EOSOL Aerospace 2022

www.eosolgroup.com

Who we are

Grupo EOSOL, founded in 2008 in Pamplona, Spain.
We are a holding offering specialized engineering and consultancy services with presence in more tan 40 countries.

We are leader in management and development of projects. Backed by a long history of success in innovative work worldwide with a high technological load.

EOSOL **IN NUMBERS**

DIVERSESITY OF PROFILES

RF/ANTENNA ENGINEERS

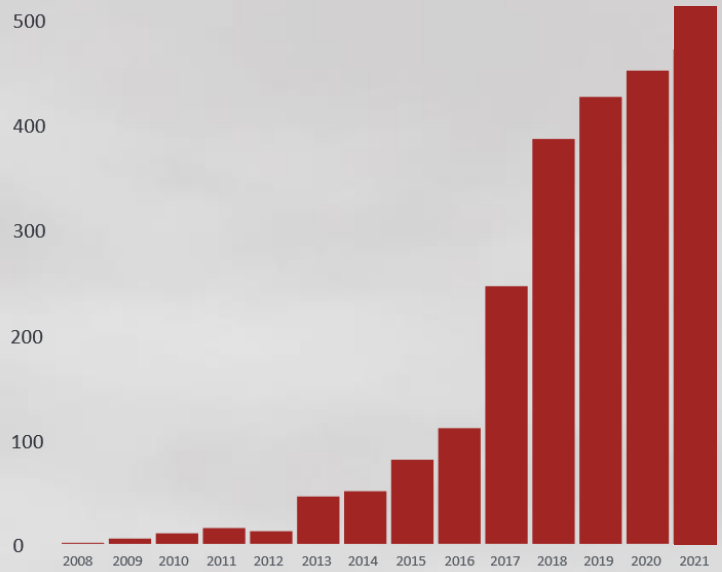
MECHANICAL ENGINEERS

PA/QA ENGINEERING

TELECOMMUNICATIONS ENGINEERS

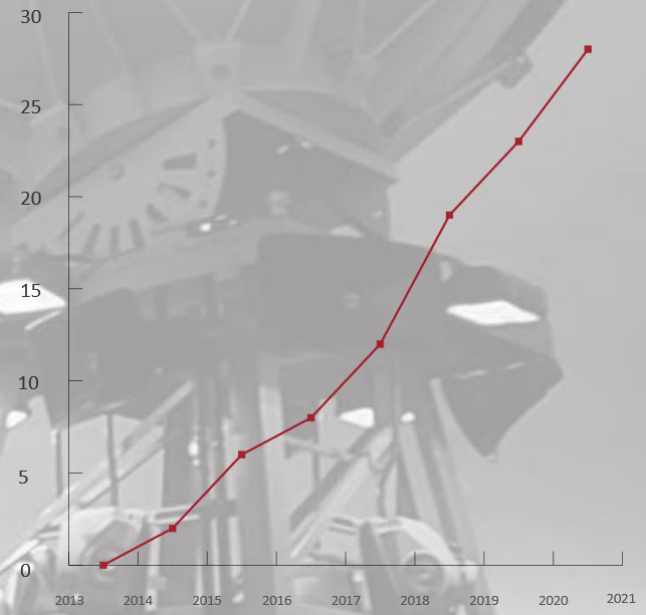
STAFF

Mean yearly growth: 90%

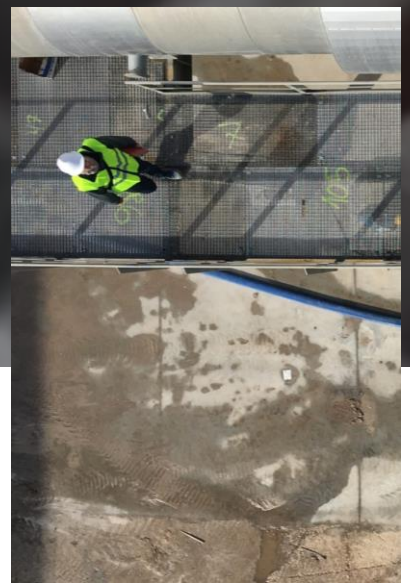


Turnover (M€)

