外部委託業者の募集

References: IO/25/OT/10033932/AJI

"Contract for construction, installation, and commissioning of this centralized thermal cycling and baking system at ITER site"

（ITER サイトにおける、集中型熱サイクルおよびベーキングシステムの建設、据付、試運転に関する契約）

IO 締め切り 2025 年 12 月 19(金)

〇はじめに

本事前情報通知（PIN）は、作業契約の入札授与および実行につながる公開入札調達プロセスの最初のステップです。

本文書の目的は作業範囲と入札プロセスに関する技術的な内容の基本的な要約を提供することです。

〇背景

ITER は平和利用の核融合発電の科学的および技術的な実現可能性の実証を目的とした、国際共同研究開発プロジェクトです。ITER 機構の 7 つのメンバーは、;欧州連合（EURATOM が代表）、日本、中華人民共和国、インド、大韓民国、ロシア連邦、および米国です。

ITER の敷地はフランス南東部のブーシュデュローヌ地区にあり、ITER 本社（HQ）もあるフランス CEA サン・ポール・レ・デュランス に近いところに位置しています。詳細については、ITER のウェブサイト http://www.iter.org を参照して下さい。

〇作業範囲

現在の入札プロセスは、ITERサイトにおける集中型熱サイクルおよびベーキングシステムの建設、据付、試運転に関する契約を締結することを目的としています。ITER機構内では、計測プログラムが本契約の実施を担当します。

本契約に選定される契約者は、顧客のサイト（ITER機構敷地内の建物55にあるポート統合施設）において、炉の納入、据付、位置合わせ、試運転を行う責任を負います。最終設計、製造、試験および据付の各作業が、期限内に高い品質水準で完了することを確保しなければなりません。

〇調達プロセスと目的

目的は、競争入札プロセスを通じて供給契約を落札することです。

この入札のために選択された調達手続きは公開入札手続きと呼ばれます。

オープン入札手順は、次の 4 つの主要なステップで構成されています。

- ステップ 1-事前情報通知（PIN）

  事前通知（Prior Indicative Notice）は、公開入札プロセスの最初の段階です。IO は、国内機関に対して、今後の入札に関する情報を公開するよう正式に招待し、企業、機関、またはその他の団体に入札の機会を事前に知らせます。入札に興味のある企業は、下記の調達スケ

ジュールに示された期限までに、表明書（付属書Ⅱ）を E メールでご提出くださいますようお願いいたします。

- ステップ 2-入札への招待（IIT）
  PIN の発行から 14 作業日以内に、関心を示した入札者に対して入札への招待（IIT）が送付されます。この段階では、PIN を確認した関心のある入札者が入札書類を入手し、入札指示に従って提案書を準備・提出することができます。

- ステップ 3-入札評価プロセス
  入札者の提案は、ITER 機構の公正で専門的な技術評価委員会によって評価されます。入札者は、技術範囲に従い、入札への招待（IIT）に記載された特定の評価基準に基づいて作業を実施できることを示す技術的な適合性の詳細を提供する必要があります。

- ステップ 4-落札
  認定は、入札への招待（IIT）に記載されている、コストに見合った最適な価格または技術的に準拠した最低価格に基づいて行われます。

〇概略日程

概略日程は以下の通りです：

マイルストーン	暫定日程
事前指示書（PIN）の発行	2025 年 12 月 5 日
関心表明フォームの提出	2025 年 12 月 19 日
iProc での提案依頼書 (RFP)と入札への招待（ITT）の発行	2026 年 1 月 7 日
明確化のための質問（もしあれば）	2026 年 2 月 3 日
明確化のための質問への回答	2026 年 2 月 9 日
iPROC での入札提出	2026 年 2 月 18 日
入札評価と契約授与	2026 年 3 月
枠組み契約調印	2026 年 3 月

〇契約期間と実行

予想される契約期間は8か月です。契約の最終調印日前の作業はありません。

〇経験

望ましくは、契約者には以下の経験・専門知識・知識が求められます：

- 熱サイクル用の大規模産業炉の設計およびエンジニアリングに関する経験
- 熱プロセス制御、熱伝達解析、および±5℃の温度均一性を達成する能力の実証
- EU 安全規制、CE マーキング、EN ISO 23693、AMS 2750 クラス 2、ならびにエネルギー効

