiveness of the welding process in all its components is an irreplaceable element, the ERSA Versaflo 3/45 selective soldering machine stands for globally recognized quality.

In cases where professionalism is an irreplaceable element, however, we have strictly ESD workbenches with Wheller multifunction digital welding stations.

The laboratory is complemented by a washing line with deionized water and detergent and one for performing conformal coating (or tropicalization).

This process consists of depositing a protective resin film on the assembled electronic circuit board, which effectively protects the components installed on the board from atmospheric agents, dust or aggressive vapours.

This process prevents oxidation and the growth of dendrites that over time could compromise the functioning of the device.





Automated OPTICAL Inspection -AOI-



After the smt assembly process, all boards are subjected to automatic optical inspection in order to prevent and detect any assembly or soldering defects. This test is performed using the latest generation of equipment, the Pemtron 8800 HSL.

Our inspection system thus guarantees maximum reliability of the assembled boards. Thanks to special image acquisition techniques and image processing combined with a very special broad-spectrum illumination system, we achieve almost complete coverage of defects in solder joints, in coplanarity and in the correct component positioning. At the same time, AOI measures the thickness of the solder paste.

The operating principle is based on the acquisition of images taken with telecentric optics in combination with an illumination system with 8 three-stage projection points.

Exploiting the Moiré effect, the images are reconstructed in three dimensions and then compared with those in the library.

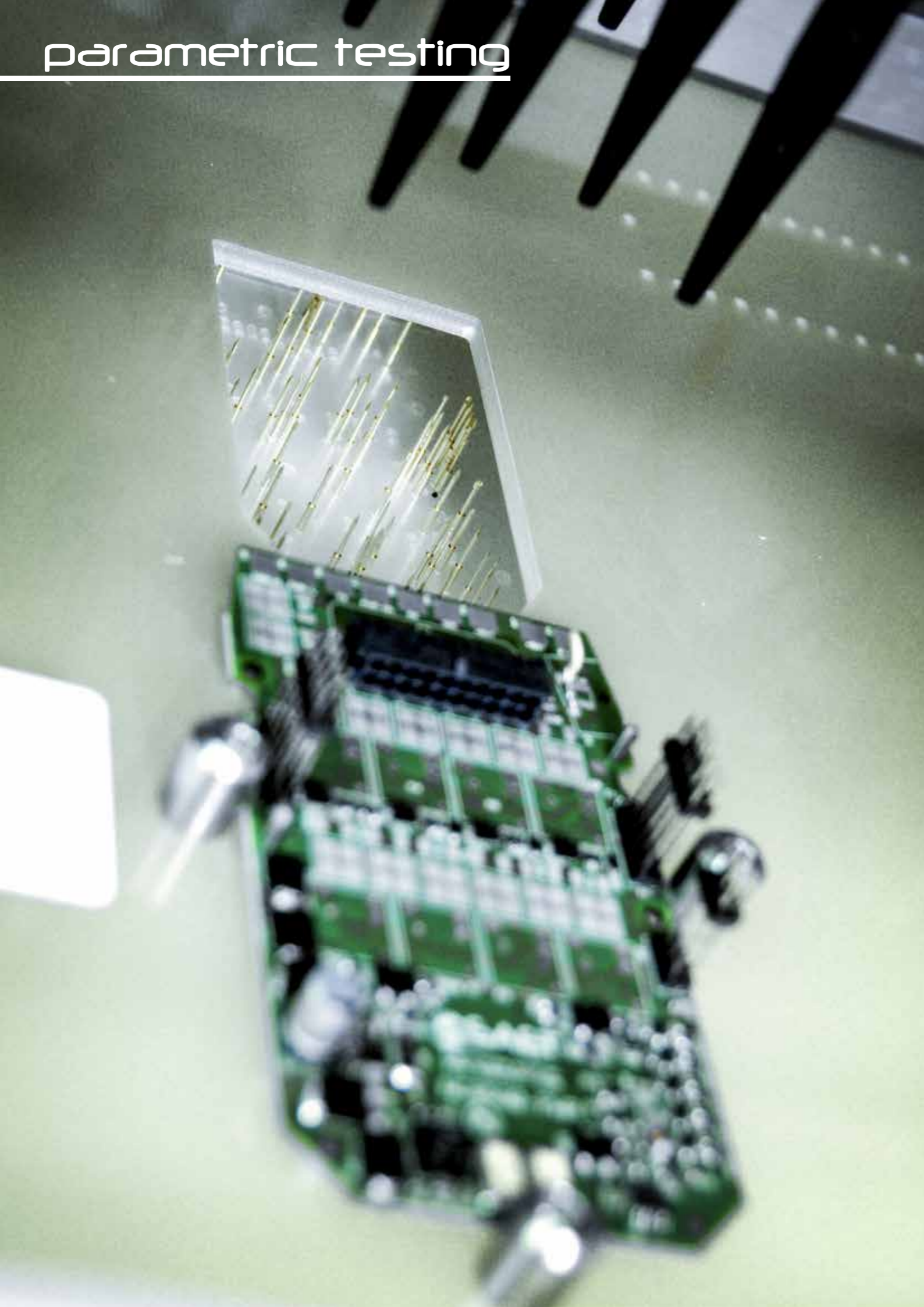
If the comparison reveals defects, the system will automatically separate the non-conforming cards from the others, preventing occasional exchanges due to human error.

