



**High
Luminosity
LHC**

Crab – RFD prototype: Fabrication Status Update



The HiLumi LHC Design Study is included in the High Luminosity LHC project and is partly funded by the European Commission within the Framework Programme 7 Capacities Specific Programme, Grant Agreement 284404.



RFD Manufacturing status

1. Design for fabrication

- *Extremity*
- *Pole, Corner*
- *Main Body, V-HOM Waveguide*

2. Tooling in fabrication

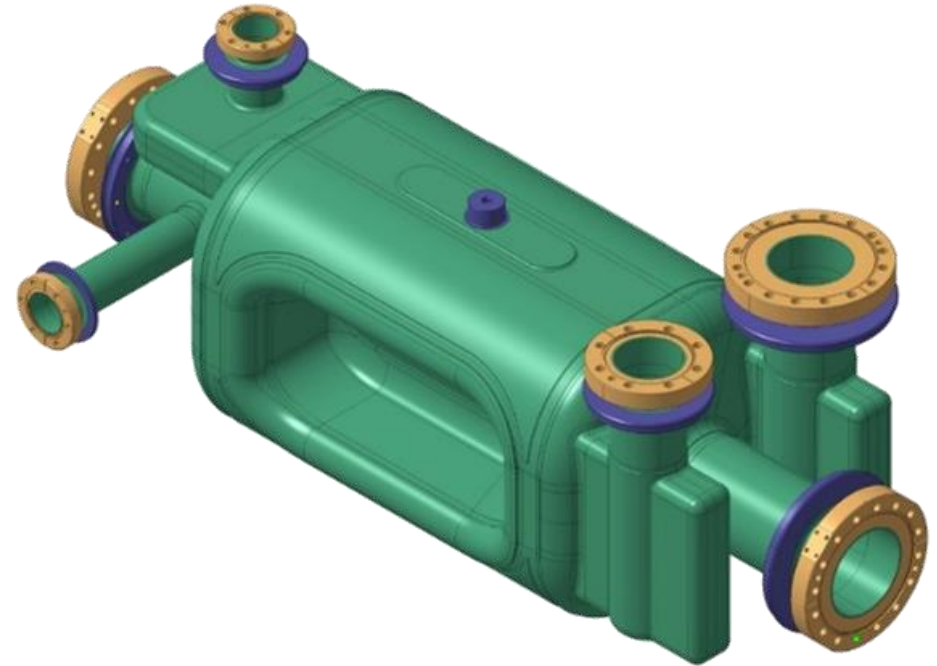
- *H-HOM Waveguide, Corner stamping*

3. Fabrication Results

- *Copper Pole Tests*
- *Copper Corner Tests*

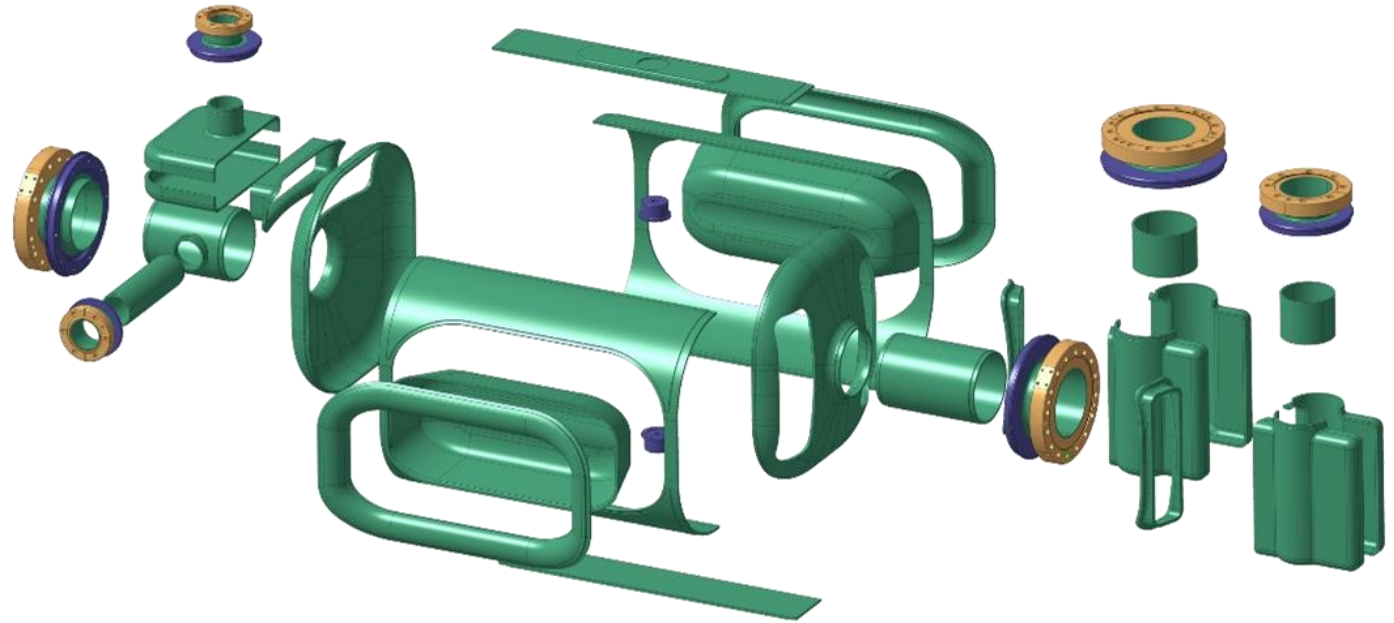
4. AOB:

- *Next forming steps*
- *Update material*
- *Other tests ongoing*



Crab RFD Cut-out for Manufacturing

- Corner
- Pole
- Main Body
- End Caps
- Waveguides/Ports
- Extremities



1 - Design for fabrication

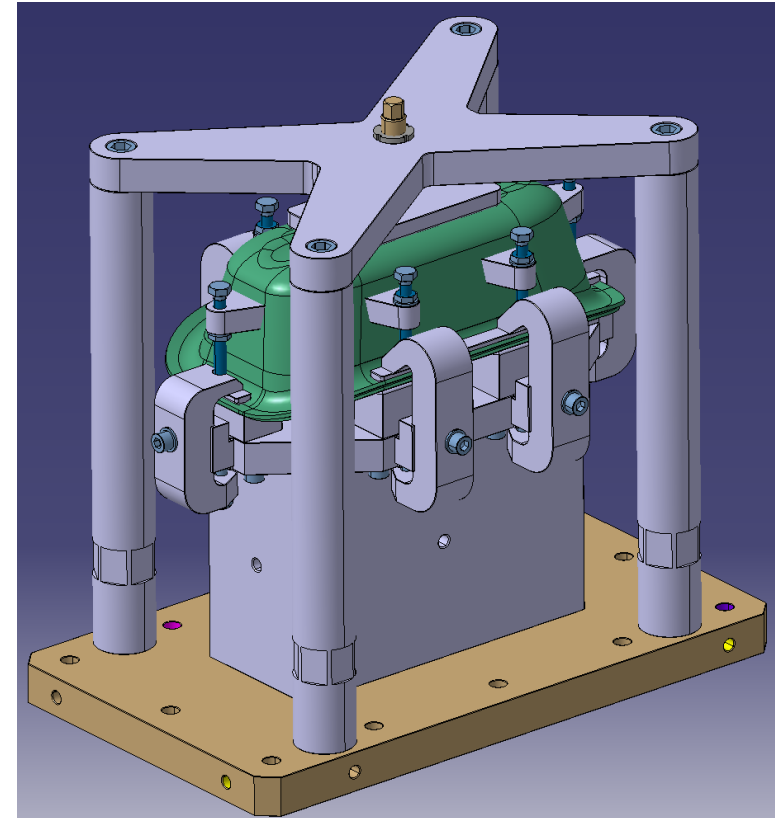
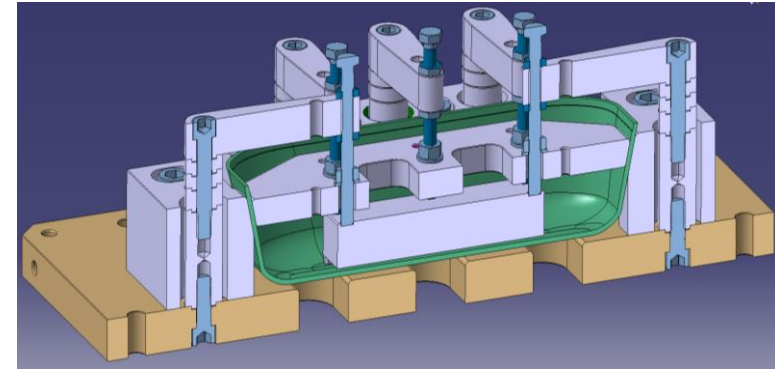
Pole, Corner

Pole machining Tooling:

- Tooling design:
 - 3D Approved
 - Fabrication drawing ongoing
- Tooling Manufacturing: end August

