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Technical Specifications (In-Cash Procurement)

Summary Technical Specifications for Supply of VV Lifting and Transport Frames

This summary technical specification provides high-level requirements for the supply of VV Lifting and Transport Frame

Contents

1. Terms and Definitions

Term	Acronym
Assembly Hall	AH
Centre of Gravity	CoG
Self-Propelled Modular Transporter	SPMT
Vacuum Vessel	VV
Lifting Frame	LF
Transport Frame	TF
Stability Blocks	SB

2. Introduction

The purpose of this document is to provide the high-level requirements for Supply of Transport Frames and Lifting Frames for Vacuum Vessel Sectors. This document is intended to provide summary specifications only, the detailed requirements will be provided at the time of full tender package issuance.

Lifting frame (LF) is designed to be able to lift up and keep the structural integrity of the VV it interface VV Sector by means of support pads and Stability blocks and with the Transport Frame, as shown on the picture below.

The Transport Frame (TF) is a different set of sub-frame designed to be able to support and maintain the integrity of the entire lifting frame and vacuum vessel in its full structure during transport operations.

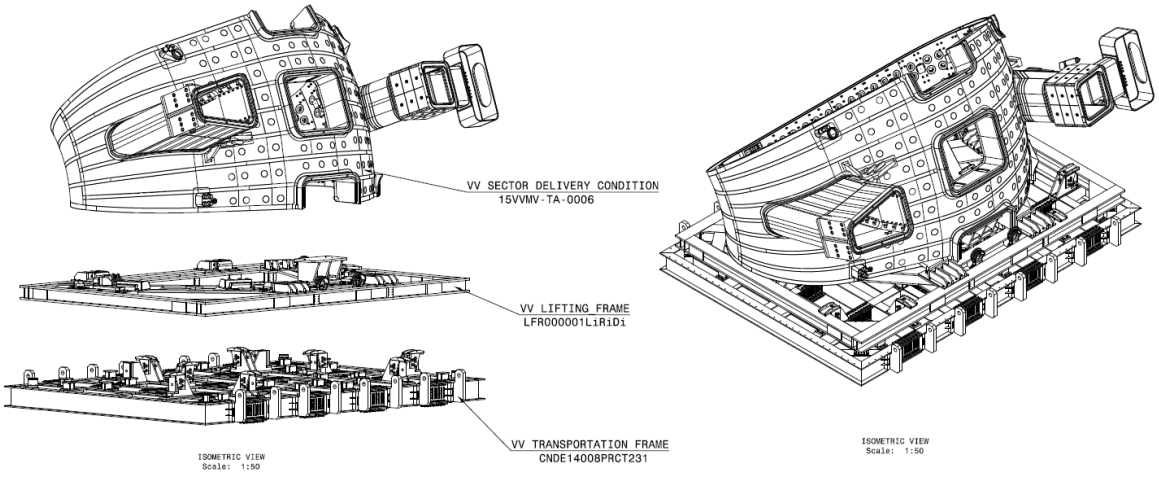

Figure 1: Assembly configuration of VV, LF and TF.

3. Design Description

The LF (Figure 2) is a set of different sub frame designed to be able to lift up and keep the structural integrity of the vacuum vessel. The material selected for all components is carbon steel (S355JR or SM490YB). All treatments applied to selected materials are described in “Material Specification” section.

