

Comments on LRM Process Document

- List of references missing
- More info (or examples) on SPC (e.g., preform gap)
- Classification of structures (good or bad?)
 - Primary
 - Fracture critical
 - Secondary
- Where is the material used? - scope
- Combine material procurement in process spec???
- Process vs. materials (is what we have a process spec)
- Assumption that reader is familiar with building block approach
- Does the building block approach work for LRM ?
- Option of not testing for incoming materials

Comments on LRM Process Document

- Scope of the document –written assuming flat panel, but there are parts of the document useful to parts
- Recommend limited focus of the document to flat panel
 - Manageable – can address important details
 - Material control*
 - Material processing*
 - Scale-up*
- * Casting mentality
- Are industry standards (like prepreg) possible/practical?
- Is there merit to LRM processing industry standards?
 - Do designers use flat panel data/material prop. to certify parts?
- What would be likelihood of material suppliers vs. part manufacturers investing in a combined material spec?

Comments on LRM Process Document

- Contamination
 - Hand touch on fabrics/preforms?
 - Do we need to consider this issue in the same way as the past?
 - Clean room proof?
- How do we check that all process variables covered?
- Process Map
 - What variations show up where?
 - Batch to batch variation occurs where?
- Preform quality control
 - Preform teardown required?
 - When does it get to its final form?
 - Is teardown required at this point?
 - How do we verify preform position/placement

Comments on LRM Process Document

- Safety (of process) one-liner only
- Recognize on site formulation issues (& Vinyl Ester)
- Sizing on fiber is reactive.
- Burping? (resin bleed/resin pulsing etc,)
- Developmental phase? (...document assumes not)
- Emphasize document is guidelines/recommendations not requirements
- Some comments too specific
- Record retention

Proposed Revisions LRM Process Guidelines.

- Review Guidelines vs Examples
 - Aim to keep specific requirements as examples of how to control area of concern.
- Review scope of document
 - Crossover between flat panel and full scale part
- Add notes on preform controls
- Add example for SPC
- Add comment on operator health and safety
 - (n.b. out of scope for this document.