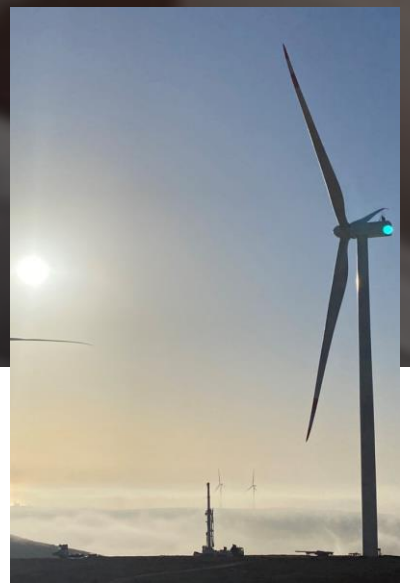
Mean yearly growth: 87%



SERVICES



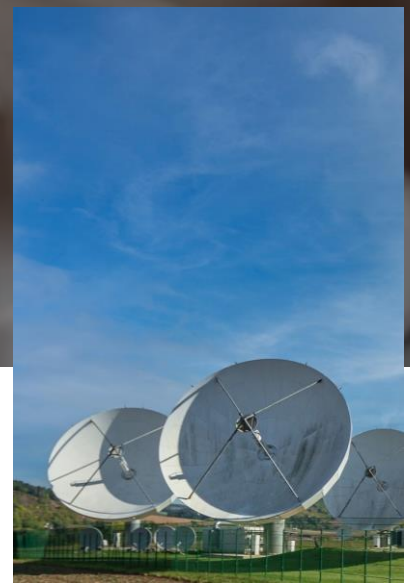
ENGINEERING & CONSULTING



SUPERVISION & TECHNICAL ASSISTANCE

AUTOMATION & CONTROL

OPERATION & MAINTENANCE



AEROSPACE ENGINEERING

SECTORS

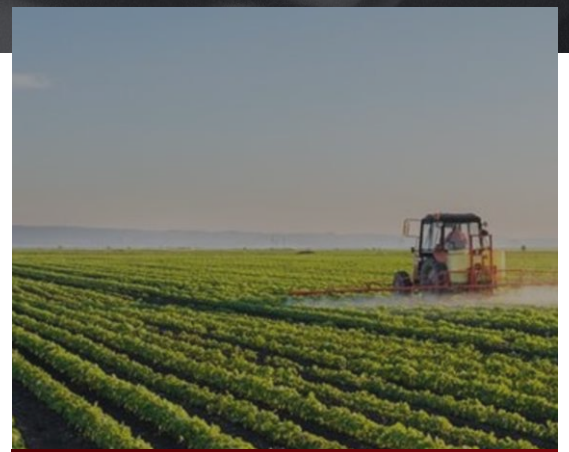
PHOTOVOLTAIC

EOLIC

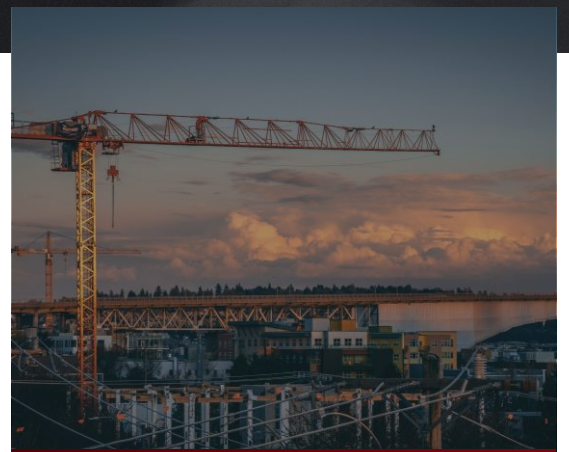
COGENERATION

CHEMICAL

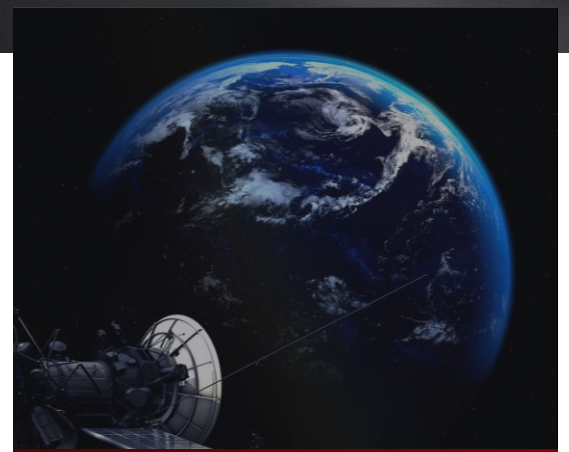
WATER



AGRI



CIVIL WORKS



AEROSPACE

AEROSPACE ENGINEERING

AEROSPACE ENGINEERING

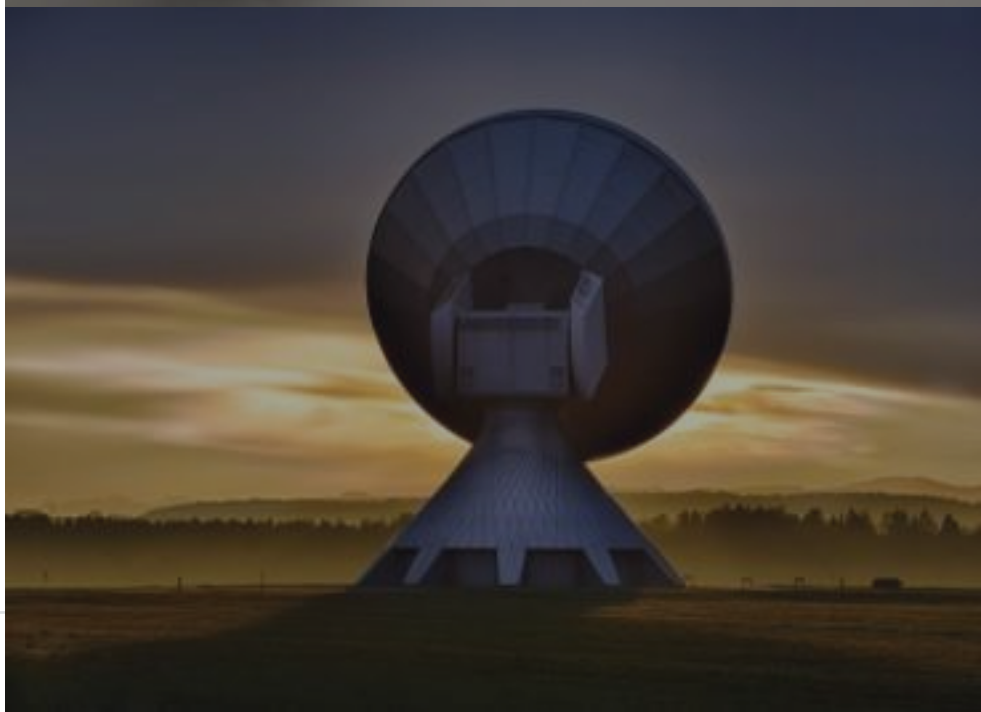
Competitive advantage

Radio frequency engineering, manufacturing, assembly and verification of communications components and subsystems for the aeronautics, defence and space sectors

Engineering and manufacturing services of radio frequency equipment for leading agencies in the space, defence and aeronautical sectors.

Formed by a team of engineers with more tan 25 years of experience in the sector, it provides services to the main satellite integrators in Europe, participating in and managing space and defence projects.

Capacity to undertake projects by completing the entire life cycle from the fesibility study and design, to manufcturing, assembly and verification, in order to provide our clients an integral solution.



Capabilities

We offer engineering services to offer our clients high-performance solutions.

1

Rediofrequency engineering

Design, optimization and development of RF components. Flat antennas, reflectors, arrays, horns, filters, diplexers, OMT, OMJ, polarizers.

2

Mechanical engineering

Design, calculation of structures and generation of 3D models and manufacturing drawings. We undertake the design and optimization of models for optimal manufacturing and cost reduction.

3

Manufacture

Manufacturing management ensuring all quality standards and generation of associated documentation (plans, roadmaps, RDIMs, CoCs ...), including direct customer manufacturing (Build to Print).