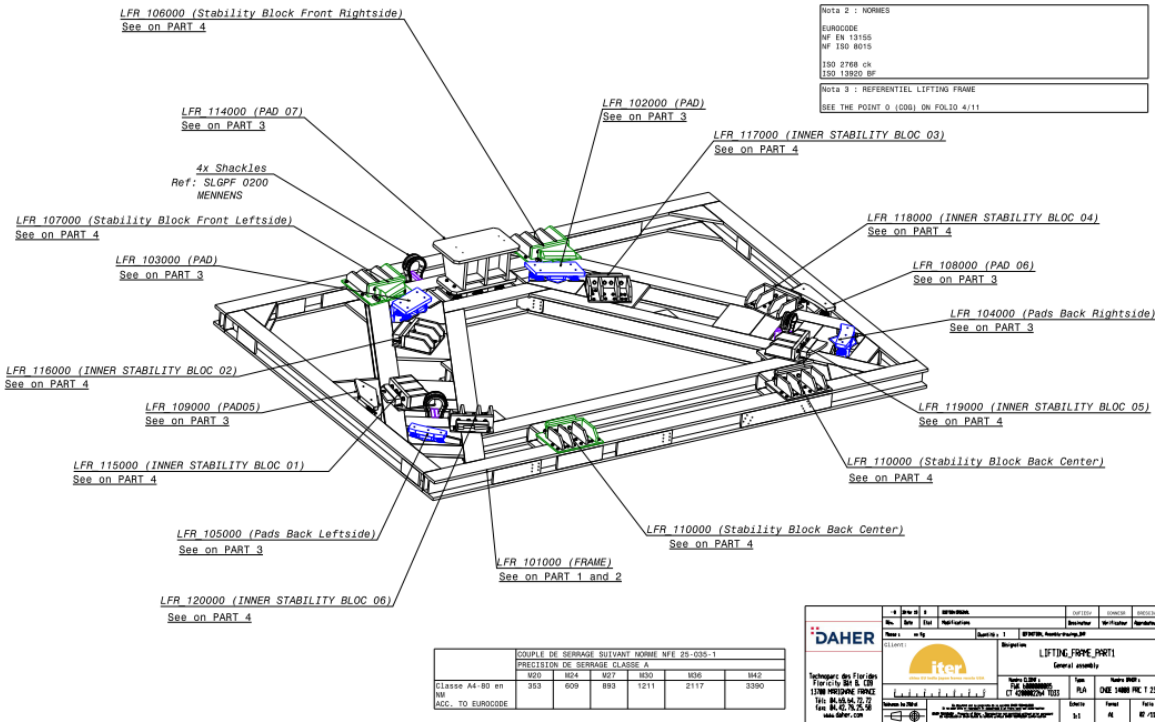

Figure 2: Lifting Frame

The TF constitutes the interface between the lifting frame and the transport means such as the boat, the trailer or stillage’s for storage. The material selected for all components is carbon steel (S355JR or SM490YB)

