

Subject: Summary of Meeting on PST Prototyping

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Hi All,

I wanted to summarize what we discussed this monday, to make sure that we all have a consistent view of what has to be done or decided in the near term for PST prototyping.

I made an estimate of the material we have remaining, and contrary to our previous fears, we appear to have enough composite material for all prototyping until December, with the exception of carbon cloth that we need for the rails. Most likely this additional cloth will be P30 or T300 equivalent high strength (relatively low modulus) carbon, impregnated with EX1515. I have requested a quote from Bryte, and if there are availability concerns, we can see if Alcomp has any of this type of material available.

We decided that for the December PRR (assuming this stays scheduled) we will need to have a one foot PST shell with flanges and rails bonded to it. This shell will have heaters co-cured to it, although their orientation will depend on how we decide to connect these heaters, and whether we will have them extend under and past the flange or not. We also would like to have an 8 foot rail for the PRR, though this will not be bonded into any shell. A cursory schedule shows that our ability to produce this rail is suspect:

July 14 - RFQ for short rail tools
August 1 - PO for short rail tools
September 1 - Short rail tools delivered
September 14 - Short rails laid up, RFQ for long rail tools
October 1 - PO for long rail tools
November 14 - Long rail tools delivered
December 1 - Long rails laid up and cured
December 7 - Long rails measured and validated

Clearly the last month of this schedule is very compressed, if not impossible. There is uncertainty in rail delivery times, however, so delivery of some rails may be moved up. In order to compensate for this schedule crunch, we can either buy long rails at the same time as short rails (risk if short rails need modification), or we can go to the PRR without a long rail (very undesirable). We will issue an RFQ for short and long rails by the 14th, to at least a couple of vendors, in order to find out what the real lead times for tool delivery are. Anmol and Tai are currently working on rail shapes and drawings, and I will do "final" analysis of the rail shape next week to determine if it meets our deflection criteria.

In order to alleviate the shortage of man power and time that we have, we will see if Wei-Shih (Alcomp) can make our flat plates for the flanges (the drops from which will be used to make mount pads for the PST). We will also ask for input from him and Bill Miller (Hytec) on whether the flange concept should be changed, and how we can simplify the gussets. We mentioned several possibilities at the meeting, from having no gussets to making simple single-rib gussets laid up on a male tool. Potentially, we will see if Alcomp can make these gussets, as well. An unresolved issue is what kind of mount pads we will make for the one foot PST, and whether they will have additional mount blocks (perhaps from aluminum) bonded to them to simulate that portion of the PST assembly and bonding process.

To summarize, our prototyping effort will consist of the following items, in general order of fabrication:

1. Hybrid shell, made with full compaction (need to avoid wrinkles) with heaters.
2. Barrel shell, with heaters.
3. MAYBE - Hybrid shell with extra carbon plies (if rail analysis suggests this is needed).
4. Flange base pieces (hoops) - made on current mandrel with a shim (if design does not change for flange).
5. Short rails.
6. Flange faces (outsourced perhaps) - basically concurrent with or before number 5.
7. Flange gussets or "buckets".
8. Mount pads.
9. Bond flanges.
10. Bond foot long PST assembly.
11. Long rails.

In schedule terms this is approximately:

July 14 - September 1 => Hybrid and Barrel shells, flange base hoops, flange plates outsourced. [1-4]

September 1 - September 14 => Short rails. [5]

September 14 - November 1 => Flange faces machined, gussets or buckets made, mount pads. [6-8]

November 1 - 14 => Bonding jig assembled, PST bonded. [9-10]

November 14 onwards => Long rails and measurement. [11]?

We will have another meeting on Monday, at 2 pm in order to discuss this more, and see if any progress has been made, but this week may not yield many tangible results. Mostly, I would like to see how people feel about this schedule and if I have missed anything. Have a happy and safe 4th of JULY!!

Neal

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