

SECURING YOUR MISSION-CRITICAL MOMENTS



EMPLOYEES

200+

2017 REVENUES

34M€

SHAREHOLDERS

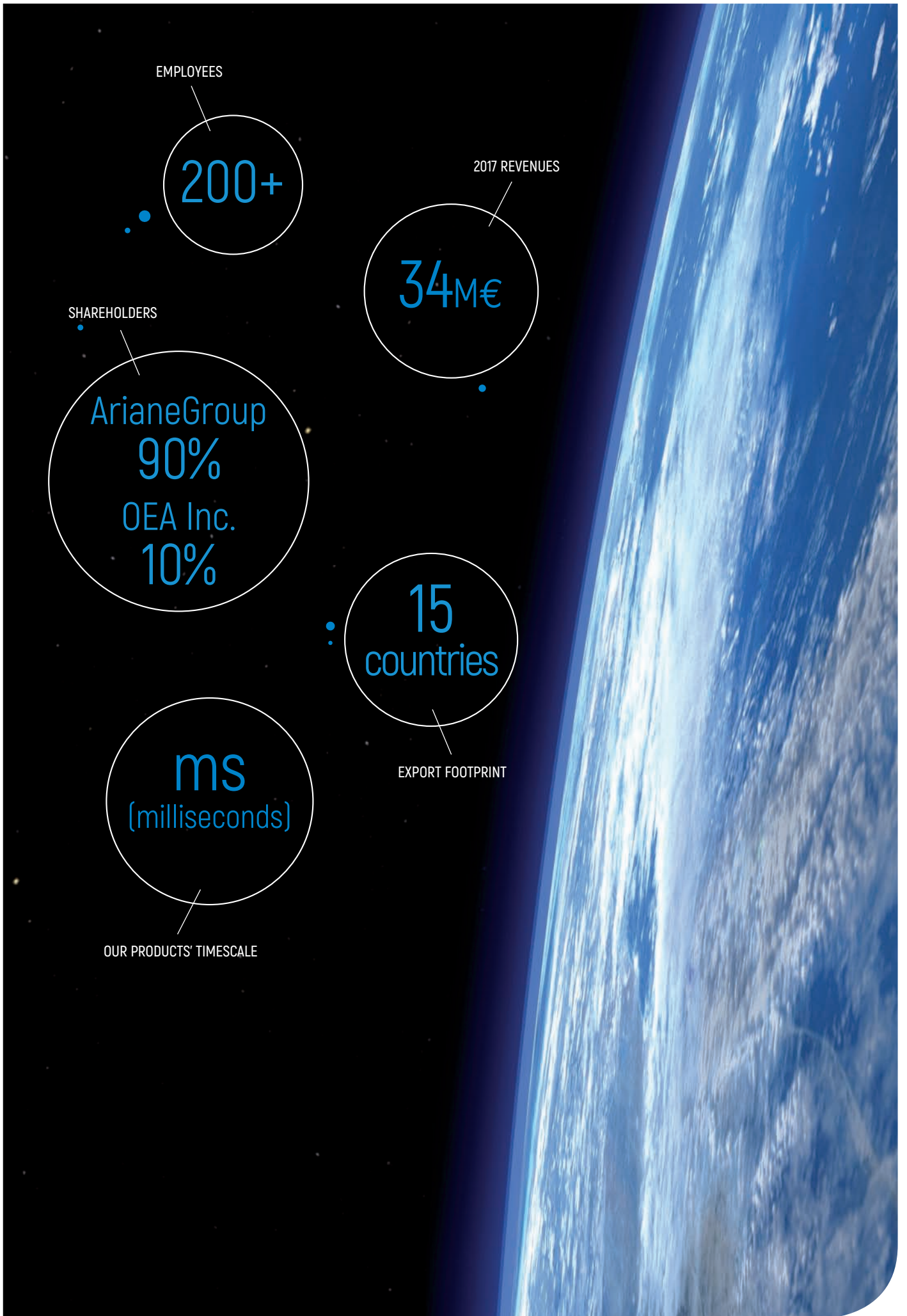
ArianeGroup
90%
OEA Inc.
10%

15
countries

EXPORT FOOTPRINT

ms
(milliseconds)

OUR PRODUCTS' TIMESCALE



PYROALLIANCE

Pyroalliance is the European leader and a world-class player in pyrotechnics, delivering innovative and cost-effective solutions tailored to our customers' critical requirements.

