



30 Mayo 2023

# 1<sup>er</sup> Foro I+DONES Sener Aeroespacial



# Sener



## SENER AEROSPACE & DEFENSE



- Space
- Defense
- Science



## SENER MOBILITY



- High speed railways
- Freight & mainline railways
- Metro systems
- LRT's & tramways
- Roads & highways
- Airports
- Ports
- Architecture
- Water & environment



## SENER ENERGY



- Hydrogen & carriers
- Circular economy
- Gas
- Power
- Renewables and storage
- Wind and marine energies
- Sustainable industry



## SENER MARINE



- Marine engineering

# Sener Aerospace

## Resulting figures



Turnover  
(M€)



106,7



Order intake  
(M€)



188,3



Workforce



741



R&D  
investment



9,8 %








# Sener Aerospace & Defense

## Activities per sector



 <b>SPACE</b>	 <b>DEFENSE</b>	 <b>SCIENCE</b>
<ul style="list-style-type: none"> <li>· Mechanical ground support equipment (MGSE)</li> <li>· Rotary actuators</li> <li>· Mechanisms for platforms &amp; Payloads</li> </ul>	<p><b>ELECTRO-MECHANICAL SYSTEMS</b></p> <ul style="list-style-type: none"> <li>· Fin control and actuation systems (CAS)</li> <li>· Stabilization systems</li> </ul>	<ul style="list-style-type: none"> <li>· Ground telescopes systems</li> <li>· Large mobile structures</li> <li>· Mechanisms for Science Infrastructures</li> </ul>
<b>NAVIGATION SYSTEMS</b>		
<ul style="list-style-type: none"> <li>· Attitude control</li> <li>· Guidance, navigation and control</li> <li>· Test equipments</li> <li>· Hybrid navigation equipment</li> </ul>	<ul style="list-style-type: none"> <li>· Autonomous Navigation</li> </ul>	
<b>RF &amp; COMMUNICATION SYSTEMS</b>		
<ul style="list-style-type: none"> <li>· Antennae pointing sub-systems</li> <li>· RF active, passive and antenna products</li> </ul>	<ul style="list-style-type: none"> <li>· Communications intelligence (COMMINT) equipment</li> <li>· Multi-band Data Link Systems</li> </ul>	<ul style="list-style-type: none"> <li>· Waveguides and cavities for accelerators and other research institutes</li> </ul>
<b>OPTO-MECHANICAL SYSTEMS</b>	<b>HELICOPTER MODERNIZATIONS</b>	<b>OPTO-MECHANICAL SYSTEMS</b>
<ul style="list-style-type: none"> <li>· Opto-mechanical sub-systems</li> <li>· Optical payloads</li> </ul>	<ul style="list-style-type: none"> <li>· Communications intelligence (COMMINT) equipment</li> <li>· Multi-band Data Link Systems</li> </ul>	<ul style="list-style-type: none"> <li>· Active optics: Tip-Tilt &amp; positioning mechanisms.</li> <li>· Instruments / Diagnostics sub-systems</li> </ul>

