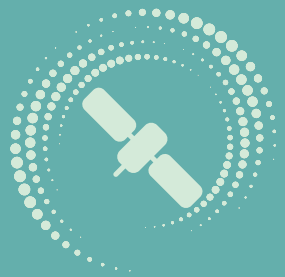
About iFACT

iFACT (iodine Fed Advanced Cusp field Thruster) aims to further investigate the use of iodine as alternative propellant for electric propulsion by creating an European ground test infrastructure, evolving the Advanced Cusp Field Thruster (ACFT) principle, and generating a detailed iodine - material compatibility library.

The unique thruster principle paired with the use of iodine as propellant and a tailored feeding architecture has the potential to significantly change the space sector. The iFACT subsystem enables a serious reduction of subsystem mass, in particular the dry mass required for the propellant feeding along with the cost and volume savings of the propellant itself.

Although the iFACT thruster offers a comparably high efficiency, it consists of a minimal amount of parts.Therefore, it is simple to manufacture and especially tailored for mass production.

With iFACT, Europe can become the leader with respect to iodine as xenon alternative as well as a provider of efficient, but very low-cost electric propulsion subsystems. With this in mind iFACT has the ambition to enable future European small satellite constellations.



Our Consortium

AIRBUS Airbus FDH

AIRBUS Airbus TLS

easn

UNIVERSITY OF Southampton

Fraunhofer IKTS

AEROSPAZIO

JUSTUS-LIEBIG-UNIVERSITÄT GIESSEN

ENDUROSAT

Scan & Connect with iFACT

https://epic-ifact.eu

Design by: EASN-TIS

iFACT

iodine Fed Advanced Cusp field Thruster

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 870336.

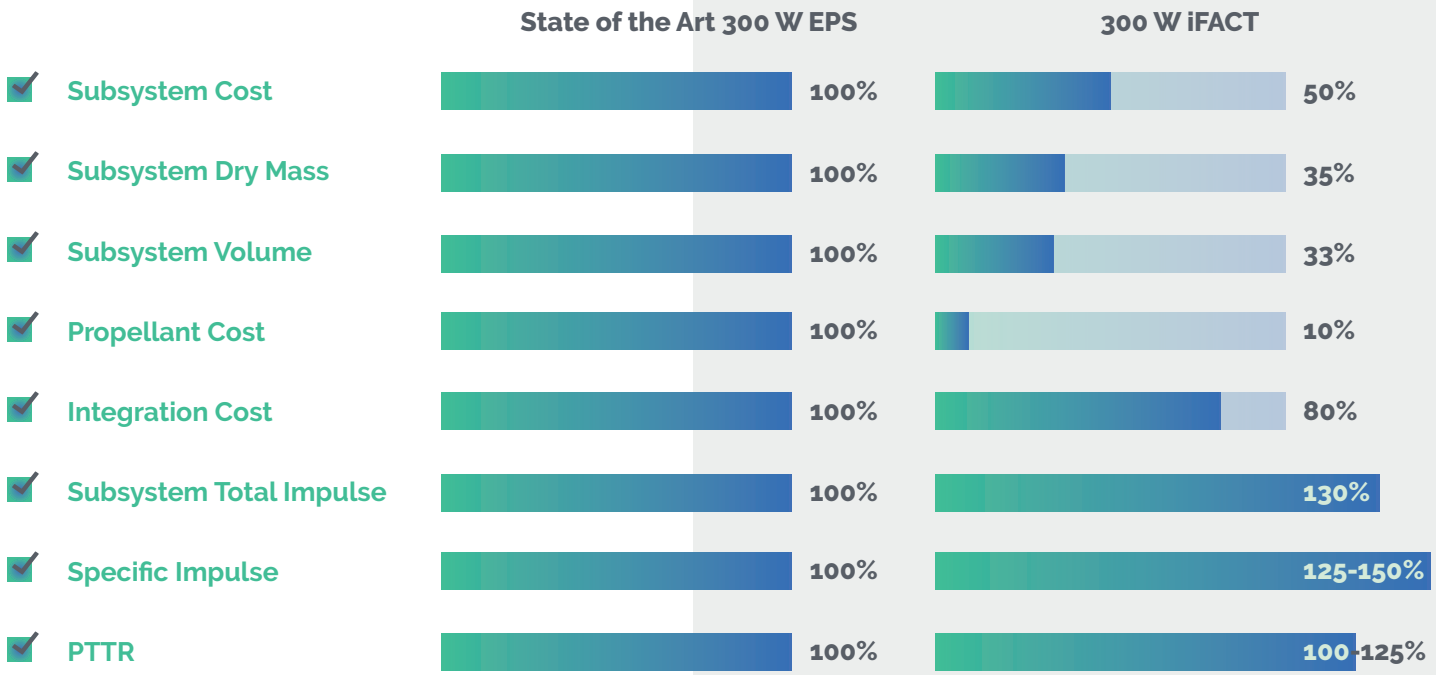
Expected Impact

Constellation satellites have constraints in terms of cost, size and mass. The iFACT technology addresses these constraints and offers an innovative approach that will make it appealing to be considered as a standard Electric Propulsion System for the next generation of small satellite constellations, increasing their capability and efficiency.

iFACT intends to examine developing variations of EP subsystems besides the main 300 W version: a 10 W subsystem will be experimentally validated enabling the fast and cost-efficient demonstration of key technologieswhile a 1000 W iFACT upscaled laboratory model will also be tested.

The development of this technology will ensure that key know-how is developed by the European industry and iFACT can play an important role to supply a worldwide demand of cost-efficient EP systems.

KPIs



Objectives

Iodine as disruptive propellant for electric thruster

- Simplification of the propellant feeding subsystem architecture enabling cost reduction
- High storage density (3 times higher than xenon) allowing decreasing the mass of the feeding subsystem
- Significant propellant cost savings (10 times cheaper than xenon)
- Off-the-shelf availability

Independent European test facility for long time iodine firing

- Creation of an European test infrastructure
- Enabling independent life time and endurancefiring of any iodine based thruster system

Maturation of the Advanced Cusp Field Thruster (ACFT) in three power classes

- Simple to ignite even at low temperatures
- Wide operational range and highly throttleable
- No erosional lifetime limit known
- Minimal electromagnetic noise and interference
- 300 W, 10 W and 1000 W variants

Significant reduction and simplification of the PPU required

- Extremely simple PPU built out of existing space qualified radiation hardened parts
- Low number of parts will lead to high cost efficiency

Calcium aluminate (C12A7) as disruptive, low-work function emitter material for cathodes

- Low work function of about 2.6 eV
- Insensitive to poisoning with iodine
- Will be developed as emitter material both for the hollow cathode and as thermionic emitter