IDM UID
GXYWUB

VERSION CREATED ON / VERSION / STATUS
21 Oct 2026 / 1.1 / Approved

EXTERNAL REFERENCE / VERSION

Specifications (In-Cash Procurement)

Technical Specification for the FWC on Diagnostic Opto-Mechanical Component Manufacturing

Technical specification document for the framework contract on diagnostic opto-mechanical component manufacturing

PDF generated on 26 Oct 2026
DISCLAIMER : UNCONTROLLED WHEN PRINTED – PLEASE CHECK THE STATUS OF THE DOCUMENT IN IDM

SUPPLY

Table of Contents

1 PREAMBLE 3
2 PURPOSE 3
3 ACRONYMS & DEFINITIONS 3
3.1 Acronyms 3
3.2 Definitions 4
4 APPLICABLE DOCUMENTS & CODES AND STANDARDS 4
4.1 Applicable Documents 4
4.2 Applicable Codes and Standards 5
5 SCOPE OF WORK 5
5.1 IO's Scope of Work 5
5.2 Supplier's Scope of Work 6
6 IMPORTANT STAGES OF MANUFACTURE & SUPPLY OF COMPONENTS & ASSEMBLIES 6
6.1 Manufacturing design & design analysis 6
6.2 Optical Surface Requirements 7
6.3 Coating Requirements 7
6.4 Optical assembly and alignment requirements 8
6.5 Material procurement 8
6.6 Manufacturing & assembly 9
6.7 Optical Component Manufacturing and Qualification 10
6.8 NDE, Testing, Inspection & FAT 11
6.9 Cleanliness, Cleaning, Packing & Delivery 11
6.10 Documentation & data management 12
6.11 Interface requirements 13
6.12 Performance requirements & guarantees 13
6.13 Classifications 14
6.14 Spare Parts 14
7 DURATION 14
8 LOCATION FOR SCOPE OF WORK EXECUTION 15
9 IO DOCUMENTS & IO FREE ISSUE ITEMS 15
9.1 IO Documents: 15
9.2 Free issue items: 15
10 DELIVERABLES AND SCHEDULE MILESTONES 15

SUPPLY

10.1 Schedule for delivery 15
10.2 List of deliverable documentation....15
11 QUALITY ASSURANCE REQUIREMENTS....17
12 NUCLEAR SAFETY & REGULATORY REQUIREMENTS 17
13 SPECIAL MANAGEMENT REQUIREMENTS 17
13.1 Contract Gates....17
13.2 Work Monitoring 18
13.3 Meeting Schedule....18

SUPPLY

1 Preamble

ITER Tokamak machine requires many diagnostics systems for machine protection, plasma control and physics exploitation. Some of these diagnostics systems are under responsibility of ITER Diagnostics Program. Each system consists of many mechanical, optical & electrical components installed inside and/or outside the vacuum vessel. These systems are at various level of maturity & will be released for manufacturing in phased manner. To align with release of manufacturing in phased manner, framework contract will be signed which will cover generic & common requirements. Task orders will be signed for each system / component as soon as reaches maturity for manufacturing with specific & applicable requirements applicable to relevant system / component. This framework contract is for manufacturing and integration of opto-mechanical components. This Technical Specification is to be read in combination with the General Management Specification for Service and Supply (GM3S) – Ref [1] that constitutes a full part of the technical requirements.

In case of conflict, the content of the Technical Specification supersedes the content of Ref [1].

2 Purpose

The main purpose of this framework contract is to define scope & requirements for supply of opto-mechanical components & assemblies for the ITER Diagnostics Program. A non-exhaustive description of typical components is given in Ref [7]. This document outlines generic & common requirements for supply of opto-mechanical components & sub-assemblies.

Under the umbrella of this framework contract, task orders will be issued for supply of specific components & assemblies to complement this document. Each task order will have specific task order specification.

This document will have common requirement applicable to all task orders & generic requirements are optional. Task order specification will specify applicable generic requirement to specific component / subassembly and will have additional or detailed requirements.

The scope of work is detailed in Section 5 below and requirements are detailed in subsequent sections.

3 Acronyms & Definitions

3.1 Acronyms

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

Abbreviation	Description
MTO	Material Take Off
CRO	Contract Responsible Officer
GM3S	General Management Specification for Service and Supply
IO	ITER Organization
PRO	Procurement Responsible Officer
NANDO	New Approach Notified and Designated Organisations
COTS Item	Commercial off the shelf items
CSFI	Counterfeit, Suspect & Fraudulent Items
FME	Foreign Material Exclusion
NDE	Non Destructive Examination
FAT	Factory Acceptance Test

SUPPLY

SQEP	Skilled, Qualified & Experience Persons
CRN	Contractor Release Note
ANB	Agreed Notified Body
DCIF	Design Collaboration Implementation Form
MDB	Manufacturing Data Base
NCR	NonConformity Report

