SAFRAN OVERVIEW

SAFRAN IS AN INTERNATIONAL HIGH-TECHNOLOGY GROUP, OPERATING IN THE AVIATION (PROPULSION, EQUIPMENT AND INTERIORS), DEFENSE AND SPACE MARKETS. SAFRAN HAS A GLOBAL PRESENCE, WITH MORE THAN 95,000 EMPLOYEES AND SALES OF 21 BILLION EUROS IN 2018. WORKING ALONE OR IN PARTNERSHIP, SAFRAN HOLDS WORLD OR EUROPEAN LEADERSHIP POSITIONS IN ITS CORE MARKETS. SAFRAN UNDERTAKES RESEARCH AND DEVELOPMENT PROGRAMS TO MEET FAST-CHANGING MARKET REQUIREMENTS, WITH TOTAL R&D EXPENDITURES OF AROUND 1.5 BILLION EUROS IN 2018.

SAFRAN OVERVIEW

more than 95,000
EMPLOYEES
WORLDWIDE

in
30 COUNTRIES

€21 BILLION IN SALES
generated in 2018

#1 WORLDWIDE
• ENGINES FOR SINGLE- AISLE COMMERCIAL JETS
  (in partnership with GE)
• HELICOPTER TURBINE ENGINES
• LANDING GEAR
• SEATS FOR COMMERCIAL AIRPLANES*
• WHEELS AND CARBON BRAKES**
• AIRCRAFT WIRING SYSTEMS
• ENGINE CONTROL UNITS***
• MECHANICAL POWER TRANSMISSIONS**
• NACELLE SYSTEMS FOR BUSINESS JETS
• CABIN INTERIORS FOR REGIONAL AND BUSINESS AIRCRAFT
• CABIN LINERS, GALLEYS, TROLLEYS AND CONTAINERS
• EVACUATION SLIDES

* Economy class seats for twin-aisle jets.
** Mainline commercial jets with more than 100 seats.
*** Through FADEC International, the 50/50 joint company between Safran Electronics & Defense and BAE Systems.
WITH DECADES OF EXPERIENCE IN AVIATION, SAFRAN MASTERS THE TECHNOLOGIES THAT MAKE ROTORCRAFT OF ALL SIZES FLY, FROM HELICOPTERS TO TILT ROTORS, IN BOTH CIVIL AND MILITARY MARKETS.

INVENTING TOMORROW’S HELICOPTER

We know that the key to performance of modern helicopters is energy generation and efficiency. This is why Safran is playing an active role in the development of next-generation helicopters by investing in hybrid propulsion systems and electrical power systems. Through additive manufacturing and the use of materials such as carbon and composites, we are providing the market with lighter and greener equipment including, engines, engine cowls and brakes. Our strategy is to improve flight safety, reduce operating costs and decrease the environmental impact of helicopters.

SAFRAN’S COMMITMENT TO THE ROTORCRAFT MARKET

SAFRAN has a global service network that provides after-sales, customer and operators support, as well as maintenance, repair and overhaul services for its rotorcraft customers. We provide cost-effective maintenance packages that can be customized to meet the unique needs of our customers.

AN UNMATCHED OFFERING FOR ROTORCRAFT

Our products meet the needs of helicopter manufacturers across the spectrum, ranging from engines, auxiliary power units (APUs), power transmissions, electrical power management systems, to landing gear, wheels, brakes, navigation systems, flight monitoring solutions and flight controls.

CUSTOMER SUPPORT GUARANTEED

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MORE THAN 80 YEARS OF HELICOPTER ENGINE INNOVATION

SAFRAN, THE WORLD LEADER IN ROTOCRAFT TURBINES, IS THE ONLY MANUFACTURER DEDICATED EXCLUSIVELY TO THIS MARKET PARTNERING WITH MAJOR HELICOPTER MANUFACTURERS ACROSS THE GLOBE. ITS PRODUCTS EQUIP THE VERY LATEST DESIGNS, INCLUDING THE BRAND-NEW BELL 505 AND AIRBUS HELICOPTERS H160.

