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| IDM UID 8U78TH |
| VERSION CREATED ON / VERSION / STATUS 29 Mar 2023 / 2.1 / Approved |
| EXTERNAL REFERENCE / VERSION |

Report

Arrangement 5 - CVNB Resin trap(26CVNB-FI-5305/5315) Equipment Summary

This document provides a summary of CVNB Resin trap(26CVNB-FI-5305/5315). Since the fluid is nitrogen during maintenance (water flashing with nitrogen), fluid type is Gas /Group 2.

| <i>Approval Process</i> | | | |
|--|--|--------------------------------|---|
| | <i>Name</i> | <i>Action</i> | <i>Affiliation</i> |
| <i>Author</i> | Kanda K. | 29 Mar 2023:signed | IO/DG/CNST/PLD/MID/TCWS |
| <i>Co-Authors</i> | West S. | 30 Mar 2023:signed | IO/DG/CNST/PLD/MID/TCWS |
| <i>Reviewers</i> | Berruyer F. | 01 Apr 2023:recommended | IO/DG/CNST/PLD/MID/TCWS |
| | Ciampichetti A. | 04 Apr 2023:recommended | IO/DG/CNST/PLD/MID/CMW |
| | Gao J. | 06 Apr 2023:recommended | IO/DG/CORP/FPD/PCD/CAL |
| | Ghirelli N. | 06 Apr 2023:recommended | IO/DG/CNST/PLD/MID/TCWS |
| | Ricou E. | 05 Apr 2023:recommended | IO/DG/CNST/PLD/MID/TCWS |
| | Van hove W. | 31 Mar 2023:recommended | ORNL - Oak Ridge National Laborator... |
| <i>Approver</i> | Lioce D. | 07 Apr 2023:approved | IO/DG/CNST/PLD/MID/TCWS |
| <i>Document Security: Internal Use</i> | | | |
| <i>RO: Lioce Donato</i> | | | |
| <i>Read Access</i> | LG: Arrangement 5 Cost Estimation, LG: USDA Arrangement 5, LG: Management, GG: IO DDGs (and Senior Advisors), AD: IO_Director-General, AD: External Management Advisory Board, AD: OBS - Project Control Office (PCO), AD: IDM_Controller, AD: OBS - Procurement & Contracts Division (PCD), AD: Auditors, p... | | |

Change Log

Arrangement 5 - CVNB Resin trap(26CVNB-FI-5305/5315) Equipment Summary (8U78TH)

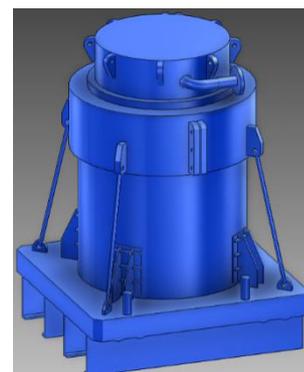
| <i>Version</i> | <i>Latest Status</i> | <i>Issue Date</i> | <i>Description of Change</i> |
|----------------|----------------------|-------------------|--|
| v0.0 | In Work | 10 Mar 2023 | |
| v1.0 | Signed | 13 Mar 2023 | The first version for review. |
| v2.0 | Signed | 27 Mar 2023 | Updated based on the reviewer's comment. |
| v2.1 | Approved | 29 Mar 2023 | Updated based on the reviewer's comment. The native word file with revision track with respect to the first version is attached. |

OPERATIONAL NARRATIVE

CVNB Resin trap is a coarse filter which captures entrained resin particle from demineralier of NBI (Neutral Beam Injector) CVCS (Chemistry and Volume Control System) during plasma operation, in order to control water quality.

Disclaimer:

- Contents of this document have been assembled, reviewed and approved as for Information Only,
- May not be used for purchasing, fabrication or construction,
- May not be used as verified input to any document (may be used as unverified assumption).