3.2 Definitions

The terms defined in Section 2.1 of GM3S – Ref [1] are applicable to this framework contract also. Some of the terms are given below & might be duplicating from GM3S – Ref [1].
Client: ITER Organization, referred to as IO in the rest of the document.
The Supplier: shall mean an economic operator who have signed the Contract in which this document is referenced. In this document as well as in the mandatory Appendixes and Annexures referred here, the names Contractor and Supplier are used interchangeably.
In-Vessel Components: This term is used in this specification for indicating all the components, sub-assemblies and provision for services (electrical) that are located inside the ITER Vacuum Vessel (attached to the Diagnostic Port Plug Assembly).
Ex-Vessel Components: This term is used in this specification for indicating all the components, sub-assemblies and provision for services (electrical, compressed air) that are located outside of the ITER Vacuum Vessel (attached to the Interspace Support Structures and Port Cell Support Structure Assemblies).
Machine: The term "Machine" is used to describe the ITER Tokamak Machine where the final installation of these deliverables will be done.
Assembly: The term "Assembly" is used to describe the assembly activities of the components (mainly mechanical) of the deliverables planned by the Contractor. This activity is expected to be at their manufacturing facility.
Free issue items: These are the items that are supplied by IO as Free Issue and procurement is not in the scope of the present contract.
IDM ID: This is the referred IDM document number.

4 Applicable Documents & Codes and standards

Following documents, codes and standards shall be applicable to this framework contract.

4.1 Applicable Documents

This 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.

In addition to documents listed in below table, applicable documents listed in GM3S [Ref 1] & detailing requirements of GM3S shall also be considered as applicable documents.

SUPPLY

Ref	Title	IDM Doc ID	Version
1	General Management Specification for Service and Supply (GM3S)	82MXQK	v2.2
2	Provisions for Implementation of the Generic Safety Requirements by the External Actors/Interveners	SBSTBM	v2.3
3	Protection Important Activities and Defined Requirements for All ITER Mechanical PIC Equipment	338G4B	v5.0
4	ITER Vacuum Handbook	2EZ9UM	v2.5
5	Quality Requirements for IO Performers	22MFG4	v6.4
6	ITER Dimensional Metrology Handbook	46FN9B	v2.1
7	General Description of Optical Diagnostic Systems to be Manufactured	GXYWGM	v1.0
8	Radioprotection guide for ESPN application	2LTQ96	v2.5

4.2 Applicable Codes and Standards

This is the responsibility of the Contractor to procure the relevant Codes and Standards applicable to that scope of work.

Ref	Title	Doc Ref.	Version
CS1	RCC-MR	---	2007
CS2	EN, ISO and ASTM Standards[1]	---	
CS3	ISO 10110	---	---
CS4	ISO 9211	---	---
CS5	ISO 14644	---	---
CS6	ISO 1101	---	2017

5 Scope of Work

This section defines the specific scope of work, in addition to the contract execution requirement as defined in Ref [1] and subsequent Sections. Technical information is available in Ref [7].

5.1 IO's Scope of Work

[FWC_5.1-REQ-1] IO's scope of work & supply is limited to performing activities & supply of items listed below. Supply of documents, 3D models & Free Issue materials listed in Section 9 of this document. Review & approval of document deliverables are listed in Section 10 of this document. It is highlighted here that it is responsibility of the Supplier to ensure & comply with all the requirements of this framework contract & task order including their applicable documents, codes & standards. Review of documents & deliverables by IO doesn't relieve Supplier from this contractual responsibility.

[FWC_5.1-REQ-2] Surveillance during manufacturing of components, assemblies and raw material, mainly for SIC / PIC, at premises of suppliers and its Sub-Suppliers & Sub-contractors involved with manufacturing & services for this framework contract. IO may perform surveillance on its own or appoint any competent third-party agency for the same at IO's cost. Surveillance by IO or appointed agency doesn't absolve contractual

[1] All the relevant standards applicable as per [CS1]

responsibility of Supplier to ensure & comply with all the requirements of this framework contract & task order including their applicable documents, codes & standards.

[FWC_5.1-REQ-3] IO will act as manufacturer for ESPN components & assemblies and liaise with ANB for conformity assessment. Cost of appointing ANB will be borne by Participation during FAT at Supplier's place before supply of components & assemblies.

[FWC_5.1-REQ-4] Performing Receipt Inspection after receipt of components & assemblies at ITER site.

[FWC_5.1-REQ-5] Audit of the Supplier and its sub-Suppliers & Sub-contractors involved with manufacturing & services for this framework contract.

5.2 Supplier's Scope of Work

Supplier's scope is to manufacture components & assemblies as requirements defined in Framework contract & Task order and supply to IO Site. Technical information are given in Ref [7].

Supplier is responsible for arranging all the materials, consumables, resources, equipment, machines, etc. and performing all the activities which are not in scope of IO but deemed necessary by Supplier for the manufacture & supply of components & assemblies to ITER site. The Supplier shall be responsible for FAT and will have opportunity for the Supplier to witness receipt inspection at ITER site. Participation in receipt inspection shall be part of Task order for specific component & subassembly. If customized tool is required for final handling & transportation of components & assemblies, the same shall be delivered to ITER site along with components & assemblies. Handling scheme shall be proposed & justified by the Supplier and submitted for approval to IO.

6 Important stages of manufacture & supply of components & assemblies

IO has identified certain important stages for manufacture & supply of components & assemblies together with requirements applicable to these stages. IO identified broad level & important stages and Supplier is responsible for defining detailed stages and steps for manufacture of components & assembly which are extension of important stages listed below.

