



## Purchase Contract

(hereafter the “Contract”)

### 1. CONTRACTUAL PARTIES

#### 1.1 Geologický ústav AV ČR, v. v. i.,

with its registered office at: Rozvojová 269, 165 00 Praha 6 – Lysolaje, Czech Republic  
represented by: RNDr. Tomáš Příklad, Ph.D., Director,  
registered in the Register of public research institutions of the Ministry of Education, Youth and Sports  
of the Czech Republic.

ID No.: 67985831

Tax ID No.: CZ67985831

Bank: [REDACTED]

Account No. IBAN: [REDACTED]; SWIFT (BIC): [REDACTED]

(hereafter the “Buyer”)

and

#### 1.2 Měřicí technika Morava s.r.o.,

with its registered office at: Babická 619, 664 84 Zastávka, Czech Republic  
represented by: Mgr. Felix Holáň, Managing Director,  
registered in commercial register maintained by Regional Court in Brno, file C/77278.

ID No.: 29316715

Tax ID No.: CZ29316715

Bank: [REDACTED]

Account No. IBAN: [REDACTED]; SWIFT (BIC): [REDACTED]

(hereafter the “Seller”),

(the Buyer and the Seller are hereafter jointly referred to as the “Parties” and each of them  
individually as a “Party”).

## 2. FUNDAMENTAL PROVISIONS

- 2.1 The Buyer is a public research institution whose primary activity is scientific research in the areas of structural geology, magnetostratigraphy, petrology, geochemistry of endogenous and exogenous processes, economic geology, phytopaleontology including microphytopaleontology, zoopaleontology of vertebrates and invertebrates and paleoecology, together with Quaternary geology, geoarchaeology and environmental sciences.
- 2.2 The Buyer wishes to acquire the subject of performance hereof for Micro X-ray fluorescence (micro-XRF) hyperspectral imaging, quantitative point, line, or area chemical analyses of the samples.
- 2.3 The Seller was selected as the winner of a public procurement procedure announced by the Buyer in accordance with Act No. 134/2016 Coll., on Public Procurement, as amended (hereafter the “**Act**”), for the public contract called “**Benchtop energy-dispersive micro X-ray fluorescence spectrometer**” (hereafter the “**Procurement Procedure**”).
- 2.4 The documentation necessary for the execution of the subject of performance hereof consist of
- 2.4.1 Technical specifications** of the subject of performance hereof attached as **Annex 1** hereto.
- 2.4.2** The Seller’s bid submitted within the Procurement Procedure in its parts which describe the subject of performance in technical detail (hereafter the “**Seller’s Bid**”) as **Annex 2** hereto.

In the event of a conflict between the Contract and its Annexes or Annexes to each other, a technical requirement of a higher level or a business condition more favorable to the Buyer always takes precedence.

- 2.5 The Seller declares that he has all the professional prerequisites required for the supply of the subject of performance under this Contract, is authorised to supply the subject of performance and there exist no obstacles on the part of the Seller that would prevent him from supplying the subject of this Contract to the Buyer.
- 2.6 The Seller acknowledges that the production and delivery of the subject of performance within the specified time and of the specified quality, as shown in Annexes 1 and 2 of this Contract (including invoicing), is essential for the Buyer. If the Seller does not fulfil the contractual requirements, the Buyer may incur damages.

## 3. SUBJECT-MATTER OF THE CONTRACT

- 3.1 The subject of this Contract is the obligation on the part of the Seller to deliver and transfer into the Buyer’s ownership:
- the **Benchtop energy-dispersive micro X-ray fluorescence spectrometer** (hereafter the “**Equipment**”) specified in detail in Annexes 1 and 2 hereto and the Buyer undertakes to take delivery of the Equipment and to pay to the Seller the agreed upon price.
- 3.2 The following activities form an integral part of the performance to be provided by the Seller:

- 3.2.1 Submission of a list containing conditions which are recommended to be met at the place of performance in order to install the Equipment;
- 3.2.2 Transport of the Equipment incl. all accessories specified in Annexes 1 and 2 of the Contract to the place of performance, un-packaging and control thereof;
- 3.2.3 Installation of the Equipment and its commissioning at the place of performance;
- 3.2.4 Testing of the Equipment in order to verify its functionality and compliance with
- the declared parameters listed in Annexes 1 and 2 of the Contract, according to the manufacturer's instructions and
  - the results of the measurements of the testing samples carried out to create the basis for the evaluation within the Procurement Procedure (results must be duplicated with only insignificant and reasonably explained departures);
- 3.2.5 Delivery of detailed instructions and manuals for operation and maintenance, including list of spare parts, etc. - all in Czech or English language, in electronic or hardcopy (printed) versions;
- 3.2.6 Basic training of operators focused on controlling the Equipment after its successful installation on site - at least 2 days (1 day = 8 hours) of training of 5 operators, extended on-site training during the first 6 months of Equipment operation - at least 2 days (1 day = 8 hours) of training of 5 operators;
- 3.2.7 Free-of-charge warranty service during the warranty period;
- 3.2.8 Provision of free technical support in the form of consultations, e.g. regarding fine tuning of the Equipment or its SW (The details of provision of this support after the warranty expires are described in Annex 1 hereto.);
- 3.2.9 Free software upgrades in the extent according to Annex 1 hereto.
- 3.3 The Seller shall be liable for the Equipment and related services to be in full compliance with this Contract, its Annexes and all valid legal regulation, technical and quality standards and that the Buyer will be able to use the Equipment for the defined purpose. In case of any conflict between applicable standards it is understood that the stricter standard or its part shall always apply.
- 3.4 The delivered Equipment and all its parts and accessories must be brand new and unused.
- 4. PERFORMANCE PERIOD**
- 4.1 The Seller undertakes to deliver the Equipment to the Buyer within **15 weeks** of conclusion of the Contract but **no later than December 13, 2024**.
- 4.2 The Seller is obliged to notify the Buyer of the date of delivery and installation of the Equipment at least 1 month in advance. This term is subject to the consent of the Buyer.