Historization of information enables the analysis of defects found on the line, and the implementation of appropriate corrective actions to reduce their incidence.

The measurement of the thickness of the solder paste is provided to the screen printing machine at the beginning of the line as information to properly adjust the settings and ensure that the amount of material placed on the board being processed is compliant and evenly distributed.

One hundred per cent of our production is subjected to this test.





PARAMETRIC testing



Parametric in-circuit test (fixture)



Parametric in-circuit test (Flying Probe)

It is extremely important to perform parametric testing on both pre-series and high quantities but at low cost and with the high level of accuracy required by new technologies. With us all this is possible thanks to a truly significant Spea machine park.

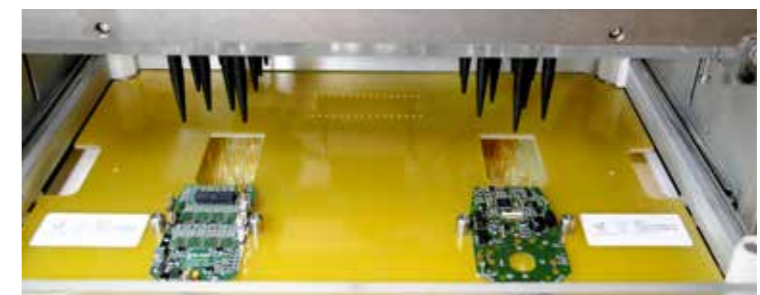
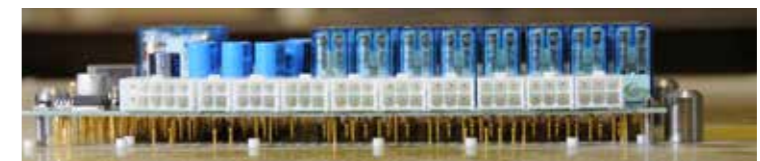
In-circuit testing, since its conception, allows us to test every single component on board. An ICT is mainly used to intercept errors arising during production, such as missing or wrong value components, shorted or open circuits, reversed polarity, and so on.

Part of the testing is both the net contacting mechanics (the bed of nails or fixture) and the circuit analysis sw program. In this case, equipment (specific to each board) consisting of the contacting mechanics and the test program is required to perform the test.

In the case of using a Flying Probe machine (i.e., with moving probes), the realization of the mechanical contacting is avoided since the machine itself, by moving its measuring probes, positions itself on the points to be tested.

This technology makes it possible to carry out parametric testing even on small production runs or on samples.

Two state-of-the-art Flying Probes and a bed-of-nails ICT allow us to automatically perform any parametric testing in perfect autonomy and with maximum safety. The development of test programs is carried out by our highly specialized personnel trained by the world's leading company in this type of testing.