4

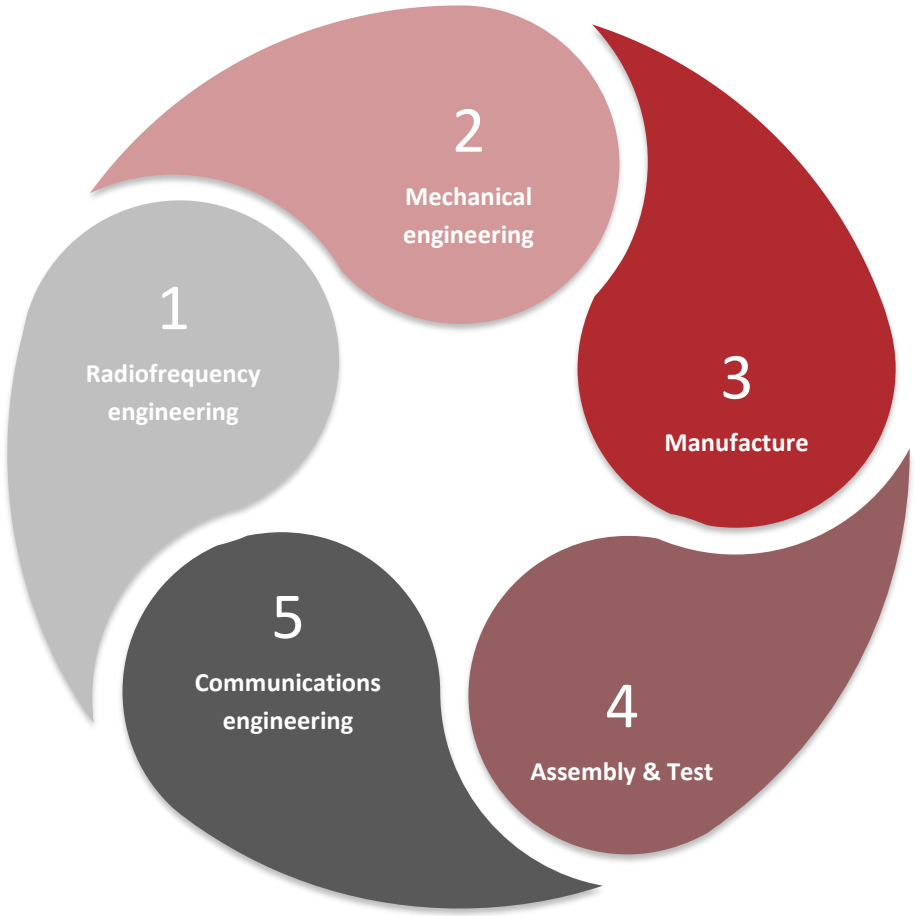
Assembly & Test

Assembly and integration of sets and RF, mechanical and environmental tests of all types of components and antennas.

5

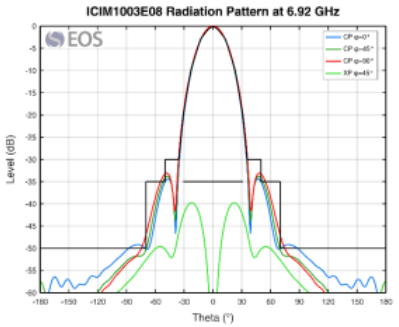
Communications engineering

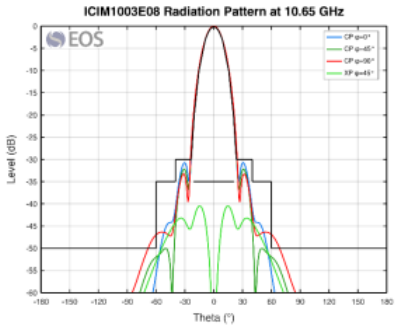
Consulting services for the development of wireless and satellite communications solutions for different types of applications.



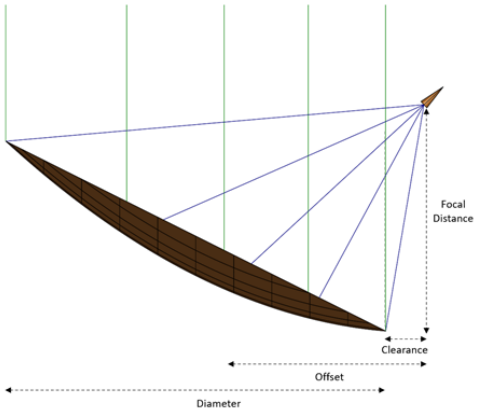
Feasibility study | Design & Development | Manufacture | Assembly & Test | Delivery

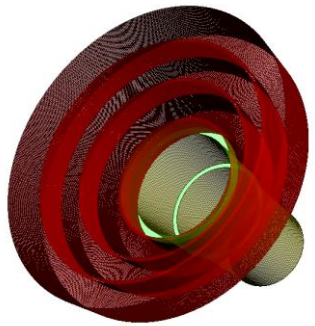
Electromagnetic simulation and analysis using advance SW tools

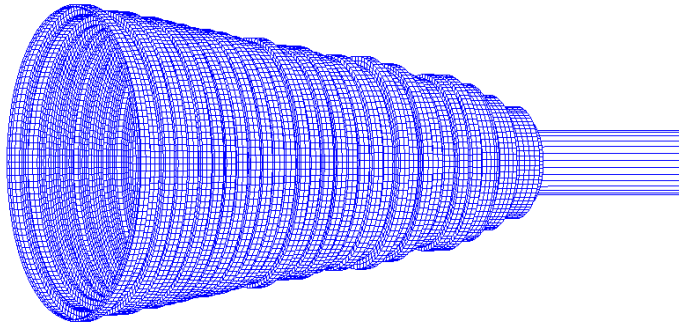


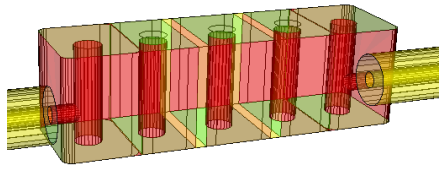


Label	Parameter	Unit	Requested	Value	SoC
R.2.1	Nominal frequency range	GHz	6.6 - 7.25 10.6 - 10.7	6.6 - 7.25 10.6 - 10.7	C
R.2.3	Polarisation	-	Dual Linear	Dual Linear	C
R.3.1	Return losses	dB	25	> 25	C
R.3.2	Port to port frequency channel isolation	dB	> 50	> 80	C
R.3.3	Port to port isolation H/V on same channel	dB	> 45	> 100	C
R.4.1	FHPBW (3dB)	º	26.2 17.8	26.2 17.8	C
R.4.2	FBW (10dB)	º	46.4 31	46.4 31	C
R.4.3	FBW (20dB)	º	62 41	62 41	C
R.4.4	FBW (30dB)	º	71 47	71 47	C
R.4.5	Sidelobes	dB	< -30 θ > 36° < -35 θ > 50° < -50 θ > 70° < -30 θ > 24° < -35 θ > 40° < -50 θ > 60°	< -32 θ > 36° < -35 θ > 50° < -52 θ > 70° < -32 θ > 24° < -37 θ > 40° < -52 θ > 60°	C
R.4.6	Integrated power	%	96.5 99	97 99.8	C
R.4.7	Cross-polar max	dB	< -35	< -38	C
R.4.8	Phase pattern template	ºpp	3.5 5.5	3.5 4	C
R.4.9	Phase centre	mm	-	-2 +/- 1.5 -3 +/- 0.5	C
R.5.1	Max Dimensions (L x W x H)	mm	L<650 D<170	L=620 D=170	C