**PHYSICAL ATTRIBUTES**

| | |
|---|---|
| <i>Commodity Type:</i> | Pre-confined Mechanical filter |
| <i>Number of equipment:</i> | 2 (installed in parallel) |
| <i>Approx. Footprint:</i> | 1.5 m x 1.5 m |
| <i>Approx. Height:</i> | 1.3 m |
| <i>Approx. Weight:</i> | 10 000 kg (wet) |
| <i>Material (Housing and filter element):</i> | 304L or 316L with composition requirement: cobalt <0.20 wt%, Niobium < 0.1 wt% and Tantalum < 0.05 wt%. |
| <i>Anchoring system</i> | EP / rollers and pin lock |
| <i>Component configuration</i> | Mounted on baseplate |
| <i>Design Life Time:</i> | 20 years |

WBS: Chemical & Volume Control System

PBS: 26CVNB / GBS: 11-L4-04

Functional Reference: 26CVNB-FI-5305/5315

REFERENCE DOCUMENTSSizing calculation: ITER_D_UDKM38_v2.0,
ITER_D_WVZ79G_v7.4

PID: ITER_D_XJ36P5_v2.3

ENVIRONMENTAL CONDITIONS

| | |
|---|----------------|
| <i>Integrated Dose Rate 20yrs:</i> | ≤ 200 Gy |
| <i>Magnetic Field:</i> | ≤ 105 mT |
| <i>Normal temperature</i> | 5 – 35 °C |
| <i>Normal Humidity</i> | 40 – 60 % |
| <i>Normal Pressure relative to atm:</i> | -0.14 kPa |
| <i>Accidental Temperature</i> | 130 °C |
| <i>Accidental Pressure relative to atm:</i> | -5 to +100 kPa |
| <i>Accidental Humidity</i> | 100 % |

DESIGN CODES AND SHIPPING

| | |
|--|--|
| <i>French Law Pressure Category / Nuclear Class:</i> | ESPN /IV / N3 |
| <i>European Law:</i> | PED |
| <i>Fluid Type / Fluid group</i> | Gas / Group 2 |
| <i>Conformity Assessment Module:</i> | IV, module G |
| <i>Construction Codes:</i> | ASME VIII Div2 |
| <i>Safety Class:</i> | SIC-1 |
| <i>Quality Class:</i> | QC-1 |
| <i>Seismic Class:</i> | SC1 (S) |
| <i>Fire:</i> | Eurocode 2h |
| <i>Shipping Information:</i> | Oversea packing per ASME NQA-1 Level C, DAP at ITER site |

