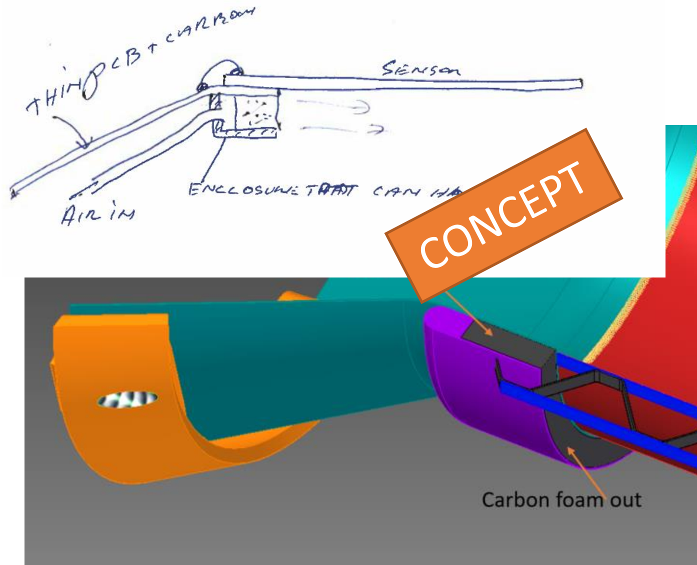
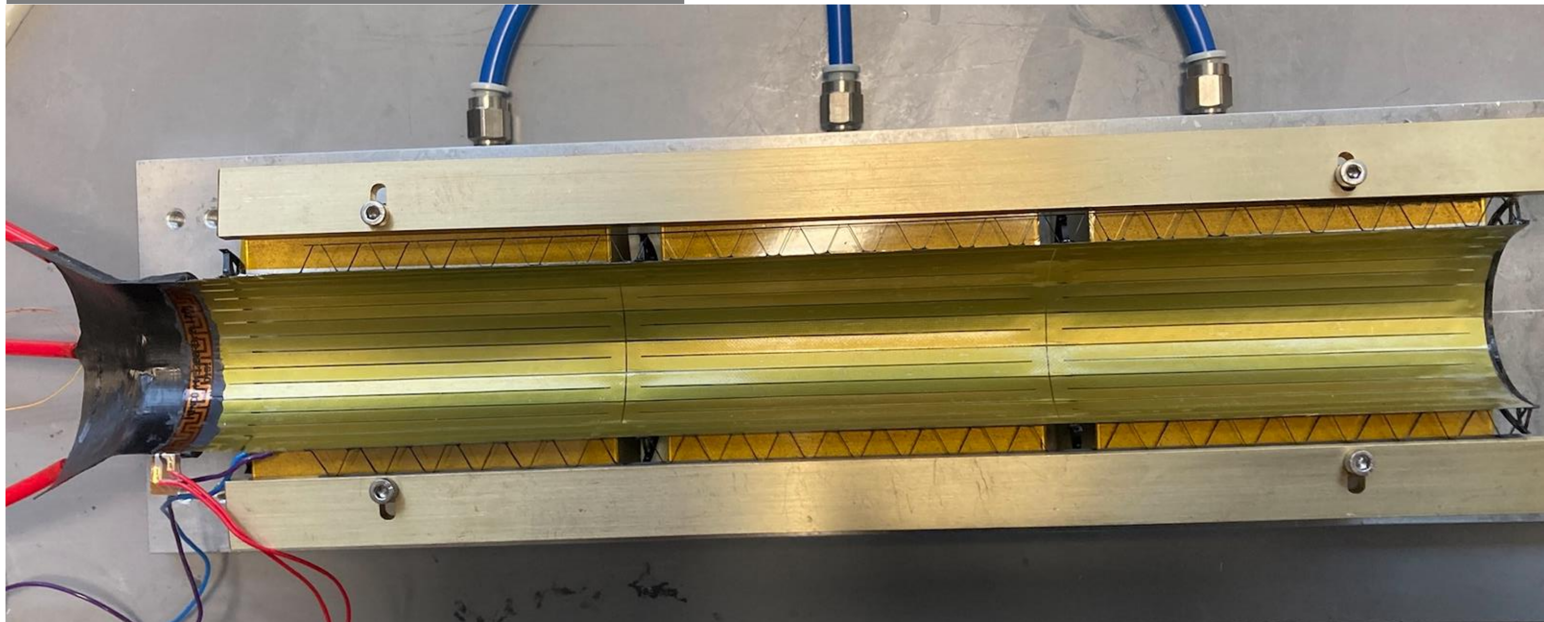
Cooling with carbon foam –no holes-confined pressure





