
	Manufacturing, testing and supply of vacuum vessels for HNB3 (Beam Line Vessel and Beam Source Vessel) and DNB <i>Annexure-2: QA, QC, Inspection and testing</i>	INDUS Ref No II-9LKNX2V-V
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1. Scope


This annexure prescribes the QA, QC requirements to be followed, inspections and tests to be conducted at the contractor's premises, sub-contractor's premises and at the site.

These inspection and tests are primarily intended to ensure proper execution of conditions imposed by the governing manufacturing specifications of component for vacuum application.

2. General Instructions

- 2.1 The Contractor shall inspect all the parts, sub-assemblies, final assemblies etc., for full compliances with specification and approved drawings.
- 2.2 All the tolerance dimensions / features in the individual parts, sub-assemblies and the completed assembly shall be inspected by approved procedure as per clause 2.8 of this annexure. All the threaded fasteners shall be checked by the thread gauges and respective fasteners shall be interchangeable.
- 2.3 The Contractor shall provide details of all the inspection and testing facilities. The inspection and testing shall be done in a manner acceptable to purchaser. If deemed necessary purchaser will have right to specify additional inspection / testing other than specified in this specification and cost of such test / inspection will be borne by the purchaser. The records of all the tests and inspection shall be maintained by the Contractor and the same will be submitted to the purchaser.
- 2.4 The inspection shall be in compliance with MIP prepared by the Contractor and approved by the purchaser. However, depending on the manufacturing procedure, quality assurance system and manufacturing and inspection facilities available with the Contractor, some additional checks may also be necessary over and above approved MIP. Such checks shall be incorporated and implemented by the Contractor without any extra financial implications to the purchaser.
- 2.5 Records, certificates and performance curves (if any) shall be supplied for all tests carried out.
- 2.6 Quality assurance program

Quality assurance program of the Contractor shall be aimed to achieve quality through analysis of the tasks to be performed, identification of skills required, the selection and training of appropriate personnel, the use of appropriate equipment, the creation of appropriate environment in which activity can be performed and recognition of

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responsibility of the individual who is to perform the task. Briefly stated, the quality assurance program shall provide a disciplined approach to all activities affecting quality, including where appropriate, verification that each task has been satisfactorily performed and that necessary corrective actions have been implemented. It should also provide for production of documentary evidence to demonstrate that the required quality has been achieved.

Periodic Quality surveillance audit of Contractor (as well as his sub-Contractors) shall be carried out at any stage of execution of contract. Quality surveillance as well as quality audit by the purchaser shall not relieve the Contractor from the responsibility of meeting the specification or the inspection duties.

The Quality Assurance provisions, regulated by the Management Specification, are to be followed during execution of the contract.

Each component, device, equipment shall be accompanied with all the necessary quality certificates, handbooks, drawings and text description, list of spares, etc.

The Contractor shall also provide all the material certificates (as per EN10204 3.1) of the mechanical, hydraulic and electrical components procured for the Supply as per the relevant clauses of this specification.


In case of incompleteness of the certificates accompanying the purchased components or materials it is the Contractor's responsibility to execute all the necessary tests for product qualification.

The Contractor shall also indicate the time required for the substitution of the main components in case of faults.

2.7 Calibration of Equipment

Measures shall be established to ensure that tools, gauges, instruments and other inspection, measuring & testing equipment & devices used in determining conformance to acceptance criterion are of proper range, type, accuracy & precision. Testing & measuring devices used in activities affecting quality shall be controlled, calibrated and adjusted at specified intervals (as per DIN / EN / ISO) on or before use to maintain accuracy within limits.

These activities shall be at expense of the Contractor in a calibration laboratory accredited to EN 45011 / A2LA / ISO 17025 which may be either his own or external. In case of accreditation by other international standards, acceptance of the same shall be subjected to purchaser's approval.

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2.8 Test Procedure

All tests are to be carried out in compliance with written procedures and approved by purchaser. The tests as described in this specification are to be included in the MIP at appropriate stage. The Contractor has to provide all necessary equipment and the personnel for carrying out the tests. All non-destructive tests shall be carried out by suitable qualified personnel (e.g Level II and Level III (for validation and authorization of the results) through written practice based on ASNT or similar international standards).


For each test to be carried out, a test certificate is to be set-up, which must contain the following data:

- a) Purpose of the test
- b) Components to be tested
- c) Test method
- d) Conditions under which the test is to be carried out
- e) Nomination of appropriate organization to certify tests
- f) Documentation foreseen / data to be recorded including at least
 - All procedural, equipment and calibration parameters sufficiently identified to provide a basis for comparison with later examinations.
 - A marked up drawing or sketch indicating the weld or part examined, the item or piece number, the datum points and co-ordinate conventions used for location, and other necessary identification information.
 - Tools and equipment used
 - Deviation request, if any
- i) An acceptance or rejection statement on the detected defects.