4.3 In the event that, due to obstacles on the part of the Buyer, it is not possible to deliver and hand over the Equipment on the agreed date or within the period according to Section 4.1, the Seller is not entitled to claim payment of any additional costs against the Buyer.

## 5. PURCHASE PRICE, INVOICING, PAYMENTS

5.1 The purchase price is based on the Seller's submitted bid and amounts to **8 250 000 CZK** (in words: **eight million and two hundred fifty thousand Czech crowns**) excluding VAT (hereafter the "**Price**"). VAT shall be settled in accordance with the valid Czech regulation.

5.2 The Price includes any and all performance provided by the Seller in connection with meeting the Buyer's requirements for the proper and complete delivery of the Equipment hereunder, as well as all costs that the Seller may incur in connection with the delivery, installation and testing of the Equipment upon handover, and including all other costs or expenses that may arise in connection with the performance of the Contract.

5.3 The Parties agreed that the Seller shall be entitled to invoice the Price as follows:

5.3.1 The Seller is entitled to issue an advance invoice in the amount up to 30 % of the Price excluding VAT after the conclusion of the Contract.

5.3.2 The Seller is entitled to invoice

- up to 90% of the Price after proper delivery of the Equipment to the Buyer confirmed by a delivery note according to Section 9.1;
- the rest of the Price after the handover protocol in accordance with Section 9.4 (hereafter the "**Handover Protocol**") will have been signed by the Buyer; in case the Equipment will be delivered with minor defects, the Price shall be invoiced after removal of these minor defects.

5.4 All invoices issued by the Seller must contain all information required by the applicable laws of the Czech Republic. Mandatory invoice details are as follows:

5.4.1 name and registered office of the Buyer,

5.4.2 tax identification number of the Buyer,

5.4.3 name and registered office of the Seller,

5.4.4 tax identification number of the Seller,

5.4.5 registration number of the invoice,

5.4.6 scope of the performance (including the reference to this Contract),

5.4.7 the date of the issue of the invoice,

5.4.8 purchase Price,

5.4.9 the date of conclusion of the Contract and its registration number, which the Buyer shall communicate to the Seller based on Seller's request before the issuance of the invoice, and it must comply with the double taxation agreements, if applicable.

5.5 The Buyer prefers electronic invoicing with the invoices being delivered to [uctarna@gli.cas.cz](mailto:uctarna@gli.cas.cz).

5.6 Invoices shall be payable within thirty (60) days of the date of their delivery to the Buyer. Payment of the invoiced amount means the date of its remittance to the Seller's account.

5.7 If an invoice is not issued in conformity with the payment terms stipulated by the Contract or if it does not comply with the requirements stipulated by law, the Buyer shall be entitled to return the invoice to the Seller as incomplete, or incorrectly issued, for correction or issuance of a new invoice, as appropriate, within five (5) business days of the date of its delivery to the Buyer. In such a case, the Buyer shall not be in delay with the payment of the Price or part thereof and the Seller shall issue a corrected or new invoice with a new and identical maturity period commencing on the date of delivery of the corrected or newly issued invoice to the Buyer.

5.8 The Buyer shall be entitled to unilaterally set off any of his payments against any receivables claimed by the Seller due to:

5.8.1 damages caused by the Seller,

5.8.2 contractual penalties.

5.9 The Seller shall not be entitled to set off any of his receivables against any part of the Buyer's receivable hereunder.

## **6. OWNERSHIP TITLE**

Ownership of the Equipment and the associated risk of damage is transferred to the Buyer upon proper handover of the Equipment in accordance with Section 9.4 of the Contract.

## **7. PLACE OF PERFORMANCE**

The place of performance (delivery, installation and handover of the Equipment) shall be the room No. 128 (first floor; the vacuum pump will be installed in the immediately adjacent room one floor below) in the premises of the Institute of Geology of the Czech Academy of Sciences at the address Rozvojová 305, 165 00 Praha 6 – Lysolaje, Czech Republic.

## **8. COOPERATION OF THE PARTIES**

8.1 The Seller undertakes to notify the Buyer of any obstacles on his part, which may negatively influence proper and timely delivery and/or handover of the Equipment.