FUNCTIONAL testing

The degree of coverage given by a test system is always relative and depends on the type of board and its application; total coverage is rarely achieved by performing only optical and parametric testing, and dedicated functional testing is sometimes required to achieve it.

Functional testing is the only method to ascertain and certify the proper functioning of even complex electronic systems and is carried out at the end of the production line before the device is placed on the market. By its very nature, functional testing is carried out to verify the device through a series of simulations that recall and reproduce as realistically as possible the standard operating conditions of the system as well as the environmental conditions in which it will operate.

Our T-800 functional test solutions are general purpose, in that they are test systems capable of testing various types

of electronic boards and devices, with minimal investment (depending or not on the need for contacting fixtures) depending on the type of product.

These are modular systems developed in-house by SAET, which are extremely flexible and can be used to carry out similar measurements of both signal and power, low or high frequency, and digital handling of various types of output.

In addition we accept the integration of a wide range of external instruments, managed via software in a simple and intuitive way, which expand the potential at will, while respecting the prerogatives of the specific architecture.

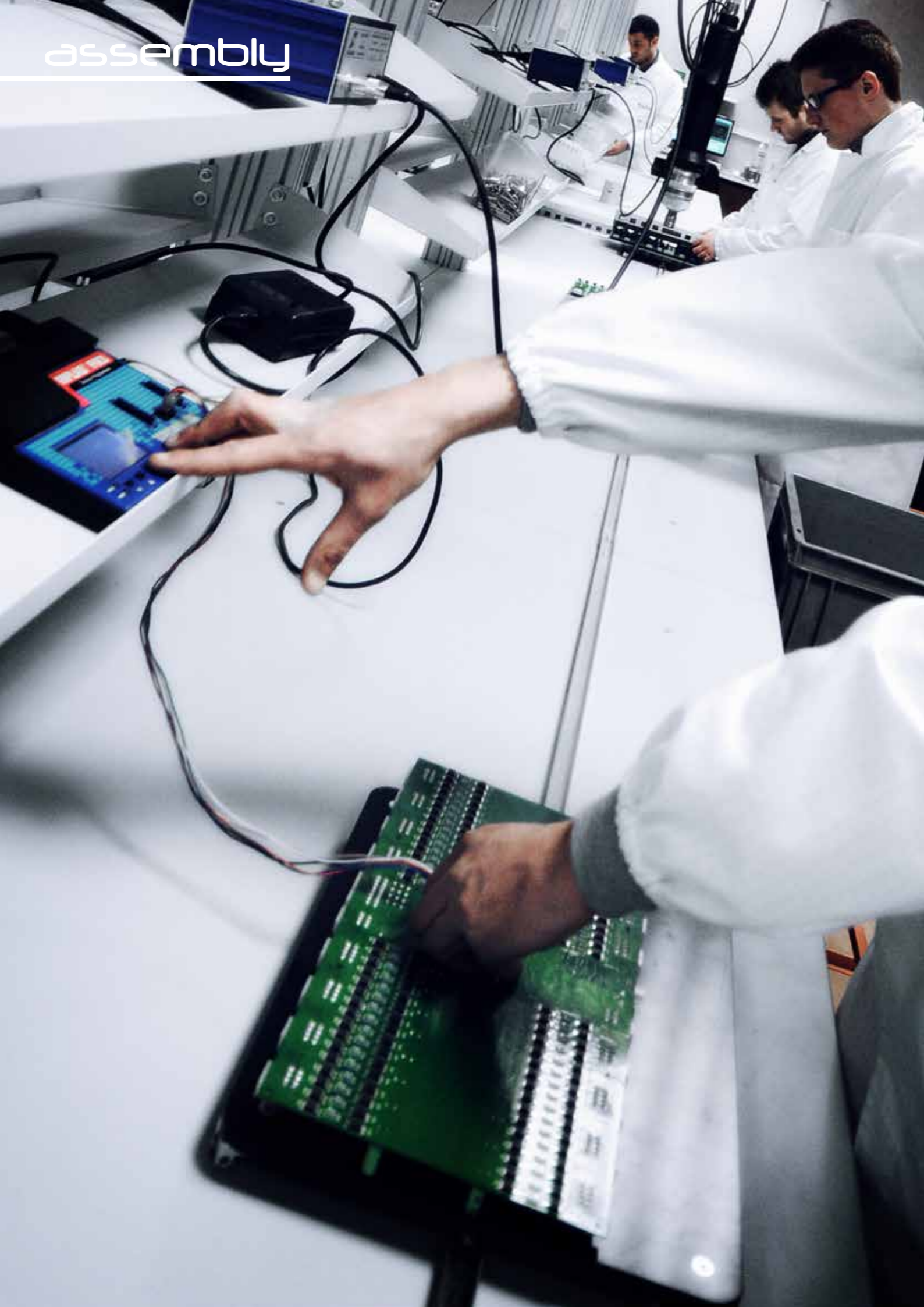
We have several functional test machines, some dedicated to specific applications and two generic ones by means of which we can set up any type of functional test.