100% FOCUSED ON SAFETY AND CUSTOMER SATISFACTION

Safran’s priorities are to provide customers with safe, reliable and high-performance engines, to stay focused on their missions and to keep their helicopters flying every day, everywhere. With safety as our watchword, we are committed to meeting and surpassing the industry’s highest safety standards. Today, our best-selling Arriel is as reliable as the CFM56, the benchmark gold standard in commercial aviation.

ADDRESSING THE HEAVY ROTOCRAFT MARKET

Designed for new super-medium and heavy helicopters, Aneto high power engine family features several models ranging from 2,500 to over 3,000 shp output. Leonardo has selected the Aneto-1K to power its AW109KX twin-engine. Airbus Helicopters has chosen the Aneto-1K to power its H160. Their low fuel consumption increases the endurance by 20% to 100% compared with small turbine engines.

PISTON ENGINES: MINI SIZE, MAXI EFFICIENCY

For light helicopters or for long range unmanned aerial vehicle (UAV) operations, Safran is developing several aero-diesel engines operating on jet fuels. These offerings range from the certified SR305 series engine (230 to 265 shp) to the next-generation High Power Density Engine (400 to 800 shp). Their low fuel consumption increases the endurance by 30% to 100% compared with small turbine engines.

POWER TRANSMISSION

Leveraging more than 40 years of experience in power transmission technologies, we provide helicopter manufacturers with new applications including engine reduction gearboxes, accessory gearboxes and transfer gearboxes to help boost performance and reliability.

TURBOSHAFT ENGINES

Our engine families, which include the Arriel, Arrano, Arrius, Ardiden, Makila and Aneto have all been recognized for their safety, reliability and operational excellence. With solutions for single and twin engine helicopters, Safran can meet very specific needs of different helicopter missions.

#1 WORLDWIDE

in helicopter turbine engines

A SAFRAN-POWERED HELICOPTER TAKES OFF EVERY 9 SECONDS somewhere in the world

MORE THAN 12,000 HELICOPTERS are powered by Safran worldwide

MORE THAN 100 MILLION HOURS FLOWN by Safran Helicopter Engines

TURBO_SHAFT ENGINE CUSTOMERS:

Airbus Helicopters Korea Aerospace Industries
Avicopter Industries
Baltic Leonardo
Industies
Hindustan NH Industries
Aeronautics Ltd Russian Helicopters
Sikorsky

ARRANO:
The most innovative turboshaft in its class

Safran’s latest helicopter engine, the 100 to 1,500 shp Arrano, incorporates cutting-edge technology and numerous innovations. It offers a 15% improvement in fuel consumption over competing engines - one reason why Airbus Helicopters chose it to power the H160. Its has received EASA certification on June 2019 and is now ready to support the H160 entry-into-service.

ARRIUS 2R:
The only 500 shp helicopter engine to feature dual channel FADEC

The Arrius 2R (500 shp) was selected to power the new Bell 505, successor to the hugely popular Bell 206 Jet Ranger – of which 7,000 examples were sold. The partnership is on track to deliver unprecedented levels of reliability and low maintenance costs. The engine was certified in December 2015.

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TURBO_SHAFT ENGINE CUSTOMERS:

Airbus Helicopters Korea Aerospace Industries
Avicopter Industries
Baltic Leonardo
Industies
Hindustan NH Industries
Aeronautics Ltd Russian Helicopters
Sikorsky

ARRANO:
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ELECTRICAL POWER SYSTEMS
INNOVATING FOR TOMORROW’S “MORE ELECTRIC” Rotorcraft

ALL ONBOARD ELECTRICAL FUNCTIONS
As the world leader in electrical wiring interconnection systems, Safran is a recognized supplier to helicopter manufacturers around the world. From design and development to production and support, we cover other onboard electrical functions including generation, distribution, conversion, load management, systems integration, filtration and ventilation.