With more than a half-century of experience as a manufacturer of state-of-the-art pyrotechnic and mechanical equipment, Pyroalliance addresses the requirements of cutting-edge industries, including aerospace, defense and energy. We leverage our proven expertise and innovative mindset to develop products that combine the performance and reliability needed to perform critical functions for our customers' systems.

Our products are designed to operate in some of today's most demanding environments, with response times

measured in mere milliseconds.






Customer satisfaction is our top priority, so we support you throughout the development process and over the complete product lifecycle.

Our complementary skills in pyrotechnic and mechanical engineering mean that we do act as design authority for the functions in question. At the same time, we offer extensive production capacity anchored in the unrivaled expertise of our staff, who boast long experience in the design, development and production of these complex products.

We are totally focused on quality and continuous improvement, as shown

by our certifications to ISO 9001 and EN/AS/JISQ 9100 for the "design, development, production and sale of energetic equipment". We are also fully compliant with the latest health, safety and environment standards, as reflected in our NF EN ISO 14001: 2004 accreditation for health and the environment.

Through our majority shareholder ArianeGroup, Pyroalliance can count on the strengths of a world leader, while also enjoying the autonomy and agility needed to independently serve a wide range of customers from around the world.

Our equipment primarily handles the following functions:					
Transmission	•		•		
Ignition	•		•		
Actuation	•	•	•	•	•
Opening/Closing of circuits		•	•		•
Cutting/Fracturing	•		•	•	
Separation	•		•		
Flight termination	•		•		

DEFENSE

Pyroalliance is a pivotal supplier of high-value-added pyrotechnic and mechanical solutions for defense, including ballistic and tactical missiles, torpedoes, ships and aircraft.

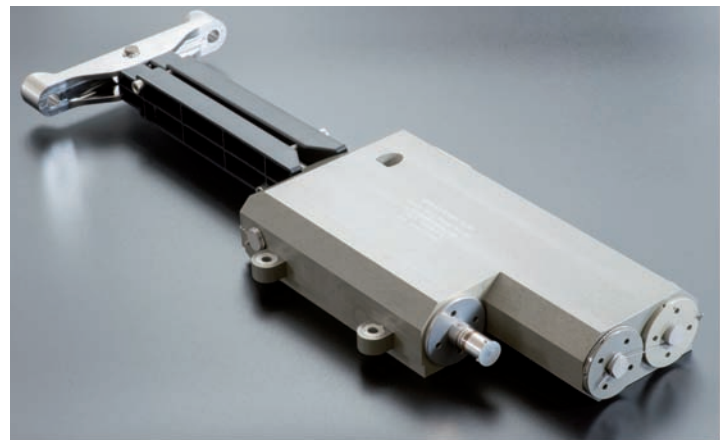
Our products are designed to carry out a number of functions that ensure the success of a weapon system, including ignition, transmission, thrust, separation, jettisoning, deployment, cutting, range safety and much more.

They are used on all kinds of missile systems, including air defense, combat aircraft, antitank, antiship, cruise missiles, etc.

By delivering equipment that meets the highest standards of mission-critical reliability, Pyroalliance plays a key role in your mission success.



Application on a cruise missile



Wings deployment actuator



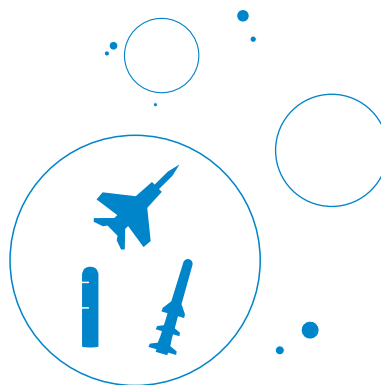
Explosive bolt



Transmission line



Air-to-Air and Air-to-Ground missiles



We also supply a large selection of crew safety equipment to leading aircraft manufacturers, all to the same demanding standards of reliability.

