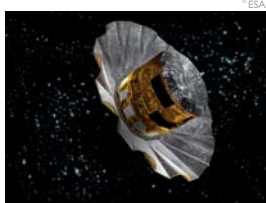


SPACE

SENER has distributed over 150 space equipments with flawless performance in the last 40 years.

Mechanical & Actuation Systems

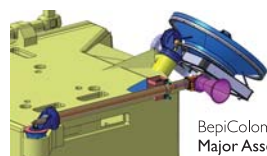
SENER capabilities in the field of Mechanisms & Mechatronics cover the whole range of activities, from conceptual design, analysis, simulation and manufacturing, up to hardware assembly, final integration and test (AIT).



GAIA Sunshield Structure and Deployment Mechanism



Mars Science Laboratory High Gain Antenna Gimbal - HGAG



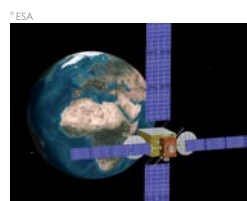
BepiColombo, Medium Gain Antenna Major Assembly (MGAMA) & High Gain Antenna Pointing Assembly (HGA-APA). Design, manufacture, integration and tests.

Guidance and Attitude Control Systems

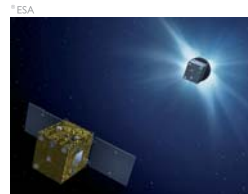
SENER is a prime contractor of those technologies for important National and European programs, including, in most cases, the development of the control software.



PLANCK
Leadership of the complete AOCs/GNC system of the Planck Satellite



SMART OLEV IN-ORBIT SERVICING SENER covers the mission analysis, GNC development (including SW), simulators development and reaction control System



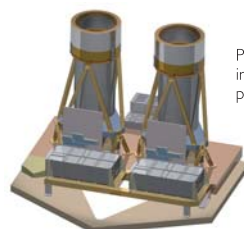
PROBA-3 FORMATION FLYING
Full System responsibility from preliminary design up to system verification in flight and acceptance

Optical Systems

As a major integrator SENER is leading critical payloads, such as the optical instrument of the Spanish observation satellite SEOSAT/INGENIO.



ROSETTA Filter Wheels for NAC and WAC cameras



Prime contractor of the optical instrument of the Spanish satellite program SEOSAT / INGENIO

AERONAUTICS

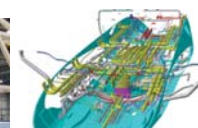
Design and manufacturing support of advanced aerostructures. Development and production of manufacturing tools for composites parts and assembly lines.

Aerostructures and Aircraft Systems and Integration

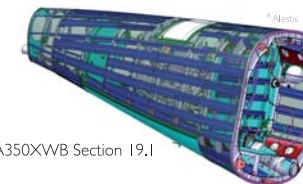
SENER participates in the engineering of complex aerostructures, and is running today several projects designing aerostructures, mainly in composite materials, for the A380, A400M, B787 and the new A350 XWB.



A380 and A350XWB belly fairing

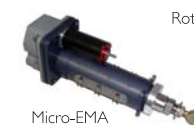


A350XWB Section 19.1



Electro-Mechanical Actuators

SENER is participating in several projects designing and manufacturing electro-mechanical actuators for aeronautical applications, providing innovative solutions, and used for aircrafts and helicopters secondary flight controls.



Micro-EMA

Rotatory Actuator HDRA



Tooling

Main activities in Composite Processing Technologies are to develop advanced manufacturing processes to produce aeronautical composite parts with increased productivity.



Hot Drape Forming Machine



Filler pulltrusion machine



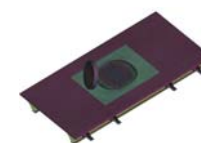
Open air test bench for A400M acoustic testing



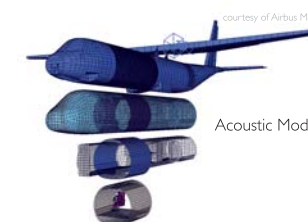
Assembly line of A400M

Simulations

Development of a simulation methodology according to the requirements for large civil transport aircraft flight certification on damage tolerance, crashworthiness and interior noise.



High velocity impact simulation



Acoustic Model