Coil Fabrication Status and NCRs - BNL

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BNL Coil Fabrication Status

- Coils to date = 9 (4 compete (1 quarantined), 2 rejected, 3 underway,):
  - QXFA202 - Complete and shipped (1st coil fabricated at BNL).
  - QXFA203 - Complete and shipped.
  - QXFA204 - Complete and shipped.
  - QXFA205 - Cable damaged during winding – coil rejected.
  - QXFA206 - Complete and shipped – shipping anomalies, impact is under investigation.
  - QXFA207 - Impregnation complete, final prep underway.
  - QXFA208 - Cable damaged during wind/cure – coil rejected.
  - QXFA209 - Reaction underway.
  - QXFA210 - Winding underway.

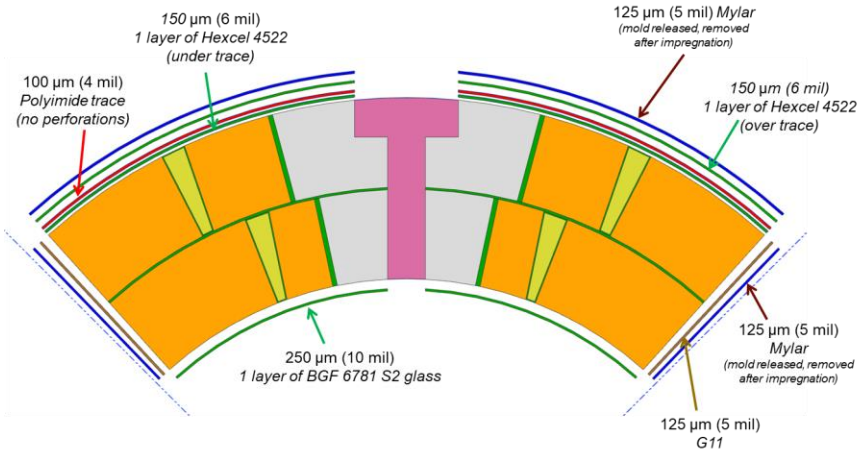
  - QXFA202 & 204 used in magnet MQXFA03

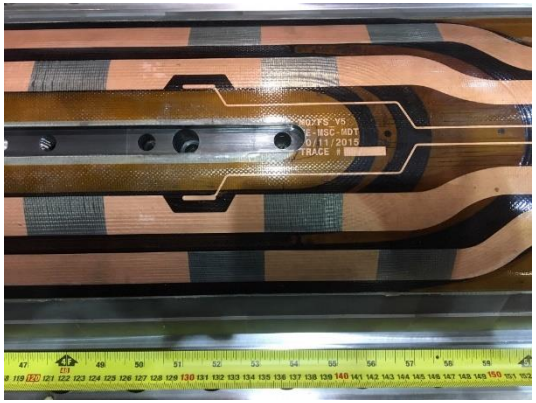
QXFS04 – Impreg test with QH Swap

- Coil that was set aside after reaction a few years ago – not impregnated.
- Recently used for an impregnation test with fiberglass under trace.
  - 1 layer of fiberglass was installed under the trace.
  - (change from 2x Hexcel over trace to 1x under & 1x over)
- Impregnation quality looks good.
- Heaters / Coil passed standard electrical checks.

Hipot Checks - leakage < 1 µA

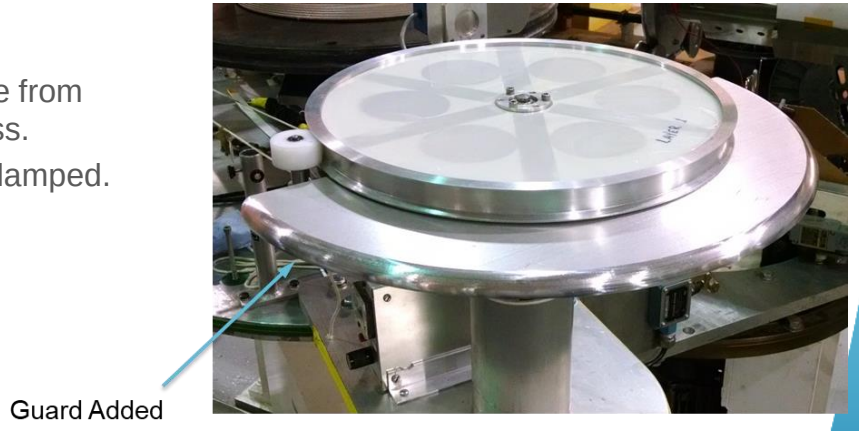
QXFS04		Grounded / Monitored Component		
		Coil	LE OL Saddle	RE OL Saddle
Powered Component	PHB01	3680 V - OK	2500 V - OK	2500 V - OK
	PHB02	3680 V - OK	2500 V - OK	2500 V - OK
	PHB03	3680 V - OK	2500 V - OK	2500 V - OK
	PHB04	3680 V - OK	2500 V - OK	2500 V - OK