率基準に準拠した機器の供給経験
- ガス密閉チャンバーおよび最大 50 トン荷重に対応する重耐久スライディングプラットフォームの製造能力
- 高温断熱材、シーリングシステム、耐食性材料に関する知識
- 低温運転（最大 250℃）用の電気加熱システムに関する経験
- 高精度な加熱・冷却速度（5℃/時間）を実現する高度な制御システムの統合経験
- 空気および不活性ガス（アルゴン）環境における制御された雰囲気管理の設計経験
- 大型産業炉の据付、試運転、および性能検証に関する実績
- 強力なプロジェクト管理、品質保証（ISO 9001）、およびアフターサービス能力

〇候補

参加は、個人またはグループ/コンソーシアムに参加するすべての法人に開放されます。法人とは、法的権利及び義務を有し、ITER 加盟国内に設立された個人、企業又は機構をいいます。ITER 加盟国は欧州連合(EURATOM メンバー)、日本、中華人民共和国、インド共和国、大韓民国、ロシア連邦、アメリカ合衆国です。

法人は、単独で、またはコンソーシアムパートナーとして、同じ契約の複数の申請または入札に参加することはできません。共同事業体は、恒久的な、法的に確立されたグループ又は特定の入札手続のために非公式に構成されたグループとすることができます。

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どのコンソーシアムメンバーも IPROC に登録する必要があります。

【※ 詳しくは添付の英語版技術仕様書「**Contract for construction, installation, and commissioning of this centralized thermal cycling and baking system at ITER site**」をご参照ください。**】**
ITER 公式ウェブ http://www.iter.org/org/team/adm/proc/overview からもアクセスが可能です。

「核融合エネルギー研究開発部門」の HP： http://www.fusion.qst.go.jp/ITER/index.html
では ITER 機構からの各募集（IO 職員募集、IO 外部委託、IO エキスパート募集）を逐次更新しています。ぜひご確認ください。

イーター国際核融合エネルギー機構からの外部委託
に関心ある企業及び研究機関の募集について

＜ITER 機構から参加極へのレター＞

以下に、外部委託の概要と要求事項が示されています。参加極には、提案された業務に要求される能力を有し、入札すべきと考える企業及び研究機関の連絡先の情報を ITER 機構へ伝えることが求められています。このため、本研究・業務に関心を持たれる企業及び研究機関におかれましては、応募書類の提出要領にしたがって連絡先情報をご提出下さい。

china eu india japan korea russia usa
Route de Vinon-sur-Verdon - CS 90 046 - 13067 St Paul Lez Durance Cedex - France

PRIOR INDICATIVE NOTICE (PIN)

OPEN TENDER SUMMARY

IO/25/OT/10033932/AJI

for

Contract for construction, installation, and commissioning of this centralized thermal cycling and baking system at ITER site.

Abstract

The purpose of this summary is to provide prior notification of the IO intention to launch a competitive Open Tender process in the coming weeks. This summary provides some basic information about the ITER Organisation, the technical scope for this tender, and details of the tender process for the award of a Contract for construction, installation, and commissioning of this centralized thermal cycling and baking system at ITER site for Diagnostic Program.

1 Introduction

This Prior Indicative Notice (PIN) is the first step of an Open Tender Procurement Process leading to the award and execution of a Supply Contract.
The purpose of this document is to provide a basic summary of the technical content in terms of the scope of work, and the tendering process.
The Domestic Agencies are invited to publish this information in advance of the forth-coming tender giving companies, institutions or other entities that are capable of providing these supplies prior notice of the tender details.

2 Background

The ITER project is an international research and development project jointly funded by its seven Members being, the European Union (represented by EURATOM), Japan, the People's Republic of China, India, the Republic of Korea, the Russian Federation and the USA. ITER is being constructed in Europe at St. Paul–Lez-Durance in southern France, which is also the location of the headquarters (HQ) of the ITER Organization (IO).

For a complete description of the ITER Project, covering both organizational and technical aspects of the Project, visit www.iter.org.

3 Scope of Work

The present tender process aims to set up a Contract for construction, installation, and commissioning of this centralized thermal cycling and baking system at ITER site. Within the ITER Organization, the Diagnostic program will be in charge of implementing this Contract.
The Contractor, who will be selected for this Contract shall shall be responsible for delivery, installation, alignment, and commissioning of the furnace at the customer's site: Port Integration Facility in the Building 55 of the ITER Organization premises, ensuring that the final design, manufacturing, testing and installation activities are completed on time and to high levels of quality.

