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Title	<u>Fabrication and supply of Transmission line components</u>
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Distribution list	Potential bidders (GeM)
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Written by	Reviewed by	Approved by
ITER-India	ITER-India	ITER-India

Part A (II): Technical Part

1. Introduction

[II-ICH-001-I] ITER-India is seeking for manufacturing, assembly and integration of mechanical Transmission lines as per ITER-India Engineering drawings and quantities as define below.

[II-ICH-002-R] Table 1: List of components to be fabricated/ procurements

Sr. No.	Description	Components	Major Material	Quantity
1.	3 1/8-inch Transmissions line	0.5 meter	ETP copper, Brass, Teflon, Steel 304L	4 Nos
		1 meter	ETP copper, Brass, Teflon, Steel 304L	8 Nos
		Elbow	ETP copper, Brass, Teflon, Steel 304L	8 Nos
		Directional coupler	ETP copper, Brass, Teflon, Steel 304L	1 No
2.	6 1/8-inch Transmissions line	0.5 meter	ETP copper, Brass, Teflon, Steel 304L	5 Nos
		0.65 meter	ETP copper, Brass, Teflon, Steel 304L	1 No.
		1 meter	ETP copper, Brass, Teflon, Steel 304L	7 Nos
		Elbow	ETP copper, Brass, Teflon, Steel 304L	8 Nos
		Directional coupler	ETP copper, Brass, Teflon, Steel 304L	1 No

2. Scope of Work

[II-ICH-003-R] Preparation of manufacturing drawings based on ITER-India engineering drawings and submit to ITER-India for approval.

[II-ICH-004-R] Preparation of Manufacturing and Inspection Plan (MIP) as per ITER-India's approved template along with quality plan and submit the same for ITER-India's approval.

[II-ICH-005-R] Procurement of material raw material and submit the test reports for ITER-India's approval. Note that all ETP copper tubes are seamless.

[II-ICH-006-R] Fabrication/ manufacturing of mechanical Transmission lines as per approved drawings.

[II-ICH-007-R] Procedure to be established for Copper and Silver plating as per section 5, which include acceptance criteria & process to be approved by ITER-India and coupon testing to be done.

[II-ICH-008-R] Stage wise inspection of individual components and whole system as per approved MIP (Annex-II).

[II-ICH-009-R] Integration of mechanical Transmission line at supplier site in presence of ITER-India representative.

[II-ICH-010-R] Submission of factory acceptance test report to ITER-India for getting dispatch clearance certificate.

[II-ICH-011-R] Disassembly and packing of the system to deliver ITER-India lab in individual sub-assembly/assembly form.

[II-ICH-012-R] Delivery of items to ITER-India, IPR site with adequate packing to avoid damage during transportation as per section 7.

[II-ICH-014-R] Providing warranty 12 months from the date of acceptance.

3. Material Procurement

[II-ICH-015-R] Supplier shall generate the quantity requirements from the engineering drawings supplied by the ITER-India and submit along with the offer.

4. Precaution during Fabrication and Assembly

[II-ICH-016-I] No modification in the drawing or design is permitted except in case where it is necessary to facilitate manufacturing without changing the function, accuracy and strength of the component. Supplier shall provide prior justification (Deviation request as per ITER-India format) and drawings to the ITER-India representatives for approval before implementing on it.

[II-ICH-017-I] All sharp edges should be avoided and rounded off as per supplied drawings.

[II-ICH-018-I] Surface irregularities, scratches, dents and tool marks are not allowed on the surfaces.

[II-ICH-019-I] Holes should be drilled with essential matching of various parts, wherever applicable.

[II-ICH-020-I] Brazing rods to be used as per drawing for brazing.

[II-ICH-021-I] Brazing procedure qualification, testing and filler material shall be as per ASME Section IX, Part QB and general piping construction as per code ASME B31.3

[II-ICH-022-I] In case manufacturing of components depends upon external agencies, it will be the responsibility of the supplier to get the things made in guarantee the manufacturing tolerances required for this assembly.