Multi-application functional test



Functional test (dedicated)



ASSEMBLY

Our prerogative is to provide a finished product, complete in every part and fully satisfying the functional, aesthetic and economic expectations of our Customers.

With this in mind, we have set up a versatile and rational assembly line consisting of 10 workstations that, depending on requirements, can be used all or in part sequentially or stand alone.

Device handling between workstations is done by a sliding pallet system with poseurs dedicated to the product to be assembled in order to facilitate assembly operations and minimize the costs of manual operations. Where customization is pushed and the professionalism of the operator covers different stages of the production phase, an additional 10 stand-alone workstations are available and can be adapted to the specific needs of the product being processed.

Each workstation is set up with all the tools needed to complete the operations required at the specific stage.

The assembly equipment is also high-tech and periodically checked and calibrated; torque wrenches, micro wrenches and dynamometric screwdrivers, volumetric and weight dispensers of resins and adhesives, computerized soldering stations, automatic labeling systems and a wide range of measuring and testing instruments complete the assembly line.





CONTROL BOX assembly

Very often our Clients' products require not only an electronic control device but also wiring and an electrical panel. In this regard, we have equipped ourselves to be able to make even very complex electrical panels in the most automated way possible.

The advantage of automating a typically manual action is that it greatly raises the repeatability of the processes and thus enables their progressive refinement resulting in an improved finished product.

We have two switchboard assembly lines and a few stand-alone stations, and we can carry out from the single switchboard to mass and repetitive productions greatly optimizing costs and achieving remarkable quality standards.

When necessary, we can propose solutions regarding components and design the entire switchboard with the supply of plans according to the law.

We have all the necessary equipment for testing and certification of our switchboards.

Our operators have specific skills and training for this activity.

Each stage of assembly is carried out with precision through the use, where necessary, of torque, speed and time controlled screwdrivers so that nothing is left to chance.





WIRING

We have a department completely dedicated to the automatic, semi-automatic and manual production of wiring.

We can produce anything from simple wire, cut to size, to the entire electrical system of even very complex equipment.

Thanks to our technical department, we are able to guide the customer towards the use of the right components and technology for his application; we can provide diagrams, drawings and bills of materials starting from a sample wiring harness. For this activity we are available to perform sub-supply work, whether or not we manage the materials and/or the work account.

The department has a large production capacity and is able to automatically process both single-core and multi-core cables as well as those with large cross-sections.

Two Komax for cable cutting and terminal insertion allow the achievement of a high degree of automation in the most critical activities of the production process, and high quality standards.

With the help of an in-house made test table system, combined with a highly configurable SAET-designed T-800 and self-learning programmes developed by our technical staff, we can test the harnesses and deliver them complete with the electrical test report.

We manage over ten thousand part numbers in stock and are able to meet the production requirements of customers operating with a kanban system for lean manufacturing.