4 Procurement Process & Objective

The objective is to award a Supply Contract through a competitive bidding process.

The Procurement Procedure selected for this tender is called the Open Tender procedure.

The Open Tender procedure is comprised of the following four main steps:

- Step 1- Prior Indicative Notice (PIN) :
  The Prior Indicative Notice is the first stage of the Open Tender process. The IO formally invites the Domestic Agencies to publish information about the forth-coming tender in order to alert companies, institutions or other entities about the tender opportunity in advance. **Interested tenderers are kindly requested to return the expression of interest form (Annex I) by e-mail by the date indicated in the procurement timetable below.**

- Step 2 - Invitation to Tender (ITT) :
  Within 14 days of publishing the Prior Indicative Notice (PIN), the Invitation to Tender (ITT) will be advertised. This stage allows interested bidders who have seen the PIN to obtain the tender documents and prepare and submit their proposals per the tender instructions.

- Step 3 – Tender Evaluation Process :
  Tenderers' proposals will be evaluated by an impartial, professionally competent technical evaluation committee of the ITER Organization. Tenderers must provide details demonstrating their technical compliance to perform the work in line with the technical scope and per the criteria listed in the invitation to tender (ITT).

- Step 4 – Contract award :
  A Supply contract will be awarded based on best value for money according to the evaluation criteria and methodology described in the Invitation to tender (ITT).

5 Procurement Timetable

The tentative timetable is as follows:

Milestone	Date
Publication of the Prior Indicative Notice (PIN)	05 December 2025
Deadline for Submission of Expression of interest form	19 December 2025
Request for Proposals (RFP)- Invitation to Tender (ITT) advertisement	07 January 2026
Clarification Questions (if any) and Answers deadline	03 Febuary 2026
Answers to Clarifications	09 Feburary 2026
Tender Submission in IPROC	18 Feburary 2026
Tender Evaluation & Contract Award	March 2026
Contract Signature	March 2026

6 Quality Assurance Requirements

Prior to the commencement of any work under this Contract, the selected Contractor shall produce a "Quality Plan" and submit it to the IO for approval, describing how they will implement the ITER Procurement Quality Requirements.

7 Contract Duration and Execution

The duration shall be for 8 months. No work shall commence before the date of final signature of the Contract.

8 Experience/Expertise/Knowledge

Preferably, the Contractor is expected to own the following experience/expertise/knowledge:

- Experience in design and engineering of large-scale industrial furnaces for thermal cycling
- Proven capacity in thermal process control, heat transfer analysis, and achieving ±5 °C temperature uniformity
- Experience in supplying equipment compliant with EU safety regulations, CE marking, EN ISO 23693, AMS 2750 Class 2, and energy efficiency standards
- Manufacturing capability for gas-tight chambers and heavy-duty sliding platforms (up to 50 t load)
- Knowledge of high-temperature insulation, sealing systems, and corrosion-resistant materials
- Experience with electrically heated systems for low-temperature operation (up to 250 °C)
- Experience in integration of advanced control systems for precise heating and cooling rates (5 °C/hour)

- Experience in design of controlled atmosphere management for air and inert gas (argon) environments
- Proven track record in installation, commissioning, and performance validation of large industrial furnaces
- Strong project management, quality assurance (ISO 9001), and after-sales service capabilities

9 Candidature

Participation is open to all legal entities participating either individually or in a grouping/consortium. A legal entity is an individual, company, or organization with legal rights and obligations established within an ITER Member State.

Legal entities cannot participate individually or as a consortium partner in more than one application or tender of the same contract. A consortium may be a permanent, legally-established grouping, or a grouping constituted informally for a specific tender procedure. All consortium members (i.e. the leader and all other members) are jointly and severally liable to the ITER Organization.

In order for a consortium to be acceptable, the individual legal entities included therein shall have nominated a leader with authority to bind each member of the consortium, and this leader shall be authorised to incur liabilities and receive instructions for and on behalf of each member of the consortium.

It is expected that the designated consortium lead will explain the composition of the consortium members in a covering letter at the tendering stage. Following this, the Candidate’s composition must not be modified without notifying the ITER Organization of any changes. Evidence of any such authorisation shall be submitted to the IO in due course in the form of a power of attorney signed by legally authorised signatories of all the consortium members.

