
	Manufacturing, testing and supply of vacuum vessels for HNB3 (Beam Line Vessel and Beam Source Vessel) and DNB <i>Annexure 13: Labelling, Packing, Handling and Shipping</i>	INDUS Ref No II-1BUFLP4- v1.1
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1. Scope

This annexure covers the requirements of Labelling, Packing for transportation, Handling and Shipping of the DNB Vessel.

2. Labelling and traceability of the DNB Vessel


Labelling shall be as per ITER Numbering System for Components and Parts (IDM UID 28QDBS) and Procedure for Identification and Item Control [U344WG v1.2], Procedure for Labelling on Physical Items (IDM UID VYJ7U2) to be provided by ITER-India along with this technical specification. Necessary information on the Functional Reference (FR) and Part Number of ITER (PNI) shall be provided by ITER-India on the Engineering Drawing. Serial Number (SN) shall be at the discretion of the manufacturer based on their internal numbering system.

3. Packaging and Handling of DNB Vessel and HNB3 Vessel


- 3.1 Components shall be packed with adequate protection from thermal or mechanical stresses, environmental exposure (as heat seal polyethylene) and transportation loads which may adversely affect the operation of the component. All packing shall be sealed and marked externally with the component VQC. Handling instructions shall also be clearly marked on the outside of the packaging. Chemical or radiological hazards, etc., shall be identified on the packaging. All such marking shall be in English and French.

The component shall be packed into dedicated transportation quality class 3 (QC-3) features.


- 3.2 All vacuum components shall be shipped dry internally and externally, irrespective of final acceptance testing at the supplier's site.
- 3.3 Aluminium foil is recommended for sealing pipe openings, and protective caps shall be fitted to flanges before packaging and sealing. Where it is not practical to enclose the components, e.g. due to size, all apertures must be sealed to prevent the ingress of contaminants during transit. Sealing surfaces shall be protected to prevent damage by scratching, impact, etc.
- 3.4 The use of adhesive tape for the protection and packaging of vacuum components shall be restricted to prevent the risk of contamination from the tape. In particular, tape used on austenitic stainless steel shall meet leachable chloride and fluoride limits of 15 ppm and 10 ppm, respectively. Where used, tape shall be fully removable leaving no residue, using isopropyl alcohol or acetone as the solvent to remove all traces of the adhesive.

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- 3.5 To prevent damage and possible contamination during transit, the packaging of components shall be done as soon as possible after acceptance testing and final cleaning at the supplier's premises. Cleaning and packaging operations may be witnessed by ITER-India and IO.
- 3.6 Vacuum components shall be handled as little as possible after final cleaning. All subsequent operations shall be carried out in clean conditions consistent with **Annexure 7_Cleaning and Cleanliness**.
- 3.7 In particular persons handling VQC 1 components shall wear clean powder-free latex or nitrile gloves (over cotton or linen gloves if desired) and, as a minimum, be dressed in clean white overalls. In the cases where the component is large (e.g. a vessel sector) and internal access is required, hair nets and clean overshoes over footwear specifically provided for use in the vacuum component shall be worn.
- 3.8 Volumes which have been pumped for leak testing (entire volume of the vessel, Instrumentation Feedthrough Box, SVS interspace, all penetrations (including cooling pipe)) shall be backfilled with dry nitrogen or air (<100 ppm H₂O) at a positive pressure of 0.12 MPa and valved off. Where the equipment allows manned access, air shall always be used. Where this is not practical, alternative conditions shall be accepted by the vacuum RO. A calibrated check relief valve and pressure gauge shall be installed on the vessels during this phase (up to the deliver) so it can be guaranteed that the pressure will never exceed the pressure value of 0.12 MPa. The installation of the relief valve and the pressure gauge shall be such that they are accessible for the monitoring and also protected from any possible damage during handling and transportation.
- 3.9 Where practical, vacuum components shall be entirely enclosed in heat sealed polyethylene for shipping. The polyethylene enclosure shall be purged and backfilled with dry air (<4000 ppm H₂O). Where this is not practical, alternative conditions shall be accepted by the vacuum RO.
- 3.10 Packing scheme used for DNB Vessel should be sea worthy and capable to avoiding any ingress during transportation. The Bidder shall be responsible for ensuring that the Items and associated transportation packaging satisfy the regulatory transportation requirements. In addition, ITER-India may ask other recommendations for packing which is to be implemented by the Bidder. This shall be approved by ITER-India before packing.
- 3.11 Number not in use

