Safran Electronics & Defense is the only company today that mass produces systems based on all inertial technologies:

- **Mechanical**
- **Optical (RLG and FOG)**
- Resonator (Coriolis vibratory gyros) including the latest Hemispherical Resonator Gyro, dubbed "HRG Crystal™", the best inertial technology in terms of lifespan and reliability.

Building on this unrivaled expertise, Safran Electronics & Defense addresses all types of applications, from the depths of the oceans to the outer reaches of space, for both the civil and defense sectors.

Given this heritage, the breakthrough HRG Crystal™ is clearly the most versatile navigation grade device now on the market.

Safran Electronics & Defense’s fleet of gyros operating around the world:

- **150,000 resonator gyros**
- **230,000 mechanical gyros**
- **100,000 optical gyros**
Since the late 1990s, Safran Electronics & Defense has designed and produced a large number of HRG inertial systems and sensors for many different applications. The HRG Crystal™ is mature and proven in terms of accuracy and reliability, meaning that Safran can address new markets, from mid-range navigation to high-grade military missions.

The Hemispherical Resonator Gyro, or HRG, is used to measure the rotation of a platform, whether aircraft, ship, tank or other vehicle, to calculate its exact position and attitude. A stationary resonance wave is maintained electronically inside a silica hemisphere called a resonator. Using the same principle as originally discovered by Léon Foucault, with his pendulum experiment in 1851, this resonant wave stays fixed in relation to an inertial reference (for example, fixed stars), like a pendulum that continues to oscillate in a fixed plane despite the Earth’s rotation around its own axis.

By measuring the relative angle between the vibration plane and the resonator, we can calculate the rotation of the aircraft, ship or other vehicle, and then deduce, using inertial principles, the mobile’s position and orientation.

Target Acquisition Systems

- PASEO
- GEONYX™ INS for land platforms
- ARGONYX™ INS for military or paramilitary ships
- BLACK-ONYX™ & BLACK-ONYX™ DUAL CORE INS for submarines

Weapons & Missile Guidance

- HAMMER Air-to-ground smart weapon

Aircraft Navigation

- SKYNAUTE INS for airborne platforms

Space Navigation

- REGYS 20 Rate Gyro for attitude & orbit control systems
- SPAECNAUTE INS for space vehicles