6.1 Manufacturing design & design analysis

Following requirements are applicable to manufacturing design stage and shall be taken into account by the Supplier.

[FWC_6.1-REQ-1] The Supplier shall study 3D CATIA models supplied by IO for components & subassemblies and prepare manufacturing drawings.

[FWC_6.1-REQ-2] As a result of manufacturing design minor design changes might be necessary to optimize manufacturing process. The Supplier shall highlight those changes to IO & take approval of IO for the same. The Supplier shall update 3D CATIA model if IO 3D model is affected.

[FWC_6.1-REQ-3] The Structural verification analyses or stress analyses shall be performed for components & assemblies to justify acceptance of deviation requests and non-conformances in accordance with code of construction, this specification, Task order specification & classification defined in Task order specification.

[FWC_6.1-REQ-4] The design and stress analysis of handling and transportation within the factory or during the delivery to ITER site for any part for component or

assembly of final component or assembly including tools required for the purpose shall be as per this specification & Task order specification.

[FWC_6.1-REQ-5] The Supplier shall carry out stress analysis of components & assemblies for test conditions (e.g. pressure test, HLT, etc.) if specified in Task order. Design of blanks necessary for testing of components & assemblies must be done by the Supplier.

6.2 Optical Surface Requirements

Following requirements are applicable to manufacturing and inspection of optical surfaces.

[FWC_6.2-REQ-1] Optical surface requirements shall be defined in Task order specification and applicable manufacturing drawings in accordance with ISO 10110.

[FWC_6.2-REQ-2] Optical surface requirements may include surface form, surface roughness, surface imperfections, clear aperture, edge condition, transmitted or reflected wavefront and other applicable optical characteristics.

[FWC_6.2-REQ-3] The Supplier shall define and justify the optical surface manufacturing process, including grinding, lapping, polishing and other precision surface finishing operations, as applicable.

[FWC_6.2-REQ-4] The optical surface manufacturing process shall be compatible with the substrate material, component geometry and subsequent cleaning, coating, assembly and inspection activities.

[FWC_6.2-REQ-5] The Supplier shall identify and control the manufacturing parameters having an impact on optical surface quality and dimensional stability and shall assess the need for stress-relief, thermal stabilization or other treatments before optical surface manufacturing.

[FWC_6.2-REQ-6] Optical surfaces shall be inspected using methods and equipment suitable for the characteristics and tolerances to be measured. Measurement methods, equipment, calibration, measurement conditions and uncertainty, where relevant, shall be documented by the Supplier.

[FWC_6.2-REQ-7] Optical inspection results shall be documented and included in the manufacturing documentation package.

6.3 Coating Requirements

Following requirements are applicable where coating of optical components is required.

[FWC_6.3-REQ-1] Coating materials, coating architecture, coating performance and applicable acceptance criteria shall be defined in Task order specification and applicable manufacturing drawings. Optical coatings shall comply with ISO 9211 and other applicable standards specified in the Task order specification.

[FWC_6.3-REQ-2] The Supplier shall define and document the coating process, including surface preparation, cleaning, coating, inspection and testing activities.

[FWC_6.3-REQ-3] The coating process shall be compatible with the substrate material, optical surface, operating conditions and cleanliness requirements.

[FWC_6.3-REQ-4] The Supplier shall prepare a coating and inspection plan identifying the coating process, process controls, inspection stages, qualification activities and documentation to be generated.

[FWC_6.3-REQ-5] The coating procedure shall follow the approved coating and inspection plan.

[FWC_6.3-REQ-6] Qualification of coating materials and coating processes shall be performed when required by Task order specification.

[FWC_6.3-REQ-7] Qualification may be performed on the optical component, representative witness samples or a combination thereof. Witness samples shall be

representative of the corresponding component and traceable to the applicable material and coating batch.

[FWC_6.3-REQ-8] Coating inspection and testing may include coating thickness, optical performance, uniformity, adhesion, surface defects, microstructure, environmental durability and cleaning resistance, as specified in Task order specification.

[FWC_6.3-REQ-9] Coating procedures, inspection results and qualification results shall be included in the manufacturing documentation package.

6.4 Optical assembly and alignment requirements

Following requirements are applicable where assembly or alignment of optical components is required.

[FWC_6.4-REQ-1] The Supplier shall define the sequence and methods for assembly and alignment of optical components and opto-mechanical assemblies.

[FWC_6.4-REQ-2] Assembly and alignment activities shall use the coordinate systems, datums, reference features and interfaces defined in applicable drawings and 3D models. Applicable geometrical tolerances shall comply with ISO 1101.

[FWC_6.4-REQ-3] The Supplier shall identify and control applicable alignment tolerances and shall define the alignment methods, equipment and acceptance criteria to be used.

[FWC_6.4-REQ-4] Fixtures, tools, bonding materials, fasteners and other means used to position or retain optical components shall comply with applicable drawings and Task order specification and shall not damage or contaminate optical components.

[FWC_6.4-REQ-5] Optical alignment shall be verified after assembly and after any subsequent operation having the potential to affect alignment.