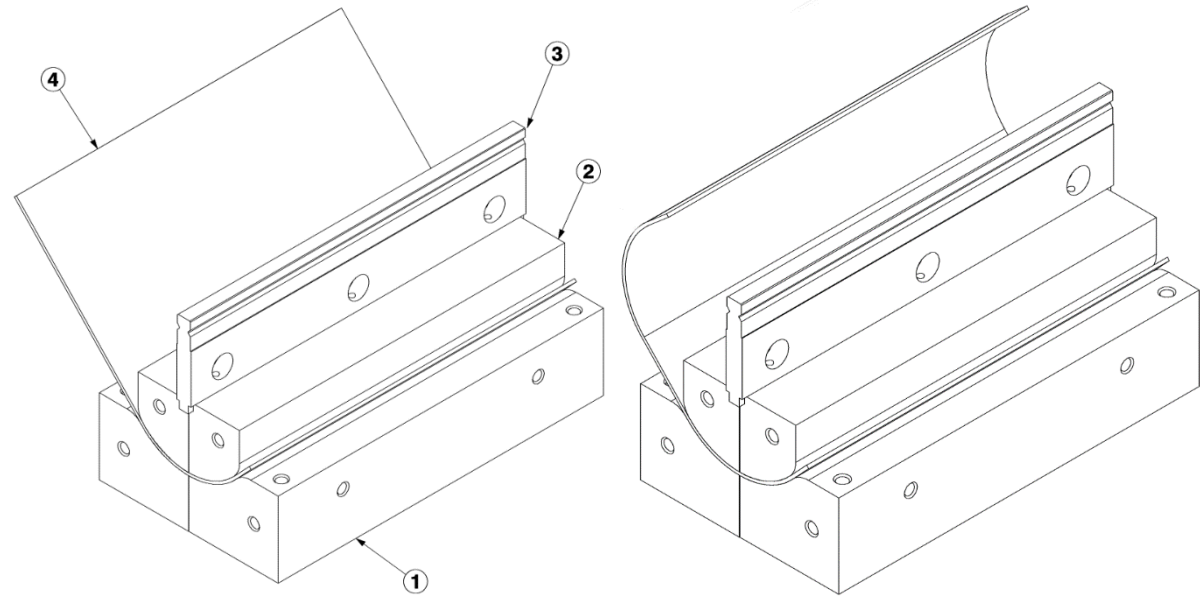
Multipurpose (machining/EBW) Pole and Corner Tooling:

- Tooling design:
 - 3D Approved
 - Fabrication drawing: ongoing
- Tooling Manufacturing: end August



1 - Design for fabrication

Main Body, V-HOM Waveguide

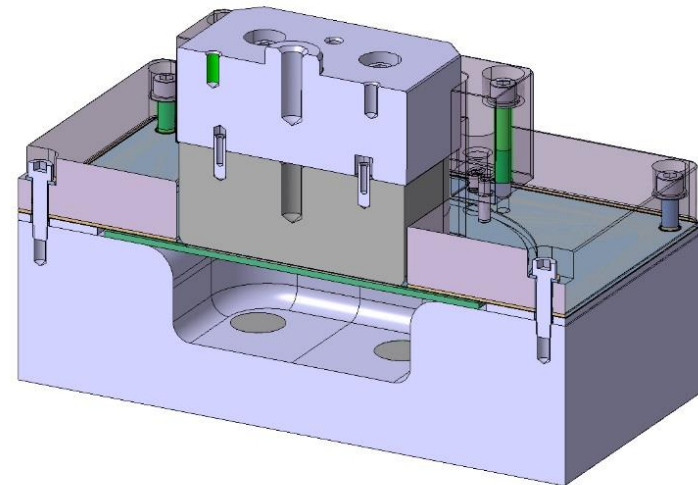


Main Body Shaping Tooling:

- Reference dwg: [LHCACFFT0065](#)
- Tooling design: **Done**
- Tooling Manufacturing: **week 31-32**

V-HOM Waveguide Shaping Tooling:

- Tooling design:
 - **3D Approved**
 - Fabrication drawing: **ongoing**
- Tooling Manufacturing: **end August**