With over forty thousand part numbers in stock divided between active and passive components, cables and connectors, we can really meet our customers' just-in-time requirements.

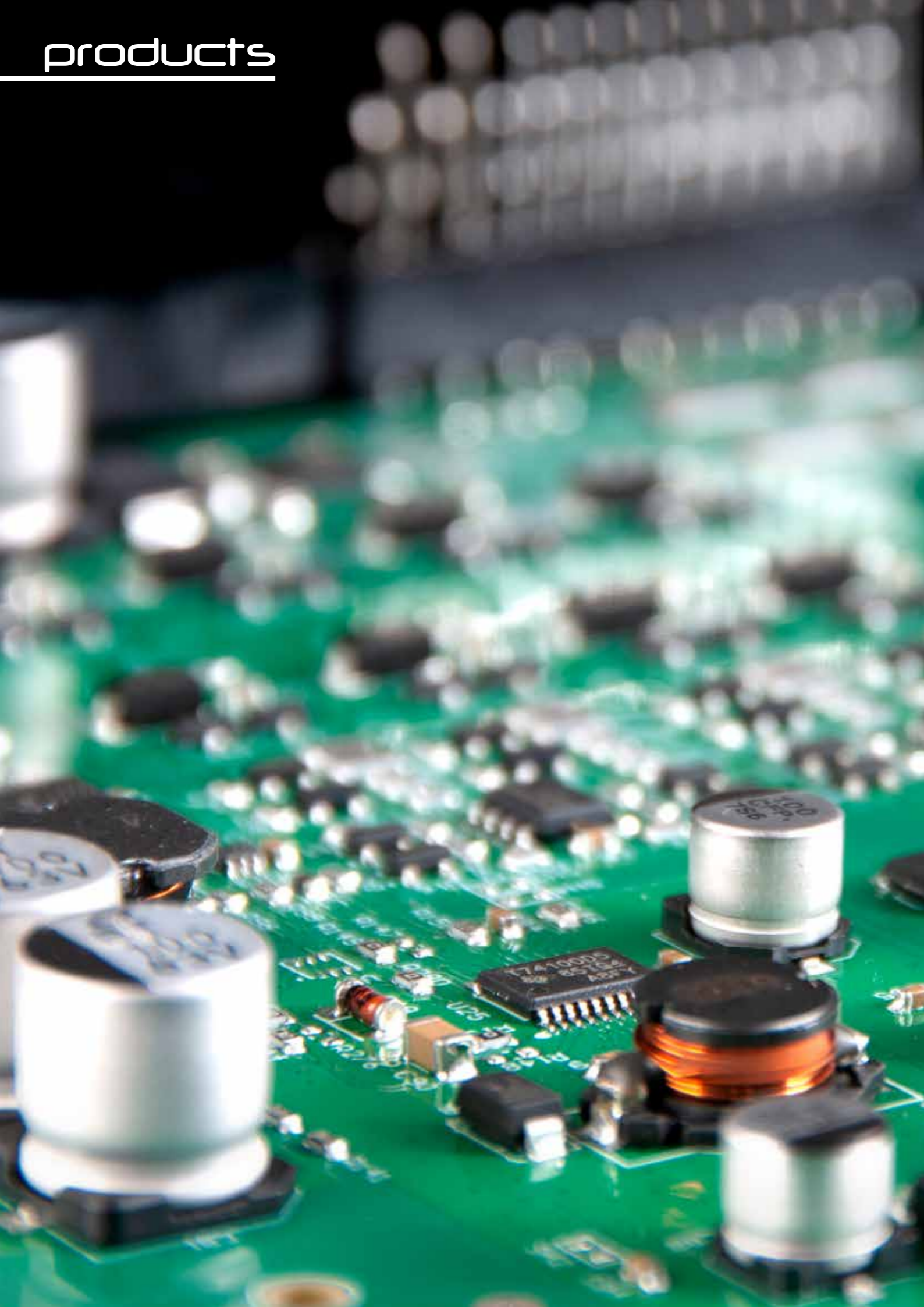
We propose ourselves for complete supplies by directly managing the purchase of all the materials necessary to complete the product. We thus relieve our customers from the always burdensome management of the work account.

