

Minutes of Meeting 8/10/00 10:00AM - 12:20PM

Attendees:

Alessandro Brez [alessandro.brez@pi.infn.it]

Andrea Moggi - Pisa

"Eduardo do Couto e Silva (E-mail)" <eduardo@SLAC.Stanford.EDU>

"Gwelen Paliaga (E-mail)" <gwelen@scipp.ucsc.edu>

"Martin Nordby (E-mail)" <nordby@SLAC.Stanford.EDU>

"Ossie Millican (E-mail)" <olm@SLAC.Stanford.EDU>

"BJ Bhatnagar (E-mail)" <brijesh@SLAC.Stanford.EDU>

"Roman Devengenzo (E-mail)" roman@SLAC.Stanford.EDU

Minutes taken by Ossie Millican.

Meeting with representatives of SCIPP, SLAC and INFN to discuss adhesives and application methods, thermal stress,

- Gwelen brought in a textbook with canned formulae dealing with stress/strain issues.
- Andrea, from Pisa, asks about chosen adhesives for the application of the ladders to the kapton and converter layers. A discussion of the requirements for the chosen adhesive followed. No specific candidates have been chosen. SLAC has obtained samples of three different conductive adhesives from Nusil Corp. Quotes for obtaining "compliant adhesives, all made by NUSIL Corp. Andrea requested that we split the samples but there is a only enough catalyst to mix two batches out of the sample volume. I prepared a file of all the manufacturers and distributors of "NASA outgassing approved adhesives" which are conductive and cure at room temperature and gave a copy to Andrea.
- There was a discussion of the plan of attack for thermal tests, noting that tests for qualifying procedures depend on the "Thermal requirements" document from Martin. Draft of this document is expected in ~one month. Discussion followed as to what might be done to perform accelerated aging tests which are credible. Martin stated that 1000 cycles of temperature would represent the entire expected mission life. 12 cycles are required to "qualify" an assembly for flight. Thermal cycling tests to be performed 10°C of the greater than the environmental survival limit.
- Pisa has agreed to build four full size mockups of trays for testing purposes and to develop ladder placement and gluing procedures, as well as to test epoxy vs. silicone conductive adhesives.
- Eduardo stated that the converter layer thickness would not be defined before December of this year.
- Discussions followed this comment that concerned the mechanism to decide between tungsten and lead to be used as a converter layer. It was stated that Physics defines the thickness of the converter, but that Engineering may define the choice of material because of mechanical properties.
- The Aero/Astro department at Pisa is going to put together a FEA model of the complete closeout structure with different adhesive layers and face sheets for study. A number to use for reference in the FEA model for shear modulus of different adhesives will be derived from tests to take place at SLAC. Note that this shear modulus number undoubtedly varies with temperature, so a wide range may have to be considered.
- Pisa representatives noted that they are on holiday until Sept 1.
- The Kapton for these tray scale tests must be designed and ordered per the new SSD size and grounding/adhesives application requirements. Some discussion of possible Kapton design features, thickness, glue reservoirs and dams followed.
- Discussion of the desired glue pattern suggested a preference for at least five points of conductive glue per SSD as well as a series of small dots, or a continuous bead under the end of the ladder where the wirebonds to kapton are found.
- Additional discussion of the "specification for maximum end of life resistance" for the conductive glue to SSD to Kapton bond. Also there was some discussion of how one might tell if an assembly passed specifications after thermal cycle tests.
- Santa Cruz states that they are ready to test "baby detectors" now for thermal cycling tests on adhesive conductivity.
- It was agreed that the procedure to encapsulate wire bond will be developed at SLAC
- SLAC need to provide detailed drawings for John's edge referenced ladder bonding fixture as well as for the existing level of tray design in order to allow Pisa reference material for their design of the ladder transfer fixture.
- There was a discussion of protocols, qualifications of Pisa and SLAC personnel per mission requirements documents to be generated, such as "contamination control", certifications of technicians producing "flight qualified hardware", cleanroom protocols, material storage and travelers. More formal protocols are expected to be confirmed by both parties toward the end of this year. It will be necessary to find out how Italian Space

Agency protocols mesh with NASA requirements and to adopt the relevant sections of each agencies procedures into a comprehensive GLAST protocol.