8.2 The Seller is obliged to notify the Buyer of inappropriate readiness of the place of performance, if possible.

## **9. DELIVERY, INSTALLATION, HANDOVER AND ACCEPTANCE**

- 9.1 The Seller shall transport the Equipment at his own cost to the place of performance. If the shipment is intact, the Buyer shall issue delivery note for the Seller.
- 9.2 The Seller shall perform and document the installation of the Equipment and launch the tests according to Section 3.2.4 hereof in order to verify whether the Equipment is functional and meets the technical requirements of Annexes 1 and 2 hereof.
- 9.3 Handover shall include any and all technical documentation pertaining to the Equipment, user manuals and certificate of compliance of the Equipment and all its parts and accessories with approved standards.
- 9.4 The acceptance of the Equipment shall be completed in a joint handover procedure (with Part 2 of this public contract) confirmed by the Handover Protocol. The Handover Protocol shall contain the following mandatory information:
- 9.4.1 Information about the Seller, the Buyer and any subcontractors;
  - 9.4.2 Description of the Equipment including description of all components and their serial / production numbers;
  - 9.4.3 Description of executed tests according to Section 3.2.4 of the Contract and their results;
  - 9.4.4 Confirmation of the basic operator training according to Section 3.2.6 hereof, including a list of participants and information on its extent;
  - 9.4.5 List of technical documentation including manuals;
  - 9.4.6 Eventually reservation of the Buyer regarding minor defects including the manner and deadline for their removal and
  - 9.4.7 Signatures of the representatives of both Parties according to Sections 11.1 and 11.2 and the date thereof.
- 9.5 Handover of the Equipment does not release the Seller from liability for damage caused by its defects.
- 9.6 The Buyer shall not be obliged to accept Equipment, which would show defects (even those that do not - on their own or in connection with other defects - constitute an obstacle to the use of the Equipment). In this case, the Buyer shall issue a record containing the reason for his refusal to accept the Equipment.
- 9.7 Should the Buyer not exercise his right not to accept the Equipment with a defect, the Seller and the Buyer shall list all defects found in the Handover Protocol, including the manner and deadline for their removal. Should the Parties not be able to agree in the Handover Protocol on the deadline for removal of the defects, it shall be understood that all defects shall be removed / rectified within 7 days from the handover of the Equipment.

## 10. PROVISION OF TECHNICAL SUPPORT

In accordance with Section 3.2.8 hereof, the Seller is obliged to provide the Buyer with free consultations and technical support related to the Equipment during the warranty and post-warranty periods.

## 11. REPRESENTATIVES, NOTICES

11.1 The Seller authorized the following representatives to communicate with the Buyer in all matters relating to the Equipment delivery, installation and handover:

[REDACTED]

11.2 The Buyer authorized the following representatives to communicate with the Seller in all matters relating to the Equipment delivery, installation and handover:

[REDACTED]

11.3 The representatives according to Sections 11.1 and 11.2 can be changed by a unilateral written declaration of the Party delivered to the other Party.

11.4 All notifications made between the Parties pursuant to this Contract, unless otherwise specified in the Contract, must be delivered to the other Party in person (with confirmed receipt) or by registered post (to the Buyer's or Seller's address), or in some other form of registered post or electronic delivery incorporating electronic signature (qualified certificate) to [uctarna@gli.cas.cz](mailto:uctarna@gli.cas.cz) in case of the Buyer and to [info@mt-m.eu](mailto:info@mt-m.eu) in case of the Seller.

11.5 In all technical and expert matters (discussions on the Equipment testing, notification of the need to provide warranty or post-warranty service, technical assistance etc.), electronic communication between technical representatives of the Parties will be acceptable using e-mails specified in Sections 11.1 and 11.2.

## 12. TERMINATION

12.1 This Contract may be terminated early by agreement of the Parties or by withdrawal from the Contract on the grounds stipulated by law or in the Contract.

12.2 The Buyer is entitled to withdraw from the Contract without any penalty from the Seller in any of the following events:

12.2.1 The technical parameters or other conditions set out in the technical specifications defined in Annexes 1 and 2 to this Contract and in the relevant applicable technical standards will not be met by the Equipment at handover.

- 12.2.2 The Seller is more than 2 weeks in delay with the removal of Equipment defects listed in the list of detected defects of the Handover Protocol according to Section 9.7.
- 12.2.3 Facts emerge bearing evidence that the Seller will not be able to deliver and/or hand over the Equipment in the year 2024.
- 12.2.4 The measurement results of the test of the Equipment on handover according to Section 3.2.4 are in clear contradiction with the measurement results stated in Seller's Bid.
- 12.2.5 The Seller has breached the obligations specified within the conditions of the Procurement Procedure, in particular the obligations arising from the affidavit which forms Annex 3 to this Contract, necessary for the selection of an economic operator according to Section 2.3 of this Contract.
- 12.3 The Seller is entitled to withdraw from the Contract in the event of the Buyer being in default with the payment for more than 1 month with the exception of the cases when the Buyer refused an invoice due to defect on the delivered Equipment or due to breach of the Contract by the Seller.
- 12.4 Withdrawal from the Contract becomes effective on the day the written notification to that effect is delivered to the other Party. The Party which had received performance from the other Party prior to such withdrawal shall duly return such performance within 30 days from the date of sending the notification of withdrawal by the withdrawing Party, unless the withdrawing Party sets a longer period.
- 12.5 In the event of early termination of the Contract, the Seller is obliged to ensure the removal of the Equipment from the place of performance within 30 days from the date on which withdrawal from the Contract became effective. The Buyer will provide the Seller with the necessary cooperation similar to the cooperation during the installation of the Equipment. The cost of removal shall be paid by the Party which caused the premature termination of the Contract by breaching it.