[FWC_6.4-REQ-6] Assembly and alignment results shall be documented and included in the manufacturing documentation package.

6.5 Material procurement

Following requirements are applicable to material procurement stage and shall be taken into consideration by the Supplier.

[FWC_6.5-REQ-1] Contractor is free to decide product form (e.g. forging, plate, pipe, etc.) for each part in compliance with construction code specified in Task order of the component & assembly together with applicable requirement coming out from this specification & task order specification.

[FWC_6.5-REQ-2] Welding, coating & brazing consumables required for welding of parts for components & assemblies shall be in accordance with code of construction and this specification & classification defined in task order specification. The Supplier shall take approval from IO for type of welding, coating & brazing consumables being planned for welding of parts for components & assemblies.

[FWC_5.1-REQ-6] If any particular additional technical requirement is applicable to material, welding, coating & brazing consumables for parts of specific component & assembly, in addition to code of construction and this specification & classification defined in Task order specification, the same shall be specified in task order specification and the Supplier shall comply with them also.

[FWC_6.5-REQ-3] All the material becoming part of components & assemblies shall have certification in accordance with chapter 3.1 or 3.2.

[FWC_6.5-REQ-4] Inspection certificate type 3.1 for material of components & assemblies classified as ESPN shall be accepted only from material Suppliers having quality assurance system certified by competent body established within the European

Community and having undergone a specific acceptance for materials. Alternatively, inspection certificate type 3.2 under recognized third-party organization approved & available on NANDO website of European Community shall be accepted.

[FWC_6.5-REQ-5] In case of small quantity, including COTS items, where the Supplier face the difficulties in sourcing of material, the Supplier can procure material from stock. However, the Supplier shall take complete responsibility of material, enforce CSFI controls and demonstrate compliance with requirements of code of construction, this specification, Task order specification & applicable component classification. In case of doubt or unavailability of certificates, compliance shall be demonstrated by retesting the material. In any case these exceptions will not apply to component & assembly classified as ESPN or for material where product qualification is required as per code of construction.

[FWC_6.5-REQ-6] Traceability of material shall be maintained by the Supplier. The requirement of traceability shall be applicable to subcontractors & sub Suppliers by the Supplier. The Supplier shall include this requirement in technical documents for subcontractors & sub Suppliers.

[FWC_6.5-REQ-7] The Supplier can select material & welding consumables required for fixtures & tools as per its choice to comply with requirements of design analysis for fixtures & tools and need not be approved by IO. Material for interfacing surfaces of fixtures & tools with components & assemblies shall require approval by IO.

[FWC_6.5-REQ-8] Raw material, welding consumable & other material for mock-up shall be arranged by the Supplier as per its choice in compliance with purpose of mock-up.

[FWC_6.5-REQ-9] Material & consumables which are not becoming part of components & assemblies but required from raw material stage to delivery of components & assemblies like jigs & fixtures, machining tools & inserts, machining coolant, NDE consumables (e.g. dye penetrant, UT couplant, etc.), packing material, blanks for testing (e.g. pressure test, HLT, etc.), temporary attachments, etc. shall be procured by the Supplier complying with requirements of code of construction, this specification, Task order specification & classification defined in task order specification.

6.6 Manufacturing & assembly

Following requirements are applicable to manufacturing & assembly stage of the components & assemblies described in Ref [7]:

[FWC_6.6-REQ-1] Manufacturing planning shall be integral part of manufacturing design stage and definition of part geometry, decision on manufacturing allowances, selection of manufacturing processes (e.g. forming, machining, welding, brazing, coating, etc.), sequence of manufacturing processes, etc. shall be chosen by Supplier in a manner that it meets all requirements of applicable 3D models, drawings, tolerance sheets, code of construction, this specification, Task order specification & applicable component classification.

[FWC_6.6-REQ-2] Contractor shall ensure during manufacturing design (which includes manufacturing planning) that manufacturing processes and its sequence don't hinder access for meaningful NDE, testing & inspection required by code of construction, this specification, Task order specification & applicable component classification.

[FWC_6.6-REQ-3] The Supplier is free to select any the manufacturing processes (unless mandated by IO drawings & documents) as long as it is in accordance with above criteria and shall perform manufacturing operations (cutting, forming, welding, coating, brazing machining, etc.) in manner complying with requirements of code of construction,

this specification, Task order specification & applicable component classification and comply with their requirement.

[FWC_5.1-REQ-7] In case of bolted assembly, the Supplier shall tighten fasteners with required tightening torque or defined pretension load whichever is specified in drawings. For torque tightening, lubricant complying with requirements of code of construction, this specification, Task order specification & applicable component classification shall be used to achieve required friction co-efficient.

[FWC_6.6-REQ-4] The Supplier can, at his own choice & cost, manufacture mock-ups & perform trials to ensure that its manufacturing design & manufacturing planning will result in component & assembly compliant with requirements of code of construction, this specification, Task order specification & applicable component classification.

[FWC_6.6-REQ-5] The choice of manufacturing methods & processes for manufacturing of parts which are not permanent member of components & assemblies (like jigs & fixtures, drawing) are left to the discretion of the Supplier.