ENHANCED RELIABILITY POWER SYSTEMS
Safran has engineered a range of auxiliary power units including the eAPU and Saphir Power System families, providing a wide range of solutions for new-generation rotorcraft. Capable of supporting either pneumatic or electric main engine start and delivering electrical power on ground, or in flight, their proven reliability allows operations in the most severe conditions.

HYBRID Rotorcraft Propulsion
Safran is committed to meeting the needs of tomorrow’s more electric helicopters. By combining expertise in engines, electrical and power management systems and eAPUs, we are developing hybrid propulsion systems to remain at the cutting edge of helicopter innovation.

ELECTRIC BRAKES
Combining new-generation composite carbon friction material and electric actuation, our electric brakes represent a major improvement in helicopter braking. We were the first company to equip a helicopter with this new-generation braking system.

ENGINEUS™ ELECTRICAL MOTORS
Safran has designed a full range of engineUS™ electrical motors. They are smart, efficient, optimized and adapted to a wide range of applications from actuation to propulsion.

CUSTOMERS:
- Airbus Helicopters
- Avicopter
- Bell
- Boeing
- Hindustan Aeronautics Limited
- Leonardo
- NH Industries
- Sikorsky

Main and Auxiliary AC/DC Power Generation (Air & oil cooled)
Electrical Harnesses

BTP Cooling

Engineering, Services Integration, Certification, On-site Installation

Primary & Secondary Distribution Systems & Components

Power Electronics, GCU & Conversion

Cabin & Avionics Fan

Full 3D structure layout

#2
WORLDWIDE IN ELECTRICAL POWER & DATA GENERATION

#1
WORLDWIDE IN AIRCRAFT ELECTRICAL WIRING INTERCONNECTION SYSTEMS

#1
WORLDWIDE IN POWER TRANSMISSIONS (mainline commercial jets with more than 100 seats)

#1
WORLDWIDE IN ELECTRICAL POWER & DATA GENERATION

A WORLD LEADER IN AIRCRAFT, HELICOPTERS AND MILITARY AIRCRAFT

SIKORSKY GOLD SUPPLIER FOR ELECTRICAL WIRING INTERCONNECTION SYSTEMS

8 9
Combining advanced engineering, integrated systems technology and in-depth service experience, we offer cost-efficient solutions to helicopter and tiltrotor manufacturers around the world. Our capabilities include landing gear, landing gear extension and retraction systems, steering systems, braking systems, as well as wheels and brakes integration.

**BREAKTHROUGH IN HELICOPTER BRAKING**

We have applied decades of experience in carbon technology to develop innovative braking systems for the helicopter market. Our brakes are designed to be lighter, more reliable and highly efficient.

Our program of continuous development is geared at providing helicopter platforms with next generation landing and braking systems that are not only reliable and easy to maintain, but lighter, quieter, more cost-efficient and robust.

**CUSTOMERS:**

- Airbus Helicopters
- Sikorsky
SAFRAN’S FULL RANGE OF HELICOPTER AVIONICS SYSTEMS COVERS FLIGHT CONTROL, INERTIAL NAVIGATION, DATA ANALYSIS, OBSERVATION AND MISSION MANAGEMENT.
A KEY INTERNATIONAL PLAYER IN AERONAUTIC EQUIPMENT AND SYSTEMS FOR HELICOPTERS,
SAFRAN DESIGNS AND MANUFACTURES HIGH TECH SOLUTIONS FOR TODAY’S HELICOPTERS.

SAFETY SYSTEMS & ONBOARD SYSTEMS
INCREASING HELICOPTERS PERFORMANCE & OPTIMIZING FLIGHT SAFETY

EMERGENCY FLOTATION SYSTEMS
Designed to enable a helicopter in difficulty to land on water, our emergency flotation systems are light and innovative. Capable of providing stability to sea state 6 and more, they reduce the risks of capsize and submersion during a sea landing.