### **13. INSURANCE**

- 13.1 The Seller undertakes to insure the Equipment against all risks, in the amount of the Price for the entire period commencing when transport of the Equipment starts until duly handed over to the Buyer. In the case of breach of this obligation, the Seller shall be liable to the Buyer for any damage that may arise in connection thereof.
- 13.2 The Seller is liable for the damage that he has caused. The Seller is also liable for damage caused by third parties undertaken to carry out performance or its part under this Contract.

### **14. WARRANTY TERMS**

- 14.1 The Seller shall provide warranty for the quality of the Equipment and all its accessories for a period of **36 months**.
- 14.2 The warranty period shall commence on the day following the date of signing of the Handover Protocol pursuant to Section 9.4 hereof. The warranty does not cover consumable parts. Consumable parts for the purposes of the Contract are understood as items contained within the Equipment, which are consumed at regular intervals during the normal use of the Equipment, i.e. parts which have a defined



typical lifetime, that does not exceed the warranty period provided the Equipment is used with normal frequency.

- 14.3 The Seller undertakes to provide free servicing of the Equipment through authorized technicians and free regular service inspection at the place of performance to the extent specified by the Equipment manufacturer and by the Contract for the entire warranty period according to this Contract, including repairs, delivery of spare parts, transport and work of an authorized service technician further specified in Annex 1 hereto.
- 14.4 Should the Buyer discover a defect, he shall notify the Seller to rectify such defect using the e-mail address: [info@mt-m.eu](mailto:info@mt-m.eu). The Seller is obliged to notify the Buyer without delay about any change of this e-mail address.
- 14.5 The Seller shall be obliged to review any warranty claim within 48 hours (within business days) from its receipt and to propose solution. In case the nature of the claimed defect requires to be dealt with by a qualified technician, such person must be sent and must appear at the place of performance within 5 business days from receipt of the above-mentioned warranty claim. All the above remains in effect unless agreed otherwise by the Parties. During the warranty period, the Seller shall be obliged to rectify any claimed defects within 15 days from receipt of the Buyer's notification. In cases of unusual defects, the Seller shall be obliged to rectify the defect in the period corresponding to the nature of the defect and to define the deadline for the handover of the rectified Equipment.
- 14.6 During the warranty period, any and all costs associated with defect rectification / repair including transport and travel expenses of the Seller shall be always borne by the Seller.
- 14.7 The repaired Equipment shall be handed over by the Seller to the Buyer on the basis of a protocol confirming removal of the defect (hereinafter the "**Repair Protocol**"). If the Equipment is delivered duly repaired and defect-free, the Buyer will confirm the Repair Protocol.
- 14.8 The repaired portion of the Equipment shall be subject to a new warranty term in accordance with Section 14.1 which commences to run on the day following the date when the Repair Protocol was executed. At the same time, the aggregate length of the warranty period of the repaired portion of the Equipment shall be a maximum of twice the warranty period according to Section 14.1.
- 14.9 If the Equipment shows defects for which it cannot be demonstrably used to its full extent for more than 60 days (defect period) during six or fewer consecutive months of the warranty period, the Seller is obliged to eliminate the defect by delivering a new Equipment without defects within a period of 60 days from receipt of the Buyer's notification, unless the Parties agree otherwise.
- 14.10 The Seller undertakes to provide paid post-warranty [out-of-warranty] service at the place of performance, including repairs, delivery of spare parts and transport and work of a service technician further specified in Annex 1 hereto, under the conditions of Sections 14.4 and 14.5 and at a price not exceeding the usual price also for a minimum period of 7 years after the expiration of the warranty.

## 15. **CONTRACTUAL PENALTIES**

- 15.1 The Buyer shall have the right to a penalty in the amount of 0.1 % of the Price for each commenced day of delay with the performance pursuant to Sections 4.1 and 14.9 hereof.

- 15.2 The Buyer shall have the right to a penalty in the amount of 2.500,00 CZK for each commenced day of delay with rectifying of defects claimed pursuant to Section 14.4 and 14.10 hereof.
- 15.3 In the event of withdrawal from the Contract due to the reason according to Section 12.2.1 hereof, the Buyer is entitled to apply a contractual penalty in the amount of 10 % of the Price against the Seller.
- 15.4 In the event that the Seller has committed to provide service support through a Czech-speaking technician in his Bid and does not fulfil this obligation, the Buyer has the right to a penalty in the amount of 15.000,00 CZK for each such case of non-fulfilment.
- 15.5 In the case of default in payment of any due receivables (monetary debt) under the Contract, the defaulting Buyer or Seller (the debtor) shall be obliged to pay a contractual penalty in the amount of 0.1 % of the owed amount for each commenced day of delay with the payment.
- 15.6 Contractual penalties are payable within 30 days of notification demanding payment thereof.
- 15.7 Payment of the contractual penalty does not prejudice the rights of the Parties to claim damages.
- 15.8 Payment of any contractual penalty cannot be demanded if the breach of the contractual obligation causes force majeure.

## **16. DISPUTES**

In the event that any dispute cannot be resolved by negotiations, the dispute shall be resolved by the competent court in the Czech Republic based on application of any of the Parties; the court having jurisdiction will be the court where the seat of the Buyer is located. Disputes shall be resolved exclusively by the law of the Czech Republic.

