

## Research & Development Request

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### H2020:PILOTS-03-2017: End users required from the oil & gas, aerospace or automotive sectors

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#### Summary

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*An East of England based research centre is preparing a proposal for the Horizon 2020 PILOTS programme. The Fries project will develop pilot lines for manufacturing of nanotextured surfaces with mechanically enhanced properties. They require end users from the oil & gas, aerospace or automotive sectors to complete the project consortium.*

<b>Creation Date</b>	05 August 2016
<b>Last Update</b>	09 August 2016
<b>Expiration Date</b>	09 August 2017
<b>Reference</b>	RDUK20160805002

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#### Details

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##### Description

The project proposes a novel approach to combining the advantages of two leading edge surface modification processes from different disciplines (cold spraying and shallow penetration friction stir processing), with the use of micro and nanoscale wear-resistant particles (WRPs) (e.g. Al<sub>2</sub>O<sub>3</sub>, SiC or WC) co-deposited with aluminium alloy on magnesium, or steel alloy industrial components. The newly developed super-surface will outperform the established benefits of the two processes when considered individually and will far exceed the recognised attributes of conventional surface coating technologies.

The ability to control extreme plastic deformations, the degree of intermixing, the surface compressive stress and local patterning using the new FRIES process will open up a new range of possibilities in tailoring the surfaces of these and other industrial components. While some promising research work in surface modifications by combined cold spray and friction stir processing have been published, investigations have been confined to a limited set of materials and used rudimentary process technology.

FRIES will be revolutionary in that it will create the template for producing novel functional surfaces for high value commercial components by generating a metallurgically bonded outer layer with substantially enhanced properties applicable in a wide range of industries. The project aims to controllably produce microstructural modifications to yield a step change in terms of enhancing

erosion-corrosion properties, toughness, fatigue and thermal shock resistance of materials in aeronautic and automotive components. Understanding this surface modification and performance is crucial for enabling rapid technology developments.

The novel surface engineering approach is technically feasible but requires a structured programme of fundamental and applied research to develop a detailed understanding of the microstructural evolution, mechanical integrity, corrosion and tribological properties of the engineered surfaces that are generated. The project is a major step towards developing new design tools for the development of multi-functional sustainable materials and will champion the role of European research collaboration at the forefront of international advanced engineering materials research. End users are required to complete the proposal consortium. Typical end users would be industry partners from the Oil & Gas, Aerospace or Automotive sectors.

### Stage of Development

Proposal under development

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## Keywords

### Technology

02007024                      Nanomaterials

### Market

08001007                      Coatings and adhesives manufactures

08001015                      Other speciality materials

### NACE

C.32.9.9                      Other manufacturing n.e.c.

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## Network Contact

### Issuing Partner

BERLIN PARTNER FUER WIRTSCHAFT UND TECHNOLOGIE GMBH

### Contact Person

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**Open for EOI :**    **Yes**

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## Client

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### Type and Size of Organisation Behind the Profile

R&D Institution

### Year Established

1968

### Already Engaged in Trans-National Cooperation

No.

### Client Country

United Kingdom

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## Partner Sought

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### Type and Role of Partner Sought

End users are required to complete the proposal consortium. Typical end users would be industry partners from the Oil & Gas, Aerospace or Automotive sectors.

### Type and Size of Partner Sought

SME 11-50, SME <10, >500 MNE, 251-500, SME 51-250, >500

### Type of Partnership Considered

Research cooperation agreement