LIFE RAFT SYSTEMS
Safran has developed automatic and reversible inflatable life raft systems to facilitate passenger boarding. Offering high survivability, our rafts have the advantage of light weight and low packaging volume.

FUEL SYSTEMS
Safran produces internal and external auxiliary fuel systems, as well as all associated equipment (gauges, fuel monitoring panels, etc.), that increase the operational range of helicopters. Backed by many years of experience in the domain of lightweight and flexible aircraft fuel tanks, Safran has reinforced its position in the helicopter market with the development of its own specific mixes and doped fabrics. This strategy of innovation has enabled Safran to develop lighter fuel tank envelopes.

COCKPIT AND LIGHTING SOLUTIONS
A major player in the lighting solutions market, Safran can deliver a complete external lighting system that is entirely LED-based. Safran also produces, for helicopter cockpits, large-scale illuminated panels, keyboards and other control panels.

CUSTOMERS:
• Airbus Helicopters
• Avic Helicopter
• Bell
• Hélicoptères Guimbal
• Korea Aerospace Industries
• Leonardo Helicopters
• MD Helicopters
• Robinson
• Sikorsky

#1 WORLDWIDE IN EMERGENCY FLOTATION SYSTEMS FOR HELICOPTERS
60 YEARS OF EXPERTISE IN EMERGENCY FLOTATION SYSTEMS
OUR FLOTATION SYSTEMS CAN EQUIP 80% OF THE WORLD HELICOPTER MARKET
Safran is aware of the challenge and is designing, manufacturing and maintaining customized technical seats that meet the specific needs. Adapting ourselves to the different requirements of customers, our pilot seats are unique to each helicopter model.

Customers:
- Helicopter manufacturers
- Operators

Safran provides light, medium and heavy helicopters with passenger and pilot seating systems that meet the specific needs of this demanding market.

Innovative Seating Systems

Based on Safran’s long experience on helicopters seating systems, our products include a shock absorption system designed to optimize pilot and passenger safety. We also offer smart, innovative seat actuation functions for a comfortable in-flight experience.
CUSTOMER SUPPORT PROVIDING COMPREHENSIVE WORLDWIDE CUSTOMER SUPPORT

FLEXIBLE, TAILORED SUPPORT

Rotorcraft manufacturers and operators require reliability, flexibility, cost-efficiency and optimized planning. Safran is well-positioned to offer extensive, custom-tailored support across the full lifecycle of rotorcraft programs.

Our global aftermarket offering includes spares provisioning and supply, maintenance, repair and overhaul (MRO), Aircraft-On-Ground (AOG) support, engineering services, real-time data monitoring, logistics management, as well as on-site and technical support and training.

IMPROVING SERVICES THROUGH INNOVATION

As an innovator, our strategy is to constantly anticipate and introduce new technologies, new production techniques and new materials in order to better maintain and repair our products.

We believe in preventive maintenance, which is why we leverage our expertise in data analytics to diagnose and forecast maintenance needs.

GLOBAL REACH, LOCAL SUPPORT

With facilities strategically located in major aviation hubs, we meet the demands of fleet operators, while strengthening ties with our customers. This strategy enables us to provide immediate, efficient and reliable support, ultimately improving dispatch reliability.

Certified Service Centers

- Support by the hour
- Training and consulting services
- 24/7 customer support and services
- Distribution centers
- International repair network on-site support
- More than 200 technical representatives worldwide

BOOST® (BANK OF ONLINE SERVICES & TECHNOLOGIES) is Safran’s new online rotorcraft engine maintenance management service. Developed in partnership with IBM, this tool provides operators of Safran-powered helicopters with real-time, personalized engine data to enrich their own fleet maintenance management, with the direct support of Safran teams.