



SPECIFICATION

Supply, delivery and installation of 1 automatic fusion system

1. Scope

- 1.1. This specification describes the requirements for an automatic fusion system ("the System") for the total digestion and dissolution of solid environmental samples in the NAEL-TEL radioanalytical laboratory. This system will be used to increase efficiency, safety and speed of the digestion process in solid materials which are being characterised for production of reference materials and in method development and validation.
- 1.2. The System shall be supplied, delivered and installed at the IAEA Terrestrial Environment Laboratory under the physical address of International Atomic Energy Agency, Seibersdorf, Friedensstrasse 1, 2444, Seibersdorf, Austria (the "Site").

2. Applicable Documents

The following documents shall be applicable for this Specification to the extent specified hereinafter:

IEC standard for Type C/F plugs, socket-outlets (International Electrotechnical Commission: <https://www.iec.ch/worldplugs/iecstandards.htm>)

In the event of conflict between the documents listed above and the content of this Specification, the content of this Specification shall take precedence to the extent of the conflict.

3. Definitions, Acronyms, and Abbreviations

The following definitions, acronyms, and abbreviations shall apply throughout this Specification unless defined otherwise hereinafter:

mL	Milliliter
Pt-Au	Platinum-Gold

4. Requirements

4.1. Functional and Performance Requirements

The System shall meet the following functional and performance requirements:

- 4.1.1. Controlled and programmable temperature, duration, heating rate, pouring modes and cooling;
- 4.1.2. Shall be lightweight and compact in volume/size for installation in a fume cupboard;
- 4.1.3. Shall be able to perform borate, peroxide fusions, then automatic flux pouring to acid dissolution vessel equipped with magnetic stirring function;



- 4.1.4. Electrical heating (no gases or flames required);
- 4.1.5. Automatic air-cooling;
- 4.1.6. Types of samples for fusion: mining and geological samples, silica, silicates, clay, ores, refractories, lime, carbonates, minerals;
- 4.1.7. High corrosion resistant materials, with replaceable holders and parts which are exposed to heat;
- 4.1.8. Shall allow fast processing time – sample digestion and cooling completed in less than 4 hours (during laboratory daily operation);
- 4.1.9. Shall have capacity to expand number of vessel positions;
- 4.1.10. The system shall be compatible with existing 30 mL Pt-Au (5% Au) reinforced crucibles (H: 32 mm, outer diameter: 40.5 mm); and
- 4.1.11. The System shall contain all vessel parts which are high quality, reusable and easy to clean.

4.2. Technical Requirements

The System shall meet the following technical requirements:

- 4.2.1. Shall have power supply compatible with Austrian standards – either type C or F and USB port;
- 4.2.2. Shall be able to heat up to 1200°C;
- 4.2.3. Shall have predefined and customized fusion methods;
- 4.2.4. Shall have safety shield or separate closed heating chamber;
- 4.2.5. Shall have cold to cold operation;
- 4.2.6. Shall have automated solution agitation unit for dissolving the sample after fusion;
- 4.2.7. Shall be supplied with all necessary cables and accessories to allow for immediate operation of the System;
- 4.2.8. Shall have active and passive safety features in place, to be able to run unattended;
- 4.2.9. The System shall be supplied with two (2) 30 mL Pt95%-Au5% reinforced crucibles (H: 32 mm, outer diameter: 40.5 mm, straight-walled).

5. Marking

The System shall have all safety markings in English language.

6. Packing

The System, for the shipment to the IAEA, shall be packed in accordance with international standards that are applicable for the shipment of this kind of equipment.

7. Quality Requirements

- 7.1. The System shall be manufactured, shipped and installed in accordance with the Contractor's ISO quality assurance system or an equivalent quality assurance system.



7.2. The Contractor shall document the compliance with this quality assurance system.

7.3. The Contractor shall guarantee the availability of spare parts for 15 years after the product is supplied.

8. Testing and Acceptance

8.1. The System, prior to shipment, shall be tested for conformance of the System with manufacturer's performance specifications and the minimum requirements specified herein.

The System, after installation, shall be tested by the Contractor together with the IAEA to demonstrate that the performance meets the manufacturer's performance specifications and the minimum requirements specified herein as determined by the IAEA.

8.2. The results of the testing of the System shall be documented by the Contractor in an acceptance protocol that shall be signed by the IAEA.

9. Installation and Training

9.1. The Contractor shall install the system in the designated laboratory at the Terrestrial Environment Laboratory located at the IAEA's facility in Seibersdorf and shall provide initial demonstration for up to four (4) staff of the End-User in the operation and maintenance of the System at the Site location immediately after the installation of the System.

9.2. The Contractor shall provide all necessary technical instructions for installation and operation of the System in written form in the English language.

10. Deliverable Data Items

The Contractor shall provide a complete set of operation and servicing manuals and technical drawings in the English language.