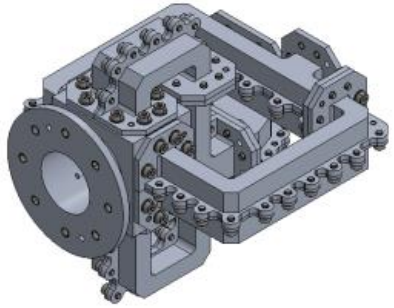


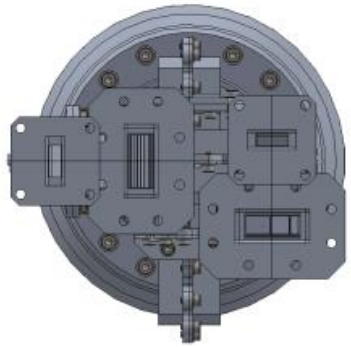


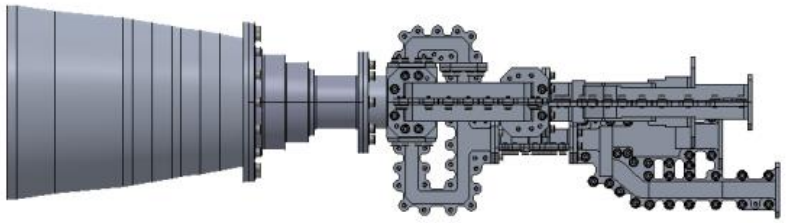


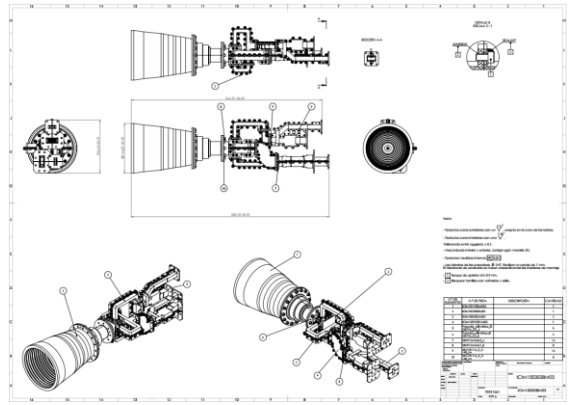


Mechanical engineering

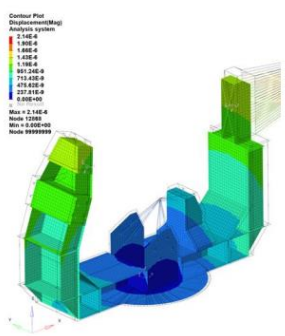


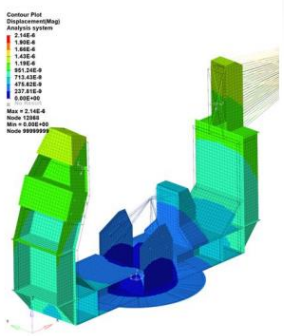


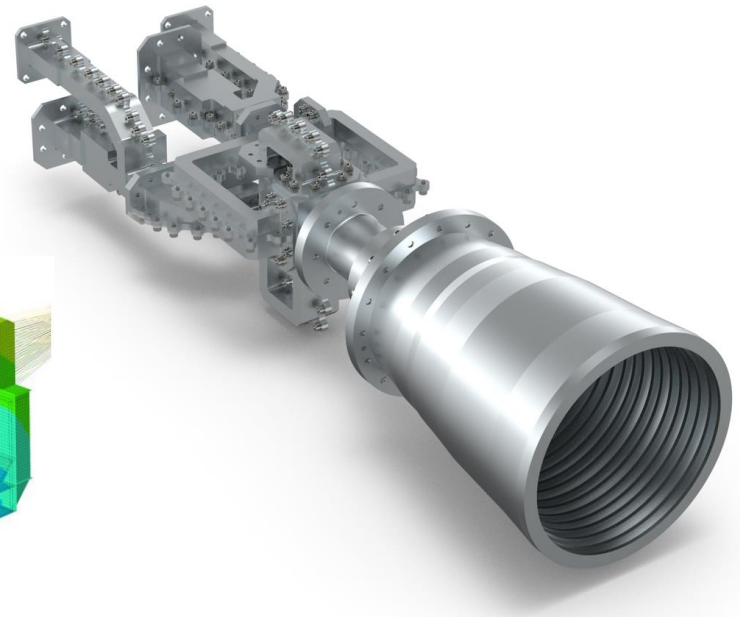


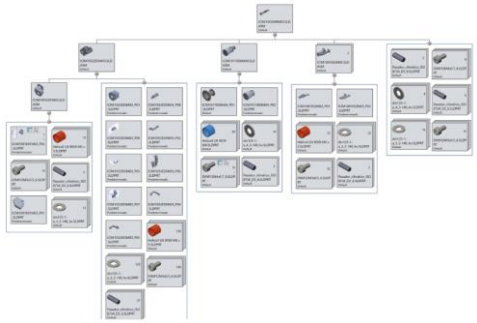


3D model and drawings generation with CAD software. Detailed mechanical and thermal analysis

