

5M

PRODUCER OF LIGHT WEIGHT STRUCTURES

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SMART

TECHNOLOGIES



5M

ABOUT COMPANY

- Czech private company
- Founded 1992
- 250 employees
- Turnover 25 mil.€.
- Member of **BSTG** –more than 400 employees

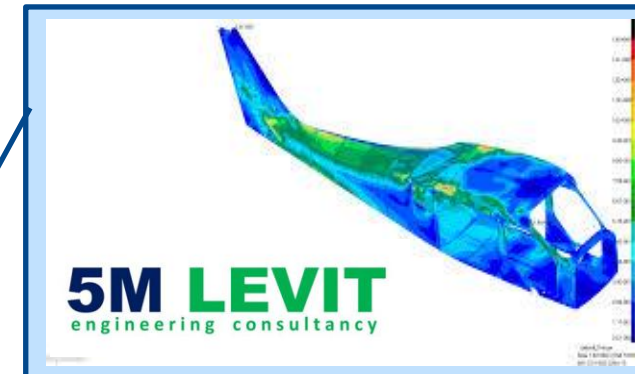


- Manufacturing company
- 17.000 m2 production space
- AS/EN 9100
- POA Part 21G
- NATO 49926



5M

- Manufacturing
- R&D
- Testing



- ### 5M Precision
- CNC machining
 - CMM

Space Subsystems

solar arrays, radiation shielding

Composite Structures

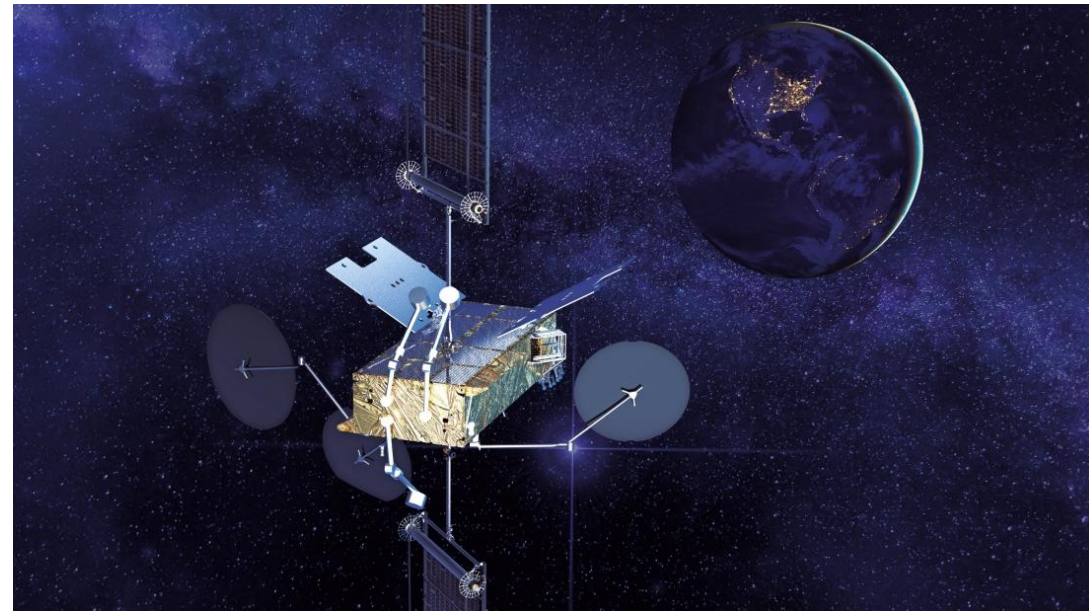
based on prepreg or LF Technology

Adhesives for Space applications

development and production of foil and paste adhesives

GSE for Space applications

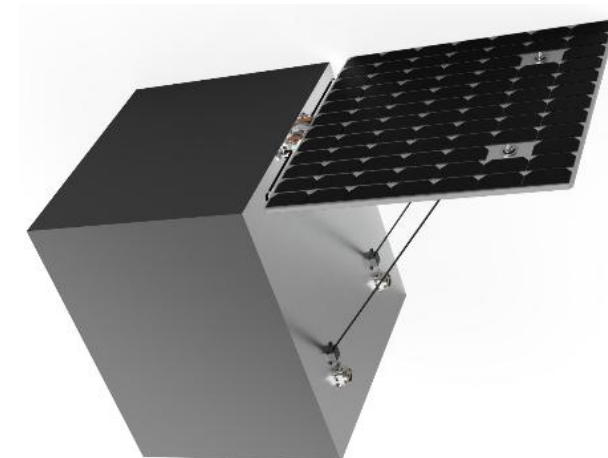
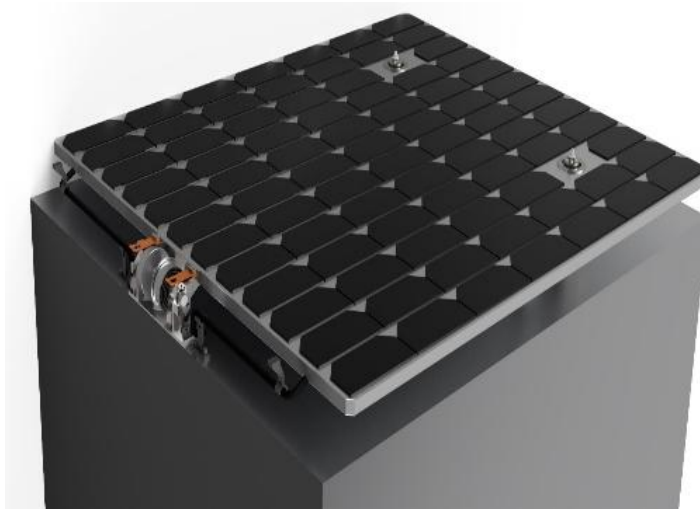
design and manufacturing of manufacturing and testing GSE