[II-ICH-023-I] PMI (Positive Material Identification) need to be performed for all applicable metallic material as per ASTM E1476.

[II-ICH-024-I] PMI shall use hand held portable analyzer of using XRF (X-Ray Fluorescence) or Optical emission analyzer (quantitative method)

[II-ICH-025-I] For Pipe internal surface roughness check where manual access is not available shall be performed using Borescope or pipe Fiberscope

[II-ICH-026-I] All metallic components material specification as per ASME Section II. (for example, Seamless ETP copper pipe standard is UNS C11000 as per ASME Section II Part B SB-152)

5. Coating/ Plating

[II-ICH-027-R] Silver plating as mentioned in approved engineering drawings (Cu: 5 micron and Ag: 15 micron Overall tolerances ± 2) and submit certificate of plating thickness & contents of plating (in %) to ITER-India.

6. Inspection & Testing

Inspection / Tests shall be carried out as per approved manufacturing and inspection plan:

I. Quality checks :

[II-ICH-028-R] The material used in the system will be checked for its required properties to confirm on the material grade, based on the test certificate submitted by the supplier.

[II-ICH-029-R] Supplier shall arrange all calibrated gauges and measurement tools for measurements and inspection at their site.

[II-ICH-030-R] All brazing joints penetrant Testing (PT) should be perform to detects surface-breaking defects like cracks, though less common for internal braze issues and submit PT test certificates to ITER-India for approval.

[II-ICH-031-R] Dimensional Inspection carried out at as per approved manufacturing drawings and vendor need to submit the inspection report for approval

[II-ICH-032-R] In case of any deviation observed at any stage vendor need to be inform ITER India immediately and submit the NCR which shall be subjected to approval of ITER India prior to any implementation. DA NCR template (Annex-III)

II. Factory Acceptance Tests (FAT) of the mechanical Transmission line:

[II-ICH-033-R] FAT shall be carried out in presence of ITER-India representative (s) for integration of mechanical Transmission line at supplier site.

1. All dimensional check to be done as per ITER-India drawings.
2. Visual Testing (VT) to be done for checking basic inspection for surface cracks, fillet size, and obvious discontinuities

III. Site Acceptance Test [SAT] of mechanical Transmission line

[II-ICH-034-R] SAT shall be carried out by ITER-India representative (s) for integration of mechanical Transmission line at ITER-India site.

1. All dimensional check to be done as per ITER-India drawings.
2. Visual Testing (VT) to be done for checking basic inspection for surface cracks, fillet size, and obvious discontinuities

Annexure-I

Engineering drawings

Annexure-I comprises of below listed drawings

Sr. No.	Description	Components	Drawing Number	Number of drawing
1.	3 1/8-inch Transmissions line	0.5 meter	II/ICH&CD/3 1/8" TX-LINE/00	14
		1 meter		14
		Elbow	II/ICH&CD/3 1/8"/00	11
		Directional coupler	II/ICH/3 1/8" DC/00	24
2.	6 1/8-inch Transmissions line	0.5 meter	II/ICH&CD/6 1/8" TX-LINE/00	13
		0.65 meter		13
		1 meter		13
		Elbow	II/ICH&CD/6 1/8" BEND/00	10
		Directional coupler	II/ICH&CD/6 1/8" DC/4-PORTS/00	26

Annexure-II

Compliance of Part-A(II) - Technical

Clause No.	Description	Bidder's Compliance (Yes/No)	Remarks (if any)
PART-A(II): Scope of Supply & Work, Technical Specifications and Drawings			
1	Introduction		
2	Scope of Work		
3	Material Procurement		
4	Precaution during fabrication and assembly		
5	Coating/ Plating		
6 (I, II & III)	Inspection & Testing		

Bidder Signature		
Name of the signatory & Title	Name	Title
Bidder's Official seal		
Place & Date	Place	DD-MM-YYYY