10 Sub-contracting Rules

All sub-contractors who will be taken on by the Contractor shall be declared with the tender submission in IPROC. Each sub-contractor will be required to complete and sign forms including technical and administrative information, which shall be submitted to the IO by the tenderer as part of its tender.
The IO reserves the right to approve (or disapprove) any sub-contractor which was not notified in the tender and request a copy of the sub-contracting agreement between the tenderer and its subcontractor(s). Rules on sub-contracting are indicated in the RFP itself.

ANNEX I

EXPRESSION OF INTEREST & PIN ACKNOWLEDGEMENT

To be returned by e-mail to: amankumar.joshi@iter.org copy Chloe.Perret@iter.org

TENDER No.	**IO/25/OT/10033932/AJI**
DESIGNATION of SERVICES:	**Contract for construction, installation, and commissioning of this centralized thermal cycling and baking system at ITER site.**
OFFICER IN CHARGE:	**Aman Kumar Joshi – Procurement Division ITER Organization**

☐ WE ACKNOWLEDGE HAVING READ THE PIN NOTICE FOR THE ABOVE-MENTIONED TENDER

☐ WE INTEND TO SUBMIT A TENDERs

☐ WE WILL NOT TENDER FOR THE FOLLOWING REASONS:

……

Company name:.....

COMPANY STAMP

Signature:

Name: .....

Position: .....

Tel: .....

E-mail.....

Date: .....

IDM UID
F6TCBB

VERSION CREATED ON / VERSION / STATUS
22 Oct 2025 / 1.1 / Approved

EXTERNAL REFERENCE / VERSION

Technical Specifications (In-Cash Procurement)

Technical Specification of Furnace for Thermal Cycling and Atmospheric Baking of Big Diagnostic Port Plug Components in the ITER Port Integration Facility

Technical Specification of Furnace for Thermal Cycling and Atmospheric Baking of Big Diagnostic Port Plug Components in the ITER Port Integration Facility

Technical Specification of Furnace for Thermal Cycling and Atmospheric Baking of Big Diagnostic Port Plug Components in the ITER Port Integration Facility

Table of Contents

1 Preamble

This Technical Specification must be read in conjunction with the General Management Specification for Service and Supply (GM3S) – [Ref 1], which forms an integral part of the technical requirements.

2 Introduction

This technical specification defines the design, operational, and performance requirements for a large-scale thermal cycling and baking furnace intended for big metallic components and structures of the Diagnostic Port Plugs (Diagnostic Shielding Modules, Port Plug Structures, etc…). These components are critical for the integration of diagnostic systems and must comply with ultra-high vacuum (UHV) conditions during operation. To achieve this, thermal cycling and baking are implemented as part of the cleaning process, serving as a compensatory measure for the removal of hot helium leak testing.

The manufacturing of these components is distributed across multiple suppliers and domestic agencies worldwide. Current fabrication specifications include the requirement for thermal baking cycles; however, manufacturers consistently report significant challenges in accessing facilities with the necessary size and technical capabilities to perform these processes. Establishing similar large-scale installations at each supplier site would be inefficient, costly, and logistically complex.

To address these constraints, an alternative approach is proposed. Instead of requiring thermal cycling at the point of manufacture, stricter standards for cleaning and surface finishing will be enforced upon delivery. Furthermore, a centralized facility will be provided to perform thermal cycling and baking for all components during their assembly at the Port Integration Facility. This solution ensures uniformity in processing, reduces multiplication of resources, and guarantees compliance with UHV requirements.

This document specifies the technical, functional, and design requirements for the construction, installation, and commissioning of this centralized thermal cycling and baking system. It includes details on capacity, temperature control, safety measures, operational procedures, and integration with existing assembly workflows.

3 Acronyms & Definitions

3.1 Acronyms

The following acronyms are the main one relevant to this document.

Abbreviation	Description
CAD	Computer Assisted Design
CRO	Contract Responsible Officer
DA	Domestic Agency
FAT	Factory Acceptance Tests
GM3S	General Management Specification for Service and Supply
HMI	Human-Machine Interface
IO	ITER Organization
PIA	Protection Important Activity

PIC	Protection Important Component
PID	Proportional-Integral-Derivative
PLC	Programmable Logic Control
QA	Quality Assurance
QC	Quality Control
SAT	Site Acceptance Tests
UHV	Ultra-High Vacuum

3.2 Definitions

Contractor: shall mean an economic operator who have signed the Contract in which this document is referenced.

