Objective

This response to the call for proposals under the Clean Sky Joint Undertaking to manufacture static engine components from IN718 using Net Shape Hot Isostatic Pressing of powder (NSHIP) involves 3 partners with complementary expertise in the areas required to undertake the work including powder characterisation; NSHIP and modelling; low cost tooling, as well as microstructural and property assessment.

The NSHIP of powder has the potential to revolutionise the production of complex high performance aerospace parts enabling significant improved buy-to-fly ratios which give cost savings as well as environmental benefits. To exploit this technology, significant challenges must be addressed including; difficulty in HIPping nickel super alloy powder, high cost of sacrificial tooling, diffused surface layer on components due to interaction with the tool material and finally the lack of credible performance information for IN718 parts produced using the NSHIP process. The partners will use a rigorous and yet innovative approach to address these challenges in this 2 year
Trials will be performed to determine the best powder and HIPping conditions to use to produce parts with the desired microstructure and properties. Novel low cost tooling methods will be developed and surface engineering techniques, to eliminate tool/component interaction, will be explored. A computation model of IN718 powder consolidation will be used to calculate the correct tool geometry to enable “right-first-time” net shape parts to be produced. Finally, demonstration components and test sample will be produced using the most appropriate powder and manufacturing parameters. Test samples will be subjected to NADCAP-approved mechanical property testing. The quality of the demonstration components will be assessed by the partners and subsequently supplied to ITP for long term evaluation.

Field of science

/natural sciences/chemical sciences/inorganic chemistry/inorganic compounds
/natural sciences/mathematics/pure mathematics/geometry

Programme(s)

Topic(s)

Call for proposal

SP1-JTI-CS-2012-03

Funding Scheme

JTI-CS - Joint Technology Initiatives - Clean Sky

Coordinator

ASOCIACION CENTRO TECNOLOGICO CEIT

Activity type

EU contribution

Research Organisations

€ 369 315

Paseo Manuel De Lardizabal 15
20018 San Sebastian
Spain

Website

Contact the organisation
Participants (2)

THE UNIVERSITY OF BIRMINGHAM
United Kingdom
EU contribution
€ 391 777
Address
Edgbaston
B15 2TT Birmingham
Activity type
Higher or Secondary
Education Establishments
Website
Administrative Contact
May Chung (Ms.)

THE MANUFACTURING TECHNOLOGY CENTRE LIMITED
United Kingdom
EU contribution
€ 447 435
Address
Pilot Way, Ansty Business Park
CV7 9JU Coventry
Activity type
Research Organisations
Website
Administrative Contact
David Wimpenny (Prof.)

Last update: 20 June 2016
Record number: 109210

Permalink: https://cordis.europa.eu/project/id/337568/

© European Union, 2020