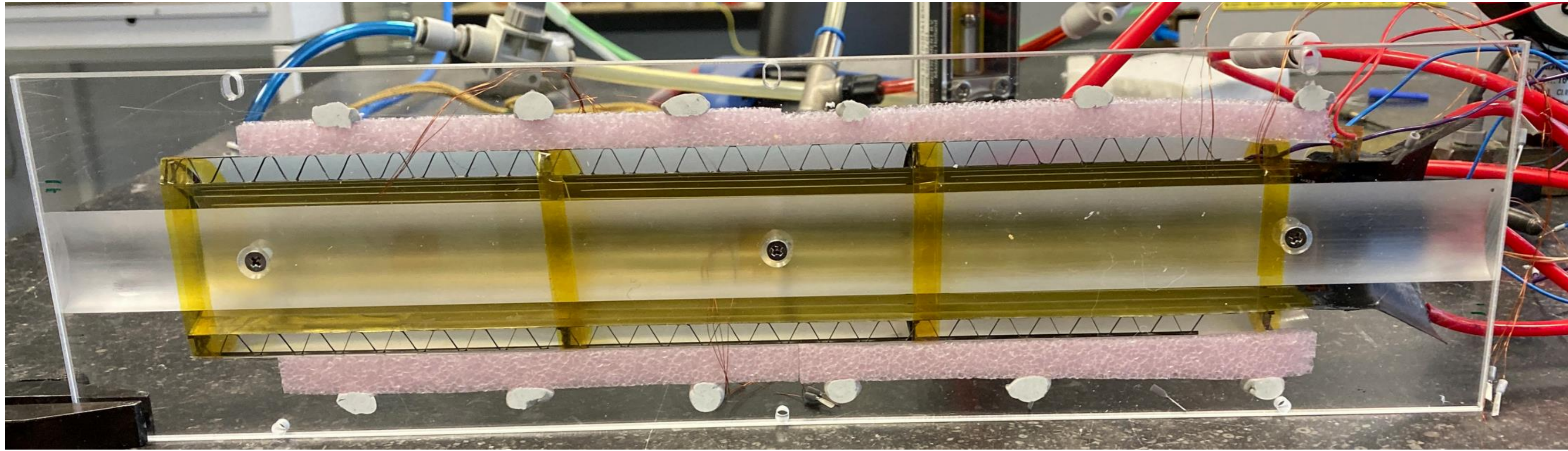
Test with Alcomp LD

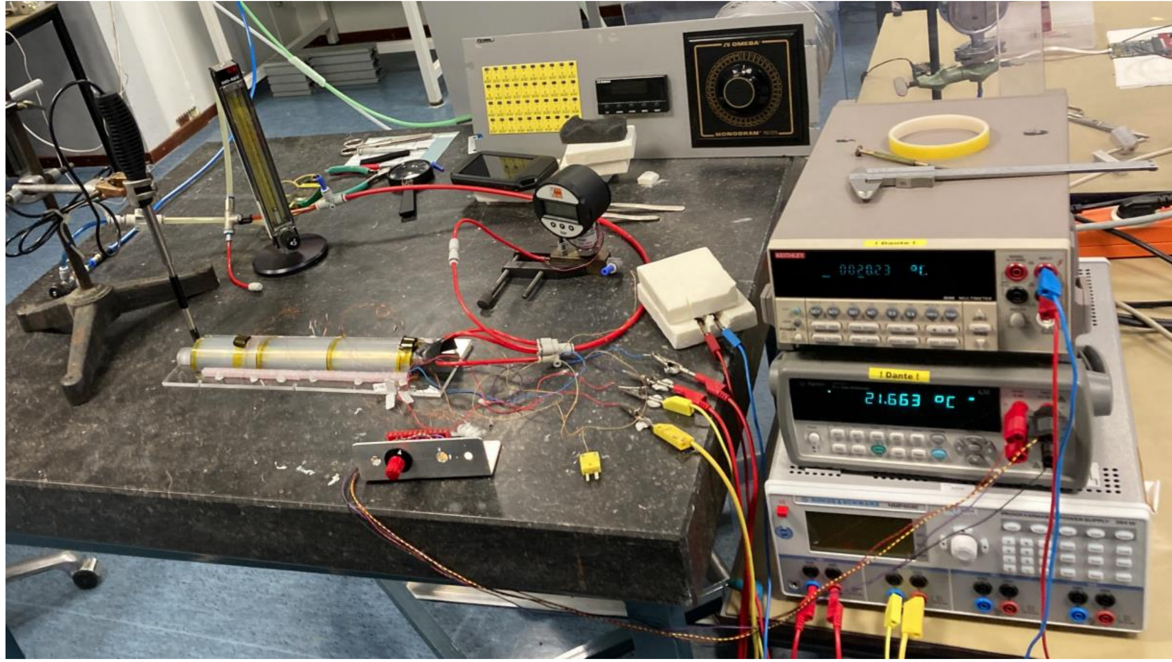
Moved to Unidirectional carbon as the Cloth+flece was "leaky"