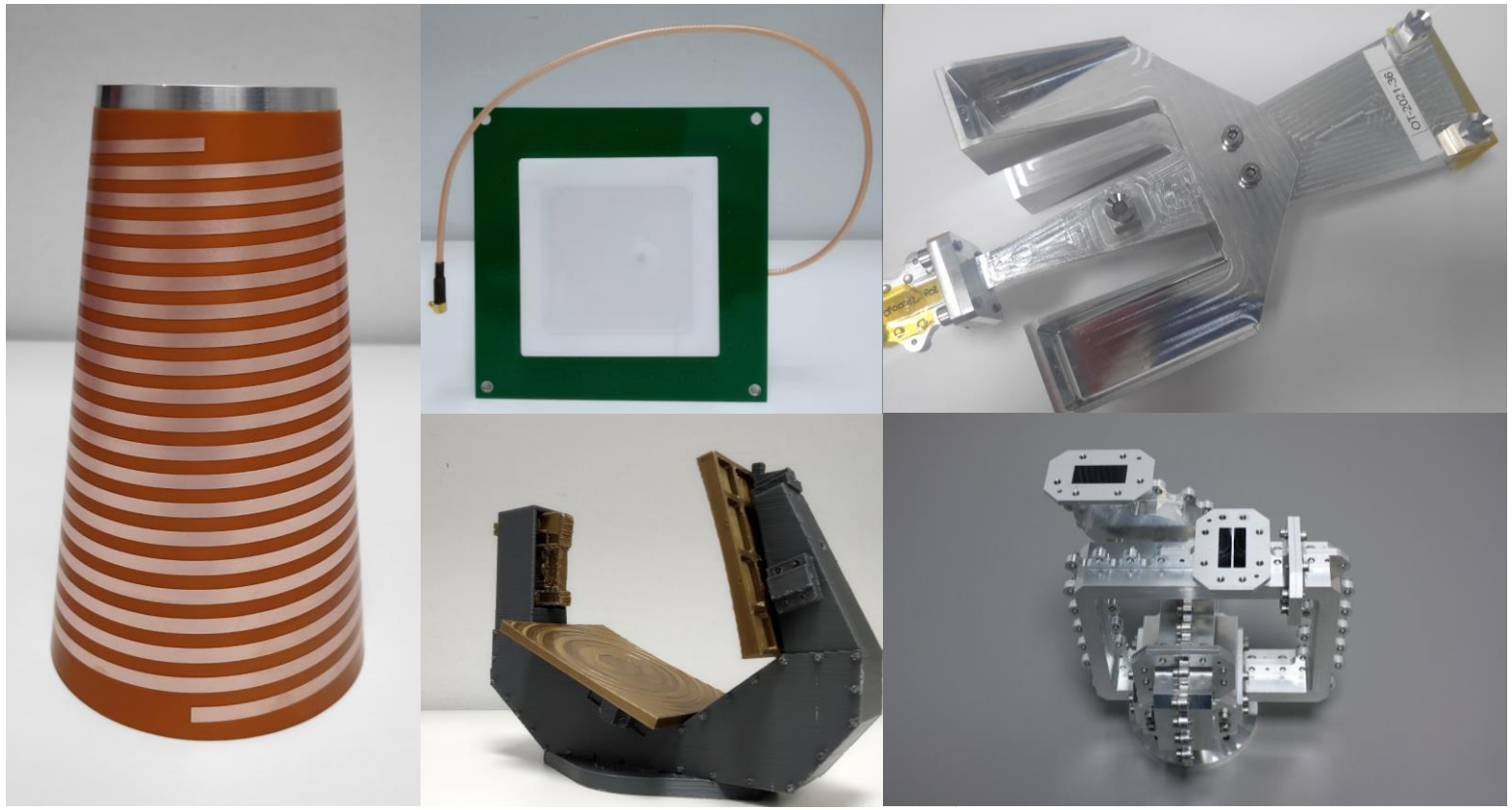








Manufacture

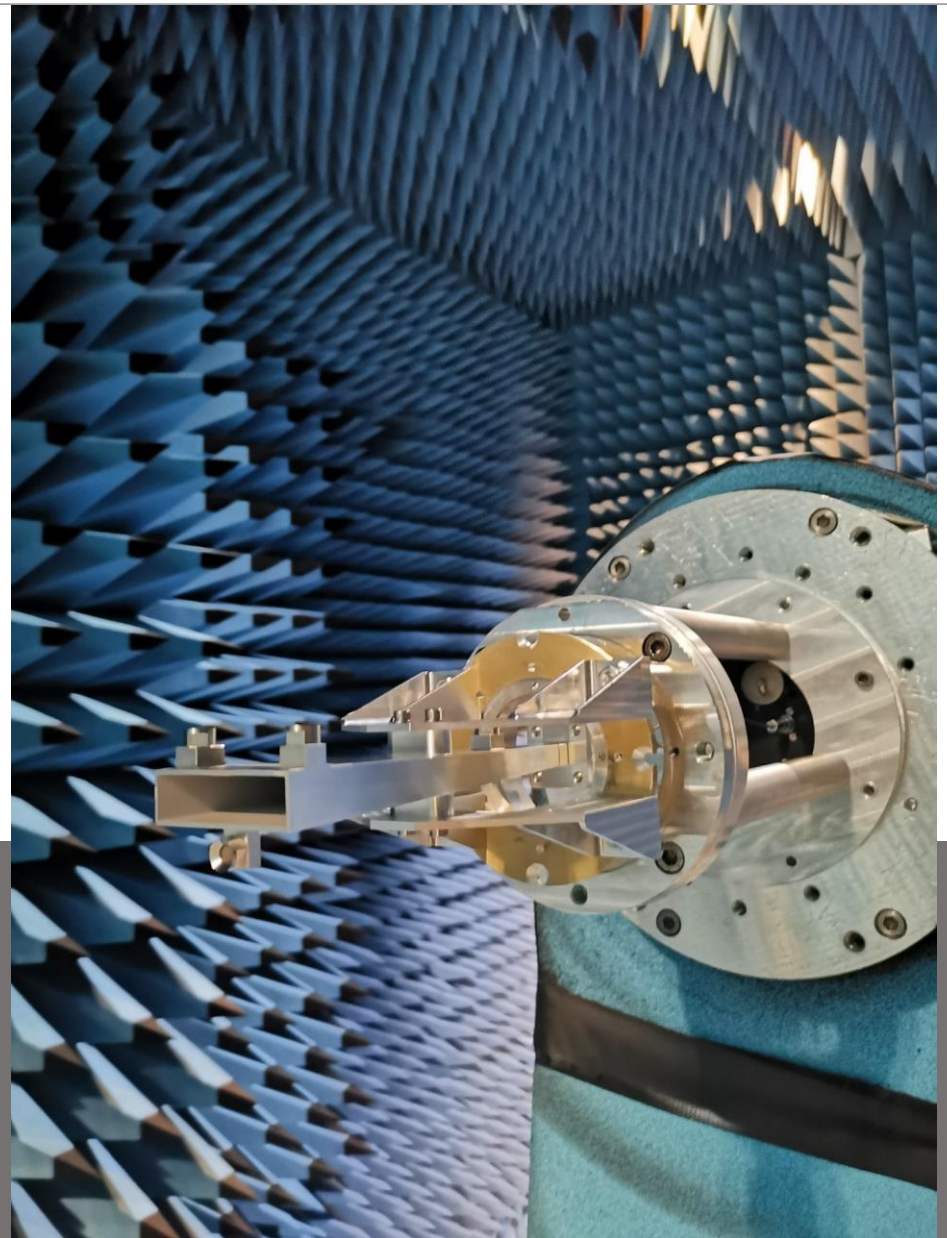


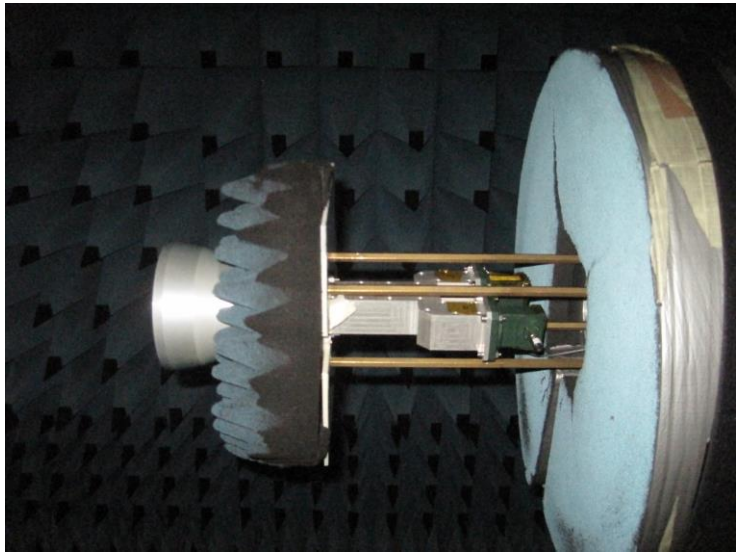
RF components and antenna manufacturing using CNC, milling or advance manufacture techniques

