

**EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH
ORGANISATION EUROPEENNE POUR LA RECHERCHE NUCLEAIRE**

CERN - PS DIVISION

PS/ CA/ Note 98-12 (Spec.)

**SPECIFICATIONS FOR THE MANUFACTURE OF VACUUM TANKS FOR
THE SEPTA BT SMV10**

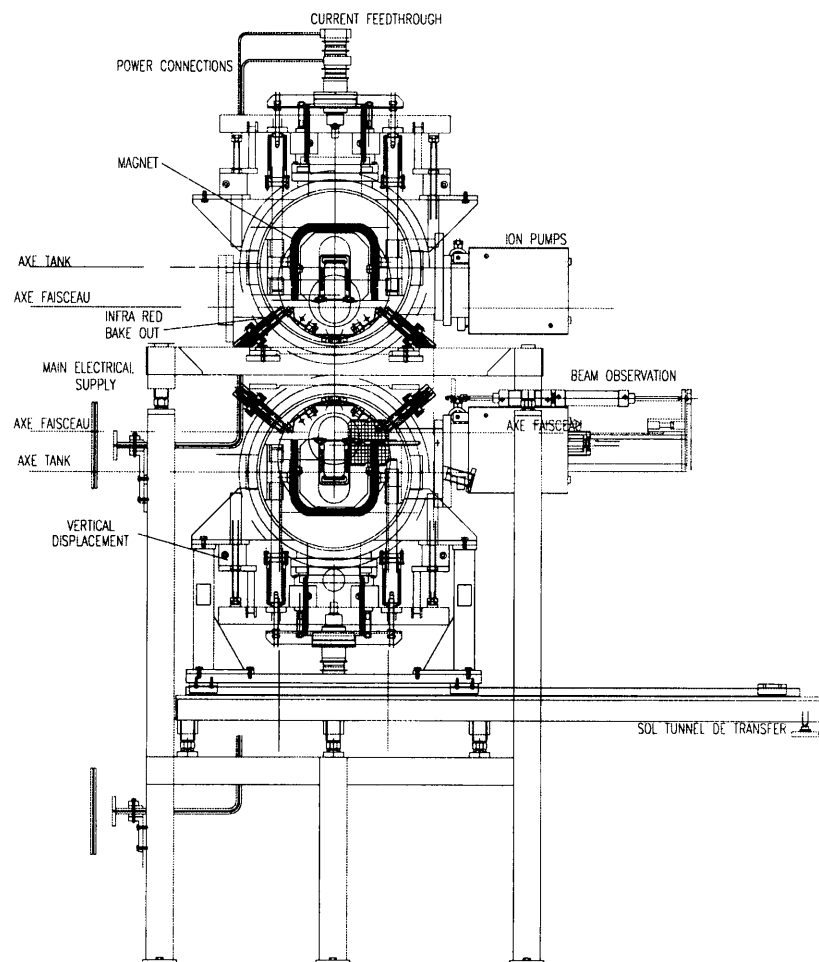
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Geneva, Switzerland
7 May 1998

Introduction

The final stage involving the ejection / recombination septa for the upgrade of the PS Booster to 1.4 GeV necessitates the replacement of the vertical recombination septa, SMV10, together with their associated vacuum tanks and support structure. The single existing vacuum tank will be replaced by two identical tanks each housing a pulsed septum magnet with all associated supports and remote positioning system. These tanks will operate under Ultra High Vacuum (UHV) in the range 10^{-9} to 10^{-10} mBar and will occasionally be baked out at temperatures up to 300 degrees centigrade. Cern invites quotations for the manufacture of these four vacuum tanks type BT SMV10. Fig. 1. below presents the overall proposed assembly of two fully equipped vacuum tanks. The upper tank is identical to the lower one but rotated through 180 degrees and thus eliminates the need to manufacture two different tanks hence reducing costs and facilitating ease of replacement in the event of breakdown. The lower tank assembly can be removed from the transfer line using a rail guide system without removing the upper tank.