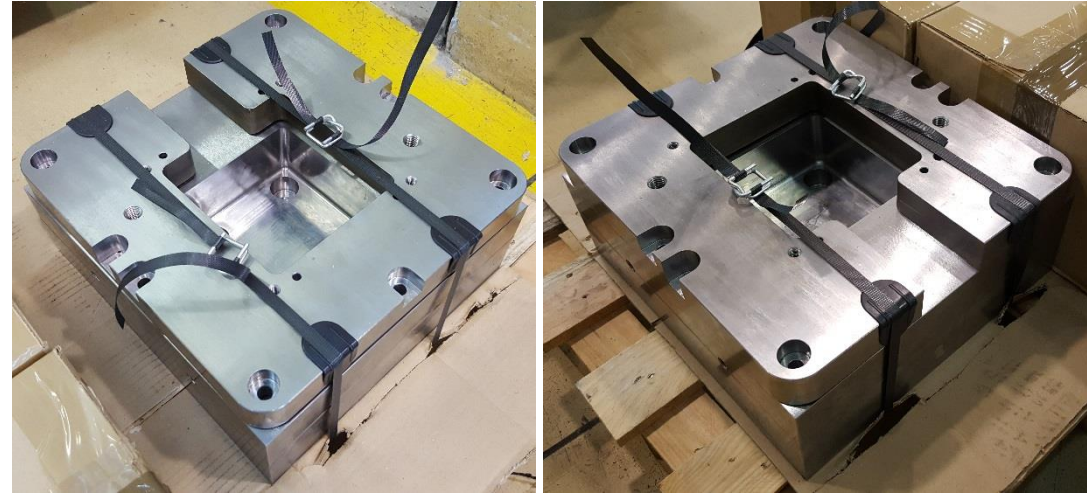


2 - Tooling in fabrication

H-HOM Waveguide, Corner stamping

H-HOM Waveguide Box Shaping Tooling:

- Reference dwg: [LHCACFFT0037](#)
- Tool components: [CERN AP ongoing](#)
- Intermediate Punches: [CERN AP ongoing](#)



Corner Stamping Tooling:

- Reference dwg: [LHCACFFT0027](#)
- Tool components: [CERN AP ongoing](#)
- Metrology: [EDMS 1984094](#)

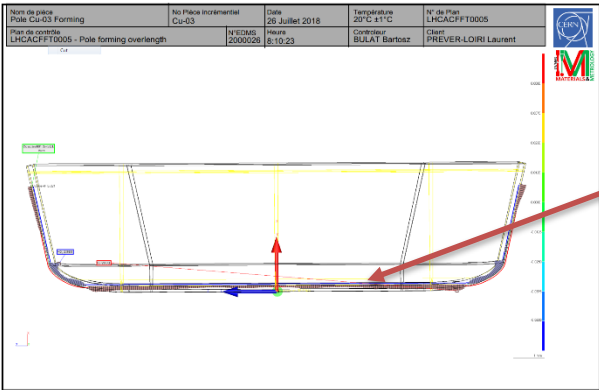


3 - Fabrication Results

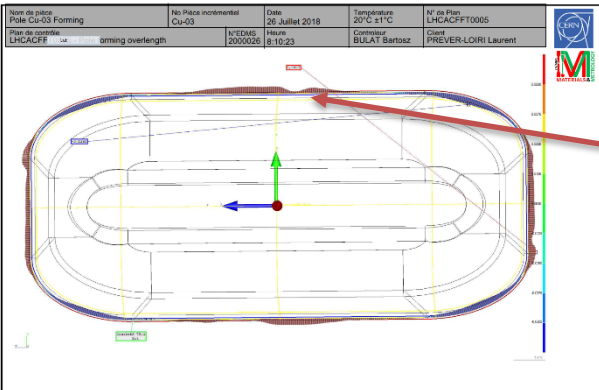
Copper Pole Tests

RFD Copper Pole forming tests:

- Reference dwg: LHCACFFT0005
- Completed Tests: Pole Cu-1, Cu-2, Cu-3
- Metrology: EDMS 2000026



Shape Tolerance ~0.55mm on:
- longitudinal sections
- cross sections



Shape Tolerance ~0.45mm on
welding profile section



3 - Fabrication Results

Copper Corner Tests

RFD Copper Corner forming tests:

- Reference dwg: [LHCACFFT0021](#)
- Completed Tests: [Corner Cu-1,Cu-2](#)
- Metrology: [ongoing](#)



4 - Any Other Business

Next forming steps, Material Update, Other tests ongoing

Next forming steps:

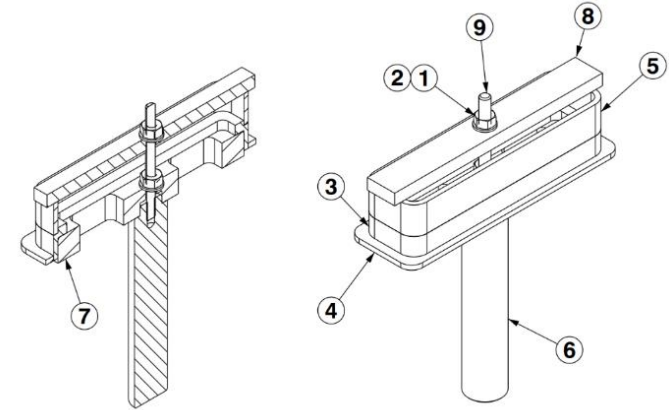
- Niobium Poles: **August**
- Niobium Corners: **August**
- Copper H-HOMs Forming: **August**

Material Update

- Niobium supply: **purchase order placed**
- Expected Delivery: **end october**

Other tests ongoing:

- Welding Test for Waveguide transition:
 - Tool components: **ongoing**
 - Welding tests: **first week August**
- Niobium property analysis:
 - Cold tests
 - Anisotropic tests
 - Frictional tests



Thank for the attention