2.11 Failure of compliance

At the end of each test all the nonconformities and malfunctions shall be recorded and written in minutes and reports that shall be issued by the Contractor.

Any component which fails to comply with the requirements of this specification in any respect whatsoever at any stage of manufacture or test, may be rejected by purchaser.

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The Contractor shall propose and undertake all the necessary actions to resolve any possible problem in order to comply with all the requirements. After adjustment, modification or repair if so directed by purchase, the Contractor shall submit the item for further inspection and/or tests. Should the component fail under test to give the required performance, further tests which are considered necessary by purchaser shall be carried out by the Contractor and the whole cost of the complete test shall be borne by the Contractor.

- 2.12 Arrangement of Equipment, instruments, gauges, pumps, leak detectors etc. required for performing all kind of inspection, examination and testing shall be under the responsibility of Bidder.

3. Mandatory QA related documents


Document	Requirements to be followed
Quality Plan (QP)	Requirements for Producing a Quality Plan (ITER_D_22MFMW_v4.0)
Manufacturing and Inspection Plan (MIP)	Requirements for Producing a Manufacturing and Inspection Plan (ITER_D_22MDZD_v3.5 ITER_D_QV7GQF_v1.3)
Deviation request (DR)	Procedure for management of Deviation request (ITER_D_2LZJHB_v5.5)
Non-conformity report (NCR)	Procedure for management of Nonconformities (ITER_D_22F53X_v7.0)

4. Requirements for all acceptances

The Contractor is responsible for ensuring all items conform to the contractual requirements as set out in this tender. The Contractor shall ensure that the items are in line with regulatory requirements and documentation.

Acceptance of the results, tests and certificates does not relieve the Contractor of the responsibility for compliance with all contractual requirements.

Any discrepancy with contractual requirements observed during receipt of components will be recorded. If the Contractor is responsible for any reported non-compliance, it is the duty of the Contractor to bear the cost of restoring all contractual requirements for the component.

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5. Factory acceptance Tests (FAT)

5.1 The Contractor shall make all components and parts available for final factory inspection for ITER-India and IO at the Contractor premises. Contractor shall submit acceptance procedure / Inspection Test Plan (ITP) for approval. The Inspection and Test Plan (ITP) see [65] shall include at minimum:

- the definition of the activities /inspection
- the definition of the procedure
- the criteria
- stakeholders/ participants
- record of results

5.2 ITER-India and IO's factory acceptance criteria (non-exhaustive) are:


- Conformance with requirements as set out in this tender; Approval of acceptance data backage
- Identification of the components and parts in the scope of supply
- Evidence of material traceability and material test reports for all materials being delivered.
- The main dimensions of the delivered components are checked before and after removal of clamps and pads.
- Control and verification of required tolerances
- The dimensional inspection of key features to identify possible part distortion.
- Control of stamping
- Checks of the final cleaning
- Successful completion of following Factory Acceptance Tests described in clause 5.3.
- Verification of packing provisions and transportation fixtures to ensure that the integrity of the component is preserved until arrival at the site.
- Factory acceptance shall take place after reviewing and checking the Manufacturing File. A certificate of compliance along with Release note as per format prescribed in ITER_D_22F52F is issued by the Contractor and counter signed by ITER-India and IO.

5.3 Tests to be performed as a part of Factory acceptance test:

5.3.1 Dimensional Check

As per Annexure 11_Dimensional Inspection.

5.3.2 Assembly Test (Applicable only for HNB3 Vessel)

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The supplier shall define in the manufacturing drawings, part of the MRR for ITER-India / IO approval, the welded interface and tolerances between the BLV and BSV according to assembly drawing criteria.

The butt weld geometry (the bevel) between BLV and BSV shall be studied, analysed in term of weldability, distortion, NDE control and defined (including the bevel geometry) in the manufacturing drawings.

A report shall be provided, for IO approval, on the study of the geometry (the bevel) chosen for the weld between the BLV and BSV.

The weld joint between BLV and BSV shall be final machined on Supplier premises, as defined in the Accepted 2D Manufacturing Drawings, before final delivery to ITER.

The BLV and its corresponding BSV shall be presented, before and after final machining of the weld joint, ensuring the final weld joint geometry and matching surfaces are well aligned all along the perimeter and so ensuring the feasibility of the weld during the on-site assembly (not in the scope of this Tender).