Our wide range of defense products includes the following:

- › Turbine engine igniters
- › Through-Bulkhead Initiators
- › Transmission lines
- › Ignition delays
- › Gas generators
- › Pyrotechnic rams
- › Shears
- › Cutting cords
- › Retractors (locking or unlocking)
- › Hold and release bolts and nuts
- › Normally closed/open valves
- › Flight termination systems
- › Stage separation systems.



Fuel valve for a tactical missile



Through-Bulkhead Initiator

SPACE

Pyroalliance designs, develops, produces and sells pyrotechnic equipment for mechanical or propulsive functions, used on launch vehicles, satellites and interplanetary probes. Our products play a key role in the success of these missions.

Because of the high added-value of this equipment, coupled with our skills and expertise, Pyroalliance has become a benchmark supplier to space agencies and leading space system prime contractors alike.

We deliver products that have been qualified to the most stringent space industry standards. Furthermore, they are not restricted by ITAR (International Traffic in Arms Regulations).

We have long played a key role in the success of Europe's launcher programs, especially Ariane and Vega, including products that carry out essential functions:

- › Solid rocket motor ignition
- › Stage separation
- › Flight termination
- › Hold and release of satellites from payload adapters and dispensers.



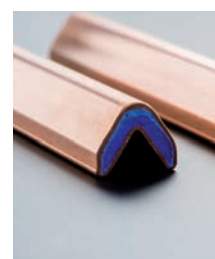
Ariane 5's solid boosters are ignited by Pyroalliance devices



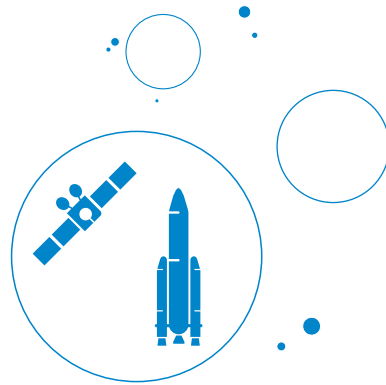
Artist's impression of satellite deployment from an Ariane 6 launcher



Transmission lines



Cutting cords



Hold and Release Mechanisms (HRM)

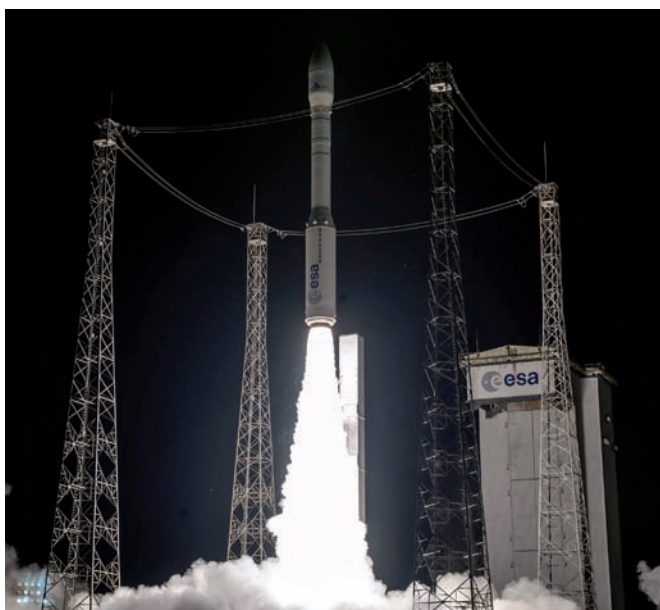


Separation nut

Pyroalliance delivers ultra-reliable hold and release solutions, as reflected in the 100% success rate of the more than 6,000 separation nuts delivered to date.

These solutions are designed for use on either satellite dispensers or the satellites themselves. We make the equipment needed for the in-orbit deployment of solar panels, antenna reflectors and masts, already fitted to a wide variety of satellite platforms.