- **SOLAR ARRAYS - Flexible**
- Range from small to big satellites
 - Cooperation with Thales Alenia Space France
 - From 2 kW
- NOVACOM II GEO Solar Array
 - 20m long, 3m width, initial power 18kw/wing
 - 5M responsible for development, qualification and supply of complete mechanical subsystem
 - 5M developed and delivered integration and testing GSE for TASF
 - 5M are able to supply whole solar array subsystem based on agreement and cooperation with TASF
- **ENCELADUS** flexible solar array concept
- Moon lander Solar array (TAS)
- Multifunctional blanket



- **SOLAR ARRAYS - Rigid**
- Solar Arrays for small satellites
- Deployable and body-mounted
- Power range: 50 - 1000 W
- Various solar cells or module type adaptation (GaAs, Silicone, based on restriction possible suppliers from EU, USA and China)



Radiation shielding

- Qualification of shielding applied to structural panel for JUICE (9/2014-9/2016, Follow up with cooperation on flying HW with ADS)
 - Qualification of shielding technology applied to structural sandwich panel for mission JUICE
 - 5M prime for ESA, Subcontractors: VZLU Prague, TTS Prague

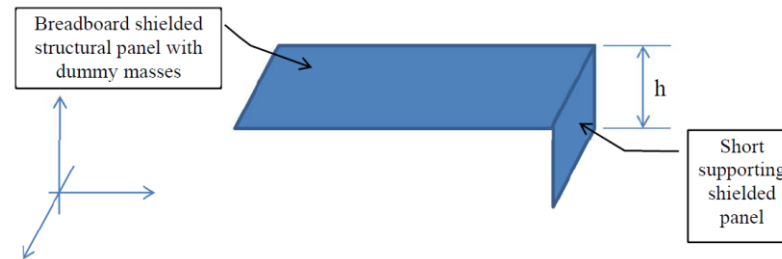
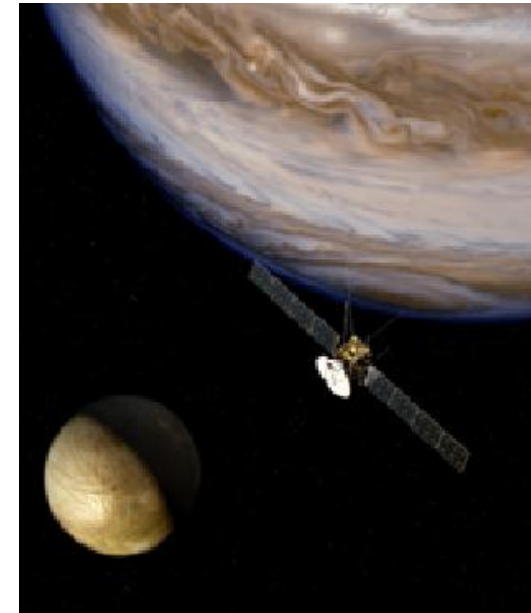
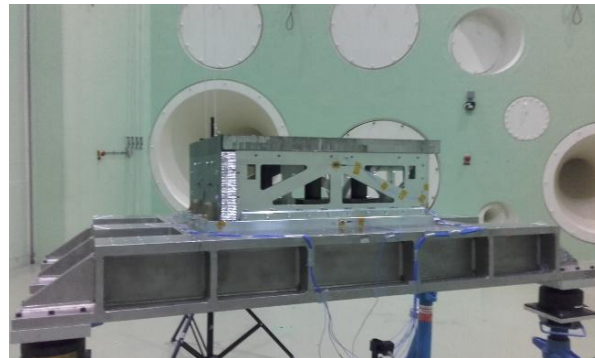
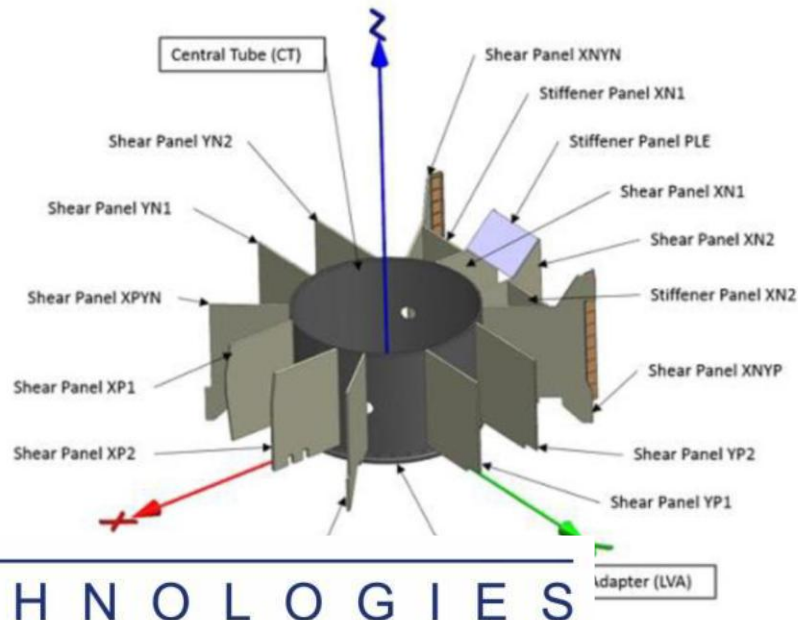
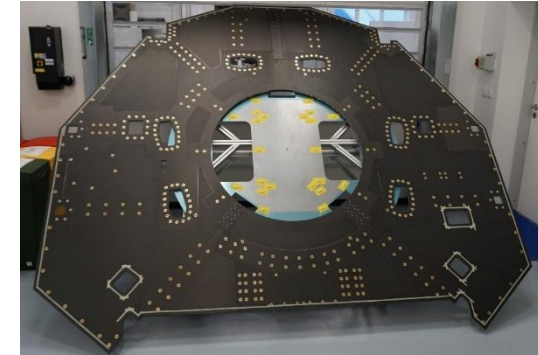