[FWC_6.6-REQ-6] All qualifications shall be according to code of construction, this specification, Task order specification & applicable component classification except following cases of special qualifications for non-conventional welding method & Deep Hole Drilling process.

[FWC_6.6-REQ-7] For special non-conventional welding method; the preparation, execution and testing of test coupons supporting the Procedure Qualification Record (PQR) shall take into account actual product constraints such as assembly geometry, welding position, access for gas protection, execution and testing of production welds. Particular situations involving more than one single welding procedure like Electron Beam Welds overlapping plug welds shall be qualified taking into account equivalent conditions as those present in production welds.

[FWC_6.6-REQ-8] Deep Hole Drilling process shall be qualified simulating actual product conditions using tools & machines which are intended to be used for drilling parts of component & assembly.

[FWC_6.6-REQ-9] Personnel for non-conventional welding method & Deep Hole Drilling shall also be qualified before they start work on parts of components & assemblies.

[FWC_6.6-REQ-10] All the work related to supply of components & assembly (starting from raw material receipt to delivery at ITER site) under this framework contract shall be performed by SQEP personnel in accordance with code of construction, this specification, Task order specification & applicable component classification.

6.7 Optical Component Manufacturing and Qualification

Following requirements are applicable to qualification of optical components and assemblies.

[FWC_6.7-REQ-1] Qualification requirements applicable to specific optical components and assemblies shall be specified in Task order specification.

[FWC_6.7-REQ-2] Where qualification is required, the Supplier shall prepare a qualification programme covering applicable manufacturing, polishing, coating, assembly, inspection and testing activities.

[FWC_6.7-REQ-3] Qualification components and samples shall be representative of the materials, geometry, surface condition, manufacturing processes and process parameters relevant to the qualification objective. Any deviation from full representativeness shall be identified and justified by the Supplier.

[FWC_6.7-REQ-4] Qualification procedures, inspection methods and acceptance criteria shall be submitted to IO for approval before start of qualification activities.

[FWC_6.7-REQ-5] Qualification results shall be documented in a qualification report demonstrating compliance with requirements of this specification, Task order specification and applicable manufacturing drawings.

[FWC_6.7-REQ-6] Where previous qualification results are proposed, the Supplier shall demonstrate their applicability to the component, material, manufacturing process and requirements of the relevant Task order. Acceptance of previous qualification results shall be subject to approval by IO.

6.8 NDE, Testing, Inspection & FAT

Following requirements are applicable to NDE, testing, inspection & FAT.

[FWC_6.8-REQ-1] NDE shall be conducted in accordance with requirements of code of construction, this specification, Task order specification & applicable component classification. In case of conflicting requirements, the Supplier shall take clarification from IO. IO decision shall be final & binding.

[FWC_6.8-REQ-2] Destructive testing, if applicable as per code of construction, this specification, Task order specification & applicable component classification, shall be in accordance with requirements specified there.

[FWC_6.8-REQ-3] Type of testing to be done is determined by code of construction, classification & configuration of component & assembly. Following type of testing is expected to be done on components and assemblies. The same shall be indicated in task order specification for relevant component & assembly:

- Pressure test
- Helium Leak Test

[FWC_6.8-REQ-4] Dimension Inspection & metrology shall follow requirements from Metrology Handbook [Ref. 6] based on Alignment & Metrology classification defined in Task order specification. Measurement method & instruments shall be selected based on dimensions & tolerances to be measured.

[FWC_6.8-REQ-5] Tests to be done as part of FAT shall be specified in Task order specification of component & assembly.

6.9 Cleanliness, Cleaning, Packing & Delivery

Following requirements are applicable to Cleanliness, Cleaning, Packing & Delivery.

[FWC_6.9-REQ-1] Cleanliness shall be maintained throughout the process of manufacturing and supply (i.e. receipt of raw material & COTS items to delivery to ITER site) in compliance with requirements of code of construction, this specification, Task order specification and applicable component classification. Where specified in Task Order specification, cleanliness requirements shall comply with ISO 14644.

[FWC_6.9-REQ-2] Cleaning & cleanliness check shall be done, at appropriate stage, during manufacturing to ensure that components & assemblies delivered to ITER site are clean. Area which would become inaccessible later shall be cleaned & checked for cleanliness just before closure of this area and FME controls shall be put in place. Cleaning shall be done in compliance with requirements of code of construction, this specification, Task order specification & applicable component classification.

[FWC_6.9-REQ-3] Cleaning procedure has to be established to ensure needed cleanliness requirements, especially in locations where accessibility is difficult and a possibility for local spots having unacceptable surface finish requirements (e.g. deep holes) exists. Surface finish shall meet requirement of ITER Vacuum Handbook applicable as per applicable classification.

SUPPLY

[FWC_6.9-REQ-4] Optical surfaces and optical coatings shall be protected during manufacturing, inspection, assembly, handling, transportation and storage to prevent contamination, corrosion, scratching, chipping or other damage affecting optical performance.

[FWC_6.9-REQ-5] Direct contact with optical surfaces shall be avoided unless required by approved manufacturing, inspection or assembly procedures.

[FWC_6.9-REQ-6] When required by Task order specification, baking shall be carried out on component & assemblies in line with requirements of code of construction, this specification, Task order specification & applicable component classification.