If the requirement above cannot be performed due to workshop constraints, dimensional Measurement Campaign (laser tracker) shall be performed on the flanges interfacing the BLV and BSV, before and after final machining of the weld joint, ensuring the final weld joint geometry and matching surfaces are well aligned all along the perimeter and so insuring the feasibility of the weld during the on-site assembly (not in the scope of this Tender).

5.3.3 Visual Examination


Visual inspections required by the weld inspection for the DNB Vessel and HNB3 Vessel shall be performed according to **Annexure 6F_Production** welds.

Visual inspection shall be done to verify the general condition of the components and subassemblies and to identify possible defect or damage.

This control shall mainly focus on the finishing and cleanliness of the surfaces exposed to vacuum or in contact with the metallic seals.

Bidder shall provide a Technical Specification document / procedure describing how the visual surfaces will be examined.

The visible surface shall be classified according to standards EN ISO 8785:1999.

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Quality assurance requirements shall be clearly identified (qualification of person, work place for quality control, size of observation surface...)

The quality assurance procedure shall be defined and submitted to ITER-India / IO for review.

The final visual examination shall be done for the 2 following phases:

- After cleaning and before the leak tests of the DNB Vessel and HNB3 Vessel
- Before packing

5.3.4 Leak Testing

5.3.4.1 General

For HNB3 Vessel: The BLV, BSV and the instrumentation feedthrough box shall be leak tested independently after manufacturing. See 5.3.4.2 below for details. Dedicated procedures shall be developed for each of the leak tests identified in 5.3.4.2 in accordance with the **Annexure 10_Leak Testing**. The same shall be provided to ITER-India / IO for approval.

For DNB Vessel: The DNB Vessel main shell and the instrumentation feed through box shall be leak tested independently after manufacturing. See 5.3.4.3 for details. Dedicated procedures shall be developed for each of the leak tests identified in 5.3.4.3 in accordance with the **Annexure 10_Leak Testing**. The same shall be provided to ITER-India / IO for approval.

These tests aim at validating the leak tightness of all the vacuum boundaries.

Before vacuum leak test, all vacuum surfaces shall be cleaned (**Annexure 7_Cleaning and Cleanliness**).

The vacuum leak test shall be witnessed by ITER-India and IO.


The vacuum leak test results shall be added to the Acceptance Data Package.

5.3.4.2 Leak Tests for HNB3 Vessel

5.3.4.2.1 BLV

STAGE-1: Test with Viton Seal on the Top Lid

In order to perform the leak test on the BLV, all apertures (including cooling penetrations) shall be closed.

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All closure features (blank flanges) and their interfaces are part of the B-t-P package (B-t-P drawings).

One of the blank flanges or pipes shall be connected to the temporary vacuum system necessary for the vacuum test.

A blank flange shall be provided to close the Fast Shutter interfacing flange. The leak tightness of this interface (with Fast Shutter) shall use double Viton seals with a monitoring interspace.

The interface between the BLV and BSV shall be blanked by a closure flange. A dedicated interface solution has been designed to install these blank flanges; the leak tightness shall be ensured by two Viton seals with a monitored interspace.

The Top Lid shall be mounted. The leak tightness with the Top Lid shall be ensured by the double Viton seals with a pumping interspace.

The Cryopump flanges apertures shall be blanked by blank flanges (part of the B-t-P package) sealed with Helicoflex seals.


For the pipes connections without flange, an extra length shall be foreseen in order to weld a cap.

For the pipes connections with flanges (DN 150 and DN 250), standard blank flanges with Helicoflex seals shall be used to close the aperture.

All welds, interspaces connected to SVS, penetrations and of the volumes between seals shall also be vacuum tested with injection of helium gas on the non-vacuum pumped side.

All cooling penetrations shall be pressurized with helium gas at 26bars (nominal pressure values).

The maximum acceptable leak rate (from exterior atmosphere to internal vacuum) shall be less than 2×10^{-9} Pam³/s air equivalent

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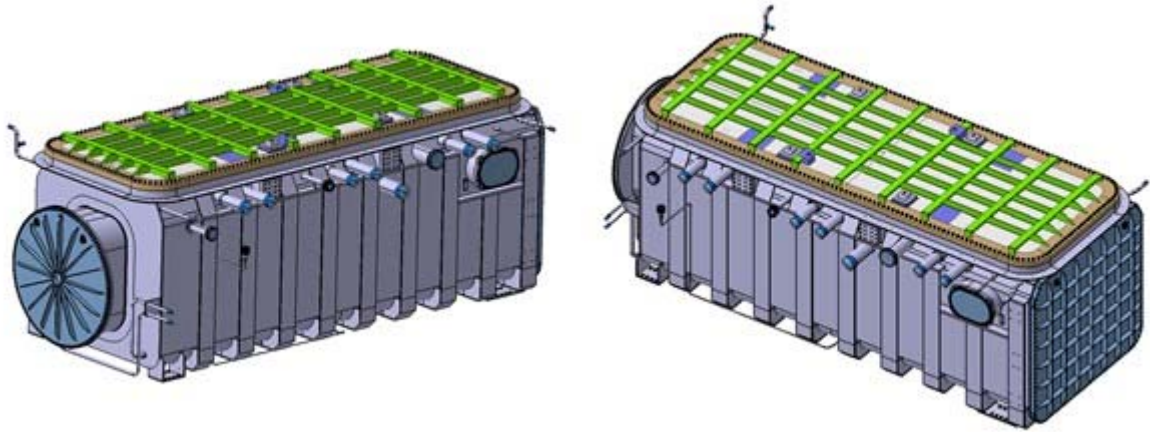