We plan supplies even beyond twelve months and create buffer stocks to meet the production needs of those who rely on us. Material management is fully computerised, we have several automated warehouses and all component traceability is guaranteed by a particularly efficient computer system.

Our management system allows us to monitor every single step of the material, from its arrival at the company to the dispatch of the finished product to the customer. For example, shipment traces are already indicated in the transport document and this is anticipated by e-mail to the customer, who is thus updated in real time on the goods he will receive.

Thanks to our material management system we can offer an unrivalled service in terms of efficiency, cost and quality.



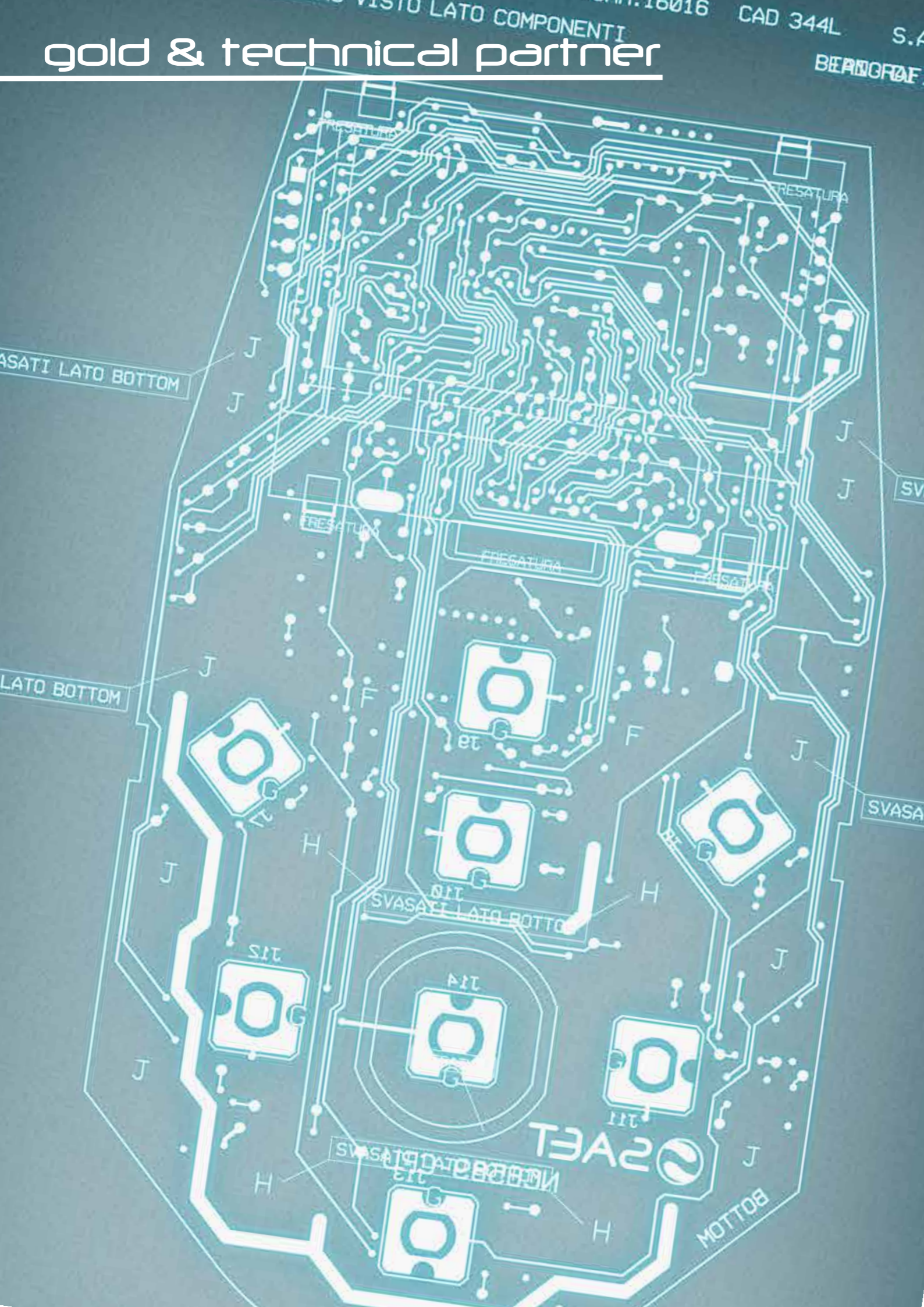


our PRODUCTS

Our product is the satisfaction of our customers.

We apply the most reliable and innovative solutions to create the technological heart of your projects and meet all the requirements of an ever-changing market. We put our experience and expertise at your disposal for the realisation of custom electronics.

