



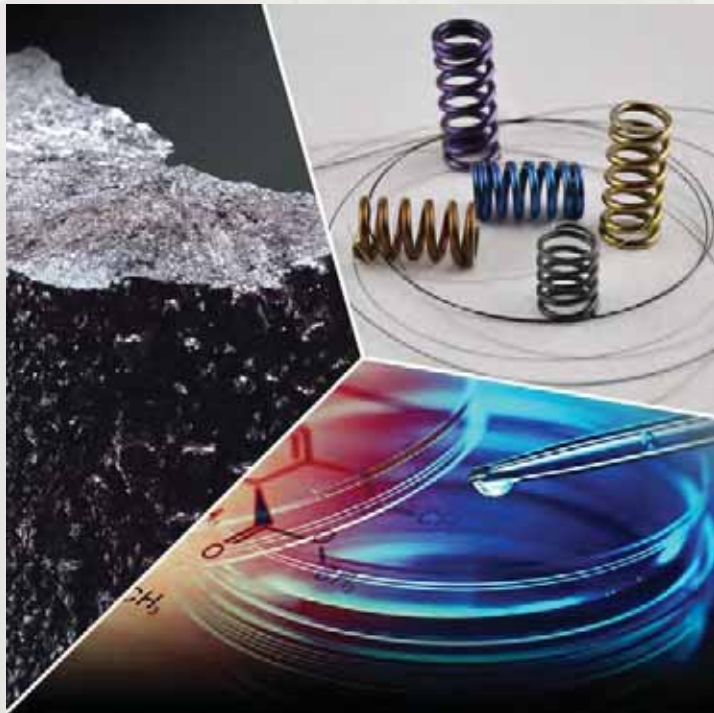
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group**

making **innovation happen**, together

Core Business

SAES® is an **advanced functional materials** Group, focusing its business on the development and production of proprietary and specifically engineered solution (components and systems) for many industrial and scientific applications.

The wide technological portfolio and the full vertically integrated production processes make SAES a **world leader** supplier of hi-tech, high quality solutions like:



- **Getters components and systems**
to guarantee the proper vacuum conditions, modified atmosphere or gas purity in a variety of applications spanning from consumer electronics up to scientific research areas
- **Nitinol based components**
for the healthcare market (minimal invasive surgery: e.g. stents)
- **Shape memory components and systems**
like actuators and valves for consumer electronics, automotive and white goods industries
- **Functional composites and coated films**
to protect goods for the packaging industry

70 years of World Wide leadership

■ For more than **70 years**, our **technology** has been supporting **innovation** in the:

- Information and Displays industry,
- Lamp industry,
- Vacuum and Ultra-high Vacuum applications,
- Vacuum tubes and electronic devices industry,
- Ultra-high gas purification,
- Renewable Energies area.