[FWC_6.9-REQ-7] Packing of components & assemblies for despatch shall be such that it avoids any deterioration or damage to component & assemblies and preserve cleanliness of components & assemblies where applicable and shall comply with requirements of this specification, Task order specification & applicable component classification. Packing shall provide protection against weather conditions and stresses due to transportation & handling during delivery phase from manufacturing location to ITER site.

[FWC_6.9-REQ-8] Calibrated shock trackers (if specified in Task order specification) shall be attached with packages prior to despatch to ITER site. Shock tracker data shall be analysed, after receipt of delivery at ITER site, to determine if any incident happened during the transportation & handling. Moisture absorbers which are complying with requirements of this specification, Task order specification & applicable component classification shall be kept inside packing.

[FWC_6.9-REQ-9] Non-standard handling tools which are supplied along with components & assemblies to ITER Site shall be CE marked by the Supplier.

[FWC_6.9-REQ-10] The Supplier shall clear the Delivery Readiness Review (DRR) gate and take approval of IO before delivery.

[FWC_6.9-REQ-11] Components shall be delivered to IO Port Integration Site following DAP Incoterms.

[FWC_6.9-REQ-12] IO shall issue final acceptance certificate for components & assemblies after receipt inspection at ITER site within 30 calendar days of receipt of component at ITER site.

6.10 Documentation & data management

Following requirements are applicable to documentation & data management.

[FWC_6.10-REQ-1] Manufacturing drawings and 3D models shall be managed through CATIA, ENOVIA & SMDD which are applicable at ITER Site and interface or data exchange shall be manged between IO & the Supplier through DCIF.

[FWC_6.10-REQ-2] All documents other than manufacturing drawing & 3D models shall be managed through IDM. IO MDB shall be used for MIP management & documentation and NCR DB shall be used for NCR management.

[FWC_6.10-REQ-3] The Supplier shall prepare technical specifications for raw materials, welding consumables & COTS items complying with requirements code of construction, this specification, Task order specification & applicable component classification.

[FWC_6.10-REQ-4] All the steps in detail, starting from material receipt to delivery of components & assemblies, covering complete manufacturing & supply shall be part of MAIT (overall manufacturing, assembly & intermediate testing document) with proper sequence.

[FWC_6.10-REQ-5] Major steps of manufacturing & supply shall be part of MIP. MIP can be one single MIP can be prepared for one component & assembly or multiple MIPs

for one component & assembly can be prepared by the Supplier as per its choice & convenience.

[FWC_6.10-REQ-6] Procedures & documents shall be prepared by the Supplier for relevant steps of MIP as well as certain generic activities to ensure compliance of entire spectrum of manufacturing & supply of components & assemblies with code of construction, this specification, Task order specification & applicable component classification. Tentative list of procedures & documents is given in Section 10.

[FWC_6.10-REQ-7] The requirements specified in applicable reference documents listed in this specification & Task order specification shall be considered as requirements of these specifications and shall be followed as applicable according to applicable classifications of components & assemblies in above documents.

[FWC_6.10-REQ-8] Various gates as defined in Section 13.1 are applicable during manufacturing & supply of component & assembly. Documents applicable for various gates shall be prepared & approval to proceed further shall be obtained at these gates. Further work shall start only after approval of the respective gate by IO.

[FWC_6.10-REQ-9] The Supplier shall prepare & submit delivery documents (like CRN, Delivery Report, Packing List, Preservation Plan, etc.) in predefined formats as required by GM3S [Ref 1] for approval of IO.

[FWC_5.1-REQ-8] For optical components, the Supplier shall provide optical manufacturing, inspection, qualification, coating and alignment documentation as specified in the Task Order specification.

6.11 Interface requirements

The components & assemblies will be installed & integrated with Diagnostics or other systems at ITER site and it will have various interfaces with other installation at ITER site. To avoid difficulties in installation & integration of components & assembly and make this process smoother, it is essential that interfaces are managed efficiently. To match the interfaces, one of following approach shall be followed and it will be concluded at task order stage.

[FWC_6.11-REQ-1] Dimensions of interfaces with tolerances or allowances on components & assemblies shall be provided by IO which shall be strictly followed by the Supplier.

[FWC_6.11-REQ-2] Template / fixture to match both the interfaces shall be prepared by the Supplier and interface shall comply with templates after manufacturing interfacing of components, assemblies or systems.

6.12 Performance requirements & guarantees

[FWC_6.12-REQ-1] The Supplier shall provide performance guarantee against manufacturing defects, workmanship and unapproved deviation from requirements of contract requirements.

[FWC_6.12-REQ-2] The Supplier shall be responsible, at his own cost & expenses, for any repair or replacement of component & assembly in case any manufacturing defect or poor workmanship or unapproved deviation from contract requirement detected after receipt at ITER site.

[FWC_6.12-REQ-3] If installation schedule of component & assembly is getting affected, IO reserves the right to get it repaired or replaced on its own and cost of the same shall be recovered from the Supplier.

[FWC_6.12-REQ-4] In any case, limit of liability on part of the Supplier shall not exceed the value of component & assembly being delivered to IO.