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- 3.12 All machined interfaces, sealing surfaces, flanges and welds preparations (if any) are to be protected against damage using temporary suitable arrangement/covers. Any damage observed on these surfaces shall be rectified or replaced by Bidder at free of cost.
- 3.13 All components shall be properly packed to prevent damage and properly fixed using metallic frame/ wooden boxes. Wooden boxes if used shall be sufficiently rigid to avoid deformation under the component weight. Supports for fixing the components shall avoid the potential for impact loading on the components due to sudden movements or accidental drop. Shock absorbing material shall be used between component and package.
- 3.14 Shrink Fit packing shall be carried out on DNB Vessel. Packing used to avoid humidity, should not be put outside the additional lugs, to avoid components getting exposed to the air even in case of packing damage on the lugs.
- 3.15 A packing list is to be issued and signed for dispatch prior to 3 months from the date of completion. Packing lists are to be numbered sequentially for each dispatch. One copy of the packing list is to be sheathed in a watertight envelope and fastened on the inside of the packing. **Package & Packing List Template (XBZLNG v2.0) (current)**.
- 3.16 Prior to packing each box, bidder shall ensure the completion of Delivery Readiness Review (DRR) (as per Working_Instruction_for_the_Delivery_Rea_ **X3NEGB_v2_0**) and a Delivery Report (Delivery_Report_Template_ **WZPYVZ_v2_6**) is prepared and approved by ITER-India and IO, , stating as a minimum:
- The packaging date;
 - The full address of the place of delivery and the name of the person responsible to receive the package, as well as of the sender's name and full address;
 - The number and type of components contained in the package;
 - Any additional relevant information on the status of the components.
- 3.17 Delivery Report shall be signed by a representative of the Bidder and ITER-India. It shall be countersigned by a representative of the IO. The signature by the IO of the Delivery Report prior to shipment represents a Hold Point (HP).
- 3.18 The following pieces of information shall permanently mark (in English) on the outside of the packing:
- ITER Organization and the ITER-India's name
 - The full address of the place of delivery and the name of the person responsible to receive the package, as well as of the sender's name and full address;

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- Origin of manufacture (country), and a brief description of the component
- Overall sizes of the package
- Gross weight including packing
- Weight of the component
- Centre of gravity in three planes
- The lifting points with the SWL (Safe working Load)

Such labelling and tagging shall be shared to ITER-India / IO before implementation for approval.

3.19 The Bidder shall install atleast two accelerometers on each package at suitable locations and rigidly fixed as per instructions provided by ITER-India. The accelerometers shall be capable of recording the acceleration along three perpendicular directions.

3.20 Regarding handling operation, all drawings showing techniques of lifting and safe securing including accelerometer location, together with test certificates of proof testing of any lifting equipment have to be documented. These documents records are to be forwarded to ITER-India for approval before proceeding. No handling is to take place until the ITER-India has approved the documentation package.

3.21 All packed components shall be stored in a covered and protected area to prevent any damage or erosion to packing.


3.22 HNB3 Vessel delivery:

The BLV, the BSV, and the Instrumentation Feedthrough box shall be shipped (as per packing requirements specified in this annexure) as three separate assemblies with all the openings closed. This means that after each of the vacuum leak test, the top lids, rear lids, closing blanks flanges, Viton seals, Helicoflex seals and welded cups, required to perform the leak test, will remain on each of the three parts.

SVS piping (see Bill of material SVS piping) can be transported in different parts by disconnecting them at the level of the connectors. They can also be temporary fitted on the BLV and BSV using their dedicated supports (which are also part of the procurement)

3.23 DNB Vessel delivery:

The DNB Vessel and the Instrumentation Feedthrough box shall be shipped (as per packing requirements specified in this annexure) as two separate assemblies with all the openings closed. This means that after each of the vacuum leak test, the top lids, closing

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blanks flanges, Viton seals, Helicoflex seals and welded cups, required to perform the leak test, will remain on both the parts.

SVS piping (see Bill of material SVS piping) can be transported in different parts by disconnecting them at the level of the connectors. They can also be temporary fitted on the DNB Vessel using their dedicated supports (which are also part of the procurement)

- 3.24 The NB Vessels parts shall be delivered in order to be held in storage conditions conforming to the requirements of ITER Vacuum Handbook. The supplier shall provide a guideline document for the storage.
- 3.25 The Supplier shall consider all the risks and the consequent safety rules to be adopted during all the phases of packing.
- 3.26 Bidder shall provide notice to ITER-India and IO in advance in order to organize a packing inspection on factory before the transportation.

4. Delivery Report

Prior to send each package, a Delivery Report shall be prepared by the supplier, stating as a minimum:

- Packaging date.
- Full address of the place of delivery and the name of the person responsible to receive the package, as well as of the sender's name and full address.
- Number and type of components contained in the package.
- The declaration of integrity of the package;
- The declaration of integrity of the components;
- Any additional relevant information on the status of the components.


The Delivery Report shall be signed by a representative of the ITER-India and Bidder.

The delivery report shall be countersigned by a representative of the IO-CT.

The signature by the IO-CT of the Delivery Report prior to shipment represents a Hold Point (HP).

5. Shipment, transportation and delivery to ITER site

- 4.1 Before the shipment, a Release Note shall be prepared in accordance with ITER Project Management and Quality Program related to the document **"Contractors Release Note"** and accepted by the ITER-India and IO.

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The Bidder shall submit all the required documents for shipment to ITER-India.

The transport fixture designed and manufactured by the Bidder shall be capable to withstand accelerations up to 5g during transportation from factory to ITER Site.

Refer **Procedure for Transportation of Components to ITER site (ITER UID RY5C6Q)**.

TRANSPORTATION OF THE DNB VESSEL AND HNB3 VESSEL from supplier's premises to the Indian Port shall be in the scope of Bidder (FCA Port; INCOTERMS 2020). Shipment from that port to 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. Refer Section A of tender for more details of the transportation responsibilities.

IO will be responsible for unloading at site.