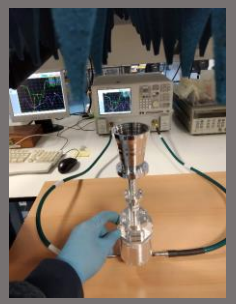
Assembly & Test

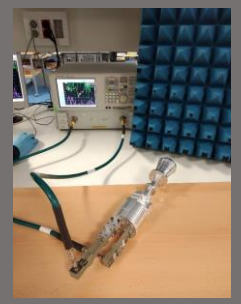
EOSOL

RF, mechanical and environmental test into certified laboratories

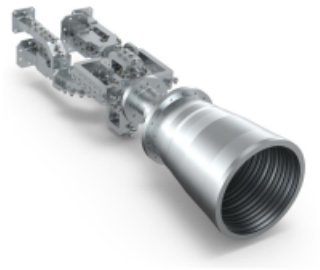








Multifrequency feeds for Radiometers



C & X

Offset configuration

Earth observation

EOSOL

High performance multifrequency feeds for Earth Observation (EO) applications such as radiometry.

- Frequency range: 6.6-7.25 GHz & 10.6-10.7 GHz.
- Directivity: 17.5 dB (6.6 GHz)
  20.75 dB (10.6 GHz)
- Return los: 25 dB
- Crosspolar: < -35 dB.
- Dual linear polarization feed with very low spillover.
- Low phase pattern and low phase center variation.
- Can feed a Single Offset Reflector

Feeds for telecom satellites (X, Ku and Ka)

Ka

Arrays y reflectors

Communications

EOSOL

Feeds for new generation of telecommunication satellites. Different applications such as telemetry, direct radiating array (DRA) or reflectors.

- Frequency range: 20.2-21.2 GHz & 30-31 GHz.
- Directivity: > 20 dB
- Return los: > 30 dB
- Crosspolar: < -35 dB.
- Dual circular polarization feed.
- Very estable phase center over frequency

Multifrequency feeds for Radiometers

K & Ka

Offset configuration

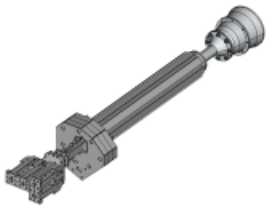
Earth observation

EOSOL

High performance multifrequency feeds for Earth Observation (EO) applications such as radiometry.

- Frequency range: 18.6-18.8 GHz & 36-37 GHz.
- Directivity: 18.8 dB (18.7 GHz)
  22 dB (36.5 GHz)
- Return los: 25 dB
- Crosspolar: < -30 dB.
- Dual linear polarization feed with very low spillover.
- Low phase pattern and low phase center variation.
- Can feed a Single Offset Reflector

Feeds for SATCOM & GCS



**Under development*

Ka

Ground Control Station

Communications and TTC

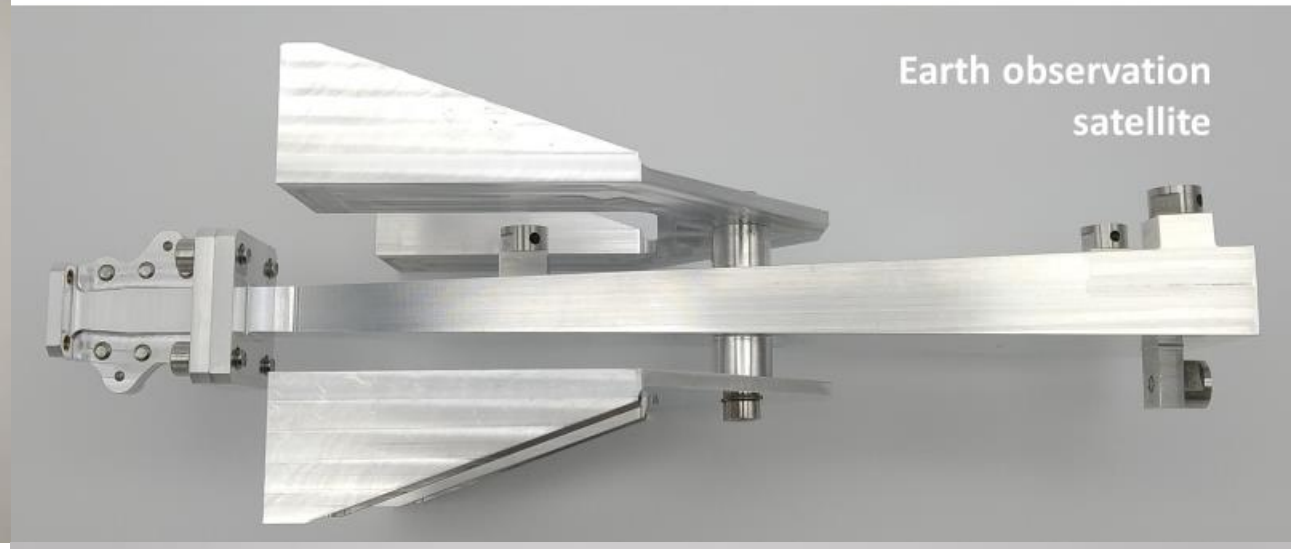
EOSOL

Ka band monopulse tracker for Ground Control Stations

- Frequency range: 17.3-18.1 GHz & 25.5-27 GHz.
- Return loss: 20 dB
- Crosspolar: < -30 dB
- Axial Ratio: < 0.5 dB
- Dual circular polarization feed (6 ports).
- Max Tx power 200W
- Monopulse TE21 coupler in Rx band.
- Optimised for 7m ring focus reflector.