Figure 1: BLV prepared for leak testing

STAGE-2: Test with Helicoflex metallic seal on the Top Lid

After STAGE-1 of leak test on the BLV, the Viton seals interfacing with the Top Lid (for the BLV) shall be replaced by Metallic Helicoflex seals **under the supervision of ITER-India and IO / Technetics**. (This metallic seal shall be supplied to Bidder as a Free Issue). These tests aim at validating the leak tightness of the Helicoflex metallic seals and seats of the Top Lid.

Prior to initiating this activity, it is mandatory that bidder shall provide a procedure of assembly (including cleaning of the grooves) of the Metallic seals to ITER-India / IO for approval. Handling and assembly guidelines of metallic seals will be provided by IO through ITER-India before the start of the contract.


ITER-India and IO shall be witnessing the leak test with the metallic seals from preparation to conclusion.

Before performing the test, Bidder shall provide IO a dimensional report of the groove/ seats of the Metallic seals. Guidelines of sampling and features to be measured, if any, will be provided by IO through ITER-India before the start of the contract.

The dimensional report of the groove/ seats of the Metallic seals shall comply the tolerances and the surface finishing requirements (See Annexure 5_Fabrication).

The procedure of Metallic seals assembly and the dimensional report will be reviewed by ITER-India, IO and Technetics company.

The activities described in the STAGE-1 above shall be repeated as required.

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Bidder shall perform He leak test.

The volume between the metallic seals shall also be vacuum tested with injection of helium gas on the non-vacuum pumped side.

The maximum acceptable leak rate (from exterior atmosphere to internal vacuum) shall be less than 2×10^{-9} Pam³/s air equivalent.

In the conclusion of the tests:

- if the leak tightness meets the criteria (defined above) then the test is considered to be completed.
- If the leak tightness does not meet the criteria (defined above), and it is concluded among Bidder, INDA and IO teams that the technical reason for non-compliance of leak tightness is the metallic seal and seat design and/or the bolting design, then no further actions are to be carried out by Bidder on FAT. IO shall undertake remedial measures to ensure the compliance with the leak test requirements and conclude FAT. Post FAT, Bidder shall complete the remaining scope related the delivery (excluding the transportation) of the vessel to IO and SAT.

5.3.4.2.2 BSV

STAGE-1: Test with Viton Seal on the Read Lid

In order to perform the leak test on the BSV, all apertures (including cooling penetrations, draining, ...) shall be closed.


All closure features (blank flanges) and their interfaces are part of the B-t-P package (B-t-P drawings).

One of the blank flanges or pipes shall be connected to the temporary vacuum system necessary for the vacuum test.

A blank flange shall be provided to close the HV Bushing interfacing flange. The leak tightness of this interface (with HV bushing) shall use double Viton seals with a monitoring interspace.

The interface between the BLV and BSV shall be blanked by a closure flange. A dedicated interface solution has been designed to install these blank flanges; the leak tightness shall be ensured by two Viton seals with a monitored interspace.

The Rear Lid shall be mounted. The leak tightness with the Rear Lid shall be ensured by the double Viton seals with a pumping interspace.

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For the pipes connections without flange, an extra length shall be foreseen in order to weld a cap.

For the pipes connections with flanges (DN 150 and DN 250), standards blank flanges with Helicoflex seals shall be used to close the aperture.

All welds, interspaces connected to SVS, penetrations and of the volumes between seals shall also be vacuum tested with injection of helium gas on the non-vacuum pumped side.

All cooling penetrations shall be pressurized with helium gas at 26bars (nominal pressure values).

The maximum acceptable leak rate (from exterior atmosphere to internal vacuum) shall be less than 2×10^{-9} Pam³/s air equivalent.

