Contract

Contract for the Supply and Installation of a Tri Beam System to the University of Birmingham

THE UNIVERSITY OF BIRMINGHAM

F03: Contract award notice
Notice identifier: 2022/S 000-021849
Procurement identifier (OCID): ocds-h6vhtk-035a2b
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Section I: Contracting authority

I.1) Name and addresses

THE UNIVERSITY OF BIRMINGHAM

Chancellors Close

BIRMINGHAM

B152TT

Contact

Kseniya Samsonik

Email

k.samsonik@bham.ac.uk

Country

United Kingdom

Region code

UKG31 - Birmingham

Charity Commission (England and Wales)

X7237

Internet address(es)

Main address

www.birmingham.ac.uk/index.aspx

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

Contract for the Supply and Installation of a Tri Beam System to the University of Birmingham

Reference number

SC8908/21

II.1.2) Main CPV code

- 38000000 - Laboratory, optical and precision equipments (excl. glasses)

II.1.3) Type of contract

Supplies

II.1.4) Short description

The University of Birmingham invites tenders for the supply of a multi-scale, high-

resolution, tri-beam facility for fast machining and 3D characterisation.

The facility should combine the advantages of the latest electron optics, plasma/ion optics and laser technologies for high throughput yet high resolution analysis of advanced materials. As well as excellent performance, the system should be compatible with a wide range of materials, including energy materials, structural materials and also biomedical materials to a high standard and in a time efficient manner.

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: £1,908,000

II.2) Description

II.2.3) Place of performance

NUTS codes

- UKG31 - Birmingham

II.2.4) Description of the procurement

The University of Birmingham invites tenders for the supply of a multi-scale, high-resolution, tri-beam facility for fast machining and 3D characterisation

The facility should combine the advantages of the latest electron optics, plasma/ion optics and laser technologies for high throughput yet high resolution analysis of advanced materials. As well as excellent performance, the system should be compatible with a wide range of materials, including energy materials, structural materials and also biomedical materials to a high standard and in a time efficient manner.

Specifications

1) Electron column and electron beam detector options

• A FEG SEM column is required with a voltage range of at least 30 kV to 0.5 kV. The resolutions of the column should be 1 nm or better at 30 kV and 3 nm or better at 3 kV. Please state whether the system includes an immersion mode and if so whether it is possible to analyse magnetic samples in this mode. If not, please quote the resolutions attainable in the non-immersion mode.

• The system must have a solid-state backscatter detector allowing low kV (

• The system must contain a minimum of a standard Everhart Thornley detector, In-lens SE and BS detectors, with ideally another STEM detector.

2) Ion/plasma column and detectors for imaging with the ion/plasma beam

• The system must possess an ion column with an attainable resolution of at least 15 nm.

• An ion beam current >60 nA is desirable - please state the standard currents available and the associated probe sizes.

• The ability of the column to operate at low kV to remove sample damage is also essential.

• The system must possess a secondary ion detector. Please state whether this detector degrades with time. Ion-induced secondary electrons must also be able to be imaged.

3) The facility should also include a laser beam enabling the machining of samples at high speed. The details of the physical location of the laser, accuracy of positioning, laser wavelength, power and probe size must be specified.

4) Gas injection systems. The system must contain a multiple gas injection system that allows Pt and C gases to be deposited. It is highly desirable that the Pt and C can be deposited by the electron beam at zero tilt without risk of collision. The ability to accommodate more gases is also desirable.

5) Micromanipulator. A micromanipulator for a wide variety of sample preparation types (TEM sample preparation, atom probe, X-ray tomography) is required. It is desirable to have a very high accuracy probe, simple (in-situ) tip change procedure and concentric rotation capability.

6) Nano-machining. The ability to cut with the FIB a variety of user defined shapes in a simple user defined manner is required. The ability to monitor patterning in real time using both the ion/plasma and electron beams in an integrated manner is also required. Please state the capabilities of the system for nano-patterning and real time imaging.

7) 3D analysis capability is required from multiple signals, including SE, In-lens SE and BS and EBSD/EDS. It is desirable to be able to do 3D analysis using other signals such as solid- state BS, SIMS and ion beam images. The ability to record electron beam images during the cutting process is also required. Please also state any 3D analysis software that comes with the system.