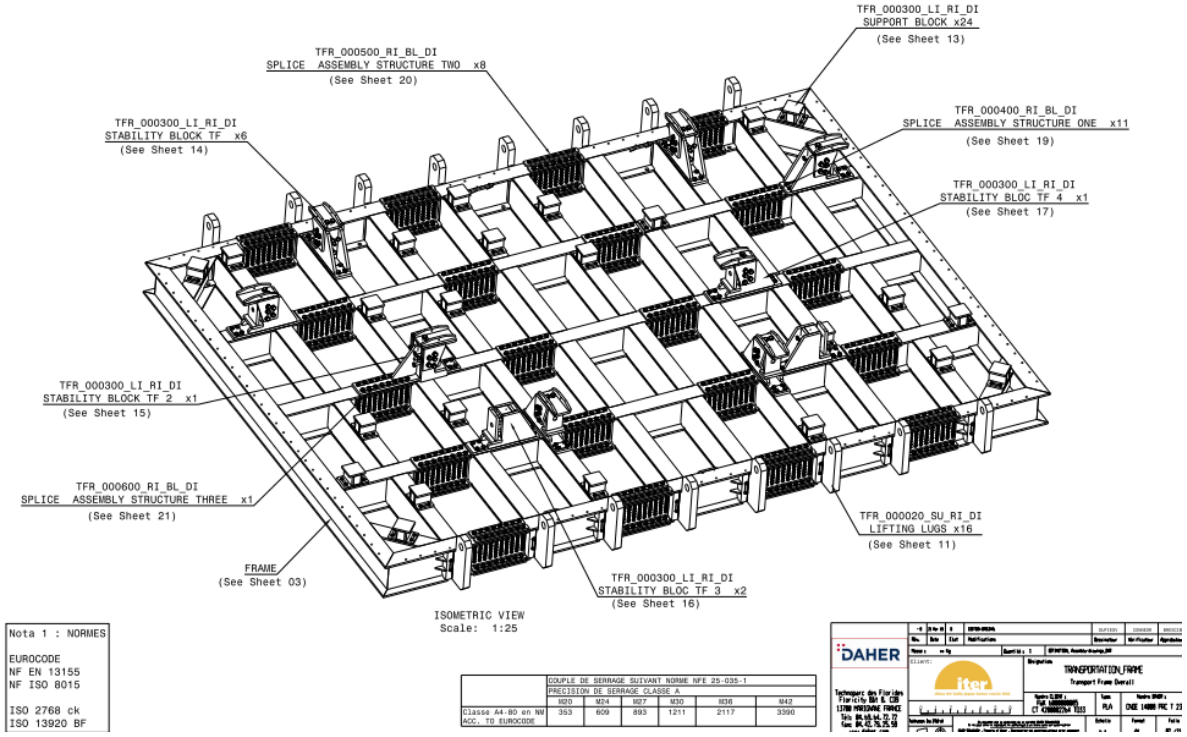

Figure 3: Transport Frame

To see the complete manufacturing drawing of the TF and LF, see Ref [5].

3.1. TF Structure

The TF structure is composed of five beams in one direction and 10 in the other divided into five transversal structures.

- Three identical structures in the centre, spliced by plates and multiple bolts.
- Two identical structures: one at each end.
- other equipment such as support block, stability block and lifting lugs

Each one of the centre structures in detail:

- Length 9000 mm
- Width 2700 mm.

Each one of the side structures in detail:

- Length 9000 mm
- Width 2200 mm.

Subsets are made in standard H-type profiles. Here, the standard beam HE650B was chosen.
Detailed profiles:

- height 650 mm
- width 300 mm
- Sections in 16 mm
- Blade thickness 31 mm

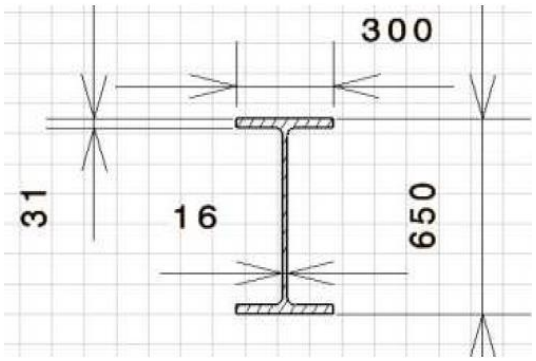

Figure 4: Section of the beam

3.2. TF Dimension

Transport frame dimensions are (with lifting lugs):

- Length: 12 500 mm
- Width: 9816 mm
- Height: 650 mm (only the beam) and 1543 mm (overall).