PARAMETERS

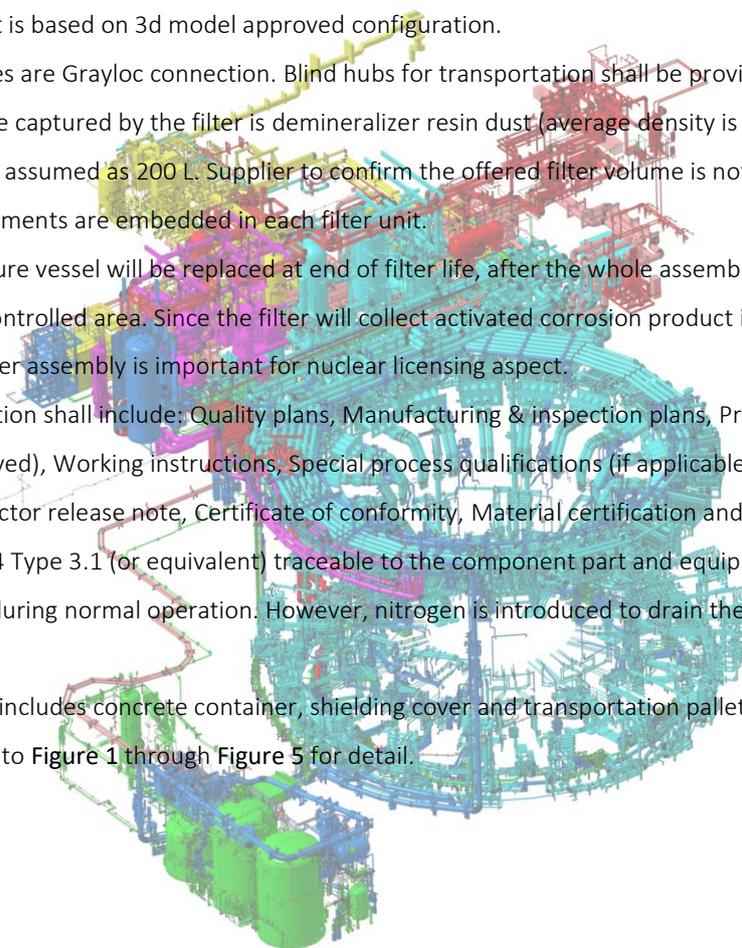
| Parameter | Value |
|---|----------------------------|
| Nominal Temperature (°C) | 38 |
| Design Temperature (°C) | 100 |
| Nominal Pressure (MPa) | 0.40 |
| Design Pressure (MPa) | 2.60 |
| Nominal mass flowrate (kg/s) | 10 (each) |
| Process fluid | Demineralized Water |
| Filtration performance | 225 µm @ 98% efficiency |
| Contained radiation level (GBq) | <1 |
| Allowable Pressure Drop @ fouled condition (kPa) | 350 |
| Thermal insulation thickness (mm) | 50 |

NOZZLE SCHEDULE

| I.D. | DN / Schedule | Service |
|------|---------------|---------|
| N1 | 65 / 40S | Inlet |
| N2 | 65 / 40S | Outlet |

Notes:

1. Approximate footprint is based on 3d model approved configuration.
2. Inlet and Outlet nozzles are Grayloc connection. Blind hubs for transportation shall be provided.
3. Expected particle to be captured by the filter is demineralizer resin dust (average density is 7200 kg/m³).
4. Volume of one filter is assumed as 200 L. Supplier to confirm the offered filter volume is not exceeding 200 L.
5. We assume 6 filter elements are embedded in each filter unit.
6. The whole filter pressure vessel will be replaced at end of filter life, after the whole assembly including transportation pallet is moved to a controlled area. Since the filter will collect activated corrosion product in the primary circuit, the qualification of the filter assembly is important for nuclear licensing aspect.
7. Minimum documentation shall include: Quality plans, Manufacturing & inspection plans, Procedures, Calculation note (where design is involved), Working instructions, Special process qualifications (if applicable), Operator qualifications, As-built drawings, Contractor release note, Certificate of conformity, Material certification and inspection documents according to EN 10204 Type 3.1 (or equivalent) traceable to the component part and equipment.
8. Service fluid is water during normal operation. However, nitrogen is introduced to drain the remaining water before the filter replacement.
9. The scope of Supplier includes concrete container, shielding cover and transportation pallet, as well as filter housing pressure vessel. Refer to Figure 1 through Figure 5 for detail.



CVBD – Resin Trap (26CVNB-FI-5305/5315)

