

HL-LHC Collimators: Design, Engineering and Prototyping #15 Minutes

Tuesday, 5th September 2017

376-1-020

Attendees: A. Bertarelli (AB), S. Sgobba (SS), F. Carra (FC), M. Galviani (MG), E. Rigutto (ER), L. Gentini (LG), J. Guardia (JG), C. Fichera (CF), M. Pasquali (MP).

AGENDA:

- Approval of minutes from previous meeting and review of action list;
- Status of TCLDA production and report from brazing task force;
- Update on developments pertaining lead screws;
- AOB.

1) *Approval of minutes from previous meeting and review of action list*

Nothing to report.

2) *Status of TCLDA production and report from brazing task force*

ER reports that the assembly of the TCLDA has been completed. Moreover, he adds that the high-temperature treatment carried out on the Glidcop jaws-Copper assembly caused a decrement in the hydrogen content outgassed by the parts, eventually reducing the blistering effect observed during the brazing process in the copper interlayer. AB suggests to carefully document all the followed procedure in order to make it repeatable for future reference.

3) *Update on developments pertaining lead screws*

LG presents the results of the second test campaign carried out on Umbra screws and of the tests performed on KSK and SKF dry screws.

The tests accomplished on dry Umbra screws encompassed (A) the use of ceramic balls only and (B) the adoption of 50% ceramic balls and 50% of stainless steel balls having

diameter 40 μm smaller than the ceramic counterparts. In the first case, after the test, the screws' thread appeared to be in good conditions, the balls scratched but not damaged and the balls' guide less damaged than in previous tests. In the second case, instead, the thread, the balls and the guide were clearly damaged.

The cycling tests performed on lubricated Umbra screws resulted into a stuck screw out of three tested. An efficiency of about 50% was measured, smaller than the value of 80% claimed by Umbra.

The 30000-cycles test performed on dry KSK screws stressed out that the torque measured in positions IN and OUT stays constant during the cycling test on both screws in both directions, with such value being slightly smaller than the one observed for UMBRA screw. AB states that such difference is directly associated to the KSK screws' better efficiency. Moreover, the torque difference between the IN and OUT positions resulted to be constant during the cycling test on both the measured screws. Finally, the torque difference between UP and DOWN screws resulted to be the same for both screws and constant during the cycling test.

The tests carried out on 2 SFK screws coated with Dicronite evidenced severe issues (motor loosing steps, lot of noise).

Summarizing, lubricated Umbra screws and dry KSK screws appeared to be eligible to future use. Cost, prior experience with the screw type and reproducibility of the screw's working conditions will be considered as important factor for the choice of the screw to be used.

Possible variable to be considered for future tests may include the effects of radiation, an increase of the load and a longer test cycle. AB propose to write a report on the tests' outcomes in 4 weeks (**action L. Gentini**).

AOB:

- Thermal treatments on the BPMs dismantled from HRMT-23 aimed at establishing their operative temperature range are currently being prepared.
- Sensors removal from Multimat spare specimens meant to be used for further investigations is scheduled for next week.

ACTIONS

- Write a report on the tests performed on lead screws in 4 weeks (**action L. Gentini**).