# cleansat

BB05
Demisable Metallic Propellant Tank
Airbus DS GmbH, Bremen / Lampoldshausen

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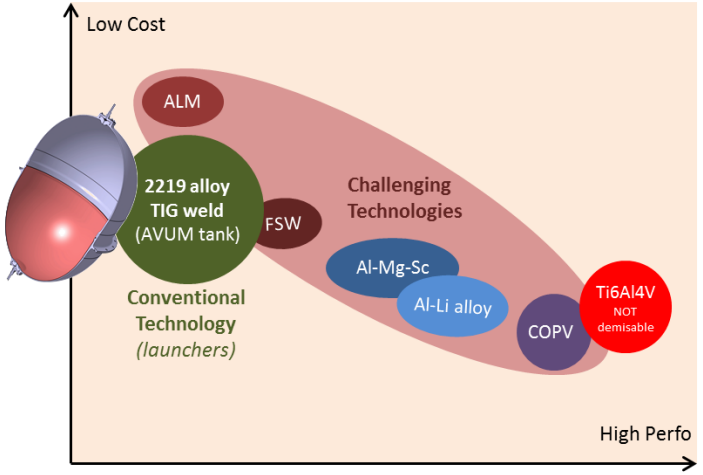
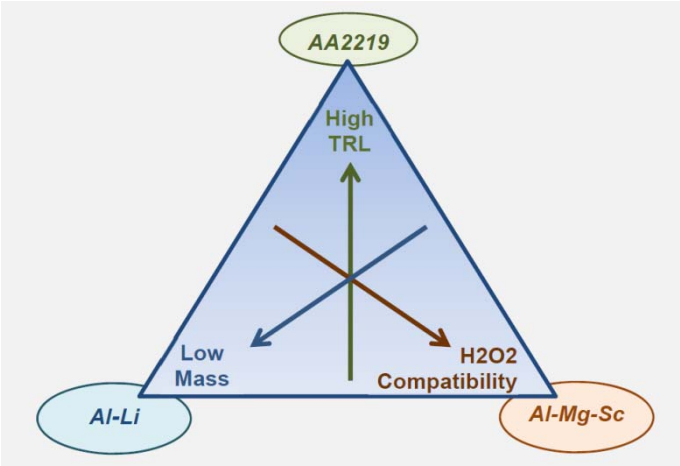
# Description of proposed technology Building Block

- **Baseline Tank Design:**
  - Material: aluminium alloy (**AA2219 preferred option**)
  - Tank family: 100 to 200 litres
  - Geometry: spherical / cylindrical
  - MEOP: 24bar
  - Blowdown mode
  - Propellant: Hydrazine (optional: green)

- **Trade offs to be performed:**
  - Alu alloys: AA2219 / Al-Li / Al-Mg-Sc
  - Propellant Delivery system: Elastomeric membrane / Surface Tension PMD



# Description of proposed technology Building Block

- **Applicability range** (satellite class and target orbits in LEO)
  - **Priority 1: LEO platform medium size (100-200L, < Ø600mm)**
  - Priority 2: LEO platform small size (37-50L, < Ø420mm)

- **Discussion of the system level impacts** (risk, mass budget, power budget and link budget)
  - Slight increase of tank mass (aluminum vs. titanium)
  - In case of membrane tank, special device required to allow for passivation on gas side
  - Tank **demiseability assumes break-up altitude at 78km** Lower Break-up altitude (e.g. 65km) to be investigated.

  ➔ **Impact on system level are rather limited**

# Development

- **Main technical challenges during development:**
  - Long term compatibility to hydrazine
    - Tank Shell
    - Membrane/PMD material
  - General compatibility to green propellants (ADN, H2O2)
    - Tank Shell
    - Membrane/PMD material
  - Tank interface to pipe line (Tank: aluminium / Piping: titanium)
    - Bolted connection / Bimetallic transition joint
  - Long term permeability effect (if diaphragm is considered)
  - Long term wettability (if surface tension device is considered)
  - **Demise verification approach is still to be defined!**