## **17. FINAL PROVISIONS**

- 17.1 This Contract may be changed or supplemented solely by means of numbered amendments in writing, furnished with the details of time and place and signed by duly authorised representatives of the Parties. The Parties expressly reject modifications to the Contract in any other manner.
- 17.2 The Parties agree that the Contract as a whole, including all attachments, will be published in accordance with Act No. 340/2015 Coll. on special conditions for the effectiveness of some contracts, publication of these contracts and Contract Register, as amended. The Buyer shall ensure the publication of the Contract.
- 17.3 This Contract becomes effective as of the day of its publication in the Contract Register.
- 17.4 The following Annexes form an integral part of the Contract:
- Annex 1: Technical specification on the subject of performance
- Annex 2: Technical description of the Equipment as presented in Seller's bid
- Annex 3: Affidavit according to § 6 paragraph 4 of the Act No. 134/2016 Coll.

17.5 The Parties declare that they have read the Contract, understand its content and agree with it, as proof of which they attach their signatures.

In Prague 9. 9. 2024

In Zastávka 9. 9. 2024

For the Buyer:

For the Seller:

---

RNDr. Tomáš Přikryl, Ph.D.  
Director

---

Mgr. Felix Holáň  
Managing Director

## Annex 1 - Technical specification on the subject of performance

Tab. 1 – The Equipment must meet the technical conditions and include components listed in this table.

| No. | Description and minimum specification of the Equipment as defined by the Buyer  | Description and specification of the Equipment offered by the Seller  | Complies YES/NO |
|-----|---|---|-----------------|
| 1   | Form factor<br>Benchtop / tabletop  | Benchtop Micro X-Ray Fluorescence Spectrometer M4 TORNADO PLUS 26S  | YES             |
| 2   | Sample types<br>Solids, particles, powders, thin films, liquids   | Solids, particles, powders, thin films, liquids   | YES             |
| 3   | Use<br>Micro X-ray fluorescence (micro-XRF) hyperspectral imaging, quantitative point, line, or area chemical analyses of the samples   | Micro X-ray fluorescence (micro-XRF) hyperspectral imaging, quantitative point, line, or area chemical analyses of the samples  | YES             |
| 4   | Elemental range<br>Carbon (C) to uranium (U)  | Carbon (C) to Americium (Am)  | YES             |
| 5   | Sample chamber size<br>At least 500 × 350 × 250 mm, vacuum tight  | 600 x 350 x 260 mm, vacuum tight  | YES             |
| 6   | Analysis atmosphere<br>Air, oil-free vacuum or He purge<br>An appropriate vacuum pump will be included in the delivered unit.<br>A helium purge system is optional in the delivery.   | Air or adjustable vacuum with oil-free pump, 2 mbar in ~3 min<br>Optional helium purge system (not included in the bid)   | YES             |
| 7   | Primary X-ray source<br>Micro-focus tube<br>Rhodium target<br>50 kV voltage   | High brilliance, light element micro-focus X-ray tube, rhodium target<br>50 kV, 30 W  | YES             |
| 8   | X-ray optics of the primary source<br>Polycapillary<br>Working distance at least 4.5 mm   | Polycapillary X-ray optics and aperture management system (AMS)<br>Working distance ≥ 5 mm  | YES             |
| 9   | Spot size of the primary X-ray source<br>20 μm or less on MoK $\alpha$ line   | < 20 μm on MoK $\alpha$ line (17,5 keV) with polycapillary optics   | YES             |
| 10  | X-ray source filters of the primary X-ray source<br>At least 6  | 7   | YES             |
| 11  | Secondary X-ray source<br>Possible as an option   | Optional fine focus X-ray tube with four position collimator changer from 0.5 to 4.5 mm (not included in the bid)<br>Target material: W (option: Rh, Mo, Cu, Cr)<br>Tube parameters: 50 kV, 40 W            | YES             |
| 12  | Detector type<br>Silicon drift detector (SDD) with at least 120 mm <sup>2</sup> active area and resolution of 145 eV on MnK $\alpha$ line at 275 kcps or better<br>In the case of more detectors working simultaneously, the cumulative area of all installed detectors is considered the active area | Two (2) simultaneously working XFlash <sup>®</sup> super light element silicon drift detectors (SDD), total active area 120 mm <sup>2</sup> , resolution >130eV and <140eV on MnK $\alpha$ line at 275 kcps | YES             |