8) The system should also be configured for 3D EBSD/EDS. It is desirable to be able to

undertake 3D EBSD and EDS simultaneously. Please state whether stage rotation is needed to move between the ion beam milling and EBSD collection positions.

9) Sample navigation. The system should allow easy navigation of large samples.

10) Stage - A stage that allows maximum flexibility of the operation of the system and of the samples that are being examined is sought. Please specify the following parameters; the values in parenthesis are values that are expected, as a guideline.

• Movement ranges: x,y and tilt [100 mm, y = 100 mm and 60°] and z as large as possible.

• Maximum sample size and weight (W) [x= 140 mm, y = 140 mm, z = 50 mm, W ? 0.5 kg]

• Repositioning accuracy [3 µm]

• Pumping time from the main door [maximum 5 mins]

• Specify the maximum sample dimensions can be machined using the laser

• An in-chamber plasma cleaner is desirable.

11) It is highly desirable to have a time-efficient sample transfer system, like a fully integrated glovebox, for air sensitive samples. Supplier must describe in detail the design, technical and maintenance requirements of such integrated sample transfer system.

12) An uninterruptable power supply (UPS) system to mitigate against power cuts must be supplied. The UPS system should prioritise protection of the field emission gun and allow safe shutdown of the equipment after a specified period.

13) System maintenance and uptime. Please state the average number of hours that the ion beam source will last and what the typical time between reporting a depleted source and having the system running again is. Since maximum uptime of the system is required, are there procedures in place to train users to replace their own ion beam sources and apertures? Can the ion beam apertures be changed individually or does the whole strip need replacing? Please highlight any other similar operational considerations.

14) Energy dispersive X-ray spectrometers (EDS) with large area (>60 mm2) silicon drift detectors (SDD) for chemical analysis are requested. The EDS system must be able to perform spot analysis, linescans and mapping, as well as be able to carry out peak identification and quantification functions via the software. It is highly desirable that the quantification function can be performed for all of spot analysis, linescan and mapping modes. Suppliers are requested to state the energy resolution and typical solid angle under specified operation conditions of the EDS system.

15) An electron backscattered diffraction (EBSD) system is requested. The supplier should specify the speed and angular resolution of the system and the number of diode detectors included.

16) It is highly desirable that the system can be used to map (for both EDS and EBSD) large area samples quantitatively via automated sample stage movement.

17) Software: any options available but not included in the budget need to be stated and their cost itemized.

18) Suppliers are requested to clarify the compliance of their products with the microscope models.

19) Suppliers are encouraged to include additional features, components or systems that can further enhance and/or upgrade the material characterisation capability at the University, including but not limited to, imaging and chemical analysis.

II.2.5) Award criteria

Quality criterion - Name: Equipment Requirement / Weighting: 40

Quality criterion - Name: Delivery, Warranty and After Sales and Technical Back up / Weighting: 15

Quality criterion - Name: Added Value / Weighting: 5

Price - Weighting: 40

II.2.11) Information about options

Options: No

Section IV. Procedure

IV.1) Description

IV.1.1) Type of procedure

Award of a contract without prior publication of a call for competition in the cases listed below

- The procurement falls outside the scope of application of the regulations

Explanation:

This contract was awarded following a mini tender process under the NWUPC HVLE Framework Agreement (Reference LAB3123 NW) - Lot 5 (Scanning electron Microscopes (SEMs). All suppliers that had been awarded a framework for Lot 5 were invited to take part in the process.

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

The procurement is covered by the Government Procurement Agreement: Yes

Section V. Award of contract

A contract/lot is awarded: Yes

V.2) Award of contract

V.2.1) Date of conclusion of the contract

21 June 2021

V.2.2) Information about tenders

Number of tenders received: 3

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

V.2.3) Name and address of the contractor

FEI UK Ltd

Altrincham

Country

United Kingdom

NUTS code

- UKD34 - Greater Manchester South West

Companies House

02380120

The contractor is an SME

No

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

Total value of the contract/lot: £1,908,000

Section VI. Complementary information

VI.4) Procedures for review

VI.4.1) Review body

University of Birmingham

Birmingham

B15 2TT

Country

United Kingdom