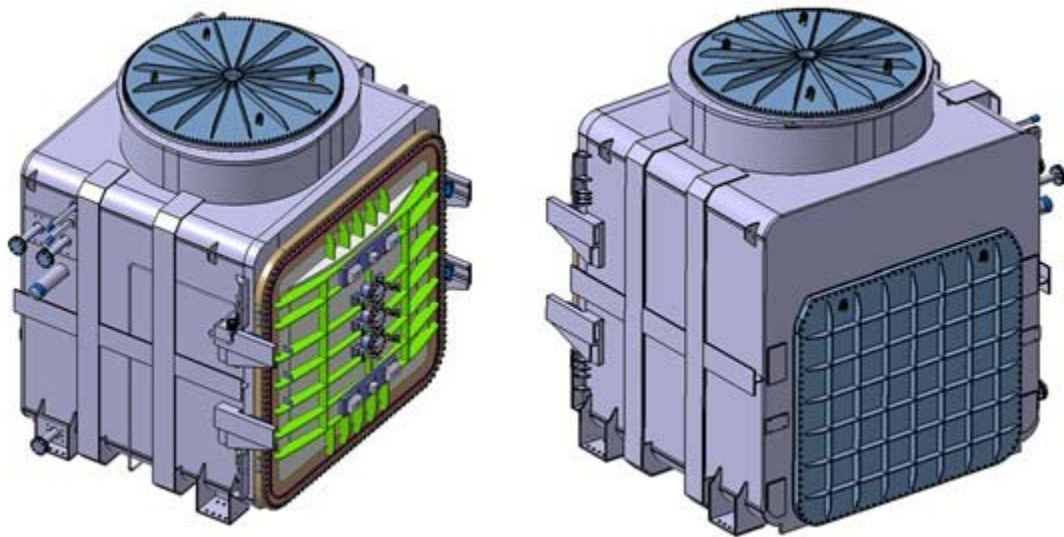



Figure 2: BSV prepared for leak testing

STAGE-2: Test with Helicoflex metallic seal on the Rear Lid

After STAGE-1 of leak test on the BSV, the Viton seals interfacing with the Rear Lid (for the BSV) shall be replaced by Metallic Helicoflex seals **under the supervision of ITER-India and IO / Technetics**. (This metallic seal shall be supplied to Bidder as a Free Issue). These tests aim at validating the leak tightness of the Helicoflex metallic seals and seats of the Rear Lid.

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Prior to initiating this activity, it is mandatory that bidder shall provide a procedure of assembly (including cleaning of the grooves) of the Metallic seals to ITER-India / IO for approval. Handling and assembly guidelines of metallic seals will be provided by IO through ITER-India before the start of the contract.

ITER-India and IO shall be witnessing the leak test with the metallic seals from preparation to conclusion.

Before performing the test, Bidder shall provide IO a dimensional report of the groove/ seats of the Metallic seals. Guidelines of sampling and features to be measured, if any, will be provided by IO through ITER-India before the start of the contract.

The dimensional report of the groove/ seats of the Metallic seals shall comply the tolerances and the surface finishing requirements (See Annexure 5_Fabrication).

The procedure of Metallic seals assembly and the dimensional report will be reviewed by ITER-India, IO and Technetics company.

The activities described in the STAGE-1 above shall be repeated as required.

Bidder shall perform He leak test.

The volume between the metallic seals shall also be vacuum tested with injection of helium gas on the non-vacuum pumped side.


The maximum acceptable leak rate (from exterior atmosphere to internal vacuum) shall be less than 2×10^{-9} Pam³/s air equivalent.

In the conclusion of the tests:

- if the leak tightness meets the criteria (defined above) then the test is considered to be completed.
- If the leak tightness does not meet the criteria (defined above), and it is concluded among Bidder, INDA and IO teams that the technical reason for non- compliance of leak tightness is the metallic seal and seat design and/or the bolting design, then no further actions are to be carried out by Bidder on FAT. IO shall undertake remedial measures to ensure the compliance with the leak test requirements and conclude FAT. Post FAT, Bidder shall complete the remaining scope related the delivery (excluding the transportation) of the vessel to IO and SAT.

5.3.4.2.3 Instrumentation feedthrough box

In order to perform the leak test on the Feedthrough Box, all apertures shall be closed.

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For the pipes connections without flange, an extra length shall be foreseen in order to weld a cap.

The leak tightness of the eight blank flanges shall be insured by Helicoflex seals with a pumping interspace.

One of the blank flanges or the pipe shall be connected to the temporary vacuum system necessary for the vacuum test.

All welds, interspaces connected to SVS, penetrations and of the volumes between seals shall also be vacuum tested with injection of helium gas on the non-vacuum pumped side.