6.13 Classifications

There are several classifications applicable to components & assemblies to be supplied according to this specification. These classifications shall be defined for each component & subassembly in applicable Task order specifications. Relevant requirements as per these classifications shall be applicable during entire process of supply of components & assemblies.

- Nuclear Safety Classification (SIC / PIC)
  [FWC_6.13-REQ-1] If components & assemblies are identified as SIC / PIC, requirements of IO documents [IDM UIDs: SBSTBM & 338G4B] shall be applicable as per classification level.
- ESPN Classification (Level & Category – e.g. Level N2 & Category 0):
  [FWC_6.13-REQ-2] When components & assemblies are identified as ESPN, requirements of ESPN order shall be followed as per Section 12.
- Vacuum Quality Classification (VQC)
  [FWC_6.13-REQ-3] If components & assemblies are identified as VQC, requirements of IO document [IDM UIDs: 2EZ9UM] shall be applicable as per type of VQC classification.
- Classification as per code of construction (Component Class)
  [FWC_6.13-REQ-4] When relevant, requirements of code of construction related to component class shall be applicable.
- Quality classification (QC)
  [FWC_6.13-REQ-5] Applicable requirements of IO document [IDM UIDs: 22MFG4] shall be applicable as per quality classification (QC).
- Alignment & Metrology classification (A&M)
  [FWC_6.13-REQ-6] Applicable requirements of IO document [IDM UIDs: 46FN9B] shall be applicable as per A&M classification.
- Seismic Classification (SC)

It is for information & mainly applicable for design & stress analysis of component & assemblies.

- Remote Handling Classification (RHC)

It is for information & mainly applicable for design & tolerance chain analysis.

To minimize variability in managing requirements of different classes, the Supplier may decide to comply with the requirements applicable to highest classification for all classes of components & assemblies. This option depends on the assessment & ease of the Supplier. However, requirements applicable to component & assembly classified as higher class shall never be reduced to lower class.

6.14 Spare Parts

[FWC_6.14-REQ-1] Spare parts for each component & assembly shall be listed in Task order specification if determined necessary by IO.

7 Duration

The duration of services under this Contract will be four (4) years fixed plus two (2) year optional. The maximum expected duration for this framework contract from the contract signature to the supply of components & assemblies shall be six (6) years.

8 Location for Scope of Work Execution

[FWC_8-REQ-1] The Supplier can perform the work at its own location or its subcontractor or its sub Supplier's place and the Supplier shall provide right of access to IO or agency appointed by IO for activities related to this framework contract.

[FWC_8-REQ-2] The Supplier shall appropriately provide all the applicable requirements of this specification & Task order specification to its subcontractors & its sub Suppliers. It is the responsibility of the Supplier to ensure that its subcontractors & its sub Suppliers comply with these requirements.

9 IO Documents & IO Free issue items

The deliverables to be supplied by IO are as follows.

9.1 IO Documents:

Under this scope of work, IO will deliver the following as defined in Task order specification:

Ref	Title
1	Design 3D models in ENOVIA
2	Design drawings (for most of the component & assembly)
3	Overall tolerance sheet for component & assembly (if only 3D model is provided or design drawing is not having sufficient tolerance)
4	Input information necessary for COTS items
5	Design documentation package & native files (where relevant)
6	Task order specification with each Task Order

9.2 Free issue items:

Any part or equipment if IO wants to provide as free issue, the same shall be listed in Task order specification.

10 Deliverables and Schedule Milestones

10.1 Schedule for delivery

Schedule for delivery of each individual component & assembly shall be specified in Task order specification.

Brief information / details of component & assemblies to be supplied are provided in document Ref [7].

10.2 List of deliverable documentation

The Supplier shall provide IO with the documents and data required in the application of this technical specification, the GM3S Ref [1] and any other requirement derived from the application of the contract.

You can find here below a minimum list of documentation, but not limited to, which are to be submitted in expected timing given in Task order specification:

Contract Gate	Document Type	Document Description
MRR	3D model	Manufacturing 3D models

SUPPLY

MRR	Drawing	Manufacturing drawings
MRR	Report	Design & Analysis Reports (if applicable)
MRR	Material	Material specifications
MRR	Material	Material compliance justification
MRR	Material	Welding consumable specification
MRR	Material	Material procurement drawings (if applicable)
MRR	Material	Specification for procurement of COTS items
MRR	QA	Quality Plan
MRR	QA	Nuclear safety control plan
MRR	QA	Manufacturing & Inspection Plan
MRR	QA	Coating Inspection Plan
MRR	Manufacture	Manufacturing, Assembly, Integration & Testing Document
MRR	Manufacture	Manufacturing Procedures (cutting, forming, machining, etc.)
MRR	Manufacture	Clean work plan (covering all aspect of manufacturing & supply including storage of material)
MRR	Manufacture	Cleaning procedure
MRR	Manufacture	Welding Documentation (Weld Maps, WPS, PQR, WQR, etc.)
MRR	Manufacture	Lifting & handling schemes / procedures
MRR	Manufacture	On-site Assembly Plan
MRR	Quality	NDE procedures
MRR	Quality	Inspection procedures
MRR	Quality	Testing procedures
TRR	FAT document	FAT procedure
TRR	Packing	Packing procedure
TRR	Packing	Handling procedure for component & assembly
DRR	EMR	Manufacturing History Docket / Data package including manufacturing records
DRR	List	List of DRs & NCRs for component & assembly
DRR	As-built	As-Built 3D model & manufacturing drawings
DRR	Delivery Documents	Delivery Documents for delivery to ITER site like Delivery Report, Packing List, Preservation Plan, CRN, etc.
DRR	CE Documentation	CE Documentation for handling tools for component & assembly (if applicable)

[FWC_10.2-REQ-1] The Supplier shall prepare their detailed list of documents & document schedule based on the above guideline and using the template available in the GM3S Ref [1] appendix II (click here to download).