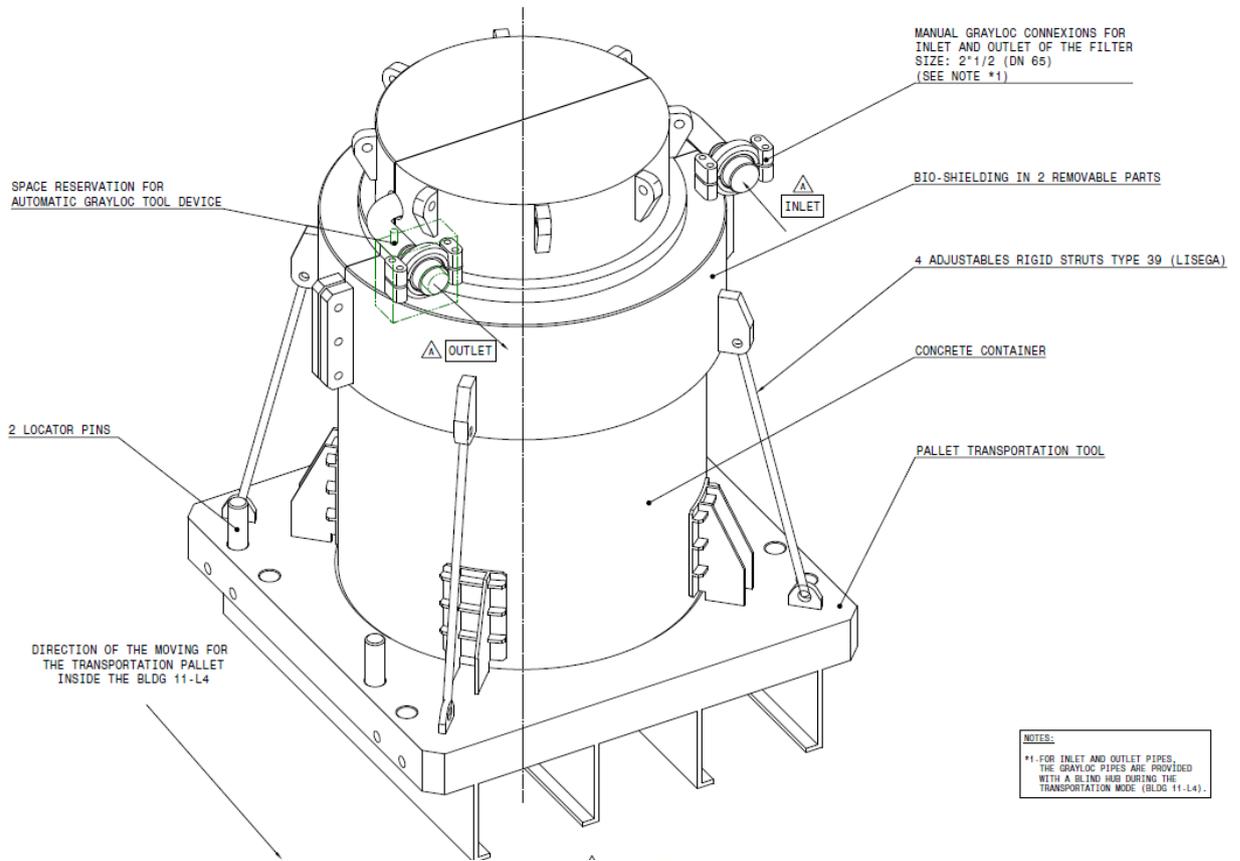
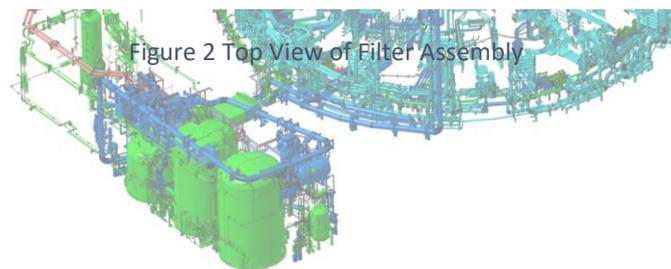
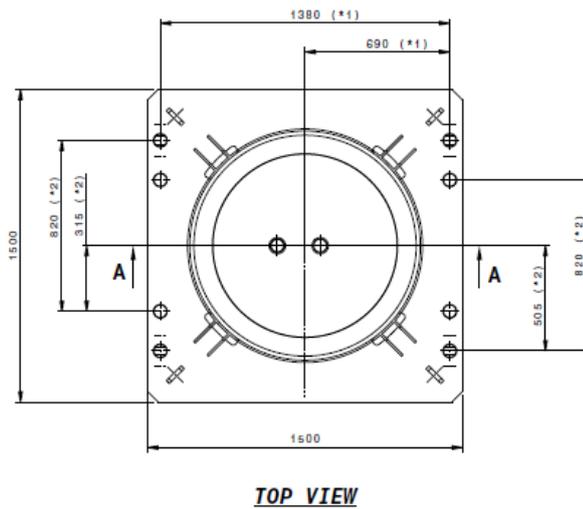