|    |  |  |     |
|----|--|--|-----|
| 13 | <p>Sample stage</p> <p>Computer-controlled, programmable with motorized X, Y, and Z</p> <p>Maximum weight load of at least 3 kg</p> <p>Horizontal stage travel at least 200 × 150 mm</p> <p>Vertical stage travel at least 120 mm</p> <p>Mapping travel at least 150 × 150 mm</p> <p>Mapping scan speed 5 ms/pixel or better</p>   | <p>Computer-controlled, programmable with motorized X, Y, and Z</p> <p>Maximum weight load of 7 kg</p> <p>Horizontal stage travel 200 × 160 mm</p> <p>Vertical stage travel 120 mm</p> <p>Mapping travel 190 × 160 mm</p> <p>Mapping scan speed 2 ms/pixel</p>   | YES |
| 14 | <p>Sample view and positioning</p> <p>Three cameras for sample navigation including chamber overview</p> <p>Camera views shown in controlling SW</p> <p>At least one camera must display undistorted sample image</p> <p>Setting of areas, lines, or points to be measured must be possible from undistorted sample view</p>   | <p>Two (2) simultaneous live images from above with different magnifications for sample overview and precise positioning</p> <p>Third lateral fisheye camera for the sample chamber overview</p> <p>Setting of areas, lines, or points to be measured is possible from undistorted sample view</p>   | YES |
| 15 | <p>Computer and OS</p> <p>PC with Microsoft® Windows®</p>  | <p>State-of-art PC with Microsoft® Windows®</p>  | YES |
| 16 | <p>Control software</p> <p>Complete control of tube parameters, filters, optical microscopes/cameras, sample illumination, sample positioning (drift correction if applicable should be included), atmosphere (ambient, vacuum, or helium purge), setting up and optimization of measurement parameters, automation (e.g., multiple measurements)</p>  | <p>Software package M4 TORNADO for instrument control and spectra evaluation. Control of the instrument: excitation conditions (tube parameters, filters), measurement time, instrument safety, stage, and camera control. Spectrum acquisition, display and edit functions</p>  | YES |
| 17 | <p>Evaluation software</p> <p>Peak automatic/manual identification, artifact and background corrections, spectra manipulations (e.g., mutual comparisons, stacked display, spectral mathematics, and normalization), peak fitting/deconvolution and area calculation, quantification with standard-based and standardless models, element and phase distribution (maps, line scans), statistical data/map processing (PCA, clustering), flexible data reporting (printing, saving to common document formats), data export to commonly used open formats (TXT, XML, CSV), map export to common graphic formats, at least 2 free licenses for offline concurrent use of evaluation software on additional computers</p> | <p>Peak automatic/manual identification, artifact and background corrections, spectra manipulations, peak fitting/deconvolution and area calculation, FP quantification, calibrated quantification with standard-based and standardless models using XMethod, element and phase distribution (maps, line scans), statistical data/map processing (PCA, clustering), flexible data reporting (printing, saving to common document formats), data export to commonly used open formats (TXT, XML, CSV), map export to common graphic formats, 8 free licenses for offline concurrent use of evaluation software on additional computers</p> <p>“On the fly” measurement, HyperMap capability</p> | YES |
| 18 | <p>Power</p> <p>100-240 V, 1 phase, 50/60 Hz</p>   | <p>100-240 V, 1 phase, 50/60 Hz</p>  | YES |
| 19 | <p>Quality and safety</p> <p>CE-marked, radiation &lt; 1 μSv/h at 0.1 m</p>  | <p>CE-marked, radiation &lt; 1 μSv/h at 0.1 m</p>  | YES |

Tab. 2 – Data on the evaluation criterion “Technical parameters”

| TECHNICAL PARAMETERS |   |            |
|----------------------|---|------------|
| No.                  | Parameter   | Value      |
| 1.                   | X-ray source spot size on MoK $\alpha$ line<br><i>(in <math>\mu\text{m}</math>)</i>   | < 20       |
| 2.                   | Stage speed in X-Y directions<br><i>(in mm/s)</i>   | 100        |
| 3.                   | Number of detectors<br><i>(number)</i>  | 2          |
| 4.                   | Detector active area. A cumulative active area is considered if multiple detectors working simultaneously are used.<br><i>(in mm<sup>2</sup>)</i>   | 120        |
| 5.                   | Detector resolution on MnK $\alpha$ line count rate of 275 kcps<br><i>(in eV)</i>   | >130, <140 |
| 6.                   | Sample stage travel in the horizontal plane [X-Y direction]<br><i>(in mm)</i>   | 200 x 160  |
| 7.                   | Mapping travel in the horizontal plane [X-Y direction]<br><i>(in mm)</i>  | 190 x 160  |
| 8.                   | Accuracy of the stage positioning<br><i>(in <math>\mu\text{m}</math>)</i>   | $\geq 2$   |
| 9.                   | Working distance<br><i>(in mm)</i>  | $\geq 5$   |
| 10.                  | Free upgrade of the controlling/evaluation software to the next major versions.<br><i>(Number of versions)</i>  | 3          |
| 11.                  | Software licenses for concurrent offline data management, processing, evaluation, and reporting on the separate computer(s) outside the institute network<br><i>(Number of software licenses)</i> | 8          |

**Annex 2**

**The Seller's bid in the extent it describes technical parameters of the Equipment**



## Měřicí technika Morava s.r.o.

Babická 619  
66484 Zastávka  
Česká republika  
IČ : 29316715  
DIČ : CZ29316715

Tel.: +420 513 034 408  
E-mail: info@mt-m.eu  
www.mt-m.eu

Firma je registrována u Krajského soudu v Brně, oddíl C, vložka 77278.

Datum vystavení: 23.08.2024  
Datum platnosti od: 23.08.2024  
Datum platnosti do: 31.12.2024

## Odběratel

Geologický ústav AV ČR, v. v. i.