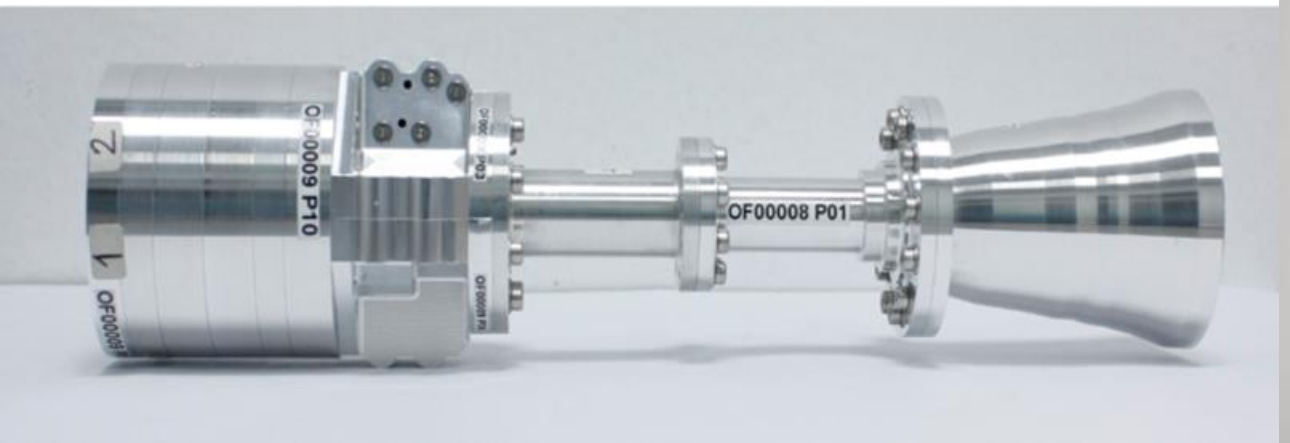
C-X BAND FEED

KA BAND FEED



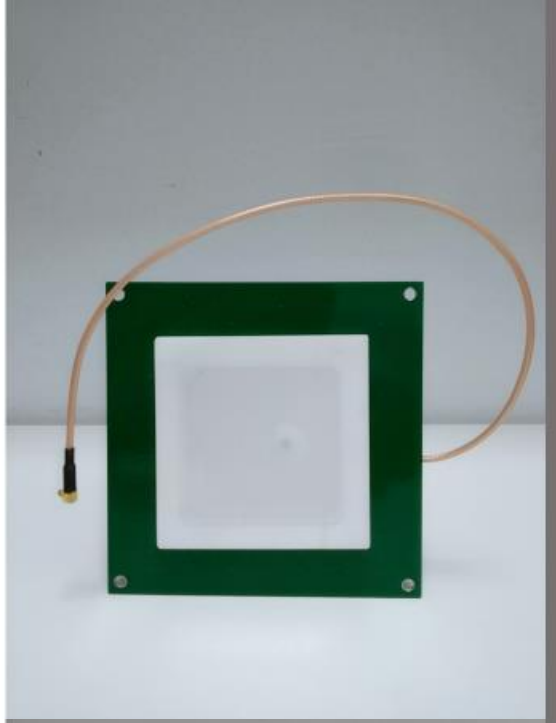
K-KA BAND FEED

Radiometer satellite



X BAND FEED

L BAND PATCH

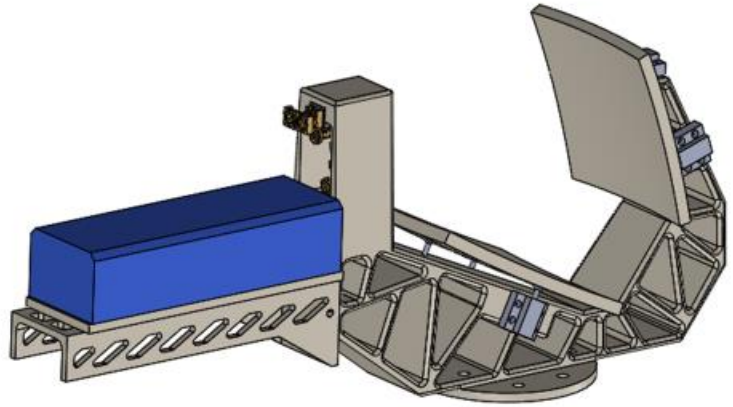


GNSS applications

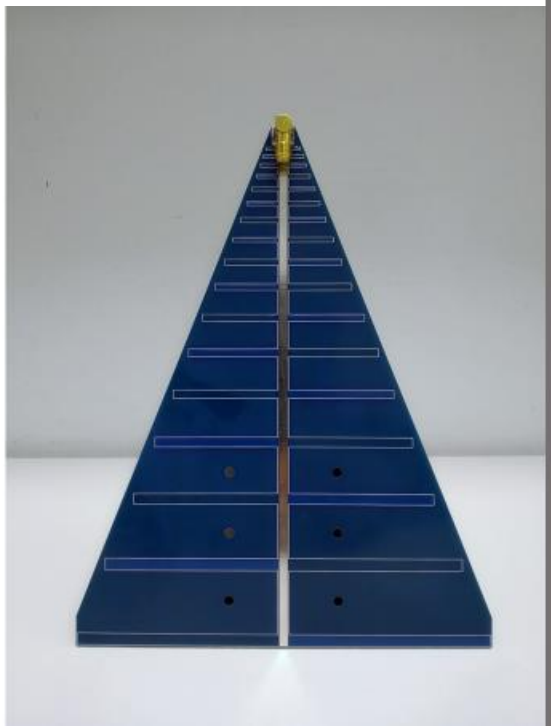
UWB ANTENNA

Earth Observation satellite

sub-mmW VAST ANTENNA



UWB ANTENNA



Signal Intelligence Antenna

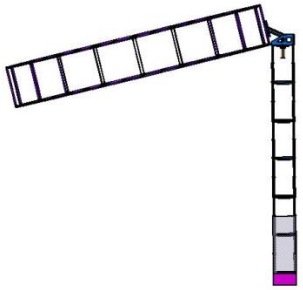
EUROPE'S master antenna

Projects

Deployable antenna development (1-3m) for cubesats and small satellites

In collaboration with COMET Ingeniería, Universidad Politécnica Cataluña y Open Cosmos the goal of this project is to develop a 1-3 meter deployable reflector antenna for telecom and/or Earth Observation applications.

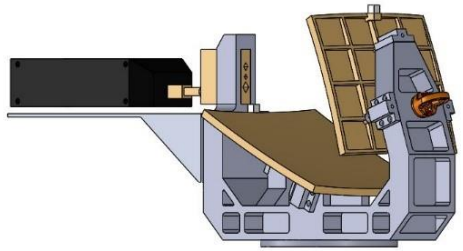
The project aims to develop a Ka band solution stowed in less than 3U. This solutions is of great interest for cubesat and smallsats due to its high performance in a reduced and light form factor.



Sub-mm (VAST) antenna up to 1.2THz

In collaboration with RPG, SPS and UPM. The main objective of the project is to develop a well-characterised, mechanically and thermally stable multi-frequency reflector submmVAST antenna covering six channels: 89 GHz, 118 GHz, 183 GHz, 325 GHz, 664 GHz and 1.2 THz.

The developed submmVAST antenna will be used for the intercomparison and validation of the antenna measurements of the more challenging future instruments. For the first time, the submmVAST antenna will be characterised down to cryogenics at the LORENTZ Chamber at the Antenna Laboratory at ESTEC.



Development of a 400MHz-2GHZ feed for earth observation radiometers

In collaboration with Airbus DS. The objective of the activity is to develop a circularly-polarized low-frequency and wide-band feed that will excite Future Earth Observation Radiometers.

After the state-of-art research and trade-off of different feasible feed solutions, the design, manufacturing and validation of a breadboard model will be carried out.