# Sener Aerospace

## Offices & locations



**Las Arenas-Vizcaya**  
7,969 m<sup>2</sup>  
SEM  
Electromechanical Systems



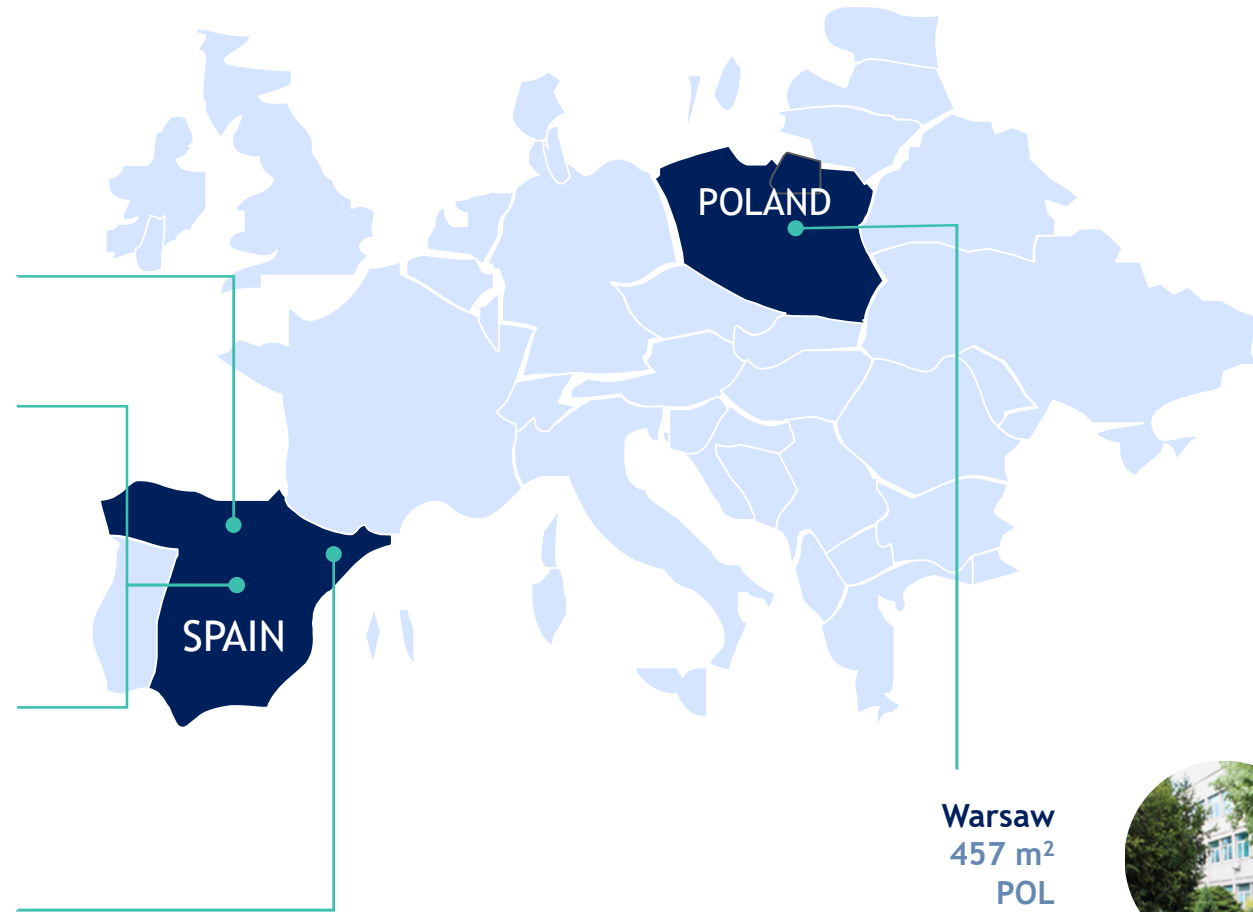
**Tres Cantos-Madrid**  
13,659 m<sup>2</sup>  
ASA  
Avionics & Advanced Systems