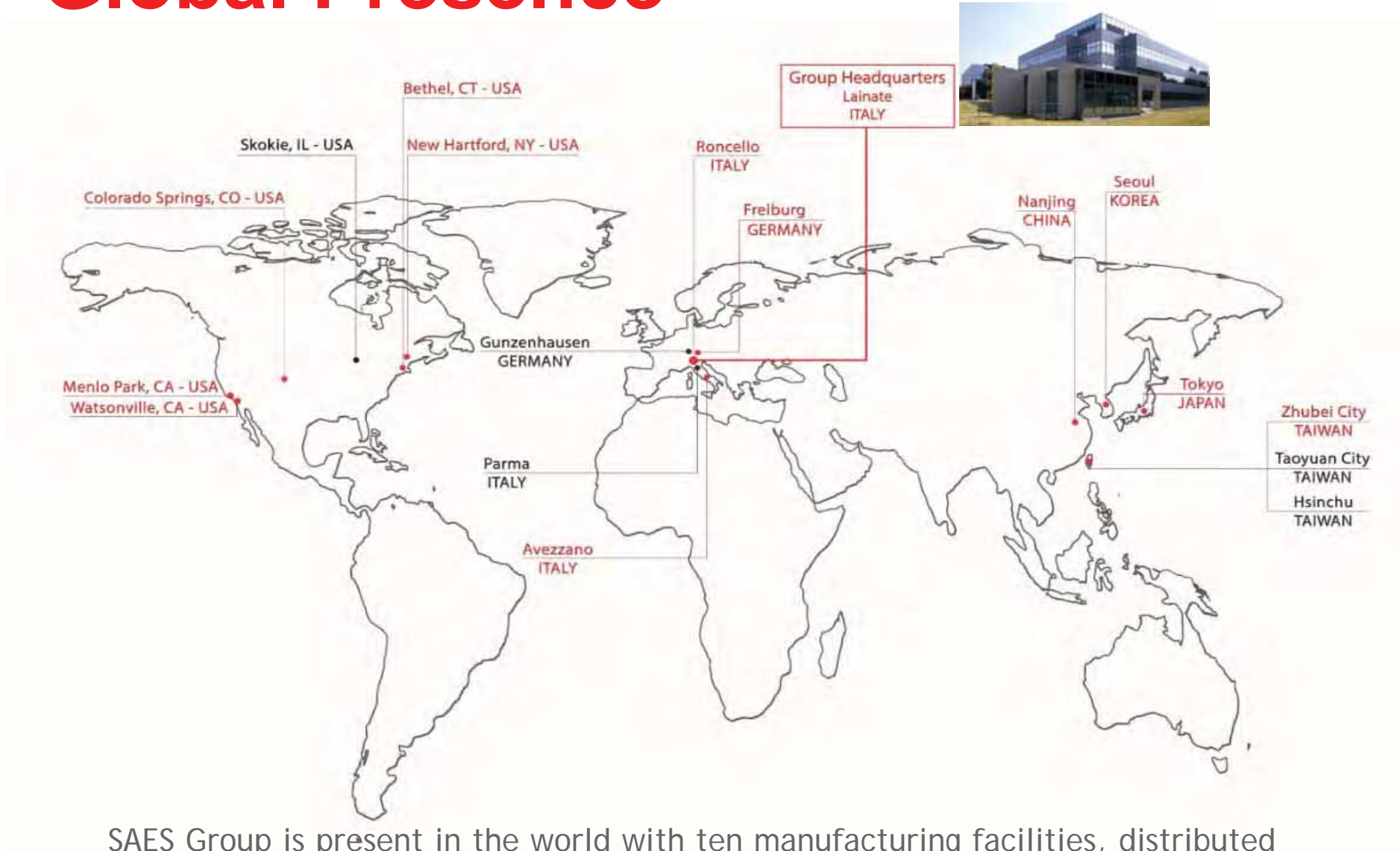
■ Since 2004 our **NiTi smart materials solutions** have been innovating:

- the Medical devices industry,
- the Consumer electronics industry,
- the Automotive industry,
- the White Goods and Domestic industries

■ Over the past 10 years we have developed a new generation of materials for gas management: the **functional polymeric composites**. And we are now also innovating the flexible packaging market through the creation of **functional coatings for the active packaging**.



Global Presence



SAES Group is present in the world with ten manufacturing facilities, distributed across Europe and United States, and has an active sales and technical service network on a global scale.

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A Global Quality Approach

Total Quality Management
is our key approach for Innovative,
safe and environmentally friendly
products development



Customer Satisfaction

for over 70 years is an
important, strategic goal
of our entire business system



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Research & Innovation

a knowledge-intensive approach to innovation is the mission for SAES people

- ▶ Annually a high percentage of revenues allocated to R&I
- ▶ 150 people engaged in R&I activities
- ▶ Over 300 inventions in 70 years

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Group Core Competences

Key Core Competences

Advanced Metallurgy

Surface Science

Gas-Solid Interaction

Macro-molecular Chemistry



ADVANCED FUNCTIONAL MATERIALS



Functional Metals



Functional Chemicals

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Our Functional Materials



FUNCTIONAL METALS

GETTER ALLOYS whose function is to capture gases in vacuum or gas stream

METAL DISPENSERS whose function is to release vapors of pure metals

SINTERED HEAT SINKS whose function is to dissipate heat

SHAPE MEMORY ALLOYS whose function is to recover their original shapes thus exerting a mechanical action



FUNCTIONAL CHEMICALS

INORGANIC & ORGANIC GETTERS whose function is to selectively capture gases and vapors in vacuum, modified atmospheres or gas streams

ADVANCED POLYMERS whose function is to control gases and vapors in combination with other functional properties