The maximum acceptable leak rate (from exterior atmosphere to internal vacuum) shall be less than 1×10^{-9} Pam³/s air equivalent

- 5.3.4.2.4 After the leak testing, the backfilling of the BLV, BSV and instrumentation feedthrough boxes shall be done according to the requirements given in **Annexure 13.**

5.3.4.3 Leak Test for DNB Vessel

5.3.4.3.1 DNB Vessel

STAGE-1: Test with Viton Seal on the Top Lid

In order to perform the leak test on the DNB vessel, all apertures (including cooling penetrations, draining...) shall be closed.


All closure features (blank flanges) and their interfaces are part of the B-t-P package (B-t-P drawings).

One of the blank flanges or pipes shall be connected to the temporary vacuum system necessary for the vacuum test.

A blank flange shall be provided to close the Fast Shutter interfacing flange. The leak tightness of this interface (with Fast Shutter) shall use double Viton seals with a monitoring interspace.

A blank flange shall be provided to close the High Voltage Bushing (HVB) interfacing flange. The leak tightness of this interface (with HVB) shall use double Viton seals with a monitoring interspace.

The Top Lid shall be mounted. The leak tightness with the Top Lid shall be ensured by the double Viton seals with a pumping interspace.

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The Cryopump flanges apertures shall be blanked by blanks flanges (part of the B-t-P package) sealed with Helicoflex seals.

For the pipes connections without flange, an extra length shall be foreseen in order to weld a cap.

For the pipes connections with flanges, standards blank flanges with Helicoflex seals shall be used to close the aperture.

All welds, interspaces connected to SVS, penetrations and of the volumes between seals shall also be vacuum tested with injection of helium gas on the non-vacuum pumped side.

All cooling penetrations shall be pressurized with helium gas at 26bars (nominal pressure values).

The maximum acceptable leak rate (from exterior atmosphere to internal vacuum) shall be less than 2×10^{-9} Pam³/s air equivalent

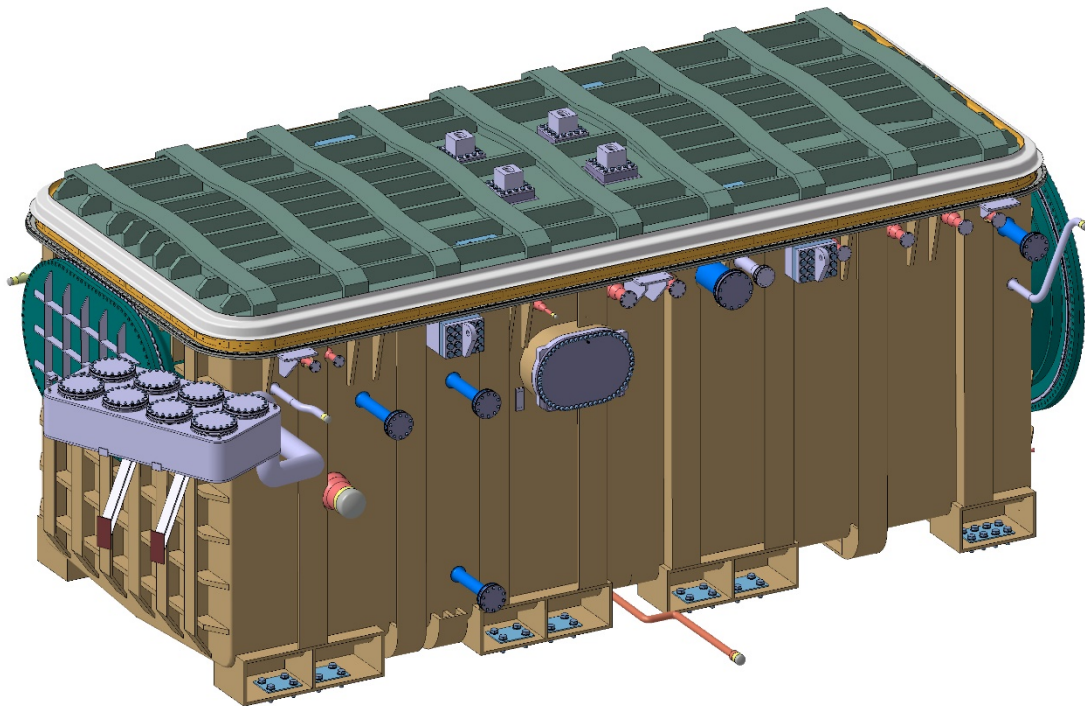



Figure 3 DNB Vessel prepared for leak testing:

STAGE-2: Test with Helicoflex metallic seal on the Top Lid

After STAGE-1 of leak test on the DNB Vessel, the Viton seals interfacing with the Top Lid shall be replaced by Metallic Helicoflex seals **under the supervision of ITER-India and IO**

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/ **Technetics.** (This metallic seal shall be supplied to Bidder as a Free Issue). These tests aim at validating the leak tightness of the Helicoflex metallic seals and seats of the Top Lid.

