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Tungsten and Bias Circuit Bonding

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Change History Log

Revision	Effective Date	Description of Changes
1	Sept. 13, 2004	Initial Release

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1 Purpose

The present document describes the Bonding Process of the Tungsten Tiles during the Assembly of the Tray

2 Scope

The goal is to increase the bond adhesion, avoid contamination during the process and to maintain the tile flat.

3 Acronyms and Definitions

EM	– Engineering Model
GLAST	– Gamma-Ray Large Array Telescope
Plyform	– Trays Manufacturing
MEK	– Methyl Ethil Kethone
IPA	– Isopropyl Alcohol
TKR	– Tracker
TVAC	– Thermo vacuum Test
W	– Tungsten
3M 2216	– 3M™ Scotch-Weld™ Epoxy Adhesive 2216 B/A Gray

4 Applicable Documents

Documents relevant to the development of this procedure include:

- [1] LAT-PS-01584, Mid Tray Assembly Procedure
- [2] Tart Report, Pisa 09/02/2004
- [3] INFN-LAT-MECH-007-01
- [4] INFN-LAT-MECH-008-01
- [5] INFN-LAT-MECH-009-01
- [6] INFN-LAT-MECH-010-01
- [7] Tart Report, Pisa 09/02/2004

5 Cleanliness Requirements

For general manufacturing guidelines and process control, refer to INFN-LAT-MECH-007-01

6 Recommendation for the use of the tool

Contamination problems should be associated with the sequential bonds to tungsten sides. Consider that mold release on alignment/bonding tool used in W bond to face sheet can be transferred to the 2nd surface of W tile. This is a particular concern for the thin W tiles where planarity is a potential problem. With the thick tiles, planarity is very good so transfer should not be as great. *For thin tiles, ensure the positioning on the tool without any friction on tooling surface.*

7 Procedure for Tungsten and Bias Circuit Bonding

1. Remove tiles with primer applied from storage bags as needed for bonding
2. Clean Tungsten tiles with Acetone and IPA as for the PROCEDURE FOR SOLVENT WIPING (INFN-LAT-MECH-007-01).
3. Prepare the face sheet surface as for Plyform I.L.
4. Prepare the glue as for Plyform I.L.
5. Degas the glue as for INFN-LAT-MECH-009-01
6. Apply the quantity of 3M 2216 Glue distribute it onto the face sheet and the Tiles as for Plyform I.L.
7. Cure 1st bond @ room temperature (or @ 35°C), under vacuum bag for 18 hours at least.
8. 2nd Bonding: Clean the exposed W surface with Acetone and IPA as for the PROCEDURE FOR SOLVENT WIPING (INFN-LAT-MECH-007-01). Clean the surface removing all the mold release used in 1st bond. Use only wipes, no abrasion. The Primer on the Tiles must be protected.
9. Wait at least 1 hour for Acetone and IPA evaporation.
10. Prepare the Bias Circuit as for INFN-LAT-MECH-008-01
11. Prepare the glue as for Plyform I.L.
12. Degas the glue as for INFN-LAT-MECH-009-01
13. Apply the quantity of 3M 2216 Glue and roll it onto the face sheet, Tiles and Bias Circuit bond surface as for Plyform I.L.
14. Cure 2st bond @ room temperature (or @ 35°C), under vacuum bag fat least for 18 hours.