11 Quality Assurance requirements

The Quality class to be applied to component & assembly to be supplied to ITER site are specified in Task order specification.

[FWC_11-REQ-1] GM3S [Ref 1] Section 8 shall apply in line with the defined Quality Class in Task order specification.

12 Nuclear Safety & regulatory requirements

In accordance with Article 14 of Agreement on the Establishment of the ITER International Fusion Energy Organization for the Joint Implementation of the ITER Project, “the ITER Organization shall observe applicable national laws and regulations of the Host State in the fields of public and occupational health and safety, nuclear safety, radiation protection, licensing, nuclear substances, environmental protection and protection from acts of malevolence”.

In accordance with the Décret n° 2016-1925 du 28 décembre 2016 (section 9) and the Order dated 30 December 2015 on nuclear pressure equipment:

Some components & assemblies to be supplied are PE/ESP classified and they are identified in Task order specification.

[FWC_12-REQ-1] In the frame of that regulation, the conformity assessment of components & assemblies which are classified as ESP / ESPN in Task order specification shall be under IO responsibility. However, the Supplier shall provide all the information & documents requested by the ESPN order and provide opportunity to witness certain activities by IO & / or ANB.

The ITER Tokamak Nuclear Installation is classified as a Basic Nuclear Installation (INB- 174) and is subject to the associated regulation of work and quality under the jurisdiction of the French Nuclear Authority (Autorité de Sûreté Nucléaire et de Radioprotection, ASNR). In application of the article 2.2.1 of the INB Order, the document [ITER_D_SBSTBM] defines generic safety requirements to be implemented by all external interveners in order to satisfy the requirements of the INB Order (French Order of 7 February 2012).

IO will identify components & assemblies to be supplied as PIC / SIC in Task order specification. Specific activities which part of manufacture & supply of components & assemblies are Protection Important Activities (PIAs) or affect nuclear safety in the context of INB Order.

[FWC_12-REQ-2] The Supplier shall identify PIAs and associated Technical Controls for each PIA in accordance with guidelines given in reference documents.

[FWC_12-REQ-3] These PIAs shall be managed through Technical and Management documentation.

13 Special Management Requirements

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

13.1 Contract Gates

In addition to the contract gates as defined in GM3S [Ref 1] Section 6.1.5, the scope of work call for Contract gates Manufacturing Readiness Review [MRR], Testing Readiness Review [TRR] & Delivery Readiness Review [DRR].

[FWC_13.1-REQ-1] All the documents as identified for each gate in Section 10 shall be approved by IO.

SUPPLY

[FWC_13.1-REQ-2] A meeting shall be arranged by the Supplier after approval of all the documents by IO to justify readiness and release of the contract gate to start work beyond contract gate till next contract gate.

13.2 Work Monitoring

Work monitoring shall be done in accordance with provisions of GM3S [Ref 1] and supplemented by following

[FWC_5.1-REQ-9] The Supplier shall submit overall schedule along with major milestones considering timeline given in Task order specification.

[FWC_13.2-REQ-1] The follow-up of the manufacturing progress shall be documented through regular monthly reports detailing manufacturing status with respect to milestones defined in contract. These reports shall be produced in accordance with the Management Specification of the Framework Contract. Any delays, manufacturing problems, recovery plans, etc. shall also be included in these reports.

[FWC_13.2-REQ-2] Design of the handling and transportation tools shall be justified with design reports and presentations in meetings before the start of manufacture. Their progress and completion shall be monitored through above monthly reports.

[FWC_13.2-REQ-3] All the contract gates shall be part of milestones in the overall schedule and progress monitoring shall be part of regular monthly reports.

13.3 Meeting Schedule

[FWC_13.3-REQ-1] Meeting shall be arranged by the Supplier as per provisions of GM3S [Ref 1] with frequency not less than once in a month.

[FWC_13.3-REQ-2] Meeting shall be arranged one week after submission of monthly report by the Supplier.

[FWC_13.3-REQ-3] In this meeting, the Supplier shall present main topics of regular monthly reports like manufacturing status update, milestone status, problems, recovery plan (in case of delay), etc. This frequency can be mutually agreed upon depending on need of contract progress. In addition, technical meetings can be arranged for technical coordination based on mutual convenience.

[FWC_13.3-REQ-4] The Supplier shall prepare & send draft minutes of meetings for all meetings to IO for review through email.

[FWC_13.3-REQ-5] The Supplier shall submit them on IDM once it is agreed between the Supplier & IO.