Other definitions can be examined in the section 2.1 of the GM3S Ref [1] and may be required to ensure proper understanding of the document.

4 Applicable Documents & Codes and standards

4.1 Applicable Documents

It is the responsibility of the Contractor to identify and request for any documents that would not have been transmitted by IO, including the below list of reference documents.

This Technical Specification takes precedence over the referenced documents. In case of conflicting information, this is the responsibility of the contractor to seek clarification from IO.

Upon notification of any revision of the applicable document transmitted officially to the contractor, the contractor shall advise within 4 weeks of any impact on the execution of the contract. Without any response after this period, no impact will be considered.

Ref	Title	IDM Doc ID	Version
1	General Management Specification for Service and Supply (GM3S)	82MXQK	1.4
2	ITER Procurement Quality Requirements	22MFG4	5.1
3	Procurement Requirements for Producing a Quality Plan	22MFMW	4.0
4	Software qualification policy	KTU8HH	2.0
5	Procedure for ITER CAD Data Exchanges	2NCULZ	4.2
6	ITER Vacuum Handbook	2EZ9UM	2.5

4.2 Applicable Codes and Standards

The thermal cycling and baking cycle parameters shall be fully aligned with the requirements specified in the ITER Vacuum Handbook and its appendices and attachments - Ref [6]. All operational settings, including temperature ranges, ramp rates, and hold times (described in this Technical Specification), must comply with the standards outlined in the handbook to ensure consistency, safety, and compatibility with ITER vacuum system specifications.

In addition, the furnace shall conform to the following European Directives and Standards:

- 2006/42/EC – Machinery Directive
- 2014/35/EU – Low Voltage Directive
- 2014/30/EU – Electromagnetic Compatibility Directive
- 2014/68/EU – Pressure Equipment Directive (for gas circuits)
- EN 746-1, EN 746-2, and EN 746-3 – Industrial Thermoprocessing Equipment Safety Standards
- EN 60204-1 – Safety of Electrical Equipment of Machines
- EN ISO 12100 – Machinery Safety – Risk Assessment
- Ecodesign Directive (2009/125/EC)
- Other specific European and ISO Standards pointing to the different technical aspects of the equipment and mentioned in the sections hereafter.

5 Scope of Work

This section defines the specific scope of work for the service, in addition to the contract execution requirement as defined in Ref [1].

The scope includes the design, manufacture, supply, installation, and commissioning of an industrial thermal cycling furnace intended for the treatment of large metallic components made of stainless steel.

The furnace shall be capable of performing low-temperature thermal cycling operations under controlled atmosphere conditions, providing precise and uniform temperature distribution across the entire working volume. The system shall comply with all applicable European Union regulations and standards concerning safety, performance, and energy efficiency.

5.1 Equipment to be Supplied

The furnace shall be a horizontal, electrically heated, atmosphere-controlled chamber furnace suitable for the thermal cycling of large metallic parts.

It shall include a movable floor-mounted loading platform, designed to slide longitudinally for convenient loading and unloading by overhead crane. The platform shall be designed to accommodate heavy loads and ensure stable, repeatable positioning during operation.

The furnace chamber shall be gas-tight and constructed to allow operation both in air and under an inert argon atmosphere. The design shall ensure optimal temperature uniformity, reliable control, and safe handling of large metallic parts weighing up to fifty tonnes.

The equipment shall be of modular design, easily maintainable, and prepared for continuous industrial operation.

Main dimensional and functional parameters:

- Useful internal dimensions: 6.0 m (L) × 3.0 m (W) × 3.5 m (H)
- Maximum load capacity (on sliding platform): 50 metric tons
- Maximum operating temperature: 250 °C
- Maximum heating rate: 5 °C/hour
- Maximum controlled cooling rate: 5 °C/hour

- Temperature uniformity: ±2 °C (verified according to EN ISO 23693 or AMS 2750 Class 2 equivalent)
- Atmosphere: Air or inert argon
- Location of operation: European Union territory

5.2 Furnace Construction

The furnace structure shall be fabricated from high-quality materials suitable for repeated thermal cycling. The internal chamber shall be constructed from stainless steel grade 304 or 316, ensuring resistance to oxidation and corrosion under process conditions.

Thermal insulation shall be composed of multi-layer, high-performance ceramic fiber and microporous insulation materials compliant with EN 14303, designed to minimize heat loss and maintain stable thermal conditions. The outer casing shall be made of painted carbon steel or stainless-steel panels, adequately ventilated to limit external surface temperatures in accordance with EN ISO 13732-1.