Figure 1. Breadboard configuration



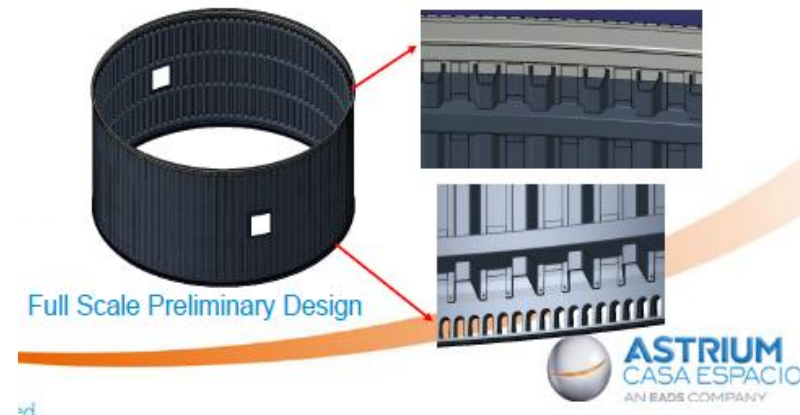
Structures - sandwiches

- PLATO Service Module (SM) Panels (2020-2023)
 - Qualification of new prepreg for CFRP production process and measurement of allowables
 - SM CFRP panel production and testing
 - 5M primecontractor for ESA
- LISA structure panels (in negotiation)



Material development

- Qualification of materials for Athena - CRYSA (2023-now)
 - Qualification of new prepregs for Athena SIM Cryostat Straps
 - Production and testing
 - OHB Czechspace primecontractor
- Development of adhesives for different projects
 - Foil adhesives for structural bonding (PLATO, ROSE-L)
 - Paste adhesive for none structural bonding - (-150 to +150°C)
 - PEEK structural bonding
 - Thermal conductive adhesives
 - Resins for prepregs and composites (solar arrays)



- 17.000 m² of working area total
- 3.000 m² of area with control temperature and filtration
- 650 m² clean room ISO 8
- 300 m² labs with control climate
- Autoclave 2.1m, length 4m
- 10 pultrusion lines
- 2 heatin ovens up to 6x3 m
- 3 presses up to 1.7x3 m
- 4 CNC Machines, 5 axes, biggest are 6x2.5m and 8x1.8m
- Kuka Robotic Arm



- 8% of turnover invested in R&D
- 14% of products younger than 1 year
- National and international cooperation with research institutions and universities
- Analytical laboratory equipped with DSC, DMA, TGEA, FTIR, CTE, Rheometry etc.
- Laboratory of mechanical testing
- Testing machines up to 100 kN (-170°C/+250°C)
- NDI - ultrasound, thermography
- 3 TVC chambers from -220°C up to 200°C
- Technology demonstration lab



5M

REFERENCES

TRANSPORTATION



SIEMENS



BOMBARDIER

IVECO



HITACHI
Inspire the Next

AEROSPACE



ThalesAlenia
A Thales / Finmeccanica Company
Space



SPORT



OTHER

Internorm



GROZ-BECKERT®



RIETER



VOSSCHEMIE