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Award

Purchase of Ceramic Additive Layer Manufacturing Machine

THE UNIVERSITY OF BIRMINGHAM

F15: Voluntary ex ante transparency notice
Notice identifier: 2024/S 000-039273
Procurement identifier (OCID): ocds-h6vhtk-04c2a2
Published 5 December 2024, 3:13pm

Section I: Contracting authority/entity

I.1) Name and addresses

THE UNIVERSITY OF BIRMINGHAM

Edgbaston

BIRMINGHAM

B152TT

Contact

Kseniya Samsonik

Email

K.Samsonik@bham.ac.uk

Country

United Kingdom

Region code

UKG31 - Birmingham

UK Register of Learning Providers (UKPRN number)

10006840

Internet address(es)

Main address

www.bham.ac.uk

I.4) Type of the contracting authority

Body governed by public law

I.5) Main activity

Education

Section II: Object

II.1) Scope of the procurement

II.1.1) Title

Purchase of Ceramic Additive Layer Manufacturing Machine

Reference number

SC13320/24

II.1.2) Main CPV code

- 31600000 - Electrical equipment and apparatus

II.1.3) Type of contract

Supplies

II.1.4) Short description

We are adding to a facility for formulating testing and applying ceramic Additive Layer Manufacturing (ALM) of ceramic bodies from photosensitive resins filled with formulated ceramic compositions for the casting of nickel base superalloys. The High Temperature Research Centre facility at the University of Birmingham will develop and explore new material formulations at scales and rates appropriate for immediate subsequent industrialisation, supported by cutting-edge expertise and on-site analytical tools.

The pivotal component of this facility will be a large scale Digital Light Processing (DLP) ALM machine, manufactured, provided, and supported by Prodways, who are the holders of the underlying patented MOVINGLight® technology.

II.1.6) Information about lots

This contract is divided into lots: No

II.1.7) Total value of the procurement (excluding VAT)

Value excluding VAT: 231,000 EUR

II.2) Description

II.2.3) Place of performance

NUTS codes

- UKG - West Midlands (England)

II.2.4) Description of the procurement

We are adding to a facility for formulating testing and applying ceramic Additive Layer Manufacturing (ALM) of ceramic bodies from photosensitive resins filled with formulated ceramic compositions for the casting of nickel base superalloys. The High Temperature Research Centre facility at the University of Birmingham will develop and explore new material formulations at scales and rates appropriate for immediate subsequent industrialisation, supported by cutting-edge expertise and on-site analytical tools.

The pivotal component of this facility will be a large scale Digital Light Processing (DLP) ALM machine, manufactured, provided, and supported by Prodways, who are the holders of the underlying patented MOVINGLight® technology.

Our decision to exclusively source Prodways for the DLP system CERAM PRO 365 is founded

on several key factors. Prodways holds a unique position as the only holder of proprietary technologies that underpin high throughput DLP ALM fabrication (EP2943329B1, EP3356121B1) and as such are the only manufacturer that can produce systems with the necessary characteristics.

It is important to outline the crucial distinction between the MOVINGLight® technology, and other vat based DLP ALM systems. Namely, MOVINGLight® systems are designed to use a single high-resolution source that enables cost effective production of fine feature ceramic bodies. The unique precision indexing of the DLP system across a body of photosensitive material enables production of large ceramic bodies that are ostensibly free of residual stress. Other systems utilising laser curing of large scale samples from large volumes of filled resins have been demonstrated prone to suffering excessive levels of residual stress that leads to formation of manufacturing defects during subsequent resin debinding prior to ceramic sintering. Hence, the only solution to this problem is use of MOVINGLight®. In the absence of the MOVINGLight® technology the maximum size of component that can be manufactured at equivalent resolution is limited to less than 150 mm x 150 mm.

Due to the nature of the materials to be developed it is necessary for the green body to be supported during fabrication, thereby avoiding creep and distortion. This can be achieved in both upward and downward build directions, but only the Prodways technology allows building of ceramic bodies larger than the size already stated above. Therefore, the proprietary downward building MOVINGLight® technology must be used.

Also, being the manufacturer, as well as the developer and holder of proprietary technology, Prodways has the expertise that positions them uniquely for the ongoing development of equipment. The proprietary nature of Prodways technology is affirmed by a series of patents, as summarized in Attachment A. Furthermore, Prodways has extensive design, materials specification/selection and equipment assembly know-how that is embodied in the production of this specialized equipment.

As Prodways are the only manufacturer of the MOVINGLight® technology, and are also the only ones who can provide the support, training and installation for these systems, we cannot obtain this type of equipment from any other provider. Prodways is the sole provider of equipment and replacement parts for MOVINGLight® systems.

This unique position of Prodways as both manufacturer and patent holder of MOVINGLight® technology translates into our sole reliance on them to provide not only the hardware and software components but also the indispensable training and engineering support essential for the optimal operation of the machine. Their proprietary knowledge and technical expertise extend to servicing the equipment and offering invaluable guidance on resolving technical challenges. This makes them the unrivalled choice for our DLP ALM facility. No other company possesses the capability to furnish us with a machine of the same capability and technical support. This service is particularly essential, as the materials to be formulated may require operation of the equipment outside the manufacturing parameters presently

considered normal or typical of such equipment.

Prodways holds a unique position for several reasons, which sets them apart from other companies and makes them the only choice for the DLP ALM Facility:

Proprietary Technology: Prodways MOVINGLight® technology is the only one that allows manufacture of large scale ceramic bodies free from residual stresses, and it is proprietary and patented, as indicated by the list of patents provided. This means that Prodways have exclusive rights to this innovative technology, giving them a competitive advantage. Other companies may use different engineering solutions that do not offer the same advantages or capabilities (in particular, they would not be designed to operate with the same precision and rate at the necessary scale). Moreover, non- MOVINGLight® based technologies are not compatible with the aim and goals of the DLP ALM Facility.

Unique properties of Prodways MOVINGLight® DLP ALM ceramic fabrication technologies that are specifically sought for the Facility are:

• Build volume 260 x 320 x 350 mm (x-y-z) at a native pixel size of 31 microns with a layer thickness between 50 and 175 microns with downward build to achieve buoyancy support of the green body during manufacture.

These properties are unique to MOVINGLight® machines manufactured and designed by Prodways, and are not available from other providers.

II.2.11) Information about options

Options: No

Section IV. Procedure

IV.1) Description

IV.1.1) Type of procedure

Negotiated without a prior call for competition

- The products involved are manufactured purely for the purpose of research, experiment, study or development

Explanation:

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Full explanation has been included in the prior information

IV.1.8) Information about the Government Procurement Agreement (GPA)

The procurement is covered by the Government Procurement Agreement: No

Section V. Award of contract/concession

Contract No

SC13320/24

Title

Purchase of Ceramic Additive Layer Manufacturing Machine

A contract/lot is awarded: Yes

V.2) Award of contract/concession

V.2.1) Date of conclusion of the contract

4 December 2024

V.2.2) Information about tenders

The contract has been awarded to a group of economic operators: No

V.2.3) Name and address of the contractor/concessionaire

Prodways Machines

FRANCE

Country

France

NUTS code

- FR - France

National Register of Companies

499 568 814 00077

The contractor/concessionaire is an SME

Yes

V.2.4) Information on value of contract/lot/concession (excluding VAT)

Total value of the contract/lot/concession: 231,000 EUR

Section VI. Complementary information

VI.4) Procedures for review

VI.4.1) Review body

University of Birmingham

Edgbaston

Country

United Kingdom