Figure 1 Isometric View of Filter Assembly



CVBD – Resin Trap (26CVNB-FI-5305/5315)

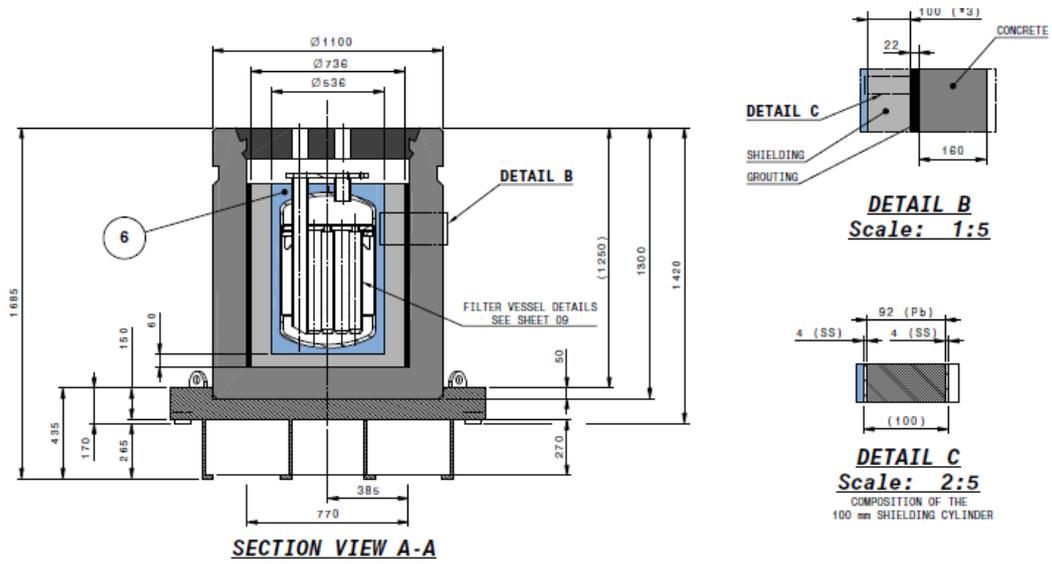


Figure 3 Section View of Filter Assembly

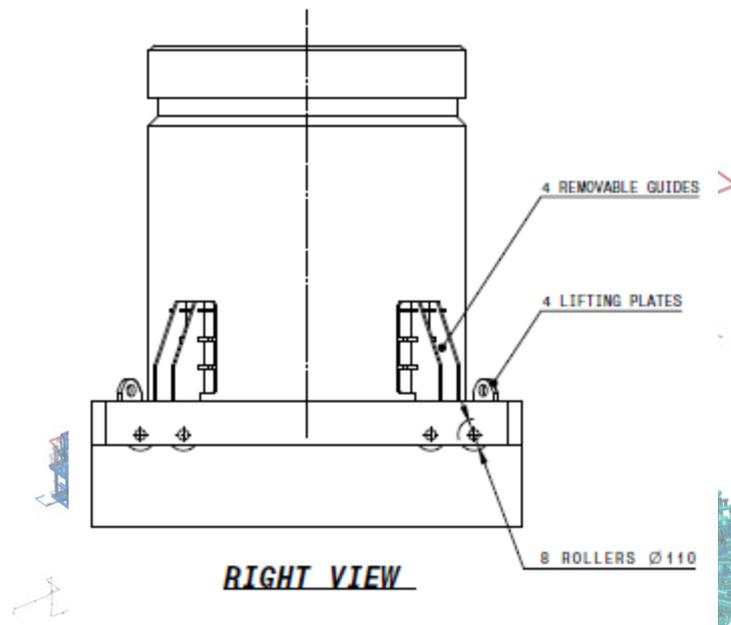
