

FUTURE SPACE TRANSPORTATION FLPP AUTUMN SESSION 2025



TELESCOPIC LANDING LEGS – THEMIS

ALMATECH

Location: Switzerland

Founded: 2009

Employees: 32

Mission: Almatech is a privately-held Swiss SME delivering critical hardware and engineering services for the space market.

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ESA FLPP ACTIVITY

Project name: Telescopic landing leg system for reusable launchers

Objective: Maturing critical building blocks for next-generation reusable launcher landing systems

Applications

- Primary application for vertical landing systems (e.g., boosters, upper stages, lunar landers)
- Adaptation of landing leg technologies for planetary exploration, cargo landers, or sample-return missions (Moon, Mars)



GET IN TOUCH

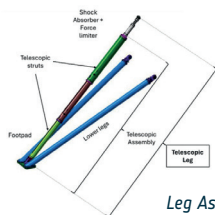
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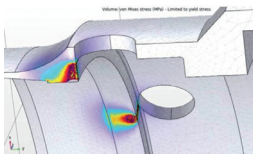
TECHNOLOGY AND INNOVATION

What we developed: Telescopic leg elements for reusable landing legs, including: locking, guiding, lightweight and high-strength CFRP struts; high-strength adhesive-based joints, mathematical models (behaviour, dynamics and structural), force-limiting shock absorber technology, leg deployment tension damper technology

Unique features: Compact, lightweight, parametrised requirements and model-based design, key functions proof-tested prototype, shock dynamics.



Leg Assembly



Locking Device



End Fitting

KEY RESULTS

- Guiding system solution developed, manufactured and tested
- Locking system solution developed, manufactured and tested
- CFRP struts filament winding manufacturing process developed, implemented and tested
- Reusable hydro-pneumatic shock absorber (supporting landing leg energy absorption) solution developed, manufactured and tested
- Reusable hydro-pneumatic linear tension damper (supporting landing legs deployment) solution developed, manufactured and tested

NEXT STEPS AND

MARKET READINESS

Roadmap:

- Development, test and qualification of a Mk2 landing leg system for Themis T1E
- Elaboration of a catalogue of landing leg solutions ranging from mini-launchers to super-heavy launcher reusable 1st stages
- Development of landing legs adapted to reusable upper stages
- Integration of HMS functions and consolidation of the product sustainability

Market readiness:

- System-level fully tested technology: Q2 2027
- Recurring production: T0+12 months
- Bespoke design needs: T0+18-24 months depending on required adaptations

Partnership opportunities:

- Sustainable CFRP
- HMS-embedded CFRP
- Reusable thermal protections systems for high to very high temperature applications