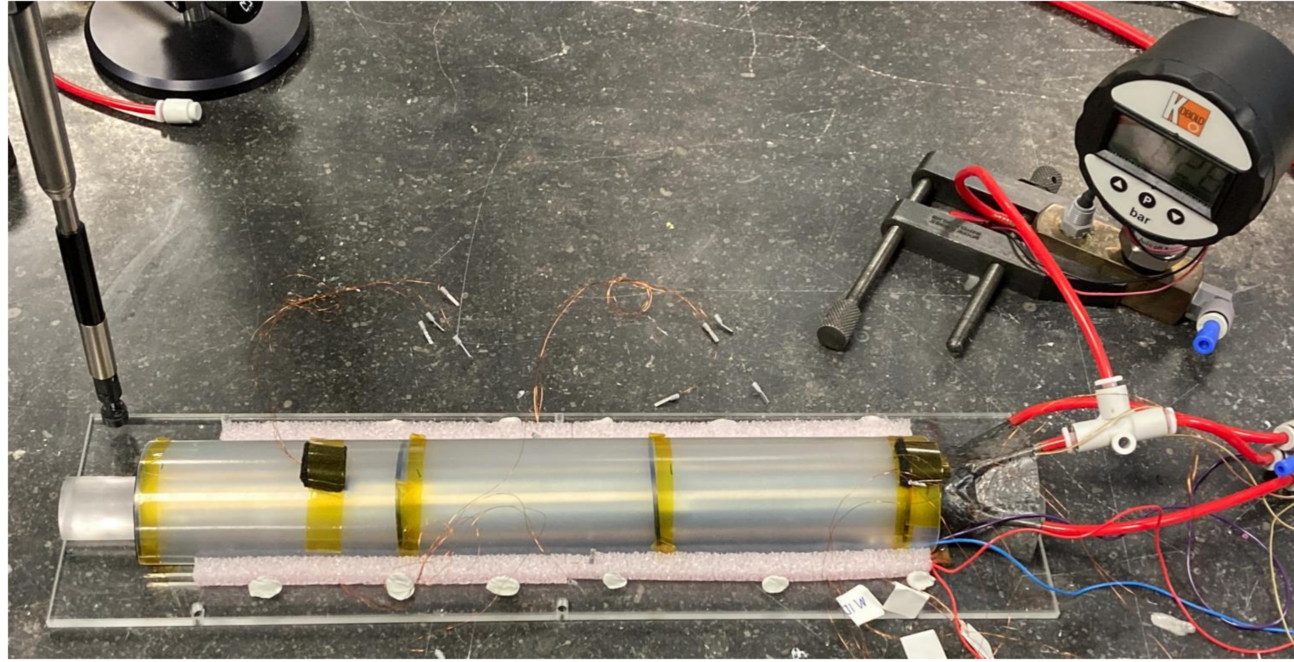
Tried to optimize thermal contact with
Thin isolation (epoxy) on LTU heater
Did not work, electric short to foam
So we added a different heater for the test

