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Contract

Short Pulse Laser

UNIVERSITY OF SHEFFIELD

F03: Contract award notice
Notice identifier: 2024/S 000-021090
Procurement identifier (OCID): ocds-h6vhtk-046d0e
Published 10 July 2024, 2:32pm

Section I: Contracting authority

I.1) Name and addresses

UNIVERSITY OF SHEFFIELD

THE UNIVERSITY OF SHEFFIELD,WESTERN BANK

SHEFFIELD

S102TN

Contact

Rachel Hirst

Email

r.e.hirst@sheffield.ac.uk

Telephone

+44 1142157590

Country

United Kingdom

Region code

UKE32 - Sheffield

Companies House

RC000667

Internet address(es)

Main address

https://www.sheffield.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

Short Pulse Laser

Reference number

4087/AMRC/CK/24

II.1.2) Main CPV code

- 38636100 - Lasers

II.1.3) Type of contract

Supplies

II.1.4) Short description

This laser will replace the SPI redPOWER QUBE 2kW continuous-wave laser currently in the Factory 2050 laser cell. Two applications are targeted: further cutting trials with thin sheets of electrical steel for the production of electrical machine laminations, and high rate cutting of CFRP panels, initially to produce perforations.

For the first of these, remote laser cutting is being investigated as an alternative to traditional gantry-mounted fusion laser cutting. The perceived benefits of this method of cutting are that the cut rate is increased (the scanner is capable of speeds of up to 8,000 mm/s) and that the thermal damage (measured in terms of electromagnetic performance, not physical material properties) is reduced, both with reference to the traditional fusion cutting baseline. Materials being investigated are high-silicon steel (e.g. NO20) and cobalt iron (e.g. Hiperco50 - 49% cobalt content). Sheet thicknesses could range from 0.35 mm down to 0.1 mm.

Previously, a continuous-wave (CW) laser has been used in this investigation. This has been shown to produce an increased cut rate but creates more thermal damage to the material in the region of the cut. This is a result of firstly there being significant melting of the material, as well as vaporisation, and the fact that the molten material is not ejected from the component surface (the vaporisation/ablation is not sufficiently energetic to eject it).

A new short pulse laser is sought to overcome these issues. This new laser shall be capable of removing material in a way that produces reduced thermal damage (HAZ)

compared to a traditional laser system. Secondly, the new laser should be capable of cutting the steel sheets at a rate such that the resultant cut rate of the system is greater than that for a traditional gantry laser system. For the purposes of this tender, consider this to be 300 mm/s.

The second application addresses a requirement to put arrays of holes into aerospace-grade carbon fibre reinforced polymer (CFRP) composite panels typically associated with primary structure components, up to 3 mm thick. These holes are required to be produced at high rate (> 10 holes per second) without affecting any visible heat affected zone (HAZ) within the fibre or matrix surrounding the through-hole entry/exit/bore surfaces in the part being laser processed. Thermal damage is typically seen through either a charring/blackening or other discoloration on a surface and/or removal of additional material in the zone surrounding the intended hole's removal zone, e.g. 100 microns of top ply material removed away from the primary hole circumference on entry side.

These high-rate through holes are expected to be percussion drilled to maximise productivity and can be produced in parallel to manage thermal dissipation. The through holes required would range in size from 0.1 mm to 2 mm in diameter with a diameter tolerance of ±10%. The AMRC's existing optics can focus the spot across this range, however, alternative solutions to enable entry diameters, with minimal taper at high rate within this range are welcomed. The laser shall be capable of meeting this baseline. An ability to produce holes up to 25.4 mm in diameter using the trepanning method is also considered desirable.

The laser will be a direct replacement for the existing CW laser. It is intended that the existing ancillary equipment will be used for the replacement as much as possible.

Tender Process and Documentation:

This procurement is an open procedure.

The ITT can be downloaded by registering and expressing your interest on the University`s e-tendering system https://in-tendhost.co.uk/Sheffield

If you have any questions or comments in relation to this tender they must be submitted via the In-tend System, this can be accessed at https://in-tendhost.co.uk/Sheffield

Completed tenders must be returned through the same e-tendering system.

Closing date for receipt of tenders: 3rd of July 2024 at 12 noon (UK time)

II.1.6) Information about lots

This contract is divided into lots: No

II.2) Description

II.2.2) Additional CPV code(s)

- 38636110 - Industrial lasers

II.2.3) Place of performance

NUTS codes

- UKE - Yorkshire and the Humber

II.2.4) Description of the procurement

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II.2.5) Award criteria

Price

II.2.11) Information about options

Options: No

Section IV. Procedure

IV.1) Description

IV.1.1) Type of procedure

Open procedure

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

The procurement is covered by the Government Procurement Agreement: No

IV.2) Administrative information

IV.2.1) Previous publication concerning this procedure

Notice number: 2024/S 000-017190

Section V. Award of contract

A contract/lot is awarded: No

V.1) Information on non-award

The contract/lot is not awarded

No tenders or requests to participate were received or all were rejected

Section VI. Complementary information

VI.4) Procedures for review

VI.4.1) Review body

University of Sheffield

Sheffield

S10 2TN

Country

United Kingdom