SAFRAN EXPLORE
Smart Materials

Safran unveils its Smart Materials Explore program

In partnership with Alcimed

SAFRAN

Discover Safran in 2 minutes

Safran on board
A to Z of aircraft equipment

Safran: no.3 aerospace company worldwide*

€31.3 bn
in revenues in 2025

€2 bn
spent in R&D in 2025

Propulsion

No.1 worldwide

Narrowbody commercial jet engines**

Helicopter turbine engines

Equipment

No.1 worldwide

Landing gear

Wheels and carbon brakes

Aircraft wiring

Evacuation slides

Interiors

No.1 worldwide

Aircraft Interiors

Defense

N°1 in Europe

Inertial navigation systems

Optronic systems

Space

No.1 worldwide

Space surveillance by radiofrequency sensors

**excluding aircraft manufacturers*
***in partnership with GE*

A worldwide presence

At year end 2025

110,000
employees
in **29** countries

Facilities

- R&D and production
- Support and services
- Offices

26%
Americas*

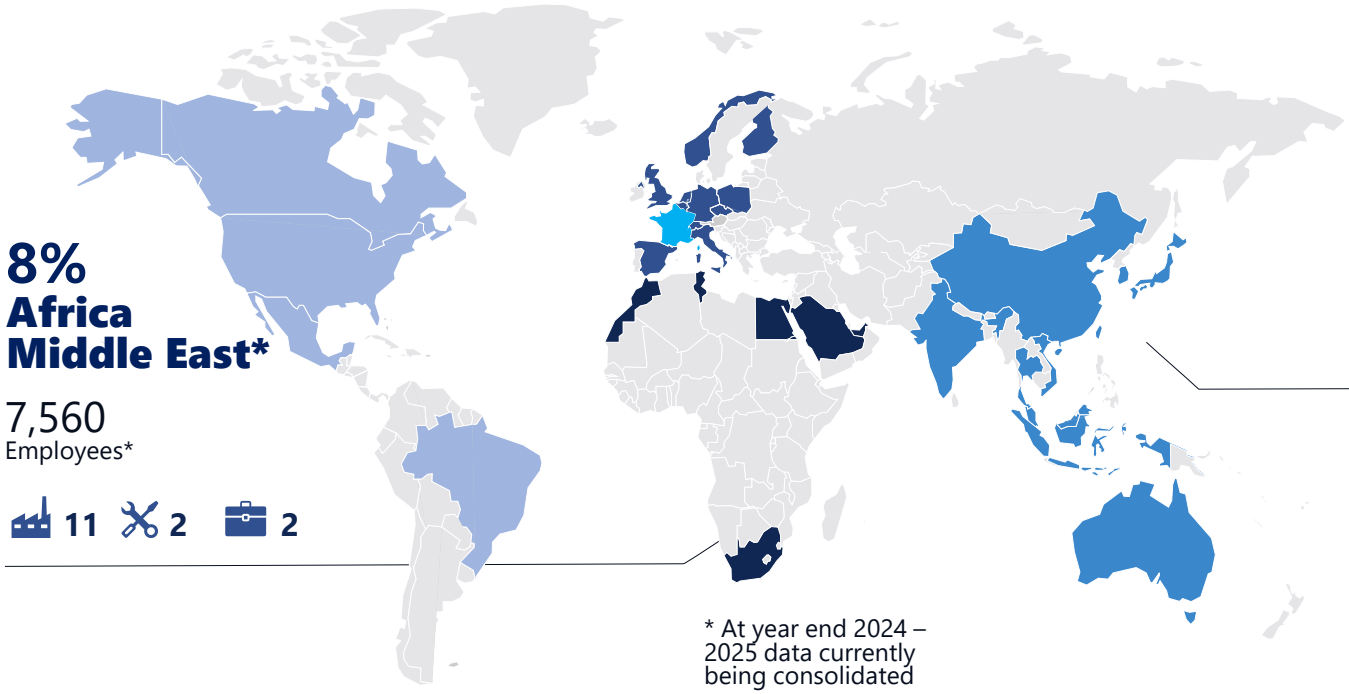
25,363
Employees*

55 | 29 | 11

61%
Europe (51% in France)*

60,968
Employees*

103 | 20 | 29



8%
Africa Middle East*

7,560
Employees*

11 | 2 | 2

5%
Asia Pacific*

5,473
Employees*

9 | 11 | 4

* At year end 2024 – 2025 data currently being consolidated

Safran Explore programs – Previous editions

Safran Explore aims at identifying **disruptive technologies** likely to that **accelerates our R&T roadmaps**, by collaborating with the most innovative companies on **our main technical challenges** (5-10 years horizon)

