Production Schedule Update

RIKEN/RBRC
Itaru Nakagawa

Executive Summary

- Silicon Sensors
  - 100 Sets (batch-2) production silicons are to be delivered today as scheduled.
  - Sensors will be shipped to NCU once they are ready.
- FPHX
  - ~1500 good FPHX chips are delivered to NCU on April 29th.
- HDI
  - Shipped 39 HDI's to BNL and are delivered on June 2nd.
  - Place the order of 2nd batch order without waiting for the confirmation of the new design around bias connectors are confirmed in BNL.
- Stave
  1. Shipped 4 staves + 3 tubes to BNL and are delivered on June 2nd.
  2. To be shipped 3 more staves to BNL soon.
  3. Proposed to separate into 2 batches. 75 staves each.
- Trigger Scintillators and PMTs
  - Reuse existing scintillators and PMTs in NCU
  - Light guides are delivered to NCU.
  - Place order of PMTs and thin scintillators once RIKEN is ready.

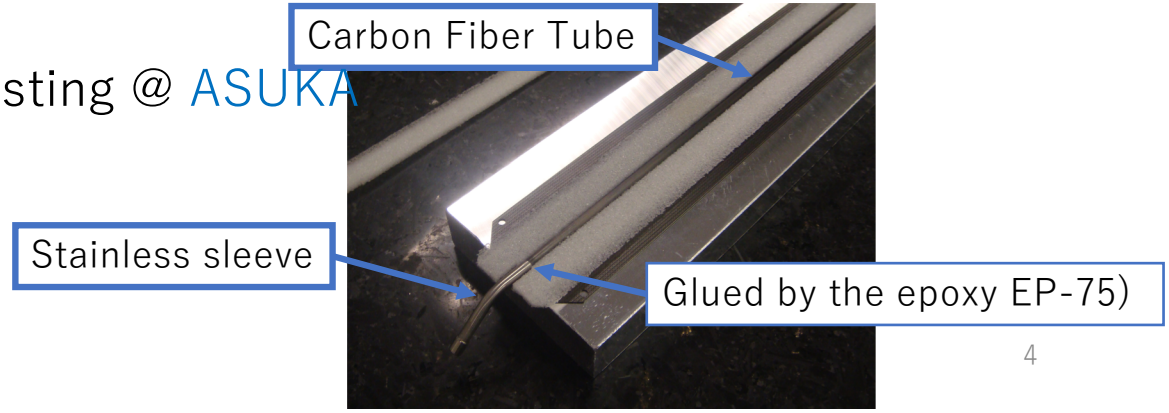
Updated Production Schedule

Year	2020												2021												
Month	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	Quantity
Silicon	bacth-II (150)																								250
HDI	bacth-I (150)						batch-II (90)																		290
Stave	prototype-IV							batch-I (75)			batch-II (75														150
								batch-I(150)																	
Bus Extender					prototype-IV						batch-I							batch-II							140
Extension Cable											batch-I,II														140

- The lead time for 150 stave production is estimated to be 4 months.
  - Splitting into 2 batch phases is now under consideration to save 1 month earlier delivery for the first 75 staves
  - Delaying the 2nd half 75 staves by 1 to 2 months is the trade-off.
  - If the first 75 staves keep assembly factories busy for 3 months, this is the way to go.

To be addressed before stave production

1. Design
   - Do we need additional alignment hole? Alignment marker on stave is not trivial.
2. Leak test procedure
   - Waiting for feedback from Rob who is working on the leak test of prototype staves.
   - Do we need to add one more testing item to check that the epoxy isn't filling the tube while assembly between carbon fiber tube and stainless sleeves.
   - Establish parallel leak testing @ ASUKA

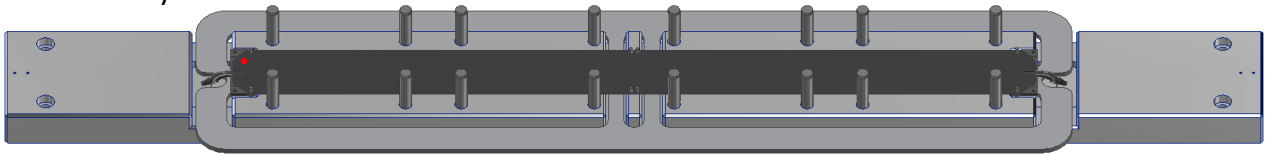


Stave Alignment Issue

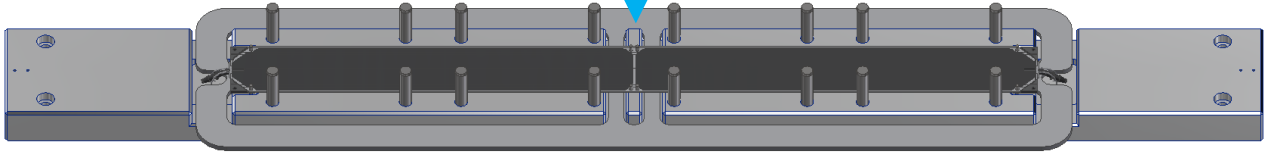
This is how staves are aligned in BNL.