**Arganda del Rey-Madrid**  
TCOM  
COM (Sener RYMSA)  
Communications. Passives



**Cerdanyola del Vallès-Barcelona**  
5,700 m<sup>2</sup>  
SEM  
COM  
Electromechanical Systems. Actives

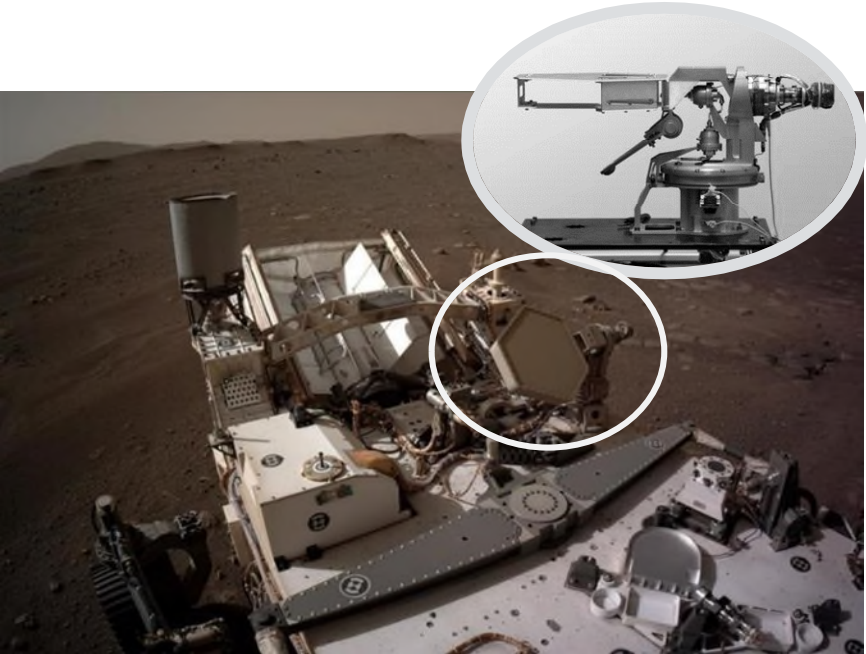


**Warsaw**  
457 m<sup>2</sup>  
POL  
Sener Polska



# Sener Science

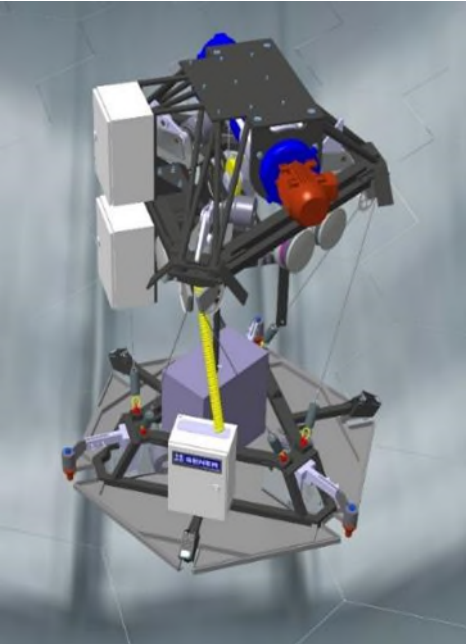
## Custom Mechanisms and Instruments



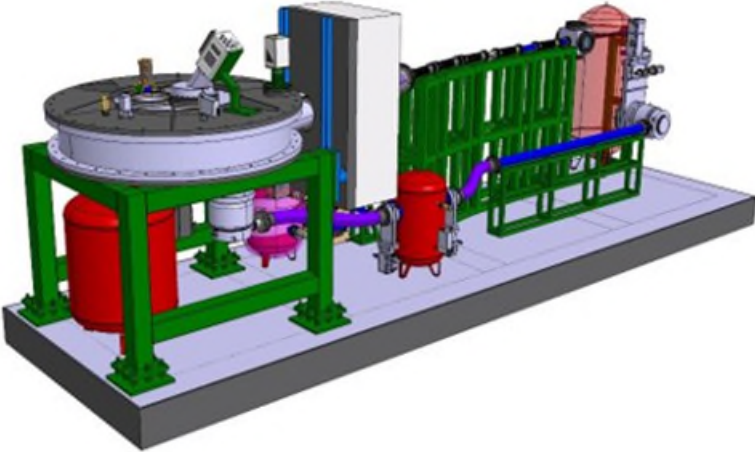
Curiosity/Perseverance  
Antenna Mechanism



ELT M2 Mirror Cell



ELT M1 Manipulator



JT60SA- Centrifuge Accelerator



# Sener Science

## RF Systems



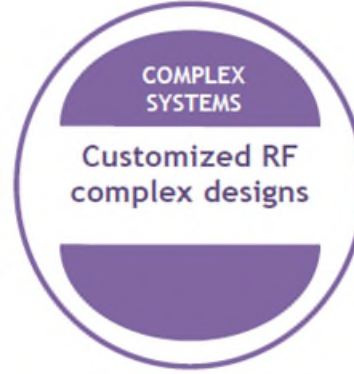
- o Different Sizes
- o Very stable performances
- o Low insertion loss and VSWR
- o Outdoor and indoor applications



- o Compact design
- o High stability
- o Easy-plug connection
- o Unified connector interface
- o Broadband operating
- o Best VSWR performances
- o Low insertion lost
- o Several dielectrics



- o Compact design
- o High stability
- o Easy-plug connection
- o Unified connector interface
- o Broadband operating
- o Best VSWR performances
- o Low insertion lost
- o Several dielectrics



- o R&D Engineering services
- o Customized complex and tailored solutions
- o According to the most stringent requirements



# Sener Science

## I+D Activities related to DONES

### Remote Handling

- Large loads (10 Tn) manipulation with micron precision
- Systems Engineering collaboration