The furnace shall include a hermetically sealed door, operated vertically, with heat-resistant seals and mechanical locking mechanisms. The door system shall include interlocks preventing it from being opened during operation or when the furnace is under argon atmosphere.

The sliding loading platform shall move along precision-ground rails or rollers and shall be capable of supporting the full rated load with appropriate structural reinforcement. The platform movement shall be smooth and controlled, either manually assisted or motor-driven, and provided with mechanical stops, safety locks, and position indicators. The design shall ensure gas-tight sealing between the platform and the furnace body during operation.

5.2.1 Heating and Temperature Control

The furnace shall be heated by electrical resistance elements made of nickel-chromium (NiCr) or equivalent high-temperature alloys conforming to EN 60115-1. Heating elements shall be distributed symmetrically within the furnace walls and ceiling to provide homogeneous temperature distribution throughout the working chamber.

The heating system shall be divided into independently controlled zones to achieve the required temperature uniformity. Each zone shall be equipped with a separate thermocouple and power regulation circuit.

Temperature control shall be achieved using Proportional-Integral-Derivative (PID) controllers integrated in a programmable logic control (PLC) system.

The furnace shall maintain a maximum temperature deviation of ±5 °C from the setpoint across the usable volume. Control accuracy shall be demonstrated by means of a uniformity test in accordance with EN 60584-1 (thermocouples) and EN ISO 23693 (temperature uniformity survey).

The furnace shall operate safely and reproducibly within the following limits:

- Maximum working temperature: 250 °C
- Maximum heating rate: 5 °C/hour

- Maximum controlled cooling rate: 5 °C/hour
- Temperature uniformity: ±2 °C across entire load volume

5.2.2 Cooling System

Controlled cooling shall be achieved by natural or forced convection, depending on the selected configuration. For forced convection, the furnace shall incorporate circulation fans constructed from high-temperature-resistant alloys and designed to operate under both air and argon atmospheres.

The control system shall regulate fan speed and airflow direction to ensure homogenous cooling and compliance with the specified cooling rate of up to 5 °C/hour. Cooling sequences shall be programmable and automatically managed through the main control system.

5.2.3 Atmosphere Control System

The furnace shall be designed to operate under a controlled atmosphere, allowing complete purging of air and replacement with argon gas to reduce oxygen content inside the chamber.

The system shall include gas inlet and exhaust manifolds, valves, pressure regulators, and safety devices designed in accordance with EN ISO 14113 (industrial gas systems) and EN 746-3 (industrial thermoprocessing equipment safety).

The purge process shall be automated, with adjustable flow and pressure parameters. Continuous monitoring of oxygen concentration shall be provided by an oxygen sensor complying with EN 50104, ensuring safe operation. Automatic interlocks shall halt heating if the oxygen concentration exceeds allowable limits.

All piping, valves, and fittings shall be of stainless-steel construction suitable for argon service, with connections designed to minimize leakage and ensure long-term reliability.

5.2.4 Control and Automation

The furnace shall be equipped with a PLC-based control system integrated with a touchscreen human–machine interface (HMI). The control system shall allow programming, execution, and monitoring of complex thermal cycles consisting of multiple heating, holding, and cooling stages.

The system shall provide real-time monitoring and recording of all critical process parameters including temperature, atmosphere composition, gas flow rates, and safety alarms. Data logging shall be continuous, with automatic storage in electronic format for traceability, in compliance with EN ISO 9001:2015 quality management requirements.

The HMI shall permit:

- Creation and storage of user-defined thermal cycle recipes
- Real-time graphical visualization of temperature curves and system status
- Alarm display and acknowledgment
- Password-protected access levels for operator, supervisor, and maintenance personnel

Data shall be exportable in CSV or PDF format and accessible via Ethernet or OPC-UA for integration with the plant’s supervisory control system.

5.2.5 Safety, Certification and Compliance

The furnace shall conform to the following European Directives and Standards:

- 2006/42/EC – Machinery Directive
- 2014/35/EU – Low Voltage Directive
- 2014/30/EU – Electromagnetic Compatibility Directive
- 2014/68/EU – Pressure Equipment Directive (for gas circuits)
- EN 746-1, EN 746-2, and EN 746-3 – Industrial Thermoprocessing Equipment Safety Standards
- EN 60204-1 – Safety of Electrical Equipment of Machines
- EN ISO 12100 – Machinery Safety – Risk Assessment

The equipment shall be CE marked and supplied with a Declaration of Conformity.