Setup

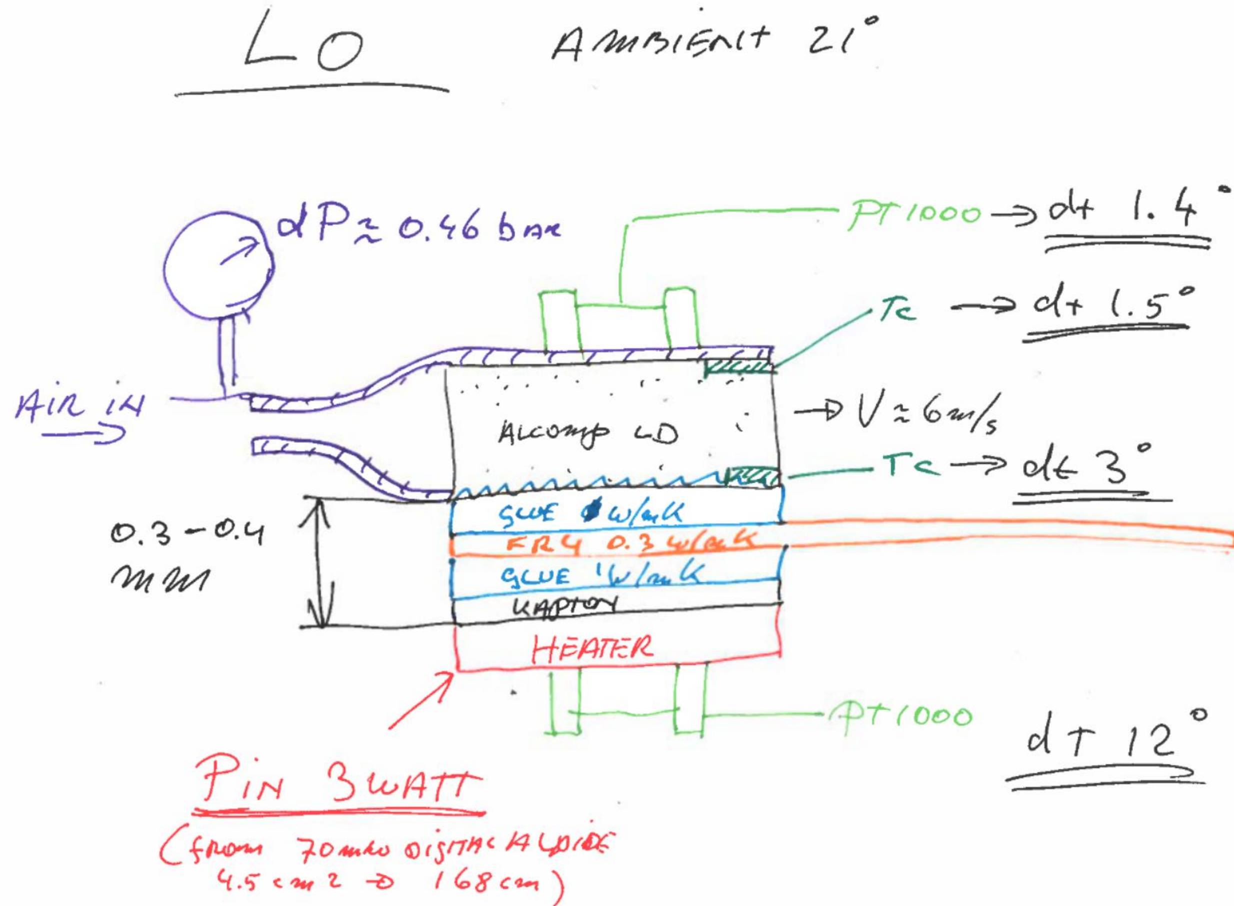
Due to availability of foam cooler is built in parts measurement done in middle of segment