Prior to initiating this activity, it is mandatory that bidder shall provide a procedure of assembly (including cleaning of the grooves) of the Metallic seals to ITER-India / IO for approval. Handling and assembly guidelines of metallic seals will be provided by IO through ITER-India before the start of the contract.

ITER-India and IO shall be witnessing the leak test with the metallic seals from preparation to conclusion.

Before performing the test, Bidder shall provide IO a dimensional report of the groove/ seats of the Metallic seals. Guidelines of sampling and features to be measured, if any, will be provided by IO through ITER-India before the start of the contract.

The dimensional report of the groove/ seats of the Metallic seals shall comply the tolerances and the surface finishing requirements (See Annexure 5_Fabrication).

The procedure of Metallic seals assembly and the dimensional report will be reviewed by ITER-India, IO and Technetics company.

The activities described in the STAGE-1 above shall be repeated as required.


Bidder shall perform He leak test.

The volume between the metallic seals shall also be vacuum tested with injection of helium gas on the non-vacuum pumped side.

The maximum acceptable leak rate (from exterior atmosphere to internal vacuum) shall be less than 2×10^{-9} Pam³/s air equivalent.

In the conclusion of the tests:

- if the leak tightness meets the criteria (defined above) then the test is considered to be completed.
- If the leak tightness does not meet the criteria (defined above), and it is concluded among Bidder, INDA and IO teams that the technical reason for non- compliance of leak tightness is the metallic seal and seat design and/or the bolting design, then no further actions are to be carried out by Bidder on FAT. IO shall undertake remedial measures to ensure the compliance with the leak test requirements and conclude FAT. Post FAT, Bidder shall complete the remaining scope related the delivery (excluding the transportation) of the vessel to IO and SAT.

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5.3.4.3.2 Instrumentation feedthrough box

In order to perform the leak test on the Feedthrough Box, all apertures shall be closed.

For the pipes connections without flange, an extra length shall be foreseen in order to weld a cap.

The leak tightness of the eight blank flanges shall be insured by Helicoflex seals with a pumping interspace.

One of the blank flanges or the pipe shall be connected to the temporary vacuum system necessary for the vacuum test.

All welds, interspaces connected to SVS, penetrations and of the volumes between seals shall also be vacuum tested with injection of helium gas on the non-vacuum pumped side.

The maximum acceptable leak rate (from exterior atmosphere to internal vacuum) shall be less than 1×10^{-9} Pam³/s air equivalent

5.3.4.3.4 After the leak testing, the backfilling of the DNB Vessel, and instrumentation feedthrough boxes shall be done according to the requirements given in **Annexure 13.**

5.4 Factory acceptance test Final Report


Factory Acceptance Test Final Reports (separately for DNB Vessel and HNB3 Vessel) shall be provided by the Bidder to ITER-India and IO for acceptance at the end of the Factory Acceptance Test

6. Delivery acceptance after transportation to IO

TRANSPORTATION OF THE DNB VESSEL AND HNB3 VESSEL from supplier's premises to the ITER site is NOT in the scope of bidder. This will be taken care by ITER-India through separate contract under the Global Transportation Program with IO. Bidder in consultation with ITER-India shall deliver a Transport Delivery Report of each shipment, for IO acceptance

Upon receipt of the package, in presence of the carrier of the ITER-India, Bidder, ITER-India, IO will open the package(s) and make a visual inspection of its content to check:

- The integrity of the package(s), including identifying visible damage;
- The number and type of components contained in the package(s);
- The enclosed documentation;
- The integrity of the equipment supplied.

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- The reading of the accelerometers

In the case of anomalies, the IO representative will introduce the relevant additional remarks on the inspection report. If an inspection requirement is not passed, a non-conformance or deviation request shall be raised and submitted to the IO. If the equipment supplied is in an acceptable condition, the IO will sign the Delivery Report and accept the delivery.

If the accelerometers record shocks above 5g, a thorough inspection of the components will be performed by IO with presence of Bidder and ITER-India.

In the case whereby the components are in an acceptable condition and pass the checks, the ITER-India and the IO will jointly sign the Transport Delivery Report.

The signature of each of the Transport Delivery Report is an IO Hold Point.

The original of each Transport Delivery Report shall be kept by the IO.


A copy of each Transport Delivery Report shall be kept by the Bidder and ITER-India.