Safety features shall include overtemperature protection, emergency stop buttons, door interlocks, gas safety valves, and audible and visual alarms. An oxygen monitoring and alarm system shall ensure safe argon operation. The system shall include emergency venting to prevent overpressure in the chamber.

5.2.6 Energy Efficiency

The furnace design shall prioritize energy efficiency in accordance with the Ecodesign Directive (2009/125/EC). Insulation materials and heating control systems shall minimize energy losses and optimize heat recovery.

The supplier shall provide evidence of energy performance, including thermal losses and power consumption data under typical operating conditions, verified according to EN 746-2.

5.3 Installation, Commissioning, and Training

The supplier shall be responsible for delivery, installation, alignment, and commissioning of the furnace at the customer’s site: Port Integration Facility in the Building 55 of the ITER Organization premises.

Site acceptance testing (SAT) shall include verification of temperature uniformity, functional testing of the atmosphere system, and full safety system validation in accordance with EN 746-1.

Operator and maintenance training shall be conducted in English and include both theoretical and practical instruction on operation, safety, and troubleshooting. Training materials shall be provided in printed and electronic formats.

6 Documentation, Deliverables and Payments Schedule

The supplier shall provide a complete set of documentation in English, including:

- General arrangement and assembly drawings
- Electrical, pneumatic, and gas schematics

- Operation and maintenance manuals
- Calibration certificates for thermocouples and controllers
- Temperature uniformity and gas tightness test reports
- CE Declaration of Conformity and compliance certificates
- Recommended spare parts list and preventive maintenance plan

All documentation shall conform to **EN ISO 82079-1** (Preparation of Instructions for Use).

The supplier shall adhere to the following project schedule, including associated payment milestones. All payments shall be made upon completion of the corresponding deliverable and formal acceptance by the IO.

Phase	Description of the Deliverable	Target Completion	Payment (% Contract Value)	Acceptance Criteria
1	Detailed engineering design, general arrangement drawings, control architecture, and documentation for purchaser approval	T0 + 2 months	10%	Approval of design documents
2	Procurement of main components (heating elements, insulation materials, control system, gas systems) and start of manufacturing	T0 + 4 months	20%	Inspection report confirming materials compliance
3	Completion of furnace fabrication and internal Factory Acceptance Test (FAT)	T0 + 6 months	35%	FAT report approved
4	Delivery to site and completion of installation (mechanical, electrical, and control systems)	T0 + 7 months	15%	Visual inspection and installation checklist approved
5	Site Acceptance Test (SAT), calibration, and demonstration of full operation including uniformity and atmosphere tests	T0 + 7 months	15%	SAT report signed and approved
6	Final documentation, training completion, and warranty activation	T0 + 8 months	5%	Delivery of all documents and training certificate

(*) T0 = Commencement Date of the contract; X in months.

Supplier is requested to prepare their document schedule based on the above and using the template available in the GM3S Ref [1] appendix II.

7 Quality Assurance requirements

The Quality class under this contract is 2, Ref [1] GM3S section 7 applies in line with the defined Quality Class. The organisation conducting these activities should have an ITER approved QA Program or an ISO 9001 accredited quality system.

The general requirements are detailed in ITER Procurement Quality Requirements Ref [2].

Prior to commencement of the task, a Quality Plan must be submitted for IO approval giving evidence of the above and describing the organisation for this task; the skill of workers involved

in the study; any anticipated sub-contractors; and giving details of who will be the independent checker of the activities Ref [3].

Documentation developed as the result of this task shall be retained by the performer of the task or the DA organization for a minimum of 5 years and then may be discarded at the direction of the IO. The use of computer software to perform a safety basis task activity such as analysis and/or modelling, etc. shall be reviewed and approved by the IO prior to its use, in accordance with Software qualification policy Ref [4].

8 Safety requirements

The scope under this contract does not cover for PIC and/or PIA.

9 Specific General Management requirements

Requirement for Ref [1] GM3S section 6 applies completed/amended with the below specific requirements.

9.1 CAD design requirements

This contract does not imply CAD activities. Contractor may receive CAD data for information purpose only from IO-TRO following rules and guidelines given in Ref [5].