
Thoughts on thermal insulation for ITk pixel modules QC tests

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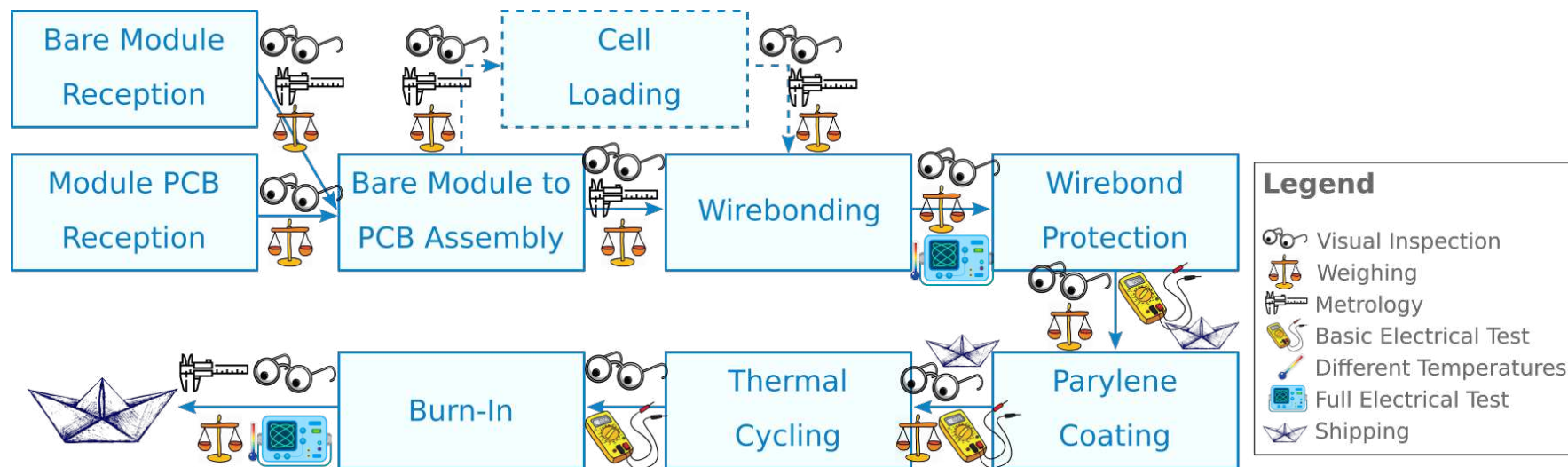
Motivation

- Need to perform Quality Control (QC) on quad modules
 - Quad module is an hybrid 4-FEs chip pixel module
 - Focus here on tests after module wirebonded to flex
- Crucial to assure controlled temperature over the QC procedure
- Range of temperature for QC is from -55 C to 60 C
- At full speed we would need to test 8 modules / week
- Need to parallelize a lot
- In this presentation I will introduce the QC procedure first
- Then I will show some ideas to assure good thermal performance of the testing setup

QC PROCEDURE

QC procedure

- Disclaimer: work in progress, documented here:
<https://cds.cern.ch/record/2702738/>



- Focus on: every time there is a basic/full electrical test, thermal cycling and burn-in

Reference temperatures

	SLDO (°C)	Low Temp. (°C)	Interm. Temp. (°C)	High Temp. (°C)
Planar	−35	−15	20	30
3D	−35	−25	-	20

Table 1: Table of suggested testing temperatures.

- To simplify we assume that all electrical tests, basic and full, have to be performed at all the temperatures listed above
- N.B.:
 1. we work only with planar sensors
 2. The estimated heat dissipation of a quad module is expected to be about 10 W

Thermal cycling and burn-in

- Thermal cycling: the module unpowered should undergo:
 1. 10 cycles from -45 C to +40 C
 2. 1 cycle from -55 C to 60 C
- Ramp rate should be less than 15 C/minute
- Burn-in: the module powered and running continuously noise scan should be tested cold for 48 hours
- As it is the longest step I would use our climate chamber for this