> Explore Hydrogen (2023)

- Safran's leadership in the future H2 supply chain
- 100 startups identified, 6 startups selected, **9 cooperations carried out**

STARBURST

TOUCH SENSITY · CALOGY · EH GROUP Engineering AG · HYDROGEN INNOVATIVE TECHNOLOGY · Insplorion · deltaVision fluid control & aerospace

> Explore Flying Experience (2024)

- Materials, Connectivity & AI, Data Management for Manufacturing & Maintenance.
- 70 startups identified, 7 startups selected, **4 cooperations carried out**

STARBURST

wiliot · HIVE COMPOSITES · WEAVAIR · METAFOLD · loopr · IRIDA LABS · BERCELLA

> Explore Canada (2024)

- AI & Sensors // Autonomous Collaborative Systems // New Space // Manufacturing & MRO
- 100 startups identified, 10 startups selected, **6 cooperations carried out**

CENTECH

OSCP · FERREOL · equispheres · Acerta · Boreal Conductors · Qoherent · SBQuantum · Metaspectral · KYNZE · EigenTechnologies

> Explore New Space (2025)

- Communication, space situational awareness, payloads & innovative services, embedded AI, antennas, sensors & instrumentation, Innovative propulsion
- 170 startups identified, **8 startups selected**, Explore Days on January 7th & 8th 2026.

Alcimed

SPHERICAL · Northern Waves · WYVERN · worms · coldXray · ARMOR ARSENAL · BETTERFUTURES · KALEIDEO A SatSure Company

Safran unveils Explore Smart Materials in 2026

SAFRAN EXPLORE Smart Materials

- For this **5th edition**, Explore Smart Materials targets the next wave of **materials and process innovations critical to future aerospace performance**.
- The program focuses on **five high-impact technical challenges**, defined by Safran experts to address priority industrial needs.
- These challenges provide a structured framework to engage external innovators and accelerate the maturation of **next-generation, high-performance aviation material systems**.

Our ambition: Foster innovation on strategic topics for Safran materials & processes activities

Our goal: Identify and collaborate with the best start-ups and SMEs

Our perimeter: Worldwide coverage

Our process: Call for applications around 5 challenges defined and evaluated by Safran experts

Alcimed SAFRAN

5 challenges to take on

SAFRAN EXPLORE
Smart Materials

MORE DETAILS

Challenge #1
Material Systems of the Future

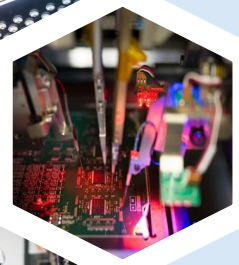
- Multifunctional Bulk Materials
- Material systems for surface solutions
- Advanced Manufacturing Processes
- Sustainable Alternatives

Challenge #2
Intelligence for M&P

MORE DETAILS

- AI-Driven Material Design
- In-Silico performance testing
- AI-driven Material Architercturing
- **Lab 4.0** - Data Management and structuring

MORE DETAILS



Challenge #3
M&P for Electrical Applications

- High-Temperature and High-Voltage Materials
- Magnetic Materials
- Alternatives to PFAS/PFA
- Multi-material additive manufacturing

Challenge #4
Circularity and recycling

MORE DETAILS

- Circularity for critical metals
- Recycling of carbon fibers
- Recycling of hybrid materials
- Materials traceability and Risk Management

MORE DETAILS

Challenge #5
Inspection, control and maintenance

- Process Monitoring and Control
- Dimensional and Material Health Monitoring
- Advanced Inspection for Composites
- Portable and On-Wing Inspection

Alcimed SAFRAN

Explore Smart Materials – Timeline*

SAFRAN EXPLORE Smart Materials

** All dates indicated in this timeline are for reference only. The official timeline is the one published on the official program website (link: http://www.alcimed.com/safran-explore-smart-materials)*

