Next Steps for Stave Prototyping

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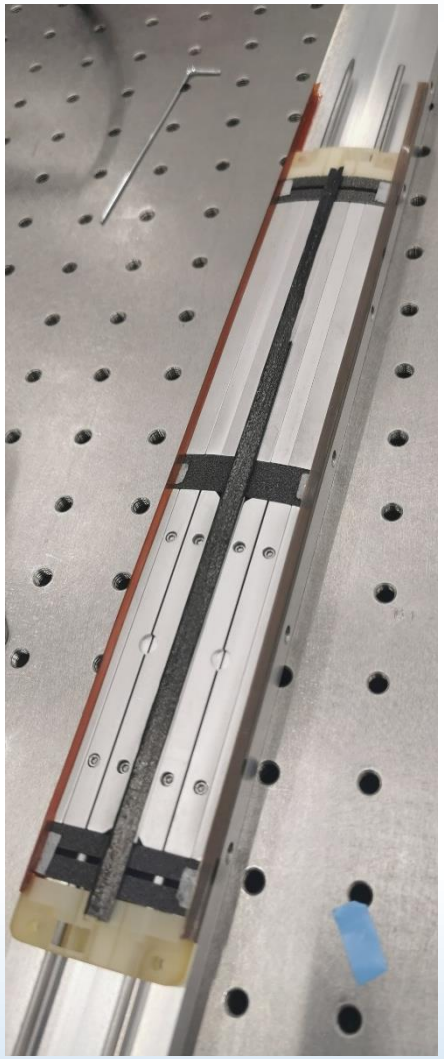
Intro to Existing ¼ Stave Prototype



- 1/4 of an L4 stave
  - One top one bottom module
- Preformed I beam and Kapton C Channel FPC Mock-ups
- SLA 3D printed end supports
- Multipart aluminium internal tooling
- 2 x 3mm rod runs through end supports, K9 foam cross braces & internal tooling to constrain and align stave components

Prototype Components - Tooling

Tested

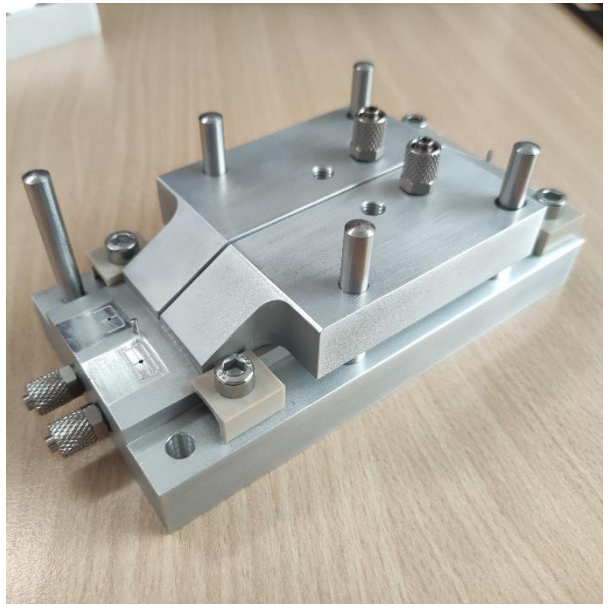
- Co-curing tooling (for ¼ length stave)
  - Carbon fibre I beam Tooling
  - Kapton C-channel Tooling
  - Internal formers

Untested but manufactured

- Sensor curve former
- LAS curved carriers
- Module assembly tooling
- Module installation tooling (for full length L4)