Our Hold and Release Mechanisms (HRM) are extremely reliable, capable of meeting even the most demanding requirements on satellites and other spacecraft. They are compatible with both NASA Standard Initiators (NSI) and their European counterparts (ESI).



A number of Pyroalliance products are used on the Vega launcher



Part of a stage separation system

INDUSTRY

By combining our skills in mechanical and pyrotechnic engineering, we provide industry with innovative, robust, safe and competitive solutions.

Our technologies underpin cutting-edge solutions in a number of industries for a wide range of applications:

- › Safety processes on potentially hazardous installations (nuclear, oil & gas, chemicals, petrochemicals, offshore rigs, etc.)
- › Fire safety
- › Inflammable product storage safety
- › Environmental protection against natural risks
- › Interventions in inaccessible or hostile environments (nuclear, submarines, etc.).



Pyroalliance makes equipment for nuclear power plants



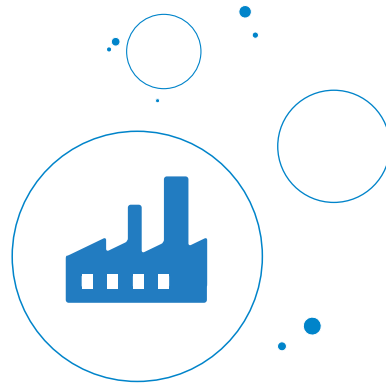
Pyrotechnic shear (wire cutter)



High-speed valve



Pyroalliance makes equipment for petrochemical plants



Pyrotechnic shear (rod cutter)



We have developed a wide range of products to meet the needs of these different sectors, including:

- Pyrotechnic valves and emergency actuators for the high-speed closing or opening of pressurized lines
- Devices that are waterproof down to a depth of 6,000 meters (bolts, shackles, nuts, pyrotechnic cutters, disconnectors)
- "Fast empty" systems for dams to ensure emergency flood management
- Pyrotechnic anti-theft and marking systems for cash-in-transit companies and currency destruction
- Automatic inflation systems (cartridges and perforators) for life vests and life rafts, and helicopter flotation systems.

Our industry customers include world leaders in the energy sector.

A COMPANY ON THE MOVE

At Pyroalliance we are laying solid groundwork for the future by investing in new technologies, production facilities and excellence-based management.

Innovating by developing new technologies

Building on our experience in the design and manufacture of pyrotechnic equipment, we conduct ambitious R&D programs to develop new technologies and technology packages. Our ultimate goal is to provide our customers with the innovative solutions they need to underpin the design of their next-generation systems. Pyroalliance's R&D programs aim to leverage the inherent advantages of pyrotechnics – energy density, quick response, high reliability – to add new functions to our products and even further improve their availability, flexibility and competitiveness.

New products under development

We are conducting a number of development programs at the same time for different customers operating in different sectors. Today, fully one-third of revenues are generated by development contracts, which ensure the renewal of our product portfolio. The multidisciplinary skills of our engineering teams underpin our

complementary theoretical and experimental approaches, so we can maintain complete control over our products' characteristics. We also continuously improve our design and test systems by calling on the best available solutions (Pro-Engineer/Pro-Mechanica, LS-DYNA, RAMS analysis, etc.), coupled with our proprietary tools (special ballistic codes, custom-tailored test benches, etc.).

Growing production capacity

We continually adapt and update our production, test resources and methods to meet our customers' changing requirements. In particular, we are increasing production rates and competitiveness while also ensuring compliance with all applicable quality standards.

Pyroalliance's new "Manufacturing Execution System", connecting all of our workshops, reflects the industry trend towards digitalization. This innovative approach delivers major quality and productivity advantages, by giving operators access to all technical

publications, and by guiding and controlling the entire production process.

Revamped management approach

At Pyroalliance we naturally pay special attention to human factors. For instance, we have adapted our management model to enhance the quality and agility of relations between all of the company's stakeholders.

Pyroalliance's core values are:





www.pyroalliance.com



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PHOTOS: ARIANEGROUP, MBDA, NUCLÉTUDES, SHUTTERSTOCK, ESA-CNES-ARIANESPACE/OPTIQUE VIDEO DU CSG - JM GUILLON