APPLY NOW

- **All applications** will be **reviewed and evaluated**
- Each application is assigned to a **jury of Safran experts** for evaluation
- **Webinars**** (Paris local time)
  - Asia: May 21st at 10am
  - Europe: May 26th at 9 am
  - Americas: May 26th at 5 pm
  - All regions: June 3rd at 12 am
  - **Register by clicking** on the corresponding slot

- Selection of **Top20 applicants** by a **jury of Safran experts**

- **Selection of Laureates**
- **Cooperation scoping** with the Safran experts

- **POC presentation** to Safran Sponsors
- **Go/NoGo decision** by Safran sponsors **to launch each POC**

Useful information

SAFRAN EXPLORE
Smart Materials

Regarding the program

- This is the **5th edition** of Safran Explore
- **International** coverage
- Looking for **small innovative companies**
- Priority for **quality applications** over quantity
- **Aiming for long-term relationships**, even if we start with POCs

Eligibility criteria

- **Are eligible**
  - Already registered companies
  - Startups, spin-off, SMEs (staff < 200-250 people)
  - Companies developing and providing innovative technologies
- **Not Eligible**
  - Mid-size and large corporates, Academic labs, Research institutes
  - Resellers or suppliers of established technologies

Regarding the selection process

- Tracking the source of the Deal Flow (through which channel or entity)
- Innovative **technologies at prototype level** at minima (≥ TRL 3)
- All applications are **evaluated by Safran experts** (no AI)
- Launch of cooperations is dependent on the capability of **both parties to converge on a** technical and financial **proposal**

Explore Days

- **Dates**: December 2nd & 3rd, 2026
- **Place**: Safran Tech – Corporate R&T center (Paris Area)
- **Who**: Laureate representatives, Safran experts & sponsors, a few selected guests
- **Objective**: Finalize the POC scoping and get Safran's sponsor approval
- **Agenda**
  - Day 1 : Morning introductions + Afternoon workshops
  - Day 2 : Collaboration presentations to the sponsor(s)

Alcimed SAFRAN

Previous Edition Highlights – Explore New Space (2025)

Discover the impact and success stories from the 2025 edition of SAFRAN EXPLORE program dedicated to NEW SPACE

170
Startup applications

22
Startup pitchs

8
Laureates

An opportunity to meet key industry leaders

It is at **Safran's Vernon** site, the **epicenter of space propulsion**, wrapped in snow, that **laureate startups, Safran experts and top executives came together for two** intense and energizing **days**.

The event was powered by **strong ecosystem support**, with **CNES** and **ESA** on hand to reaffirm their commitment to innovation and collaboration. But beyond the spotlight, it was the **depth of the technical discussions** that stood out, diving straight into how these **partnerships will take shape and scale**.

SAFRAN EXPLORE PROGRAM

SMART MATERIALS

SAFRAN EXPLORE Smart Materials

In partnership with Alcimed

Dr. Jawad BADREDDINE

Safran Corporate Ventures
Open Innovation Manager

Follow me on LinkedIn

Mr. Steffen HARM

ALCIMED
Project Manager

Follow me on LinkedIn

Are you up for the challenge ?

APPLY NOW

Program website & rules

Contact us

SAFRAN

SAFRAN EXPLORE
Smart Materials

APPENDIX
Detailed definition of the M&P Explore challenges

In partnership with Alcimed

SAFRAN

Explore Smart Materials – Challenge 1

SAFRAN EXPLORE Smart Materials

Smart Materials – Multi-functionality, Performance & Sustainability

Objective: *Explore and develop advanced, multifunctional, and sustainable materials to meet the extreme requirements of aerospace and industrial applications.*

Associated Topics

1.Multifunctional Bulk Material Properties

1.Multi-material systems for improving temperature resistance of engine alloys
2.Materials with gradients of physical, mechanical, and electrical properties…
3.Players capable of producing metallic materials with composition gradients in small quantities (lab scale) and characterizing them (microstructure and mechanical properties, ideally at high temperature)

2.Smart Materials for surface solutions and functionalities

1.Smart materials: coating and fiber-based systems with new functionalities (corrosion detection, chemical composition variation, self-healing, tribology, chemical resistance, de-icing/anti-icing…)
2.New technologies for environmental barrier coatings (EBC) and thermal barrier coatings (TBC)
3.Tailored ion implantation for interface hybridization (bulk, fiber, etc.)
4.Portable/mobile solutions for localized Chemical Vapor Deposition (CVD) ceramic coating depositions