Rozvojová 269  
16500 Praha 6  
Česká republika  
IČ : 67985831  
DIČ : CZ67985831

## Platební údaje

Způsob platby: Bankovním převodem  
Požadovaná záloha: 0,00  
Splatnosti dní: 30  
Měna: CZK

## Obchodní údaje

Doba dodání (týdny): 15  
Záruční lhůta (měsíce): 36

## M4 Tornado Plus 26S

Micro X-Ray Fluorescence Spectrometer M4 TORNADO PLUS

M4 TORNADO PLUS is a state-of-the-art energy dispersive micro X-ray fluorescence spectrometer capable of elemental distribution analysis for all elements above atomic number 6 (Carbon) with variable atmosphere pressure. The instrument is designed for analyzing a wide range of samples beginning with large inhomogeneous specimens down to the smallest particles.

The M4 TORNADO PLUS 26S comes standard with a special light element micro focus X-ray tube and a polycapillary optic with a <20 µm spot size for Mo K $\alpha$  (17.5 keV). Using the patented aperture management system (AMS), the depth of field and effective working distance range can be significantly increased and the energy dependence of spatial resolution of the polycapillary can be reduced. With the FlexiSpot feature, the polycapillary optic can be used for point and multi-point analysis providing a spot size of approximately 0.2 mm.

The M4 TORNADO PLUS 36S also includes a fine focus X-ray tube and a 4-position collimator changer with 0.5 mm, 1.0 mm, 2.0 mm and 4.5 mm collimator sizes.

On both instruments, the fluorescence spectrum is acquired using two large area Silicon Drift Detectors (SDD) with super light element windows. These detectors have excellent count rate capability even for the high excitation intensity of polycapillary optics combined with best possible energy resolution.

To improve sample handling, positioning, and repeatability, the M4 TORNADOPLUS is equipped with a quick-change stage. This dovetail-based system allows the standard plate to be easily removed without any tools, for easier sample positioning and securing.

The System is designed as a fully protected system according to German X-Ray safety regulations.

Important: This instrument produces X-Rays. The customer/user is responsible for obtaining approval from the local authorities and adherence to safety precautions in accordance with local regulations.

The M4 TORNADO software offers a flexible and easy-to-use software interface and a wide range of functions for instrument control, spectrum accumulation and evaluation. The small spot allows distribution analysis which is supported by the "TurboSpeed" stage and with measurement "on the fly". Data is saved in a "HyperMap" data cube, which saves the complete spectrum for every pixel and allows comprehensive data evaluation after the measurement. Other measurement modes are Point, MultiPoint and LineScan.

The special M-Quant quantification model offers accurate standardless analysis for bulk materials. An analysis report can be automatically generated using customizable report templates.

| Č. | Katalog | Popis | Počet MJ | Cena bez DPH |
|----|---------|-------|----------|--------------|
|----|---------|-------|----------|--------------|

Vystavil: [redacted]

Vytiskl(a): [redacted]



# NABÍDKA VYDANÁ NAB-20240510

| Č. | Katalog | Popis  | Počet MJ | Cena bez DPH |
|----|---------|--|----------|--------------|
| 1. |         | M4 Tornado Plus 26S - Super Light Element Micro-XRF<br>with 50 kV light element micro focus tube, polycapillary optic, AMS, 2 x 60 mm <sup>2</sup> super light element SDDs, quick change stage, high throughput electronics, variable vacuum pump | 1,0 ks   | 8 250 000,00 |

## Technical specification – M4 TORNADO<sup>PLUS</sup> 26S

- Radiation protected large evacuable sample chamber
- Motorized sample chamber door and EasyLoad function for quick sample handling
- Programmable high-speed motorized TurboSpeed X-Y-Z-stage for sample positioning, with mouse control (stage speed up to 100 mm/s)
- Quick change stage plate with dovetail mount for other stage types (second stage plate and geological specimen holders, available as options)
- Two video-microscopes for the display of approx. 1 cm<sup>2</sup> and 1 mm<sup>2</sup> sample area and the mosaic function allow sample viewing for both larger overview and final positioning, fisheye view into the sample chamber
- Excitation with high brilliance, air cooled X-ray tube, Be-side window, anode material Rh for light element micro focus tube (other anode materials on request)
- AMS for high depth of field and low energy dependent spot size variation with up to 6 primary filters
- Small spot size using polycapillary optics, spot size < 20 µm for Mo-Kα
- HV-generator with max. HV = 50 kV, max. power 30 W for micro focus tube
- Detection of fluorescence radiation by dual SDD
  - Energy resolution: >130 eV and <140 eV for Mn-Kα at 275 000 cps throughput
  - Sensitive detector area: 2 x 60 mm<sup>2</sup>
  - Maximum throughput up to 550,000 cps output
- Oil-free diaphragm vacuum pump for sample chamber evacuation, ready for measurement within ~200 s
- “On the fly” distribution analysis with continuous acquisition over each recorded line of an elemental map
- Instrument control unit connected via USB and Ethernet (high end workstation)
- dimensions:

| Parameter                       | M4 TORNADO <sup>PLUS</sup>                                  |
|---------------------------------|---|
| Instrument size (W x D x H)     | 815 x 680 x 620 mm <sup>3</sup>                             |
| Sample chamber size (W x D x H) | 600 x 350 x 260 mm <sup>3</sup>                             |
| Instrument Weight               | 125 kg  |
| Packing size (W x D x H)        | 1 crate 1040 x 940 x 940 mm<br>1 pallet 900 x 750 x 1150 mm |
| Total weight                    | 205 kg crate + 85 kg pallet                                 |

