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BB# 26

Green propellant deorbiting system

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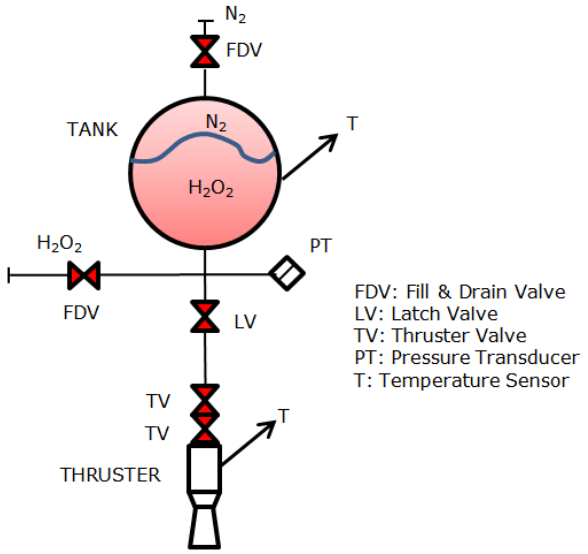
Description of proposed technology Building Block

For a chemical spacecraft probably the simplest deorbiting solution is to shift from hydrazine-based thrusters operated with green propellants.
We propose a 5-500 N monopropellant system, based on H_2O_2 and on proprietary catalyst, both designed, developed and tested by SITAEL under a FP7 funded project (PulCheR, GA 313271)

Expected performances are the following:

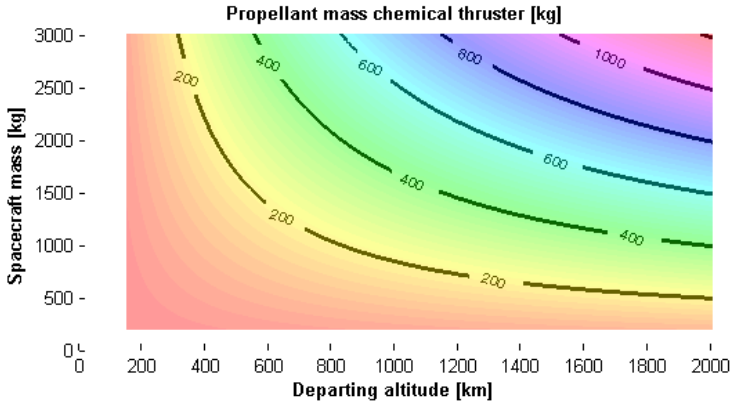
- Thrust: 5 – 500 N
- I_{sp}: up to 185 s
- Variation: 70% (blowdown)
- ON/OFF/ON cycles: > 5
- Max continuous firing: 90 min
- Lifetime: > 5 years
- Reliability: 95% (TBC)

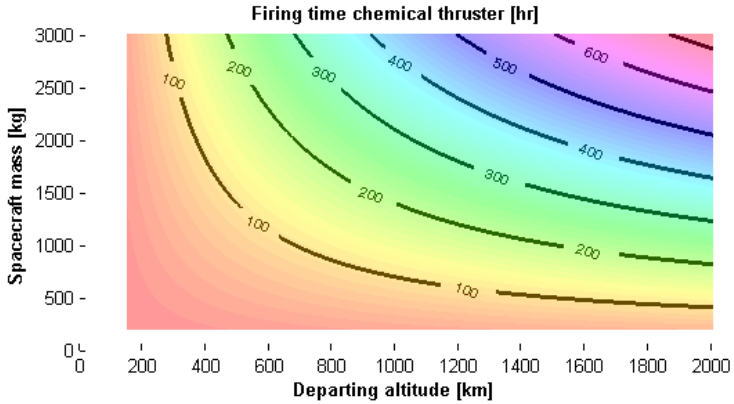


Description of proposed technology Building Block

- Two baseline applicability range: LEO orbit for satellites up to 500 kg and LEO orbit, chemical platforms up to 2 ton
- Option: GEO telecom platforms, > 2 ton

H_2O_2





- A compact system will be designed, with very limited impact in terms of mass (max. 340 kg for a deorbiting system to be installed on a 2000kg Sat in LEO).

- Required power will be in the order of 50 W, which is achievable even for a small platform in LEO.

Development

- Definition of platform requirements (to be done with a LSI, on the basis of a real platform and of real future missions);
- Performance, cost, mass and volume optimization of the thruster unit according to the specifications matured during the c.TEDS and the requirements of the selected platform (on-ground test with a breadboard model of the thruster unit);
- Tank, valves and piping design/selection for green propellant;
- Pressure and temperature transducers design/selection for green propellant;
- System EQM design and production;
- Integration of the subcomponents into a compact, robust and reliable system;
- H_2O_2 storage limits to be carefully assessed;
- Performance and qualification plan;
- System qualification.

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