3.Advanced Processes & Additive Manufacturing

1.Additive processes of tomorrow
2.New innovative or hybrid additive manufacturing processes (from both materials and process perspectives)
3.Contactless solutions to machine and cut ceramics and ceramic composites
4.Disruptive material assembly processes

4.Sustainable Material & Processes Alternatives

1.Alternatives materials and processes to fluorinated materials and resins (PFAS/PFA), which do not require the use of such ingredients

Explore Smart Materials – Challenge 2

SAFRAN EXPLORE
Smart Materials

Intelligence for Materials & Processes – Towards an augmented design and testing

Objective: *Unlocking the potential of AI in the screening, design, testing of tomorrows material solutions*

Associated Topics

1.AI-Driven Material Design for Physico-chemical properties

1.New hybrid material systems for metal-ceramics and metal-Organic composites
2.New hybrid chemical gradients for ceramics and metallic alloys

2.In-Silico testing for material performance screening

1. Simulation and modeling tools for numerically testing the performances of newly identified material systems

3.AI-driven Material Architecturing

1.AI for designing composite architectures (metals, ceramics, organic composites)
2.AI for designing organic composite architectures (short/long fiber hybridization, weaving, fabrics)

4.Lab 4.0 - Data Management and structuring

1.Lab connectivity solutions for gathering and coupling numerical and experimental data (tests, machines, etc.)
2.Full exploitation of unstructured and legacy data (PDF, WORD, Images...), along side with structured data

SAFRAN

Explore Smart Materials – Challenge 3

SAFRAN EXPLORE Smart Materials

Advanced Solution for Electrical Systems in Extreme Environments

Objective: *Develop innovative material systems and manufacturing approaches to enable high-performance, PFAS-free, multi-functional solutions for high-temperature, high-voltage, and magnetic electrical applications.*

Associated Topics

1.High-Temperature and High-Voltage Materials

1. Integration of all-thermoplastic systems (machine-oriented, PAEK, PPS, in-situ heat sealing study)
2. Materials for >1kV approaches (DP resistant, stress grading, evaluation of ceramic/sol-gel coatings)
3. Flexible thermally conductive encapsulation materials, with good adhesion to interfaces
4. High-performance insulating materials for high-temperature windings (thermal class >220°C, high thermal conductivity, > 1 kV)

2.Alternatives to fluorinated materials (PFAS/PFA)

1. Synthesis of PFAS-free materials for high-temperature capacitors (>175°C, see >200°C)
2. Evaluation of PFA-free alternatives for cables (PEEK, PEKK, silicones and associated semi-cons)

3.Magnetic Materials & Magnets

1. Magnetic materials with high saturation and low losses (non-laminated)
2. Rare-earth free permanent magnets with residual polarization >1-1.2 T (low thermal derating, strong coercive field)

4.Multi-material additive manufacturing for electrical applications

1. Additive manufacturing processes combining conductor and insulator materials
2. Multi-material additive manufacturing: ferromagnetic, electrical conductors, electrical insulator

Explore Smart Materials – Challenge 4

SAFRAN EXPLORE Smart Materials

Circularity & Recycling – Closing the Loop for Critical Materials

Objective: *Develop economically viable solutions for circularity, recycling, and valorization of critical and strategic materials.*

Associated Topics

1.Recycling and Valorization of carbon fibers

1.Processes/solutions to revalue our carbon fiber (dry fibers, uncured prepreg, cured composites) for retaining the highest performance/properties levels for structural applications

2.Critical Metallic Materials Circularity

1.New circularity (production & end of life) solutions for critical metals while maintaining high purity levels (Titanium, Cobalt, Nickel, Rare Earths, Aluminum, Copper)
2.Recycling of Magnetic materials and magnets

3.Recycling of hybrid and composite materials

1.Powder recycling solutions with Oxide Dispersion-Strengthened (ODS) alloys (metal powders with ceramic particles)
2.Eco-friendly recycling solutions for organic resins with the least impact on the properties of recycled resin compared to new resin
3.Recycling solutions of ceramic ingredients (ex. ytterbium), SiC wires and Alumina (Al_2O_3)
4.Sustainable solutions for the dismantling of multi-material systems and architectures (other than burning and acids)