References

Design, Development and delivery of flight units for space projects:

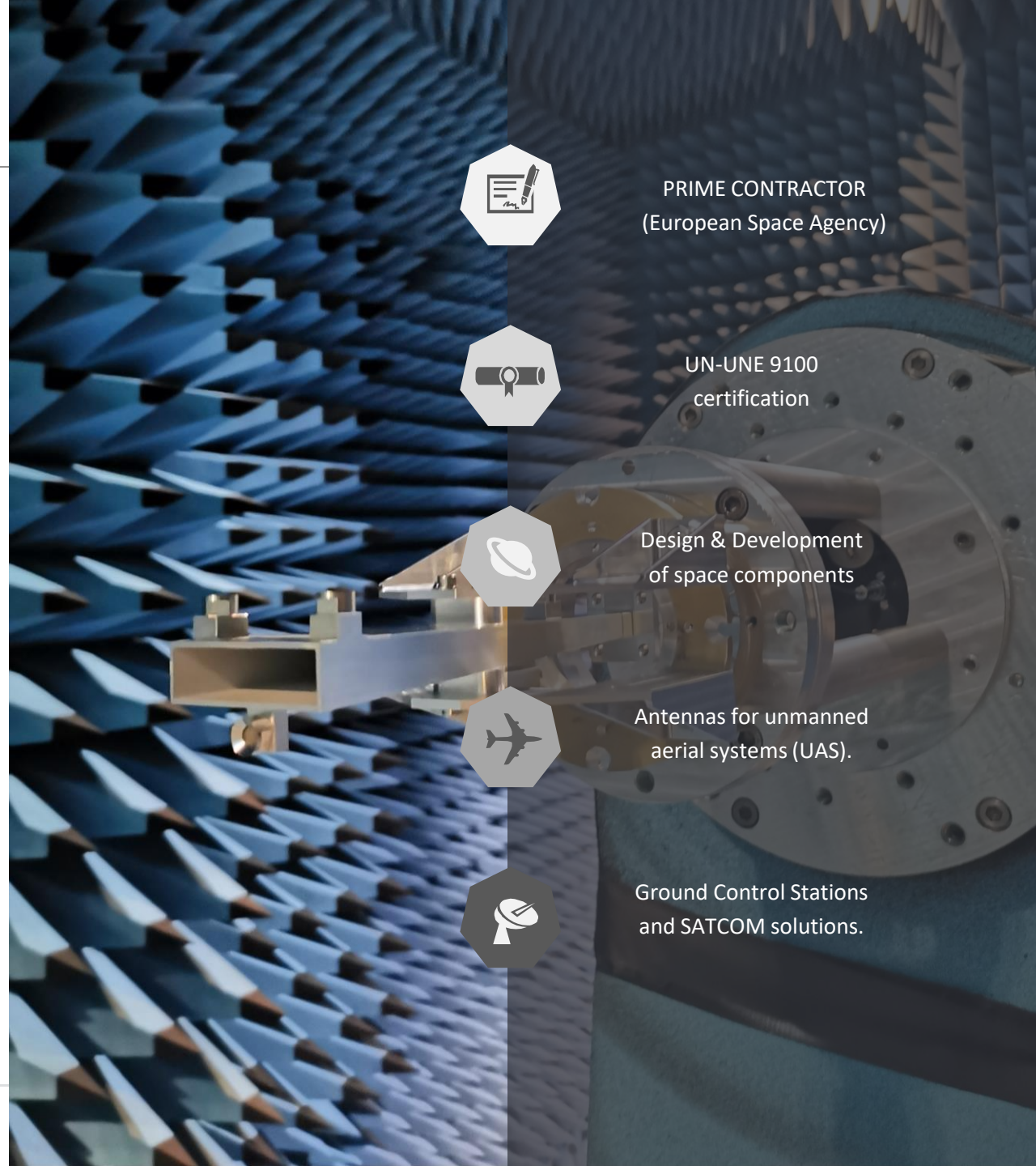
- ✓ Communications satellites (X, Ku, Ka)
- ✓ Governmental satellites (X, Ka)
- ✓ Launchers (FTS, GNSS, TT&C)

Design and Development of components and subsystems for the ground segment:

- ✓ VSAT antenna for UAV/HAPS
- ✓ Active antenna for GNSS
- ✓ Dual band feeds for terminals and GCS (inc. tracking monopulse)

Design and Development of antennas for scientific applications:

- ✓ 300GHz reflector antennas
- ✓ Feeds for radiometers
- ✓ Multifrequency feeds



Certifications

At EOSOL Group we apply a quality, environment and safety Management System that meets the demands and requirements of the standards:

- **ISO 9001:2015** Quality management system
- **ISO 14001:2015** Environmental management system
- **OHSAS 18001:2007** Occupational health and safety management system
- **UN-UNE 9100:2018** Specific quality system for the aeronautical industry

TÜVRheinland CERTIFICADO
Sistema de Gestión
ISO 9001:2015
ISO 14001:2015
OHSAS 18001:2007
www.tuv.com
ID 9108634318

Locations

Headquarters, Pamplona, España
C/ Camino de Labiano, 45ª Bajo 31191 Mutilva, Navarra, España
info@grupoeosol.com | Tel.: +34 948 32 69 72

Ciudad de México, Mexico
Av. Presidente Masaryk 17, int. 301
Col. Polanco – Del. Miguel Hidalgo
11560 Ciudad de México
Tel.: +52 (55) 5545 7753

Durango, Mexico
Ave. Las Águilas No. 532
Col. Miraflores – Durango
34030 Durango
Tel.: +52 (618) 811 0961

Houston, United States
609 Main Street 25th Floor
Houston, TX, 77002

Madrid, Spain
Avenida de Manoteras 24
28050 Madrid.
Tel. +34 918 04 96 74

Murcia, Spain
C/ Fernando Alonso Navarro,
nº 12 4ª Pta (Edf. MBC)
30009 Murcia, España.

Tarragona, Spain
Calle Pau Claris nº2
43005 Tarragona, España

France
1 avenue avenue du medoc Espace sonora
33114 Le Barp, France

Lisboa, Portugal
Rua Luciano Cordeiro, 123, 2ºD
105-139

Southafrica
Cube Workspace The Icon Building,
24 Hans Strijdom Avenue, Cape Town,
8000

Giza, Egypt
3 A Ahmed Orabi St., Sphinx Sq.,
Mohandeseen

Morocco
59 Boulevard Zerktouni
6º nº18
Casablanca

Kuwait
Al Soor Building, 16th Floor, Al Soor Street, Kuwait

Colombia
Calle 77B, No. 59-61 Of. 301
Edificio Las Américas II
Barranquilla

Chile
Padre Mariano 391, oficina 904
Providencia, Santiago

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Sistema de Gestión
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ISO 14001:2015
ISO 45001:2018
ISO 9100:2018

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