**Fig. 1 Twin Tank solution for BT SMV10 1.4 GeV Upgrade
(Looking in direction of Beam)**



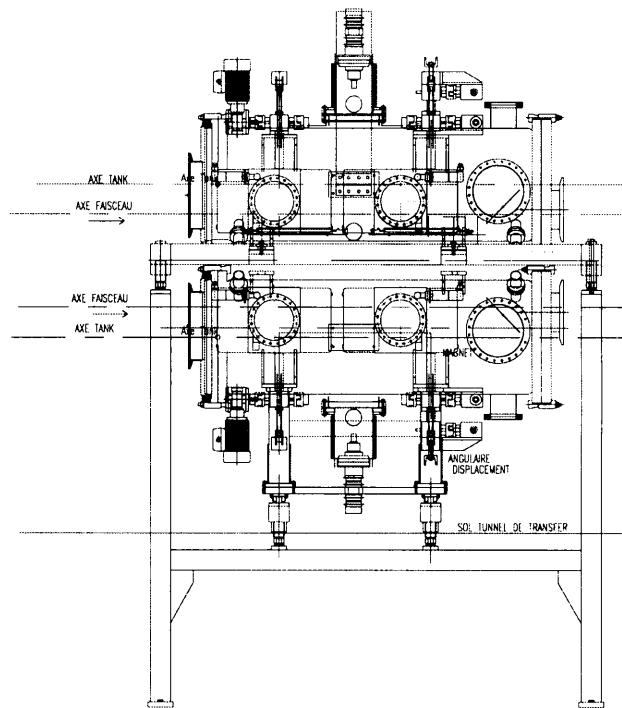
Proposal for the manufacture of the vacuum tanks

The main drawing of the tank is provided for the purpose of cost estimate and may be subject to minor modifications during the period of tender. The detailed manufacturing drawing shall be provided to the company awarded with the contract.

The vacuum tanks are designed to be interchangeable and as such strict attention should be paid to the machining of reference surfaces. Following completion of the tanks a dimensional control should be carried out on the functional dimensions as indicated on the final manufacturing drawing.

The tanks should be manufactured according to the general specifications as described in annex I 'Specification for welded stainless steel chambers for the ultra high vacuum system'.

**Fig. 2 Twin Tank solution for BT SMV10
(side view)**



Manufacturing Procedure

Central section (see drawing PS CA 9870 0)

- The tank body shall be cold rolled and butt welded according to the drawing.
- Weld the pre-machined rings (Drawing No. PSCA 9868.4) for the 'Wheeler' flanges to the tank.
- Weld all tubes for the 'Conflat' flanges, internal and external supports, and the survey target supports. This will be followed by rough machining.
- Vacuum bake out of the tank according to the procedure indicated in appendix annex II

- Final machining of the reference surfaces and support surfaces
- Final machining of the surfaces of the 'Wheeler' flanges (see drawing PS CA 9876.1, PSCA 9878.1, PSCA 9879.1)
- Welding the 'Conflat' flanges (these will not be refinished after welding)

Endcovers

- Pre-machine the 'Wheeler' flange (Drawing PS CA 9868.4)
- Machine the tubes for flanges $\varnothing 250$ and DN273 (drawings MPS 3A81 130-4 / PS CA 9880.2)
- Weld the machined cover in place
- Vacuum bake out cover and flanges according to the specifications in appendix II
- Final machining of the surface of the 'Wheeler' flange
- Weld quick disconnect flanges in place (drawings MPS 3A81 130-4 / PS CA 9880.2)

Material

Cern will provide all the material needed for the manufacture of the four vacuum tanks as per part list (see Material list, annex VI)

All material will be annealed according to the specifications described in appendix II.

With respect to the 'Conflat' flanges, Cern will provide all the machined plain flanges (see annex IV).

Cern will provide pre-annealed black forged rings $\varnothing 520 / 430$ mm x 50mm thick according to drawing PS CA 9868.4, annex VI, for the manufacture of the Wheeler flanges.

Cleaning

Before the vacuum leak tests are conducted, the tanks should be cleaned. This cleaning procedure is described in annex III.

Tests

Before shipment of the tanks to Cern, the company is requested to perform a leak test according to the specifications in annex V. A technical representative from Cern may request to be present during leak testing. The results of this leak test must be made available to Cern upon delivery.

Transport

Cern insists that upon transport the tanks will be closed off, and filled with nitrogen under a small overpressure, to avoid contamination. Care must be taken to protect the tanks mechanically during transport.

Quotation

Cern requests quotations for four vacuum tanks as described in this specification. If test material needs to be supplied by CERN, or certain procedures need to be subcontracted, this should be indicated on the quotation.

Delivery

The delivery date for the vacuum tanks is critical and must be strictly adhered to.

- The first pair of tanks should be delivered to CERN no later than 5th October 1998 while the second pair of tanks should arrive at CERN no later than 9th November 1998.
- If the successful contractor wishes to deliver four completed tanks together in one shipment then the first delivery date should be respected i.e. 5th October 1998.

Annex I

Specification for Welded stainless steel chambers for the ultra high vacuum system

CERN/PS/ML/spec.84-7 rev. 8/11/90

Annex II

Vacuum firing stainless steel for UHV

CERN PS/ML TR - 03

Annex 3

Cleaning Stainless steel for UHV

CERN PS/ML TR - 01

Annex IV

Conflat flanges as provided by CERN

Annex V

Specification for the leak rate measurement of components for UHV systems

CERN AT/VA/PS TR - 05

Distribution:

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