Innovation is the only true entrepreneurial tool.



together ...
WE GROW

gold partners:

Important domestic and foreign companies have chosen us as their technology partner.

We collaborate with the same enthusiasm and professionalism with both small artisans and multinationals, knowing how to find the right technical solutions for every need.



www.buchermunicipal.com/it/it



www.aquarama.it

technical partners:

Institutional links

Always close to the academic world, we can boast numerous collaborations both with universities and with numerous world-renowned laboratories.

We actively participate in European and national projects alongside leading research centres.

We look for the right competences wherever they are to give our customers the best solutions for their products.



www.mesapiemonte.it



www.mictorino.it



www.poloinnovazioneict.org



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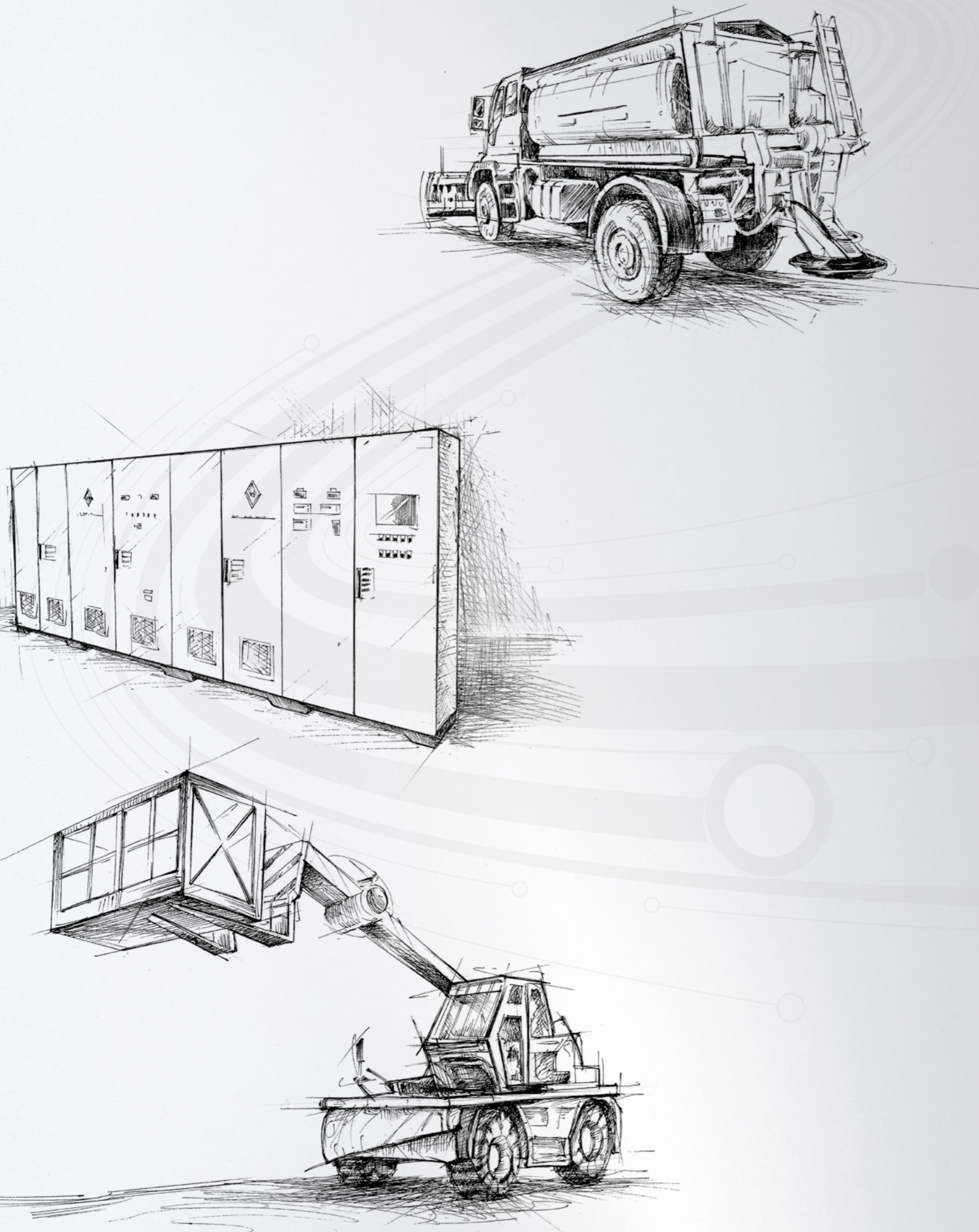
www.polito.it