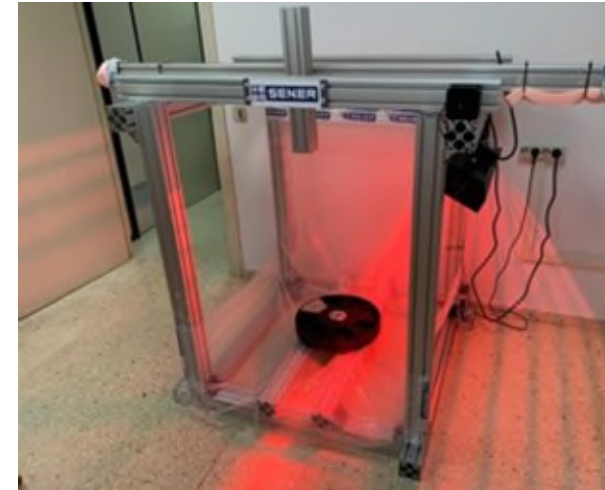
Rad-Hard Rotary Actuator  
Up to 20 MGy



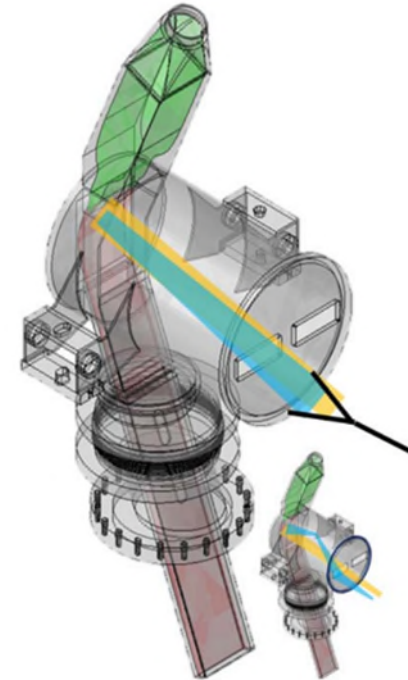
Parallel Kinematic Manipulator

### Diagnostics Systems

- Li Target RF Diagnostics



Li Target Design & Prototype

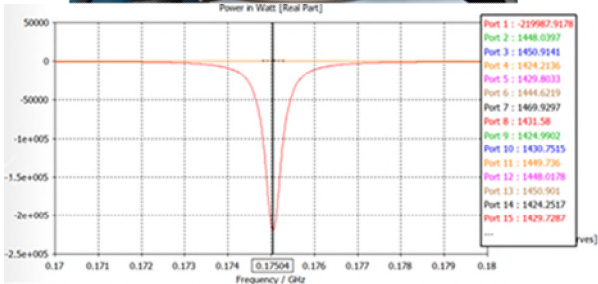
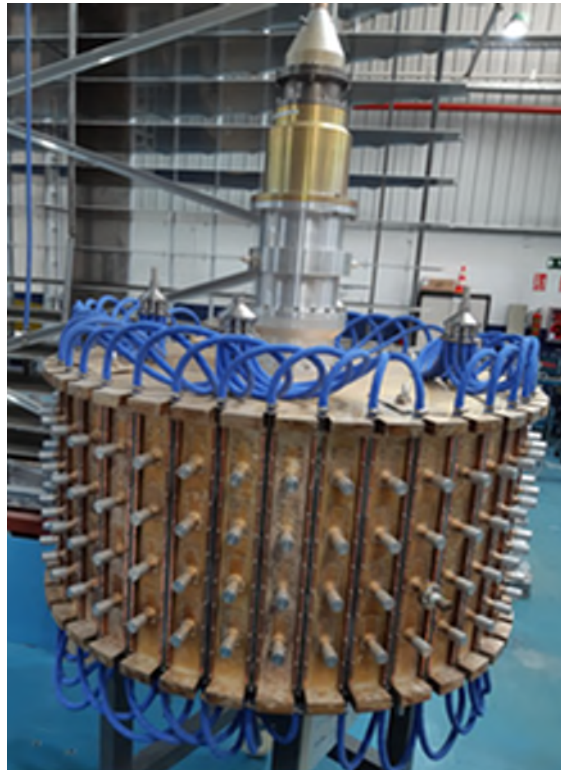
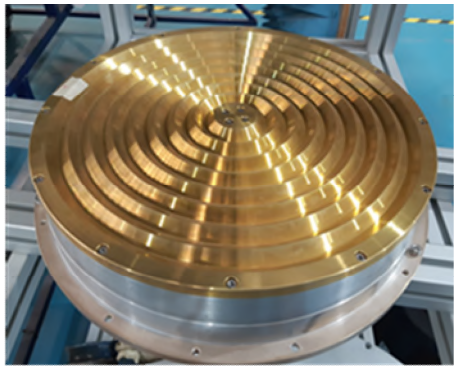






