

HDT Topic - Material Qualification for Large Scale Projects

Monday September 23rd 18:00

Ground rules:

- *Make your point quickly and from a technical basis*
 - *Back it up with examples*
- *Let others respond to your point*
- *Do not argue*
 - *Instead say I disagree, and then make your point*

Question 1

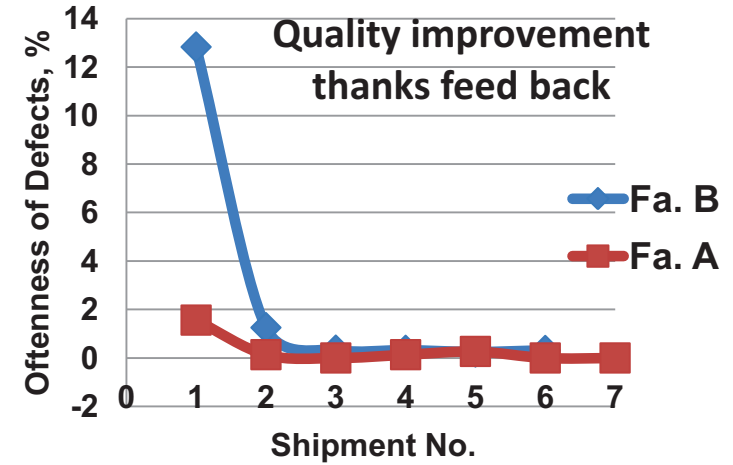
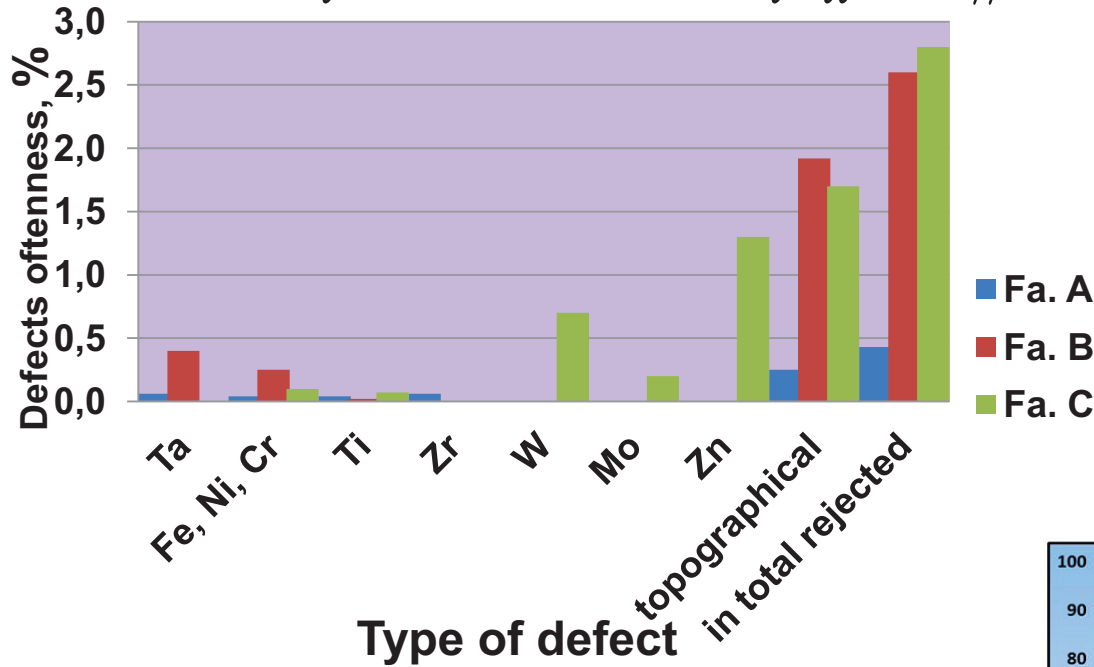
- Is material scanning necessary, cost effective?
- High gradients $> 20\text{MV/m}$?
- Low gradients $< 20\text{MV/m}$?

Experience with semi-finished material purchased for JLAB upgrade cavities

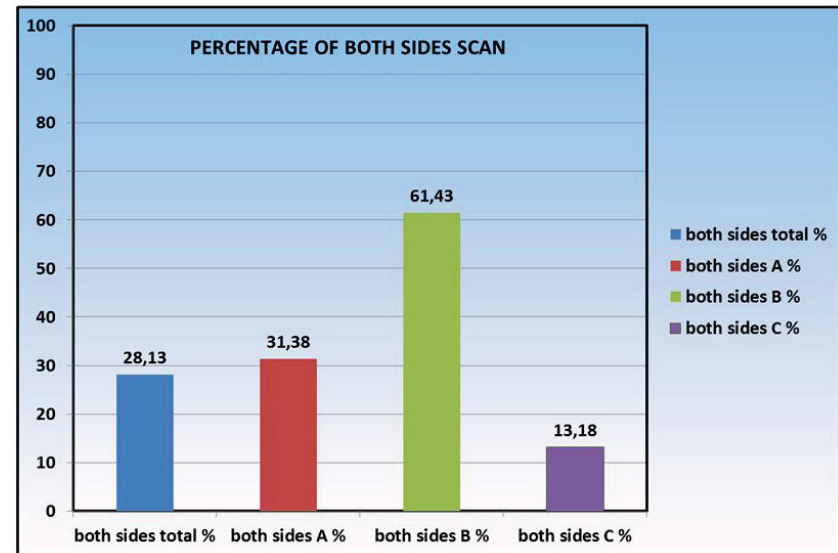
- Material (RRR250) purchased according to JLAB specification
- about 1300 sheets, 3.2 mm x 240 mm x 240 mm required for 86 pieces 1.5 GHz 7 cell cavities
- Material ordered at Tokio Denkai
- No eddy current scanning performed on cell sheets
- Tubes manufactured from sheets, 4 mm thick, EB welded and turned
- One sheet showed lamination after deep drawing
- No cavity limited by material defect to our knowledge
- If material is ordered by industry, overhead cost do apply. Decision who purchases the material (industry or institute) involves risk evaluation.



Defects detected in Nb-sheets of different suppliers. For details see MOP047, MOP031



2,5% of defects means that each 40th Nb-sheet has a defect and in worst case the performance of each second cavity will be affected



Question 2

- Should the vendors provide the material and material QA or the laboratories?

AES- *Cavity Material Purchase*

- Cost → Reduced if Labs Purchase Material
 - If the Labs purchase the material they avoid the procurement burdens that companies must apply to the purchase price
- Schedule → Improved if Labs Purchase Material
 - With the long lead time associated with RRR Nb the Lab can purchase some or all material in advance of awarding the cavity manufacturing contract
- QA → Slight Premium if Labs Purchase Material
 - If Labs purchase material there will be QA at the Lab and receiving QA at the cavity manufacturer though the company QA can be at a reduced level
 - Can be offset if Lab QA is performed at the cavity manufacturers facility

Question 3

- Are the current material specifications adequate, same lab to lab? or are we over paying?

Jefferson Lab 12 GeV C100 Cavity Final E_{max}

