

CHANGES IN CONSTRUCTION PROCEDURES

Dan Kolybaba

January 24, 2011

Version 4

During initial construction procedures of each BCAL module the first 13 cm wide lead layer was set in industrial epoxy and aligned via an optical fiber placed in a machined groove in the base (outer) plate. A 6 mil poly sheet used as a separator covered the lead and a 1/16 in. rubber mat, used to seal epoxy migration, covered the poly. An aluminum plate was placed on top and all was pressed until the epoxy set up.

- The pros:
 - a) If the lead moved during the pressing procedure we could strip off the lead sheet and start over losing only one fiber.
- The Cons:
 - a) We were not able to eliminate epoxy migration into the fiber grooves on the top of the lead sheet and much time was wasted cleaning hardened epoxy out of the grooves.
 - b) The lead did not stay flat.
 - c) The center groove was distorted and at times it had to be re-worked.
 - d) Only one lead layer could be laid that day.

On March 24, 2010 the first build of Module 7 was done using two additional layers of fibers using optical epoxy and lead and the rubber mat was eliminated. This proved to solve all but one of the above problems. We still had epoxy migration into about 2- 3 grooves on the side of the lead sheet. We were able to minimize this to one layer on modules 7- 18 by getting the second build to a height where the third build would be 12 cm sheets. At this point we would have ½ cm on each side of the lead where epoxy migration would not be a problem. The top of each successive build would have a top lead sheet that is wider and longer than itself, totally eliminating epoxy migration. To get to this height in two builds proved too difficult for the smaller group of students that started on module 19 on Sept. 2010. This of course meant that we had to clean grooves on two layers.

By module 22 the group was able to get the 13 cm build up to the 12 cm wide sheet height in two builds, but not without great difficulty.

On Jan. 12, 2011, on module 29 the first build was done using a total of five optical fiber layers. This proved to be a lot less stressful leaving 14 -15 layers for the next build vs. 16-17 layers that were previously needed.

On Jan 14, 2011 the first build of module 30 was started the same as module 29. Both builds were successful and will be used on the remaining 28 modules.