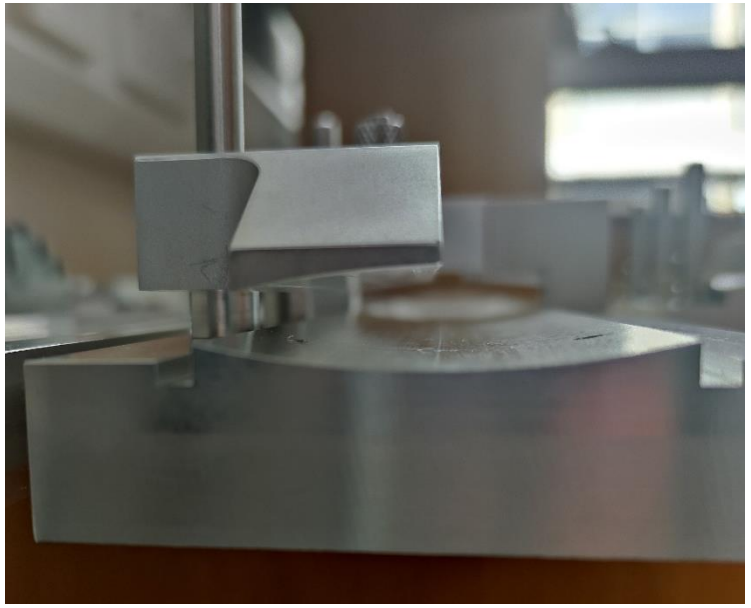
Module Tooling

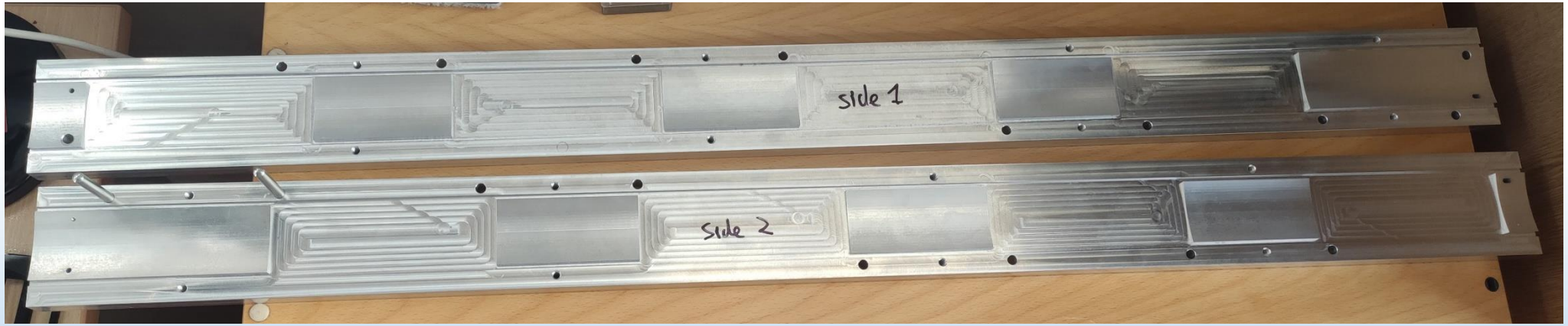
Module Assembly Tool



LAS Vacuum Chuck

Vacuum Chuck on Module Installation Tooling





Prototyping Plan

- First ¼ length stave proved production method is feasible but failed 3D printed end support means we can't use it for structural/thermal tests.
  - Can be used for first attempt at module mounting

- Design is not suitable for required structural and thermal testing
  - Revised end support required which can withstand autoclave conditions and gives mounting points for vibrational analysis and air inlet/outlet for flow testing needed

- Cure another quarter stave
  - Automated knife cutter
  - Improved trimming of I-beam
  - Cure with rubber sheets as intensifier
  - Use revised end support design

Module Testing

- Transfer EIC-LAS mock-ups from wafer mount to vacuum chuck
- Use electronics suction cups to move LAS from vacuum chuck to curved sensor former
- Show curved vacuum pad can be used to transport the EIC-LAS securely
- Build a module mock-up on the module assembly tooling
  - Drag knife cut Kapton carrier
  - 2 EIC-LAS mock-ups
  - Options for ASIC mock-up?

- Adhesively mount 2 modules onto 1st prototype quarter length stave assembly.
  - Repeat static deflection test
  - Stiffness of module bonding will impact stave first mode

2nd Quarter Length Stave

- Will replace one end support of quarter stave with large square mounting block to give high stiffness mount location for cantilevered structural stiffness testing
  - First test without modules
  - Bond module using module transfer tooling and repeat vibration testing.
- Thermal Testing
  - Modify flow rest rig at Oxford
  - Add temperature monitoring to stave (or use non-contact measurement)
  - Pressure transducers on inlet & outlet to measure pressure drop across stave.