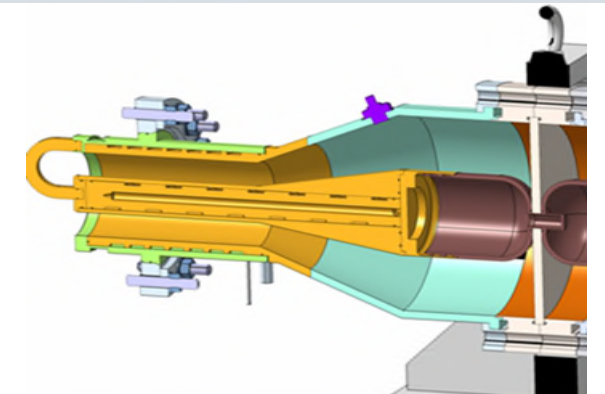
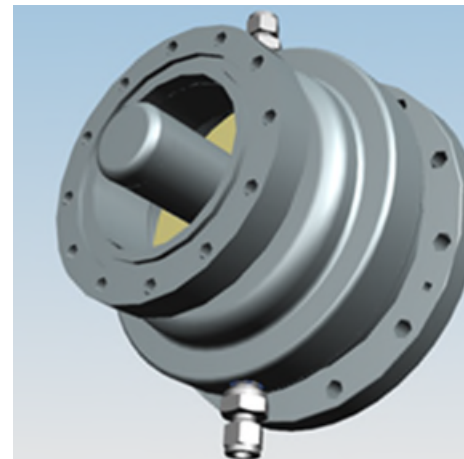
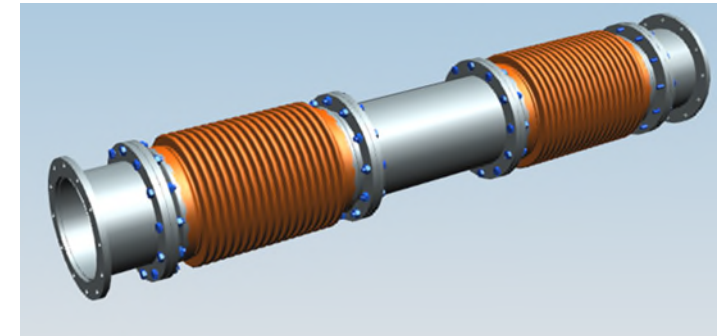
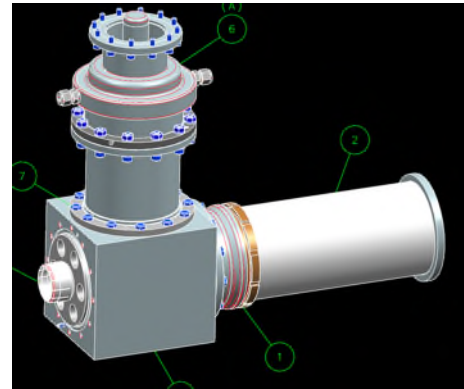
### RF High Power Combiner Cavity

- 160 coax 7/8" coax inputs, output 9"
- To admit 1500W RF solid state modules, per input.
- In 40 plates with 4 inputs (loops) each.



### RF couplers for SRF Linac

Prototyping assembly with ceramic window, with TiN Surface cover, flanges, ...





Contact person:

**Joan-Manel Casalta**

Business Development - Science and Astronomy

E-mail: [joanmanel.casalta@aerospacial.sener](mailto:joanmanel.casalta@aerospacial.sener)

T: +34 93 227 65 63

M: +34 639 057 518



[www.group.sener](http://www.group.sener)

[www.linkedin.com/company/sener](http://www.linkedin.com/company/sener)

[www.youtube.com/@SenerGroup](http://www.youtube.com/@SenerGroup)