ADVANCED COMPOSITES whose function is to block or selectively control gases and vapor in combination with other functional properties

Our Products

From our **ADVANCED FUNCTIONAL MATERIALS**



our **PRODUCTS**

COMPONENTS

products using proprietary advanced materials as active elements and which are **used in systems** to perform the function for which they were designed

- Getters
- Alkali and other Metal dispensers
- Nitinol components
- Polymeric composites
- Coated films
- Dispenser Cathodes
- and more

&

SYSTEMS

complex products that use proprietary materials and components as active elements to perform the function for which they were designed

- Vacuum pumps
- Electro-mechanical actuators
- Fluid-dynamic valves
- and more



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The Group at a glance

...a long history of innovation



~1,100 Employees



250 Mio € global turnover 2017



10 production sites worldwide



R&D-based Group: our first values are Research & Innovation



Total quality management:

all the Group factories are certified according to proper ISO/DIN standards related to their own business field.

The parent Company SAES Getters S.p.A. is listed on the Italian Stock Exchange Market, STAR segment, since 1986.

Main Final Markets



Healthcare



Consumer Electronics



Automotive



Advanced Packaging



Security & Defense



Scientific & Research Areas



Other Industries

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Challenging Markets

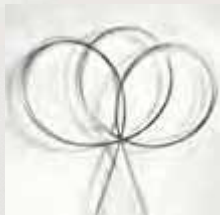


HEALTHCARE

FINAL APPLICATIONS:

- Minimally Invasive Surgery (angioplasty balloon shafts, stents, spinal clips, cardiac valves, parts for guidewires, etc.)
- Medical accelerators
- Implantable Medical Devices
- X-Ray tubes for diagnostic/ medical imaging industry
- ... and more

PRODUCTS: Nitinol components, getters, metal dispensers, vacuum pumps, polymer composites.



Challenging Markets

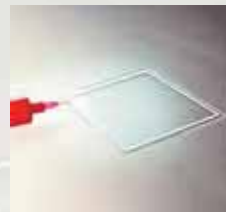


CONSUMER ELECTRONICS

FINAL APPLICATIONS:

- Gyroscopes, Resonators and Infra-red Sensors, that enable positioning and thermal vision of mobile phones, tablets and laptops.
- Miniaturized Autofocus & Optical Image Stabilizers for smartphones
- OLED displays,
- Flexible and Wearable Electronic Devices
- Actuators and Valves for Domotics
- ... and more

PRODUCTS: Getters, metal dispensers, electro-mechanical actuators, polymeric composites, Nitinol components.



Challenging Markets

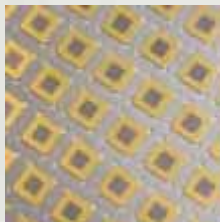


AUTOMOTIVE

FINAL APPLICATIONS:

- Comfort Seats Systems
- Engine Thermostatic valves
- Gyroscopes and accelerometers inside electronic stability devices (ESP)
- Infrared Cameras
- Emission Control of Cars
- ... and more

PRODUCTS: Getters, electro-mechanical actuators, fluid-dynamic valves, Nitinol components.



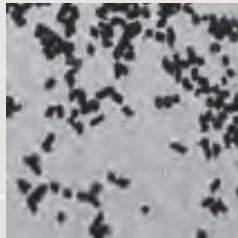
Challenging Markets

ADVANCED PACKAGING



FINAL APPLICATIONS:

- Food packaging
- Gas barrier films
- Pharmaceutical
- Nutraceutical
- ... and more



PRODUCTS: Lacquers, active & passive coated films

Challenging Markets

SECURITY & DEFENSE



FINAL APPLICATIONS:

- Sensor Detectors
- X-Ray Image Intensifiers
- Thermal Imaging Systems
- Night Vision Tubes
- Vacuum based Gyroscopes and Pressure Sensors to assure a reliable position to satellites and airplanes
-and more

PRODUCTS: Getters, metal dispensers, sintered components



Challenging Markets



SCIENTIFIC & RESEARCH AREAS

FINAL APPLICATIONS:

- Particle Accelerators and High Energy Labs
- Analytical Instrumentation
- Processing Tools for semiconductor manufacturing
- Vacuum Systems

PRODUCTS: vacuum pumps, vacuum chambers



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Challenging Markets



OTHER INDUSTRIES

FINAL APPLICATIONS:

- Lighting
- Domotic
- Energy Devices
- Solar Collectors
- Gas Lasers & High Power Semiconductor Lasers
- MEMS Atomic clock
- Seismic Sensors for oil exploration
- Vacuum Insulated Pipes for Oil Extraction
- Cryogenic Applications

PRODUCTS: Getters, metal dispensers, polymeric composites, sintered components, Nitinol components and devices.