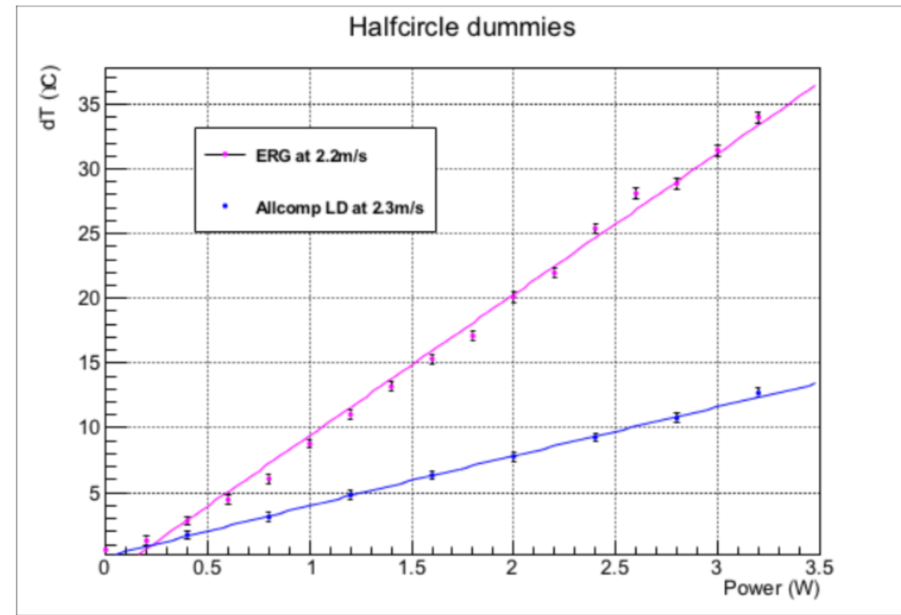




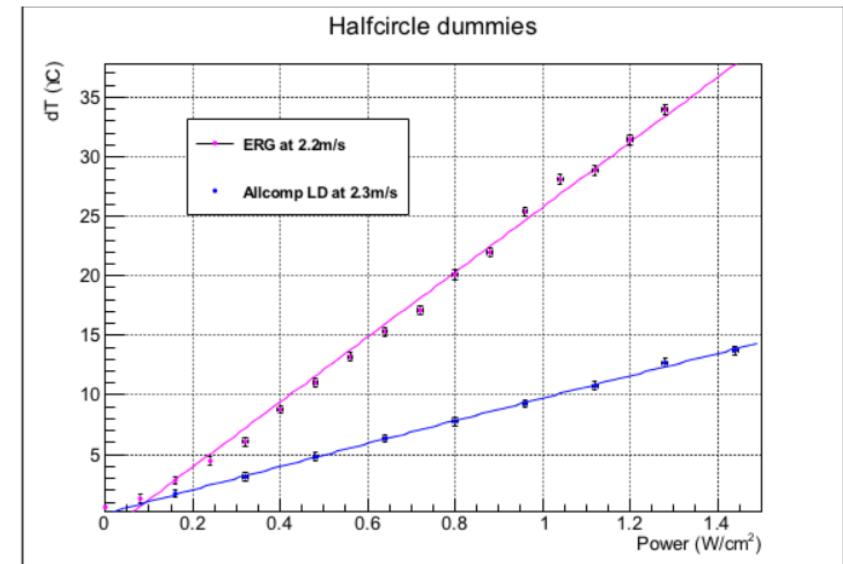


Assembly was finished yesterday “first results”
Details will follow (Judith)





Total assembly heater ca.2.5cm2

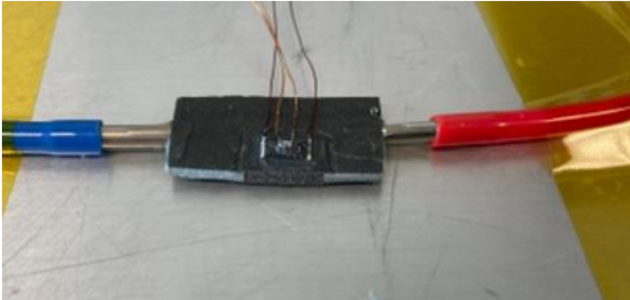


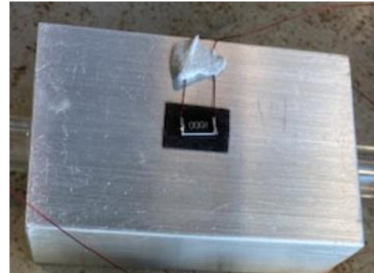
Scaled to W/cm2

NEXT (Pending results EM module @ CERN)

It seems the biggest temperature drop is due to contact /Glue we found epoxy/alumina glue with 6.5 and 30 W/mK
Redo minitest (we have about 1-2cm3 alcomp ld @utrecht)