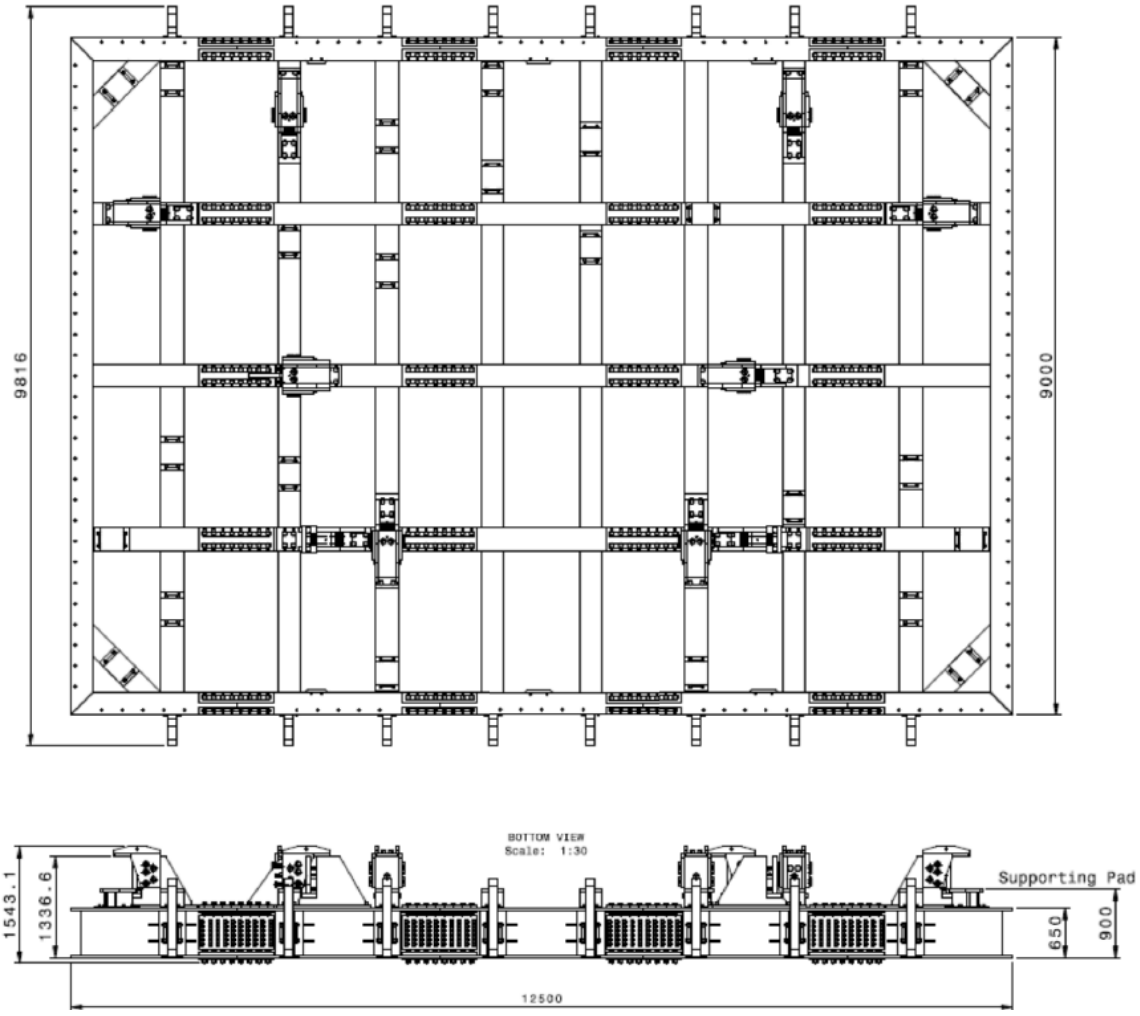

Figure 5: Overall dimension of the TF

The entire subassembly structure beam is welded by full penetration

3.3. TF Mass

The mass of the complete transport frame is: 160 tonnes

3.4. LF Structure

The LF structure is composed of:

- Four longitudinal structures
- Two transverse beams structures,
- Other equipment such as Pads, Stability blocks, Lifting lugs
- Hydraulic jacks (defined by IO)

Subsets are made in standard H-type profiles:

- Height: 436.6mm
- Width: 412.2mm
- Sections: 35.8mm
- Blade thickness 58 mm

The Figure 6 represents a section of the beam.

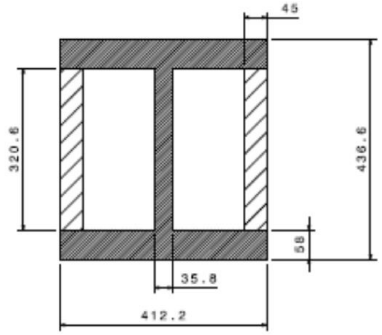

Figure 6: Beam structure

The entire subassembly structure beam is welded by full penetration.

Each one of the main structure in detail:
Main Structure :

- L=11800 mm length and H beam 436.6x412.2mm section
- L=7480 mm length and H beam 436.6x412.2mm section

Each subset is made of welded profiles reconstituted (PRS in French)
Some welded profiles reconstituted of the front and back structure are reinforced.
The reinforcement has been done around the pad position and the surface where the load is applied.

3.5. LF Dimension

The overall dimensions of the lifting frame are (without lifting lugs):

- Length: 11800 mm
- Width: 8300 mm
- Height: 436.6 mm (only the beam) and 1324 mm (overall).

