

**Finland-Helsinki: Laboratory, optical and precision equipments (excl. glasses)**

OJ S 67/2023 04/04/2023

Contract award notice

Supplies

**Legal Basis:**

Directive 2014/24/EU

**Section I: Contracting authority**

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**I.1. Name and addresses**

Official name: University of Helsinki  
National registration number: 0313471-7  
Postal address: Yliopistonkatu 3  
Town: Helsinki  
NUTS code: FI1B Helsinki-Uusimaa  
Postal code: 00100  
Country: Finland  
Contact person: Katri Leino  
E-mail: [hankinnat@helsinki.fi](mailto:hankinnat@helsinki.fi)  
**Internet address(es):**  
Main address: <https://www.helsinki.fi/en>

**I.4. Type of the contracting authority**

Body governed by public law

**I.5. Main activity**

Education

**Section II: Object**

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**II.1. Scope of the procurement****II.1.1. Title**

Qtac 100 Low energy ion scattering (LEIS) instrument

**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**

Qtac 100. Low energy ion scattering (LEIS) instrument.

**II.1.6. Information about lots**

This contract is divided into lots: no

**II.1.7. Total value of the procurement**

Value excluding VAT: 900 000,00 EUR

**II.2. Description**

### II.2.3. Place of performance

NUTS code: FI1B Helsinki-Uusimaa

### II.2.4. Description of the procurement

Qtac 100. Low energy ion scattering (LEIS) instrument.

### II.2.5. Award criteria

Price

### II.2.11. Information about options

Options: no

### II.2.13. Information about European Union funds

The procurement is related to a project and/or programme financed by European Union funds:  
yes

Identification of the project: Business Finland / NextGenerationEU

### II.2.14. Additional information

## Section IV: Procedure

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### IV.1. Description

#### IV.1.1. Type of procedure

Award of a contract without prior publication of a call for competition in the Official Journal of the European Union in the cases listed below

- The works, supplies or services can be provided only by a particular economic operator for the following reason:
  - absence of competition for technical reasons

Explanation:

IONTOF GmbH is the only manufacturer in the market that produce high sensitivity, high resolution and

Low Energy Ion Scattering (LEIS) spectrometer. LEIS uses 1 to 8 keV beam of noble gas ions and allows

to quantitatively analyse the outer (single) atomic layer for its elemental composition, so it is essential that the ion beam used for that does not modify this outer layer significantly.

Therefore, the analyser must be optimised to achieve sufficient energy as well as angular resolution to separate even neighbouring heavy elements. Due to the intrinsic scattering peak width in LEIS, this requires using Ne or Ar scattering and energies up to 8 keV, beyond the traditional He scattering.

Simultaneously, a large solid angle of detection, high transmission, and parallel detection of energies must be applied to allow for sufficiently high sensitivity. The primary ion dose density on a given sample area must be limited to prevent noticeable sample modification while detecting enough scattered ions for good signal/noise ratio.

Only the Qtac 100 achieves all this. It implements a dedicated electrostatic double-toroidal analyser to

combine a well-defined scattering angle (polar angle) while accepting ions from all azimuths.

The position sensitive detector records a significant fraction (10-20 %) of the energy range in parallel. In addition, the primary ion beam can be focused to typically 20 µm to allow recording the LEIS spectra of patterned samples. Together with the overall instrument design optimised

for LEIS including relevant accessories and procedures for sample preparation (removal of atmospheric adsorbents without modification of the outer sample surface) it is a unique tool to apply LEIS to real world samples with excellent detection limits down to some 10 ppm of the outer atomic layer and reliable quantification. In practice the mass resolution of the instrument is sufficient to separate virtually all pairs of neighbouring (even heavy) elements. For example a mass resolution  $m/dm > 35$  is reached on Cu, so the isotopes 63 and 65 can be separated using peak fitting while still not changing the outer atomic layer.

In principle, LEIS measurements can be done using a hemispherical analyser typically called as ion scattering spectrometry (ISS) but the limitations of the hemispherical analyser prevent achieving high resolution and high sensitivity simultaneously. Also, the ion beam is a broad beam without any lateral resolution. This allows the application only with favourable combinations of elements (large difference in mass) and moderate detection limits. In the UHV cluster of ALD center Finland there is already such an option and hence the current purchase aims to take a major leap forward in performance. Consequently, the Qtac 100 allows a much wider range of samples and applications to be addressed: It offers true outer atomic layer analysis for practically relevant samples without limitation from ion beam damage, provides reliable quantification, analysis of patterned samples and excellent detection limits. Qtac 100 is the only device in the market that allows us to achieve next level of performance and our research goals; high resolution and high sensitivity simultaneously.

#### **IV.1.3. Information about a framework agreement or a dynamic purchasing system**

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

The procurement is covered by the Government Procurement Agreement: yes

#### **IV.2. Administrative information**

#### **IV.2.8. Information about termination of dynamic purchasing system**

#### **IV.2.9. Information about termination of call for competition in the form of a prior information notice**

### **Section V: Award of contract**

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#### **Title:**

Qtac 100. Low energy ion scattering (LEIS) instrument

A contract/lot is awarded: yes

#### **V.2. Award of contract**

##### **V.2.1. Date of conclusion of the contract**

14/02/2023

##### **V.2.2. Information about tenders**

Number of tenders received: 1

Number of tenders received from SMEs: 1

Number of tenders received by electronic means: 1

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

**V.2.3. Name and address of the contractor**

Official name: IONTOF GmbH

National registration number: HRB 10680

Postal address: Heisenbergstraße 15

Town: Münster

NUTS code: DE Deutschland

Postal code: 48149

Country: Germany

The contractor is an SME: yes

**V.2.4. Information on value of the contract/lot**

Total value of the contract/lot: 900 000,00 EUR

**V.2.5. Information about subcontracting**

**Section VI: Complementary information**

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**VI.3. Additional information**

**VI.4. Procedures for review**

**VI.4.1. Review body**

Official name: Markkinaoikeus

Postal address: Sörnäistenkatu 1

Town: Helsinki

Postal code: 00580

Country: Finland

E-mail: [markkinaoikeus@oikeus.fi](mailto:markkinaoikeus@oikeus.fi)

Telephone: +358 295643300

Internet address: <http://www.oikeus.fi/markkinaoikeus>

**VI.5. Date of dispatch of this notice**

30/03/2023