www.keplerotech.com



www.teoresigroup.com/it/



Our philosophy is to become a technology partner for our customers and not just a supplier.

Certainly this is an ambition that entails great responsibility and presupposes a commitment that goes far beyond what is normally required, and we are well aware of this.

Today, much more than in the past, technologies evolve rapidly and knowing how to seize the opportunities they offer is crucial to the success of a new product.

Our multi-sectoral experience allows us to see far beyond the specific application and thus to borrow solutions that are only apparently distant from each other.

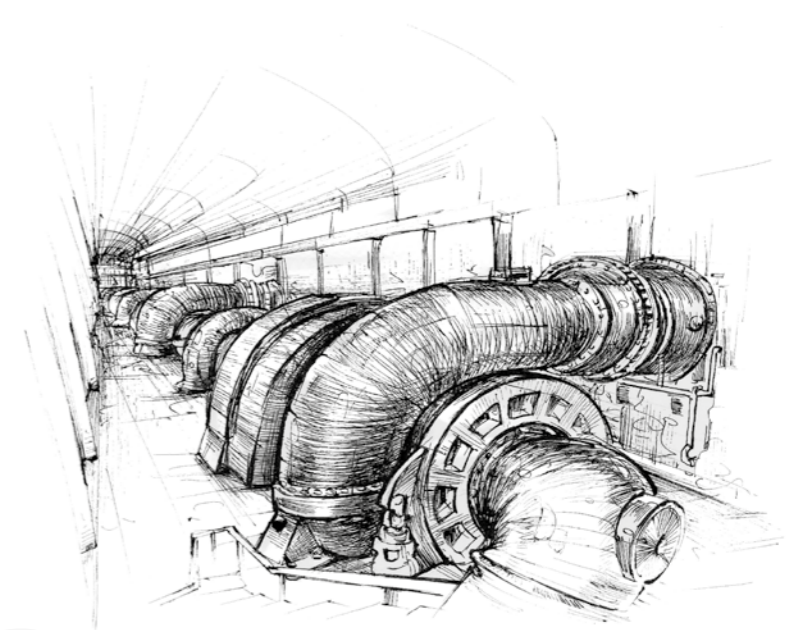
We apply the most suitable technologies to each individual project having a clear and complete vision of what the market offers.

Our essential and effective design approach allows us to combine technology, performance and cost in compliance with the strictest regulatory and quality standards.

●●●●●
Ours is not just a job but a passion that we foster every day.

Each of our projects gives us the awareness that we have created something that did not exist before and that will remain to testify that we existed.

Massimo Gaido C.E.O. SAET srl





SAET
build up your Ideas

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