4.Materials traceability and Risk Management

1.Software solutions for product and material traceability (including recycling & circularity)
2.Software solutions for anticipating risks (HSE, toxicology, PFAS, REACH) and raw material obsolescence (sustainability)

Explore Smart Materials – Challenge 5

SAFRAN EXPLORE Smart Materials

Inspection, Maintenance & Reliability – Securing Material Performance

Objective: *Develop innovative inspection methods to ensure the quality, reliability, and maintenance of complex materials and parts.*

Associated Topics

1.Process Monitoring and Control

1.Process monitoring, reproducibility, and corrections during manufacturing
2.In-process and post-process monitoring of complex Additive Manufacturing (AM) parts (geometry, internal cavities, roughness…), with resolution < 100 µm
3.Sensors for Lean Controls and real-time data acquisition
4.In-situ equipment and sensors for processes monitoring (e.g., fusion furnaces up to 1600°C, ceramic AM machines, heating unit & high temperature mechanical testing for X-Ray *in-situ* Tomography…)

2.Dimensional and Material Health Monitoring

1.Dimensional control and material health monitoring (products or tooling)
2.Data analysis and processing for non-destructive testing
3.Internal instrumentation of parts, resistant to in-service high temperatures (> 1100-1200 °C)

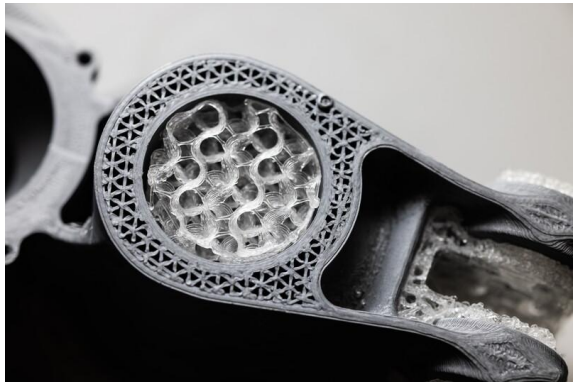
3.Advanced Inspection for Composites

1.Inspection solutions for thick and multi-material Organic Matrix Composites (OMC)
2.High-speed/high-productivity inspection methods for Ceramic Matrix Composites (CMC)

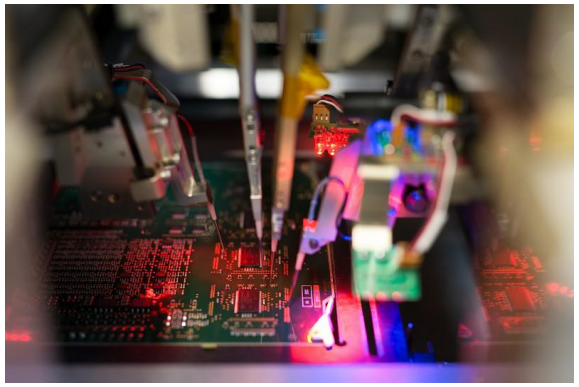
4.Portable and On-Wing Inspection

1.Reference inspections on partially disassembled equipment or directly under wing (portable systems, endoscopy, fiber optic imaging…)

Copyright ©



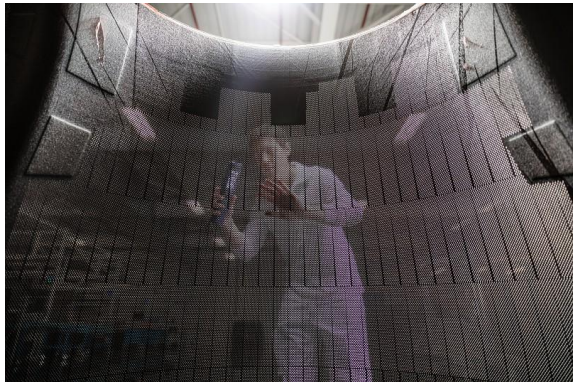
© Anthony Guerra / Safran



© Christel Sasso / CAPA Pictures / Safran

© Adrien Daste / Safran

© Alex Marc / Safran



© Adrien Daste / Safran