## Instrument control and spectra evaluation software – Software package M4 TORNADO

for instrument control and spectra evaluation. The intuitive and flexible GUI meets the needs of users at different levels. The functions available include:

- Control of the instrument: excitation conditions (tube parameters, filters), measurement time, instrument safety, stage, and camera control
- Spectrum acquisition, display and edit functions
- Peak area determination by peak fitting or deconvolution procedures
- Linear and area distribution analysis by LineScan and HyperMap functions
- Manual and automatic qualitative analysis
- Single-, multi-point and area-spectrum acquisition with qualitative and quantitative analysis
- Quantitative analysis by standardless methods for bulk material with the quantification package M-Quant
- Report generation and project management
- FlexiSpot feature for flexible spot sizes with polycapillary optic
- Two licenses for offline data evaluation on separate Windows-PCs included

## Online application training

Each M4 TORNADO comes with a comparative online training which consists of access to training material for self-learning as well as personal remote training sessions by a Bruker application

# NABÍDKA VYDANÁ NAB-20240510

| Č.   | Katalog   | Popis  | Počet MJ            | Cena bez DPH |
|--|-----------|--|---------------------|--------------|
|  |           | specialist. The online training can be upgraded to an on-site training with costs. When upgrading to on-site training, the access to the self-learning material is preserved.  |                     |              |
|  |           | <b>XMethod software package (subject to additional charge)</b><br>for special method and standard database creation and management <ul style="list-style-type: none"><li>• Standard samples manager</li><li>• Method manager<ul style="list-style-type: none"><li>○ Method creation of applications for standardless layer system analysis</li><li>○ Calibration of standardless methods for layer analysis</li><li>○ Method template library</li><li>○ Individual method optimization according to customer needs</li></ul></li></ul> |                     |              |
|  |           | <b>He-flush option (subject to additional charge)</b><br>To optimize light element performance at atmospheric pressure, an optional electronically controlled helium-purging system is available, allowing optimized strategies for short point measurements or for longer distribution analysis.  |                     |              |
| 2.   | SXRF-0014 | XMethod Bulk FP  | 1,0 ks              | 0,00         |
| 3.   | SXRF-0015 | XMethod Empirical (Lucas Tooth and Polynomial)   | 1,0 ks              | 0,00         |
| 4.   | I1000-21  | Installation & instruction M4 TORNADO PLUS 26S   | 1,0 ks              | 0,00         |
| 5.   | M-996     | Upgrade of included online training to 2 days on-site, incl. travel  | 1,0 ks              | 0,00         |
| 6.   | M-998     | Additional day of training on site for software modules or special applications (requires M-996)   | 2,0 ks              | 0,00         |
| 7.   | M4-020    | Additional software license for M4 TORNADO (dongle)  | 6,0 ks              | 0,00         |
| 8.   | EXW-M4    | Extended warranty per year per system  | 2,0 ks              | 0,00         |
| 9.   | UPGRADE   | Free upgrade of the controlling/evaluation software to the next major versions   | 3,0                 | 0,00         |
| 10.  | D1000     | Packing, freight & insurance   | 1,0 ks              | 0,00         |
| <b>Cena celkem bez DPH (bez volitelného příslušenství)</b> |           |  | <b>8 250 000,00</b> | <b>CZK</b>   |

|  |                     |            |
|--|---------------------|------------|
| <b>DPH</b>   | <b>1 732 500,00</b> | <b>CZK</b> |
| <b>Cena celkem s DPH (bez volitelného příslušenství)</b> | <b>9 982 500,00</b> | <b>CZK</b> |

## Annex 3

**Affidavit according to § 6 paragraph 4 of the Act No. 134/2016 Coll.**

|                       |   |
|-----------------------|---|
| Public Contract name: | <b>Benchtop energy-dispersive micro X-ray fluorescence spectrometer</b> |
|-----------------------|---|

**Bidder / Supplier**

|  |  |
|--|--|
| Registered company name / Trade name / Name: | Měřicí technika Morava s.r.o.                |
| Registered Office:                           | Babická 619, 664 84 Zastávka, Czech Republic |
| (Company) Identification No.:                | 29316715                                     |

The Supplier of the above-mentioned Public Contract undertakes to:

- a) ensure compliance with all labour law regulations (concerning remuneration, working hours, rest periods between shifts, paid overtime), as well as regulations concerning employment and safety and health protection for the entire duration of the contractual relationship established on the basis of this Public Contract, to all persons involved in the performance of the contract (regardless of whether the activities will be performed by the Supplier himself or his subcontractors) and
- b) ensure compliance with legal regulations in the field of environmental law, which meets the objectives of environmental policy related to climate change, use of resources and sustainable consumption and production. The Supplier must therefore take all measures that can reasonably be required of him to protect the environment and reduce the damage caused by pollution, noise and other activities, and must ensure that emissions, soil pollution and waste water from his activities do not exceed the values laid down in the relevant legislation.

At the same time, the Supplier acknowledges that a breach of the above obligations may be a reason for the Contracting Authority to withdraw from the contract in accordance with its relevant provisions.

|   |                                     |
|---|-------------------------------------|
| <b>Signature of the person authorized to represent the Bidder/Supplier:</b> |                                     |
| Place:  | Zastávka                            |
| First name, Surname, Position in the company:                               | Mgr. Felix Holáň, Managing Director |
| Signature:  |                                     |