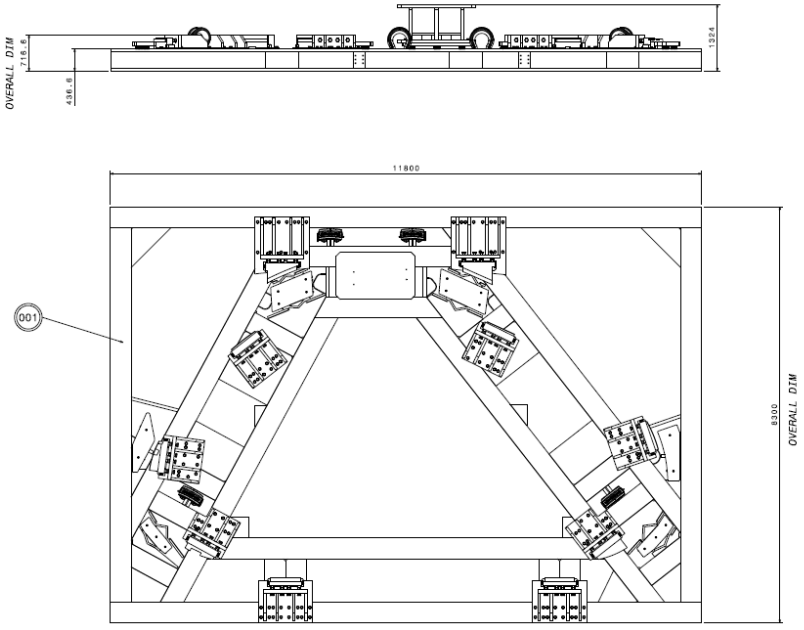

Figure 7: Overall Dimension of the LF

3.6. LF Mass

The mass of the complete lifting frame is 75 tonnes

4. Technical Requirements

4.1. Material specification

The manufacturer must be certified ISO9001: 2008 or have a quality system compliant with ISO 9001 approved by IO.

All the requirements described below must be done and respected for the SM490YB or equivalent procurement.

The material chosen must respect the norms and standards:

- Of the rolled products
- Of the different standard profiles.

Component	Part	Material	Treatment
Transport Frame	Structure (Build-up beam)	SM490YB/S355K2(+N) (1.0595)	Painting (1)
	Support blocks	SM490YB/S355K2(+N) (1.0595)	Painting (1)
	Stability Blocks (Clamps)	SM490YB/S355K2(+N) (1.0595)	Painting (1)
	Fastening	Carbon Steel/SS (Grade 10.9)	Coating to prevent corrosion. e.g. GEOMET 720
Lifting Frame	Structure (Build-up beam)	SM490YB/S355K2(+N) (1.0595)	Painting (1)
	Pads	SM490YB/S355K2(+N) (1.0595)	Painting (1)
	Stability Blocks	SM490YB/S355K2(+N) (1.0595)	Painting (1)
	Part in contact on VV	Ertalon 6SA	
	Lugs for Lashing	RUD type ABA20	
	Fastening	Carbon Steel/SS (Grade 10.9)	Coating to prevent corrosion. e.g. GEOMET 720
	Hydraulic Jacks	Euro Press Pack MODEL: COG100N144FX	

(1) Painting will be applied as shown below or similar.
- Shot blast: sweep blast (shop primer)
- 1st: EP170-1105 (blue gray) 50µm
- 2nd: LT313-1128 (gray) 50µm

4.2. Welding

The acceptance criteria for weld imperfections shall be EN ISO 5817 quality class C,

Quality class D for

- "Undercut" (5011, 5012),
- "Overlap" (506),
- "Stay arc" (601)
- "End crater pipe" (2025)

Not to be taken into account are;

- "Incorrect toe" (505)
- "Micro lack of fusion" (401)

All welds shall be performed based on the requirements of EN 1993 Eurocode3 and EN 1090 (Execution class 2). The welding procedures, qualification of welders, welding and welding defects shall be evaluated by the EN ISO standards.

