

# BEAST TPC production & testing strategy

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# Construction and LAB. testing schedule

Part/Month	January	February	March	April	May
Vessel/End-plate	design	design/manuf.	manuf.	vac. test	
FE-I4B	discussion	order/populate/plate	populate/plate/mount	mount/bridge	glue/scans/cal.
FC	discussion	order/spacers	spacers/mount/glue	mount/linear	sparking/shielding
Plates & wires	design	design/order	plates	plates	plates
Circuits	test	test	test	order	circuits
Assembly					

Testing will be done with a single TPC or in each TPC (depending of pressure vessel arrival), a 3<sup>rd</sup> work bench and gas system are required.

- Assembly prior of LAB. testing to avoid un-necessary GEM exposure to air
- Storage places, in each vessels ? Vessels store in dark room
- Assuming all TPCs will be produced at once and arrived in May
- Assembly + testing: 2 weeks per TPC i.e. 14 weeks for all 7 TPCs

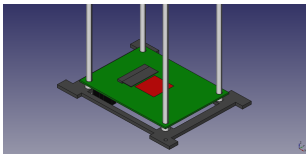
Part/Month	June	July	August
Vessel+Endplate	vac. test	vac. test	vac. test
"inside"-TPC	testing	testing	testing
Assembly	TPC	TPC	TPC

# Readout region

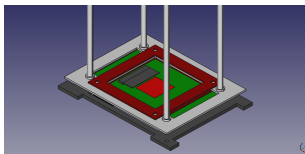
For the readout region, we should agree on:

- Transfer gap size - 2.8mm between GEM foils
- Collection gap size - 3.4mm between chip and bottom GEM foil  
=> dictate wire bond bridge design
- GEMs attached to a Delrin plate spacer by 4 Al screws, bolts and washers
- 0.6 mm between top GEM foil and cathode

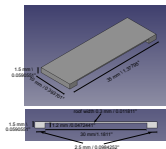
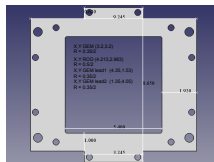
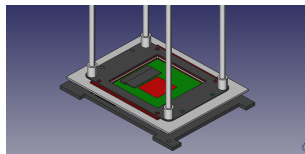
► FE-I4B board



► FE-I4B board+GEMs



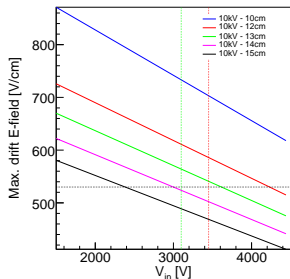
► FE-I4B board+GEMs+cathode



# Field cage

To start the purchases, we should agree this week on:

- Drift length
  - ▶ With FC support plates each 5cm from each sides: we have 20cm, **standard rods of 25cm**
  - ▶ At 11kV, sparks start to occur
  - ▶ HV supply 10 kV (?)
- Spacing between each rings - 1cm (Kurtis will produce some to test CNC machinery)
- Ring + cathode designs (bear machinery), **minor change on the ring and cathode: add holes**
- Mesh (e-fab)



- Al screws, bolts, washers
- Resistance of 100 M $\Omega$  with 0.1% tolerance
  - ▶  $\sim 1/15$  for 1% tolerance i.e. 1440
  - ▶  $\sim 1/60$  for 5% tolerance i.e. 5670

# Prototype 1 purchases

- Gas system
  - ▶ Gas
  - ▶ Tubing
  - ▶ Mechanical valves
  - ▶ String valves
  - ▶ Pressure gauge
  - ▶ Flow regulator
- HV cabling (RG58 cables  $20 \times 1\text{m} + 2 \times 6(?)\text{m}$ ) ( $\sim \$2000$ )
- Feedthrough STT Grounded Shield Recessed 5kV 10 Amp 0.094 Nickel Conductor 4 each in a KF40 Flange Without Plug
- Kapton for shielding ( $\sim \$1000$ )
- Boxes + resistances