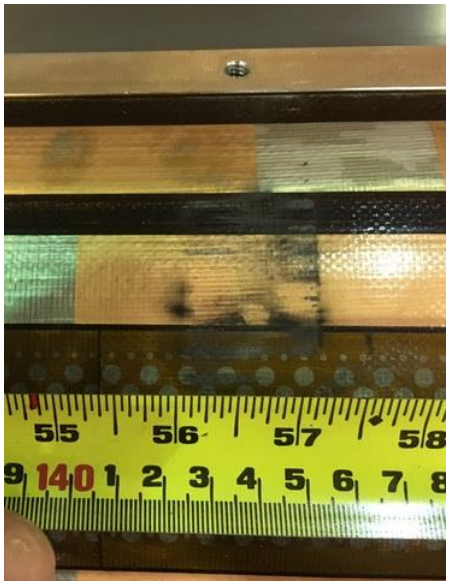
QXFA205 - NCR

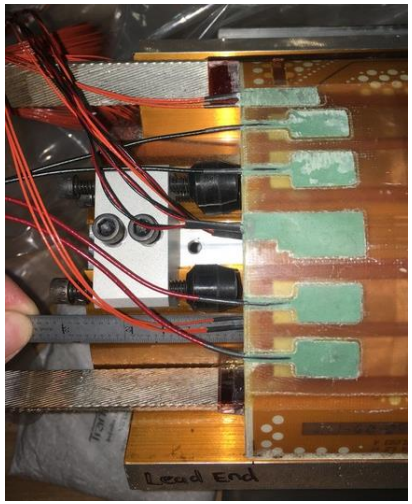
- Cable was damaged during winding of inner layer.
  - Winding was paused to address oil leaking from a gearbox.
  - Cable spool was clamped and control power was turned off.
  - Winding was resumed without removing the spool clamp.
  - Immediately paused to remove clamp.
  - When resume again there was some slack in the cable that went unnoticed, as a result the cable was not fully in contact with the guide pulley.
  - When cable tension was applied, the cable was pulled below the guide pulley and got caught against the guide roller bracket.
- Coil was unwound, all parts were recovered.
- Improvements made to prevent in future:
  - Added a guard below the guide pulley to prevent cable from dropping / becoming caught in the event of tension loss.
  - Incorporated interlock to prevent start when spool is clamped.



QXFA206 - NCR

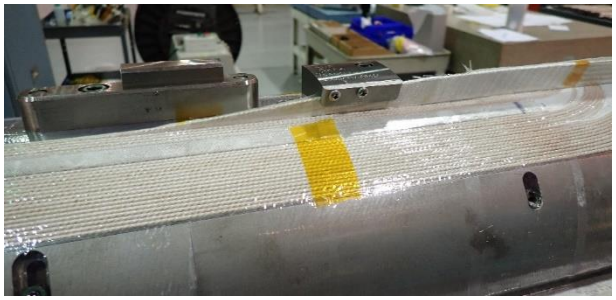
- Coil movement on shipping fixture during transport, discrepancies noted upon receipt at LBNL:
  - Rub marks on coil from aluminum coil OD clamps.
    - Indications of small axial motion.
  - End restraint screws not in contact with coil end.
    - One rubber tip appears to be cracked.
- Coil disposition under evaluation.
- Improvements for future shipments:
  - Add thin rubber between coil and aluminum coil OD clamps.
  - Add lock nuts to end restraint screws.
  - Replace end restraint screw rubber tips with swivel pads.

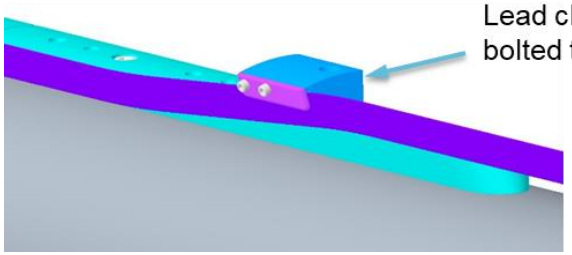




QXFA208 - NCR

- Cable was damaged during curing of inner layer.
  - Cable was not in correct position in the transition ramp area during curing of layer 1.
  - Transition lead was dislodged during prep for curing / Teflon wrapping.
  - Lead was thought to have been repositioned correctly prior to curing.
  - Damage was discovered after curing layer 1.
- Coil was unwound, all parts were recovered.
- Improvements made to prevent in future:
  - Added clamp on pole to be installed at start of winding, when the lead is initially positioned in the ramp, and to remain in place thru curing.
  - Added clamp at end of coil to be installed before moving L2 spool prior to Teflon wrapping.
  - Revised procedure for installing LE filler segments & inspecting lead prior to curing.
  - Eased sharp edges on filler segments.





BNL Coil Fabrication

- Thank you
- Questions?