The manufacturer shall prepare the WPS base on the associated section of the EN ISO standards. The bevel shape of welds zones shall be prepared beforehand according to WPS and approved manufacturing drawings. The bevel angle shall be in the range that is not affecting the welding quality by lack of penetrations.

4.3. Non-Destructive Testing

All welds shall be inspected by visual test (also at the interpass) and surface examination according to EN ISO 5817-level C.

Personnel who perform NDE shall be certified and qualified in accordance NDE Level 2 or 3. All NDE procedures shall be written at minimum by a NDE level 2 and approved by a NDE level 3 with a good knowledge of the selected techniques.

Standards to be use for personal qualifications shall be ISO 9712 or similar (SNT-TC-1A).

Detail of NDE method to be performed on the welds to be defined at final Technical Specification.

4.4. Technical File for Machinery

According to the Article 2 of the Machinery Directive, lifting accessory means a component or equipment not attached to the lifting machinery, allowing the load to be held, which is placed between the machinery and the load or on the load itself, or which is intended to constitute an integral part of the load and which is independently placed on the market.

As such the LF is considered a Lifting Accessory. Thus the LF provided by the Manufacturer is subject to CE Marking according to the Machinery Directive.

In order to obtain the CE marking, a technical file for machinery must be compiled by the manufacturer. This file must demonstrate that the LF is compliant with the Directive requirements. Even though the manufacturer is responsible for this file, the technical file covers design, manufacturing and operation

of the LF. That's why, the elements of the technical file that cover design will also be provided by the ITER organization.

4.5. Codes and standards

- EN 10204 type 3.1 - for material inspection documents;
- EN1993 (Eurocode 3) - for design of steel structures;
- EN 1090 – for manufacturing.

In case if use of national standards other than mentioned above, manufacturer shall demonstrate in technical assessment, note the equivalence to harmonized European standards.

5. Responsibility

Main activities of the Supplier are:

- Preparation and submission for APPROVAL of a Manufacturing Dossier to ensure compliance with specifications and requirements
- Procurement and supply of structural steel and other material necessary to complete the Work
- Fabrication of Lifting Frame and Transport Frame and related parts (including NDT, labelling and painting)
- Factory Acceptance Test
- Delivery of the LF* and TF to ITER site
- Final documentation

*Due to dimension of the frame a manufacturing plan that include completion of the main frame at IO could be envisage. Load test for CE marking of LF could be envisage at IO premises, considering that contractor shall keep responsibility upon load test results.

6. Delivery Schedule

The supplier shall develop a detailed schedule and a MIP (Manufacturing and Inspection Plan). A first issue of both documents will be provided at the tender stage and a consolidated version will be issued at the kick off meeting.

The deliverables and due dates are listed in Table below:

	Deliverables	Due Time
	Contract Signature	T0
1	Kick off Meeting • Schedule	T1 (no later than 1 month after contract signature)
2	**MRR** (see note) • Presentation material for the MRR • Schedule for the manufacturing phase	T1 + 4 weeks
3	**Manufacturing and assembly of the components** • Manufacture dossier of the TF and LF components • Non Conformity Request (if required)	T1 + 18 weeks

	• Verification of the functionalities of the TF and LF (FAT)	
4	**Delivery to IO site** Verification of the functionalities of the Tool SAT	T1+20 Weeks

Note: All documents shall be delivered, stored in IO IDM and approved by IO

7. Reference Documents

[1] CNDE 14008 PRC T 230 - LIFTING_FRAME_PART1 ITER_D_ YDAG2U

[2] CNDE 14008 PRC T 230 - LIFTING_FRAME_PART2 ITER_D_ YDTFQH

[3] CNDE 14008 PRC T 230 - LIFTING_FRAME_PART3 ITER_D_ YDU4CQ

[4] CNDE 14008 PRC T 230 - LIFTING_FRAME_PART4 ITER_D_YEZ7YZ

[5] ITER-HHI-VM-0614-02 Manufacturing drawings of TF and LF. ITER_D_ YMEBNA v1.8

[6] EUROCODES 3 - NF EN 1993 - Design of steel structures

[7] 2006/42/CE Machinery directive 2006