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HYBRID ABLATIVE DEVELOPMENT FOR RE-ENTRY IN PLANETARY ATMOSPHERIC THERMAL PROTECTION

Fact Sheet

Project Information

HYDRA

Grant agreement ID: 283797

[Project website](#) 

Project closed

Start date

1 February 2012

End date

28 February 2015

Funded under

Specific Programme "Cooperation": Space

Total cost

€ 2 613 735,96

EU contribution

€ 1 909 588,00

Coordinated by

FUNDACION TECNALIA
RESEARCH & INNOVATION



Spain

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Nothing gets lost: the power of biomass

Objective

The aim of this proposal is the development of TPS for their use in space applications with extreme oxidative environments and high temperature resistance, such as hot parts of space vehicles for orbital entry (ARV), planetary probes and NEO exploration. Previous studies on ARV vehicle have shown that TPS hybrid systems based on ablators integrated with thermo-structural materials are good candidates. Europe has limited research and producers in ablative materials, almost abandoned since ARD missions in the 80's. Recently the Moon robotics exploration program within ESA demands ablative solutions for thermal protection of planetary probes.

As expressed in the work program 2011, the space sector is contributing to the independence, security and prosperity of Europe. In this way, the European Commission has stated that a non-dependent access to the critical space technology is required at Europe level. The development and testing of ablative materials has not been intensively studied in European in the last 10 years, and few producers have been maintaining the capabilities for dual applications.

These technical approach is focused on a Hybrid TPS based on ablative/thermostructural assembly and their further testing rather than on the material development. The hybrid systems development will be addressed to the integration of ablative outer-shield and their joining with thermostructural frames based on ceramic composites and will provide an innovative technology solution consistent with European supplier's capacities. In particular the joining of the different parts will be carried out by the use of advanced bonding technologies. The ablative parts will consist of two kinds of materials (resin based and cork based) while the CMCs will be based on carbon fibres reinforced SiC conventional composites. Relevant on-ground re-entry testing will be carried-out in a "plasma wind tunnel" facility and the results will be contrasted with the envisaged specifications.

Fields of science (EuroSciVoc)

[engineering and technology](#) > [mechanical engineering](#) > [vehicle engineering](#) > [aerospace engineering](#) > [astronautical engineering](#) > **[spacecraft](#)**

[engineering and technology](#) > [materials engineering](#) > **[composites](#)**

[engineering and technology](#) > [mechanical engineering](#) > [vehicle engineering](#) > [aerospace engineering](#) > **[aircraft](#)**

[natural sciences](#) > [physical sciences](#) > [astronomy](#) > [planetary sciences](#) > **[natural satellites](#)**

[engineering and technology](#) > [electrical engineering, electronic engineering, information engineering](#) > [electronic engineering](#) > **[robotics](#)**



Programme(s)

[FP7-SPACE - Specific Programme "Cooperation": Space](#)

Topic(s)

[SPA.2011.2.2-02 - Space critical technologies](#)

Call for proposal

FP7-SPACE-2011-1

[See other projects for this call](#)

Funding Scheme

[CP-FP - Small or medium-scale focused research project](#)

Coordinator



FUNDACION TECNALIA RESEARCH & INNOVATION

EU contribution

€ 423 750,30

Total cost

No data

Address

PARQUE CIENTIFICO Y TECNOLOGICO DE BIZKAIA, ASTONDO BIDEA, EDIFICIO 700
48160 DERIO BIZKAIA

 Spain 

Region

Noreste > País Vasco > Gipuzkoa

Activity type

Research Organisations

Links

[Contact the organisation](#)  [Website](#) 
[Participation in EU R&I programmes](#) 
[HORIZON collaboration network](#) 

Participants (10)



AIRBUS DS GMBH

 Germany

EU contribution

€ 166 000,00

Address

ROBERT KOCH STRASSE 1
82024 TAUFKIRCHEN 

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

[Contact the organisation](#)  [Website](#) 
[Participation in EU R&I programmes](#) 
[HORIZON collaboration network](#) 

Total cost

No data



AIRBUS DEFENCE AND SPACE SAS

 France

EU contribution

€ 141 550,00

Address

31 RUE DES COSMONAUTES ZI DU PALAYS
31402 Toulouse Cedex 

Region

Ile-de-France > Ile-de-France > Yvelines

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

- [Contact the organisation](#) 
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- [Participation in EU R&I programmes](#) 
- [HORIZON collaboration network](#) 

Total cost

No data



SOCIETE DES LIEGES HPK

 France

EU contribution

€ 51 710,00

Address

RUE DE LASSERENS 19
47230 LAVARDAC 

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

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Total cost

No data



DEUTSCHES ZENTRUM FUR LUFT - UND RAUMFAHRT EV

 Germany

EU contribution

€ 258 447,25

Address

LINDER HOHE
51147 Koln 

Region

Nordrhein-Westfalen > Köln > Bonn, Kreisfreie Stadt

Activity type

Research Organisations

Links

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[HORIZON collaboration network](#) 

Total cost

No data



FHP- FREZITE HIGH PERFORMANCE LDA

 Portugal

EU contribution

€ 48 360,00

Address

RUA ENGENHEIRO FERREIRA DIAS 401-40
4149-013 PORTO 

Region

Continente > Norte > Área Metropolitana do Porto

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

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[HORIZON collaboration network](#) 

Total cost

No data



"NATIONAL CENTER FOR SCIENTIFIC RESEARCH ""DEMOKRITOS"""

 Greece

EU contribution

€ 181 465,97

Address

END OF PATRIARCHOU GRIGORIOU E AND 27 NEAPOLEOS STREET
15341 Agia Paraskevi 

Region

Αττική > Αττική > Βόρειος Τομέας Αθηνών

Activity type

Research Organisations

Links

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[Participation in EU R&I programmes](#) 

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Total cost

No data



INSTITUTUL NATIONAL DE CERCETARI AEROSPATIALE ELIE CARAFOLI - I.N.C.A.S. SA

 Romania

EU contribution

€ 143 933,00

Address

IULIU MANIU 220 SECTOR 6
061121 BUCURESTI 

Activity type

Research Organisations

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Total cost

No data



CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS

 France

EU contribution

€ 257 918,68

Address

RUE MICHEL ANGE 3
75794 Paris 

Region

Ile-de-France > Ile-de-France > Hauts-de-Seine

Activity type

Research Organisations

Links

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[HORIZON collaboration network](#) 

Total cost

No data



UNIVERSITY OF STUTTGART

 Germany

EU contribution

€ 236 452,80

Address

KEPLERSTRASSE 7
70174 Stuttgart 

Region

Baden-Württemberg > Stuttgart > Stuttgart, Stadtkreis

Activity type

Higher or Secondary Education Establishments

Links

[Contact the organisation](#)  [Website](#) 
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[HORIZON collaboration network](#) 

Total cost

No data



EADS Astrium Space Transportation GmbH 

 Germany

EU contribution

No data

Address

HUNEFELDSTRASSE 1-5

28199 BREMEN 

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

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[HORIZON collaboration network](#) 

Total cost

No data

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Permalink: <https://cordis.europa.eu/project/id/283797>

European Union, 2025