With our experience now it is possible to get thin glue layers when assembling under vacuum/clamping
But I don’t think this is viable on silicon I would expect glue layers thinner then 0.2-0.4 not possible
with low force and reasonable tollerances so mesure heatconduction of glue in different layer hights
And asses workability of glue as Viscosity ranges from 16000-280000cps (ketchup to peanut butter)





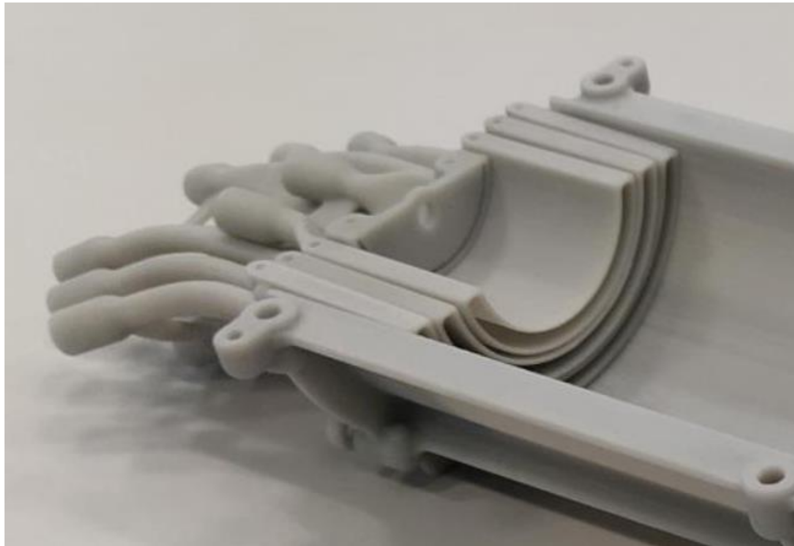
Properties	G3000	Test Method
Thermal Conductivity	30W/mK	JESD51-14 After cured
Component A / B		
Appearance & Color	Brown paste / White paste	Visual Inspection
Viscosity@ 25°C	260000cps / 280000cps	Brookfield DV-3
Density@ 25°C	2.3g/ml / 1.8g/ml	ISO 1183

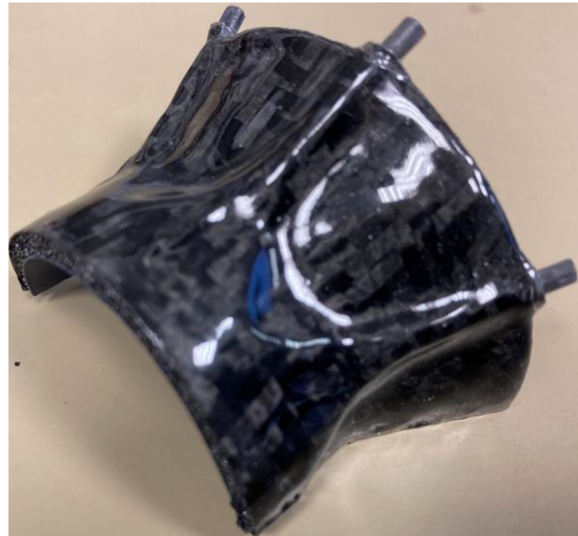
Properties	G650	Test Method
Thermal Conductivity	6.5W/mK	JESD51-14
Component A / Component B		
Appearance & Color	Light pink paste / White paste	Visual Inspection
Viscosity@ 25°C	16000cps / 8000cps	Brookfield DV-3
Density@ 25°C	1.63g/ml / 1.25g/ml	ISO 1183

https://www.thal-technologies.com/en/high-thermal-conductive-glue/a3882?c=3487

Build Full L0-1-2 with “nohole” cooler and LTU heaters and improved gluing

*need foam , 10 cm3 should be oke when using segments
* I would like to have a “best guess” design. Say combination of Gael’s design for
EM module and carbon shells + latest insights in interconnect e.t.c I only need general layout
I extract molds for carbon from 3d assembly and would only make say the part close to sensor





As discussed last meting We Prepared some samples For WP5 and a couple extra for anybody interested wil schip this week
Please test/messure /compare/break/comment