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Business Organization view

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Business Organization



INDUSTRIAL APPLICATIONS

- Getters & Dispensers
- Solutions for Vacuum Systems
- Sintered Components for Electronic Dev. & Lasers

SHAPE MEMORY ALLOYS

- Nitinol for Medical Devices
- SMA for Thermal & Electro Mechanical Devices



ADVANCED PACKAGING

- Solutions for advanced packaging



BUSINESS DEVELOPMENT

- Organic Solutions for Electronic Devices



INDUSTRIAL APPLICATIONS



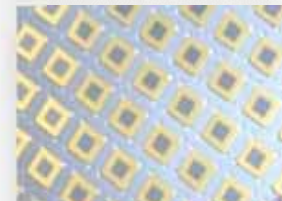
Areas offering: Getters, Metal Dispensers, Cathodes and NEG Pumps

These areas deal with components and systems utilized into :

- electronic and photonic devices,
- sensors (advanced technology solutions used in various market sectors: consumer electronics, security & defense, healthcare diagnostic, aerospace, industrial)
- lamps,
- solutions for vacuum insulation (for cryogenic applications, for both domestic and high-temperature solar collectors, for thermos and for vacuum insulating panels for the white industry)
- solutions for vacuum systems utilized both in industrial and scientific applications like: analytical instruments, vacuum systems for research and particle accelerators



PageWafer®



PageLid®



Alkali Metal
Dispensers



Sintered Porous
Getters



Hg Dispensers
Total Quality Shield TQS®



Non Evaporable Getter Pumps



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SHAPE MEMORY ALLOYS



Nitinol for Medical Devices

This Business Area follows all SMA medical applications. NiTiNol is used in a wide range of medical devices, particularly in the cardiovascular field. Its superelastic properties are ideal for the manufacture of devices used in mini-invasive surgery such as catheters for navigating within the cardiovascular system and self-expanding devices (aortic and peripheral stents or cardiac valves).



Stent Graphs



Cardiac Valves

SMA for Thermal & Electro Mechanical Devices

The shape memory alloy property is used in the production of various devices (valves, proportional valves, actuators, release systems, mini-actuators). This Business Area follows the use of SMA devices in the industry that is transversal to many application areas, including consumer electronics, automotive, home automation, and white industry.



Wires/Springs/Strips
SmartFlex®



Actuators



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ADVANCED PACKAGING



The SAES Group has recently expanded its business offer adding flexible packaging materials, focusing on the development of high performance polymer coatings for plastic films, with a particular focus on biocompatibility and low environmental impact.

Unique expertise in this field is the result of SAES investment in the field of innovation and research of "hybrid" technologies that **integrate getter materials into polymer matrices**.



SAES developed an evolved and innovative packaging that can be used when its contents are environmentally sensitive. In fact, thanks to the **active coatings**, the packaging incorporates, in addition to the traditional protective functions, the ability to increase the life of the product or improve its features.

Fields of application include **food** such as fruit and vegetables, but also non-fresh products that require controlled storage, both in food and in food-related areas such as **home & personal care**, **nutraceuticals** and the **pharmaceutical industry**



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BUSINESS DEVELOPMENT



Organic Solutions for Electronic Devices

This area allows SAES to deploy its unmatched experience in the field of innovation in hybrid technologies (integrating getter materials into polymer matrices).

This unit deals with developments mainly related to applications in electronics and photonics, including display and photovoltaic sectors. A special focus is dedicated to the **OLED** (Organic Light Emitting Diodes) industry, the ultimate innovation frontier in information **display** and **lighting**.

SAES products based on functional chemicals also enable **implantable medical devices** such as pacemakers and cochlear implants.



Active Barrier Sealants



Active Fillers



Dispensable Getter Composites



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Thank you for your attention

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