

Collimator Design Meetings

Minutes of the meeting 70 (28/07/2005)

Present: Aberle, Bertarelli, Chamizo, Kadi, Mayer, Principe

WATER COOLING SYSTEM

1. A meeting took place in week 29 between Oliver and TS/CV. The main conclusions of this meeting were acknowledged and backed by Rosario, i.e.:
 - a. A single water line, derived from the main demineralised pipe, will supply several collimators. At least one flow meter will be placed on this line.
 - b. The number of collimators to be supplied should not exceed 4 in order to avoid flow unbalances between upstream and downstream collimators.
 - c. A temperature probe should be installed on each collimator outlet.
 - d. No special purge item is foreseen for the bake-out over-pressure. Vapour bubbles will propagate in the main demineralised water line.
 2. Alessandro remarked that the vapour tension at 300° C is roughly 100 bar, well in excess of the test pressure of the internal pipes (50 bar), and asked Rosario if any risk of pipe obstruction exists. Rosario answered that this risk cannot be completely excluded and that a disposable ("fuse"-like) safety device should be foreseen (something which fails when pressure exceeds a safety threshold).
 3. Rosario also recommended having a flow-adjusting valve on each collimator (instead of a calibrated diaphragm). This would avoid costly interventions in case the water flow has to be changed. In this case more than 4 collimators might be connected on the same line.
 4. On the basis of the discussion, Oliver will draft the best strategy to be adopted for the cooling system (number of collimators per line, number of valves, temperature sensors ...), taking into account the different stages of machine operation (start-up, nominal phase 1, phase 2 ...).
- Action** Oliver

POSITION SENSOR DIMENSIONS

1. According to an e-mail from Roberto no final decision has been taken yet. The design of the support pieces is again on hold. A final decision is expected by September 2005. Impact on timing for machining?

WATER PLUG-IN

1. Activity on the issue is progressing well. A final counter-proposal from supplier (following new Roger's proposal) is expected by next week. Prototype manufacturing will then follow.

ASSEMBLING OF COLLIMATOR #3

1. 1st collimator bloc is assembled. Measures are due beginning of next week.

DESIGN OF SUPPORTS, TOOLS AND WATER CONNECTIONS

1. Alessandro informed on behalf of Roger that all the support system components have been released and delivered to the workshop for manufacturing. 4 complete sets are being manufactured (already well advanced), including the base support. By next week all the supporting components down to the plug-in will be ready. AB/ATB may then start the assembly of the 4 different configurations. The base support is not necessary to start the tests at the various orientations.
2. Catherine Magnier is well progressing on the water distribution system (flexible hoses and manifold) for the different configurations.
3. Rocio is following up on the telescope to be adopted for the adjustment bench.

AOB

1. Manfred showed the results of the measurement performed on the pre-series batch of the C/C jaws. Though the measured values were very good, Alessandro found out that the tolerance on the Conductivity as given on the report (60 ± 30 W/m/K) is not acceptable, since a value below 60 W/m/K might seriously compromise the performance of the collimator both in terms of maximum

temperature and maximum deflection. This value as well as the one erroneously indicated on CERN technical specification for C/C (25 ± 10 W/m/K) are not consistent with the value initially required (see AOB # 2 in [Minutes of meeting 55 \(20/01/05\)](#)). It is strongly recommended that the requirement be corrected to ≥ 70 W/m/K to avoid very serious consequences in case of new order. It is also important that a conductivity measure on the C/C production batch be done as soon as possible.

2. The test results sent by the roller screw produced show a good behavior of the irradiated Santovac Grease (no degradation of friction coefficient –reversibility force lower than 100 N). Yacine also informed that the type of irradiation to which the grease was submitted in the radiation facility well matches the actual collimator radiation (i.e. essentially Gamma rays). On the basis of these results, it is decided to accept the use of this grease for the roller screws.
3. Yacine suggested that, given the very similar dimensions, the design of the passive absorbers for the accelerator be combined with that of the absorbing masks for the injection lines. To be followed up as soon as passive absorbers dimensions are specified by Ralph.

ACTION LIST to be followed up:

Play between motor spindle and jaw	#34	Roger
Updated calculation on beam optics during transients	#49	Ralph
New heating tests for pre-series collimator blocs	#67	Sergio & Alessandro
Strategy for external cooling system	#70	Oliver