

## **Endcap Module Production Overview for Glasgow**

This document gives an overview of the stages and procedures used in Glasgow for the production of Endcap modules. The scope of the document takes the module as it arrives from Manchester through to a completely assembled, characterised and qualified module ready to be shipped to Liverpool for assembly on a disk. Details of each step are contained within separate documents.

Visual inspection, bonding and transfer of modules from transport boxes to testboxes are performed in the clean bonding area with anti-static protection.

### **1. Reception of modules from Manchester**

<b>QA</b>	<b>F. Doherty</b>
<b>Responsibles</b>	<b>J. Melone, M. Horn</b>

#### **Equipment**

PC with Bar Code Reader  
N<sub>2</sub> storage cabinets

#### **Procedure**

Check travel documents against the modules.  
Input into the database the acceptance of the modules.  
File the travel documents.

### **2. Visual Inspection**

<b>QA</b>	<b>W. Bell</b>
<b>Responsibles</b>	<b>J. Melone and F. Doherty</b>

Visual inspection is performed in the clean bonding room.  
Document “Visual\_inspection\_of\_modules.doc” details visual inspection of module before and after wirebonding

### **3. Confirmation Scan**

<b>QA</b>	<b>W. Bell</b>
<b>Responsibles</b>	<b>J. Melone, F. Doherty</b>

A confirmation scan is performed as according to the document “Electrical\_testing\_of\_Endcap\_modules.doc”. This should catch any defects in the hybrid not seen in the visual inspection.

### **4. Wirebonding**

<b>QA</b>	<b>R. Bates</b>
<b>Responsibles</b>	<b>J. Melone, F. Doherty and M. Horn</b>

Wirebonding is performed in the clean bonding room.  
Document “Atlas\_module\_bonding\_in\_Glasgow.doc” details the procedure of wirebonding a module.

## **5. Visual Inspection after wirebonding**

<b>QA</b>	<b>R. Bates</b>
<b>Responsibles</b>	<b>J. Melone, F. Doherty and M. Horn</b>

Visual inspection is performed in the clean bonding room.  
Document “Visual\_inspection\_of\_modules.doc” details visual inspection of module before and after wirebonding

## **6. Initial IV test**

<b>QA</b>	<b>R. Bates, W. Bell</b>
<b>Responsibles</b>	<b>R. Bates, W. Bell, F. Doherty, J. Melone</b>

### **Equipment**

SCT DAQ – single module test station  
SCT-HV card  
Valencia test box

### **Procedure**

This test is performed with the single module SCTDAQ test station.  
Mount the module in the Valencia test box and connect to the SCTDAQ according to the module mounting section of “Electrical\_tests\_of\_Endcap\_modules.doc”. Turn the chiller on and set the temperature to 20°C. Confirm that the st\_system\_config.dat has the correct module name and the detector file exists; see “Electrical\_tests\_of\_Endcap\_modules.doc” for details.  
Run root and .x ST.cpp.  
Turn the module LV power OFF as soon as the SCTDAQ has started.  
Wait 10 minutes for the temperature of the module to stabilise.  
Perform the IV measurement, found under ABCD tests in the SCTDAQ menu, as per section 5.1 of ATL-IS-QA-0004 measuring the current at 150V and 350V. Compare currents to the sum of IV values for the detectors from the information in the database. Record the outcome of the test in the traveller document. Save the IV curve and data to the database.  
After this test the kaptons are removed from the module and the module is removed from the Valencia test box in the clean room and placed in temporary storage. On passing this test the module can pass for thermal cycling. If the module fails the test the module is placed to one side for further investigation at a later date.

## **7. Thermal cycling**

<b>QA</b>	<b>A. Tcheplakov</b>
-----------	----------------------

**Responsibles**                      **M. Horn and J. Melone**

The equipment used and the procedure to be followed are outlined in the separate document “Thermal\_cycling\_of\_Endcap\_modules.doc” as per section 5.2 of ATL-IS-QA-0004.

Following this procedure the module is placed in temporary storage to await electrical testing.

## **8.        Electrical Characterisation**

**QA**                      **R. Bates**  
**Responsibles** **W. Bell, F. Doherty**

The equipment used and the procedures to be followed are outlined in the separate document “Electrical\_tests\_of\_Endcap\_modules.doc” as per sections 5.14, 5.5, 5.6, 5.7 and 5.8 of ATL-IS-QA-0004. This procedure will perform IV electrical and long term IV and electrical tests.

## **9.        Storage**

- Finally the module will be stored in the nitrogen flow cabinet in the clean room with its Traveller Document. The module is now ready for shipping to Liverpool for mounting on the disk. When the module is shipped physical it will be shipped via the database.

## **Overall sequencing of the steps**

- We expect to receive 5 modules per week from Manchester
- The expected bonding rate is 1 per day including visual inspection and the initial IV test
- Thermal cycling takes ~ 30 hours
- Electrical characterisation takes ~ 2 days
- Operating in units of 5 modules per week when in full production is possible where 5 are bonded in week 1 and then thermally cycled, measured and electrically tested in week 2.