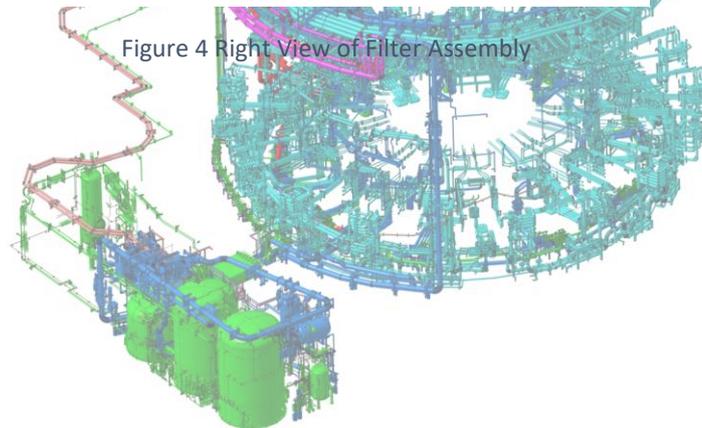


Figure 4 Right View of Filter Assembly



CVBD – Resin Trap (26CVNB-FI-5305/5315)

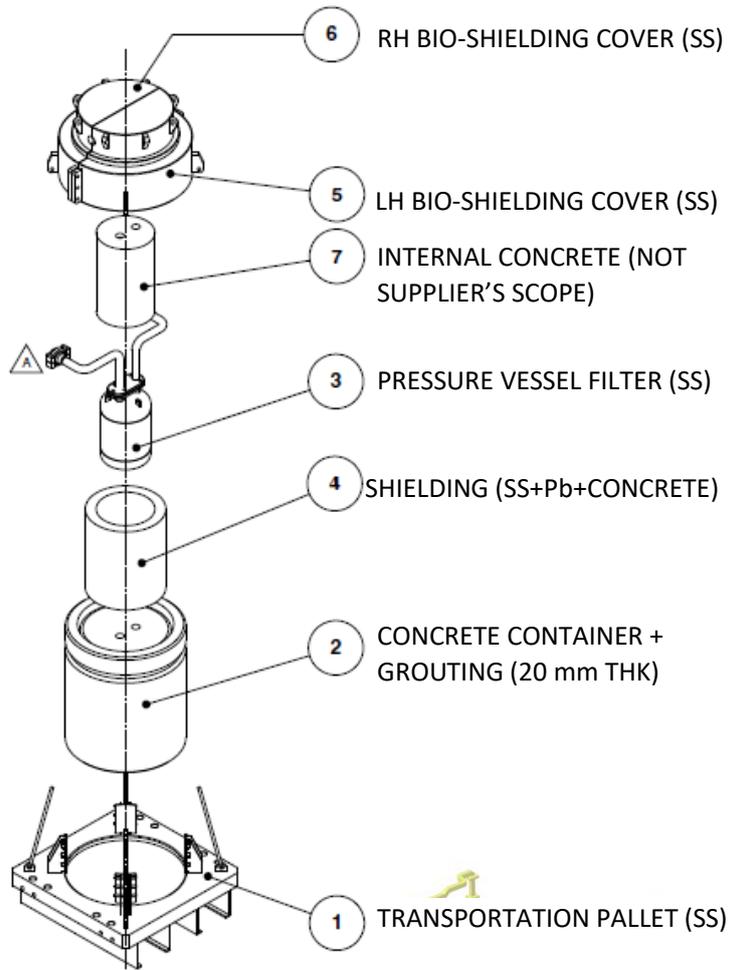


Figure 5 Exploded View of Filter Assembly