INTT Technical Overview – HDI Placement

1. CFC stave is installed on the base fixture, and scanned by the OGP for flatness.



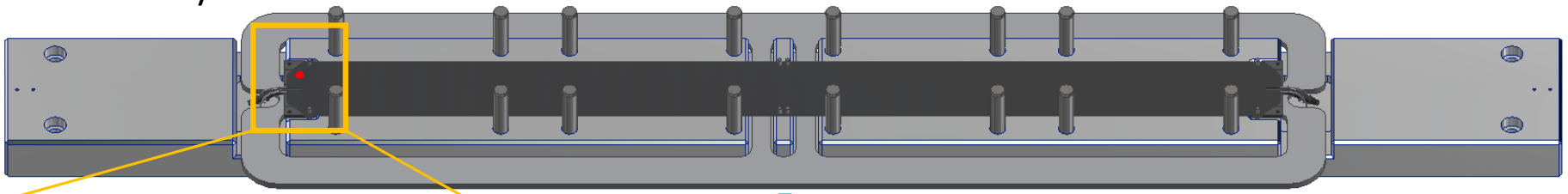
2. Glue mask is applied to prevent overspill of epoxy during and after application.

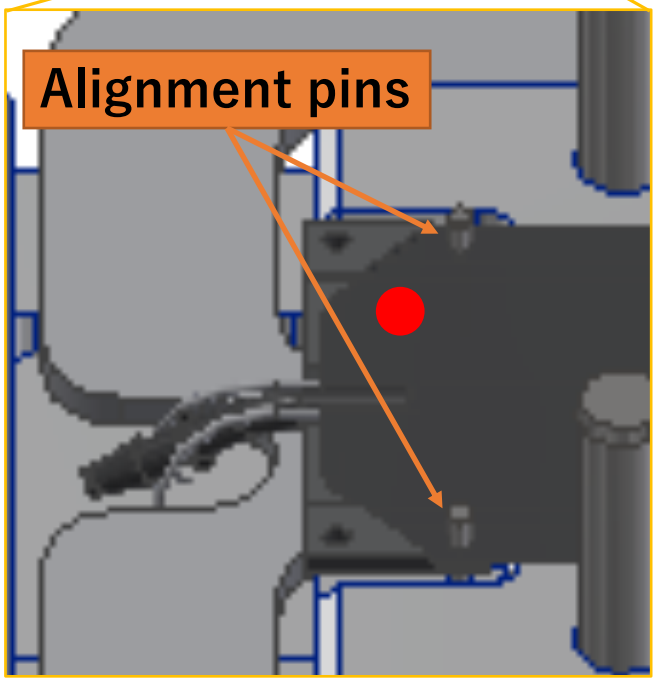


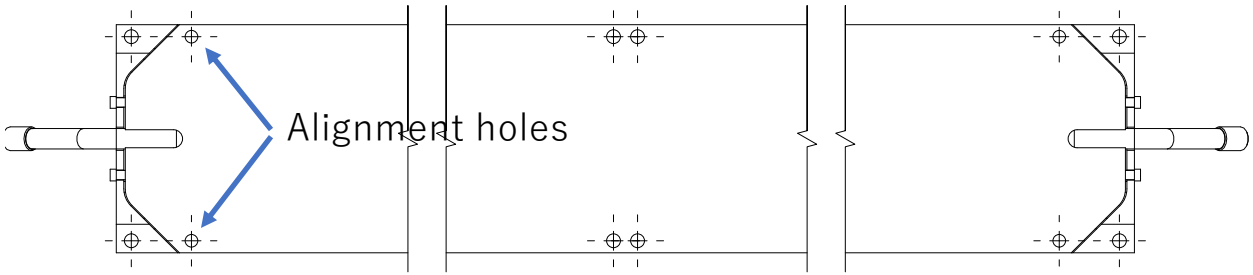
March 24, 2020 sPHENIX - INTT 9

Connor's slide

1. CFC stave is installed on the base fixture, and scanned by the OGP for flatness.







QA Test Procedures for Production

Quantity : **150** Staves

1. Tube Flow Test at 200ml/min. Pressure difference between both ends < 1 ± 0.25 psi?
2. Burst Test : Keep the tube at the high pressure of 60 ± 2 psi and won't burst for 1 hour.
3. Leak Test : < 0.2ml-mbar/min (was < 0.01ml-mbar/sec)
4. Assembly with CFRP plates. Drill alignment holes.
5. Heat cycle test : ＋40°C～0 ± 5°C (one cycle)
6. Measure flatness (**<100 μm** is now feasible) and alignment positions

Leak Test Options

Expected to test **200** cooing tubes taking into account yield rate.

1. Dan's Proposal : 15 ~ 20 minutes
   - 30 minutes/cycle x 200 tubes = 100 hours ~ 10 days
   - Every 30 minutes requires dedicated personnel on this for two weeks -> Ends up with pricy labor
   - A few days **by 10 parallel measurements**
2. Rachid's Proposal : overnight
   - 10 hours x 200 tubes = 2,000 hours ~ 200 days! -> Out of question
   - 20 days (~ 1month) **by 10 parallel measurements**
   - Personnel needs to work ~1hour/day for a month

Plan

- Proceed procurements to be supplied from RIKEN.
  - Carbon fiber sheets (done)
  - Carbon fiber tubes (processing @ RBRC)
  - EP-75 Epoxy
  - Stainless tubes
- Itaru visit Asuka in middle of July and work together to establish reliable leak test setup.