7. Site acceptance Tests (SAT)

- 7.1 Final acceptance of the DNB Vessel and HNB3 Vessel is done at the ITER site following delivery and execution of the IO Site Acceptance Test (SAT).
- 7.2 IO site Acceptance Testing will be carried out by IO under the responsibility of IO and with the participation of the Bidder and ITER-India, to verify that the Items are in accordance with this Technical specification.
- 7.3 ITER-India / IO inspects all components upon arrival at the ITER site and checks the physical state and Condition of the packing for possible damage during transportation. The IO will not open to the atmosphere the internal volume of the BLV, BSV and Instrumentation Feedthrough.

After Delivery Report has been signed (see Clause 4 of Annexure 13), IO will organize a SAT, as soon as practicable, for each of the BLV, BSV and Instrumentation Feedthrough:

- Checking of the back filled volumes including the backfilled internal sealed volume of the NB Vessels and refilling in case it is necessary.
- Check the external cleanliness and visual inspection
- Checking the integrity of packing and status of accelerometers. If the accelerometers record shocks above 5g, a thorough inspection of the components shall be performed.

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IO will fill-in a Site Acceptance Test (SAT) report that will be signed and commented (if needed) by the DA after completion of the above checks and counter signed by Bidder.

- 7.4 On completion of the incoming inspection any non-conformance with, or deviation from, the vacuum specification or this Handbook shall be raised in accordance Quality Requirements as per clause 3 of this annexure.

If any test or inspection prescribed in the present specification reveals a defect due to a fault or damage attributed to Contractor, the Contractor is required to provide an urgent repair or replacement of the faulty deliverable free of charge within mutually agreed time frame.

- 7.5 The Final Acceptance for the delivered components, alongside the transfer of ownership of the items, will be granted when:
- All the documentation described in Technical Specification is delivered to the IO.
 - All the tests described in this document are passed and report accepted
 - All the components are delivered at the ITER site and the Site Acceptance Test(s) (SAT) are passed.


In more detail, the Final Acceptance requires:

- Final Acceptance of Transport Delivery Report” (see Clause 4 of Annexure 13)
- The signature by the IO of the Delivery Report prior to shipment (see Clause 4 of Annexure 13)
- Acceptance of Cleaning Report
- Acceptance of the Metrology and Tolerances Final Report
- Acceptance of the Factory Acceptance Test Final Report
- Acceptance of the Final Report on the Tests during manufacturing
- Acceptance of the successful Site Acceptance Test(s) (SAT) report.
- As soon as all the above are met, IO will provide the Final Acceptance in writing to INDA without delay.
- Contractor Release Note

8. Right of Access

- 8.1 Right access to ITER-India and IO

The bidder shall inform ITER-India of all locations where contract is executed. Bidder shall further ensure that contracts include the rights of on-the-spot access to specified locations subject to the following provisions in this section.

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The bidder shall ensure that ITER-India's and IO's representatives are granted access to the premises of the bidder and its sub-contractors in order to witness on-site tests and critical fabrication operations, and to participate in periodic review meetings.

The bidder shall ensure that ITER-India and IO's representatives are granted access to the premises of the bidder and its sub-contractors at all reasonable times in order to carry out on-the-spot checks in addition to the tests foreseen in the technical specifications.

The bidder shall grant access rights to ITER-India, IO and regulatory body representatives to its facilities and records and those of its sub-contractors for the purpose of Quality Requirements.

In case of marked up interventions in the Manufacturing and Inspection Plan, it is the bidder's responsibility to ensure that adequate notice is given to ITER-India and IO. However, the bidder shall not bear any costs of such travel arrangements.

ITER-India shall agree with the bidder in advance of the appointed ITER-India and IO representatives who will participate in activities described in the preceding sections. The appointed ITER-India and IO representatives must always be accompanied by the bidder's representatives on their visits to the bidder's and/or its sub-contractor's premises unless otherwise agreed by the Parties. ITER-India and IO representatives shall be bound by appropriate confidentiality obligations to be agreed in advance.

8.2 Right of access of the Third Party Inspection Agency (TPIA), French Safety Authorities and/or Agreed Notified Body / Notified Body

For the supply of items under this tender, the bidder shall ensure that TPIA (Appointed by I-I and IO) are granted free and appropriate access to its and its sub- contractors facilities, where this item is being manufactured and to the records for surveillance, inspection, (including unscheduled inspections) or audit as requested by them in accordance with the applicable national laws and regulations. Where possible, such access shall be coordinated in advance with ITER-India.

For the supply of items under this tender, the bidder shall ensure that the French Safety Authorities and/or Agreed Notified Body / Notified Body are granted free and appropriate access to its and its sub-contractors facilities, where this item is being manufactured and to the records for surveillance, inspection, (including unscheduled inspections) or audit as requested by them in accordance with the applicable national laws and regulations. Where possible, such access shall be coordinated in advance with ITER-India and IO.