



REPUBLIC OF SLOVENIA
MINISTRY OF THE ECONOMY,
TOURISM AND SPORT



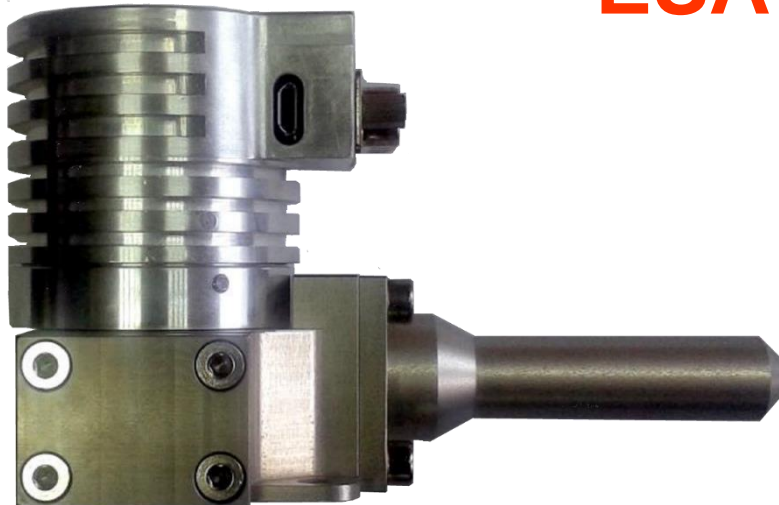
REPUBLIC OF SLOVENIA
MINISTRY OF HIGHER EDUCATION,
SCIENCE AND INNOVATION



MINIATURE CRYOGENIC COOLERS

OPPORTUNITIES FOR SPACE RESEARCH

ESA AND HORIZON EUROPE



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www.cryocoolers.eu

Company overview and history



- R&D and production in Kranj, Slovenia
- 5 departments:
 - Telephony
 - Hydraulics and pneumatics
 - **Cryogenics**
 - LED street lightning
 - Tourism

History

- 1989: LE-TEHNIKA established when Yugoslavian law allowed privately-owned companies
- 2000: Cryogenics department take over (program started in 1980s), received ISO 9001 certification
- 2003: received ISO 14001 certification
- 2021: 1st ESA project

Today:

- serving customers worldwide,
- 80 employees, 25 in Cryogenics
- revenue 6M €

Cryocoolers production



Purpose: Cooling of IR sensors to cryogenic temperatures around 77K (-196°C)

Joule-Thomson cryocoolers

- Typical applications: missiles with IR seeker head
- Cooling by compressed gas expansion



Stirling cryocoolers

- Typical applications: long-range IR cameras for night vision
- Cooling by cyclic expansion and compression of gas in Stirling thermodynamic cycle



Some Customers already in Space




- AIM Infrarot Module, Germany 

- IRnova, Sweden 

- Safran, France 

- Lynred, France 

- VIGO Photonics, Poland 

- DRDO, India



- SCD, Israel 

- Jamstec, Japan



- Aselsan, Turkey 

- Roketsan, Turkey 

Space activities



Adaptation of SRI401 rotary Stirling cryocooler (0,5W @77K, 71°C) for space

- Previously qualified for non-space applications according to MIL-STD-810G
- Currently TRL4, TRL6 in 2 years (ESA)
- Goal: MTTF >30.000h

Target application for space-grade SRI401

- EO: cameras with cooled IR detectors
- small satellites in LEO
- 2-3 year missions

Other possible applications

- Cooling of rock samples before extraction of cold-trapped volatiles
- Thermal conditioning of biological/temperature sensitive samples during transport on/off a space station
- Condensation of gases

Working with ESA – our experience



- Great support by Ministry of the Economy, Tourism and Sport
- ESA is looking for a WIN-WIN outcome
- Emphasis on a long-term relationship
- Long project preparation and approval time
- Bureaucratic workload can be sometimes reduced for small satellites
- Solution-oriented

Benefits



- Improved company reputation and visibility
- Support to R&D through projects
- Faster response to ground applications market demands
- Networking (Cryogenics/Space – it's a small world)
- Invitations to bigger projects and consortia (Horizon Europe)



More details about our
company and
products on
www.cryocoolers.eu

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