



U.S. MAGNET
DEVELOPMENT
PROGRAM

High- C_p Cable Development

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U.S. MDP Collaboration Meeting CM8
05/02/2024



U.S. DEPARTMENT OF
ENERGY

Office of
Science

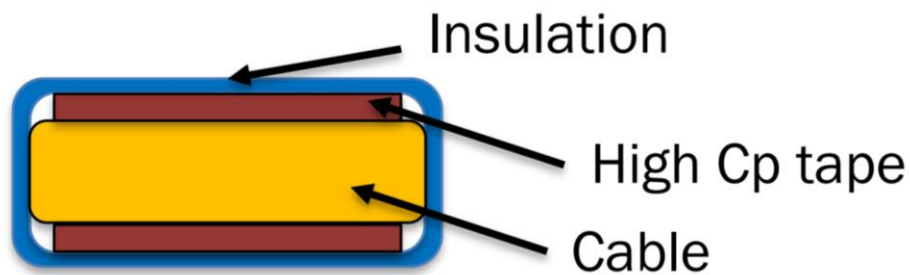
- At the previous CM, the TAC asked that we tried to use the non-ductile high- C_p tape made of Cu and high- C_p ceramic powders nevertheless in Rutherford cables.
- The experiment was performed unsuccessfully.
- **CONCLUSION:** Either we just use the tape as core in the cable, OR we need some material R&D by Hypertech to make the tape DUCTILE.

M3 - First High- C_p Cable Fabrication (1)

Subscale CCT Cable Test With High C_p Tape

50 micron E-glass and 50% overlap

Winding of initial test cable



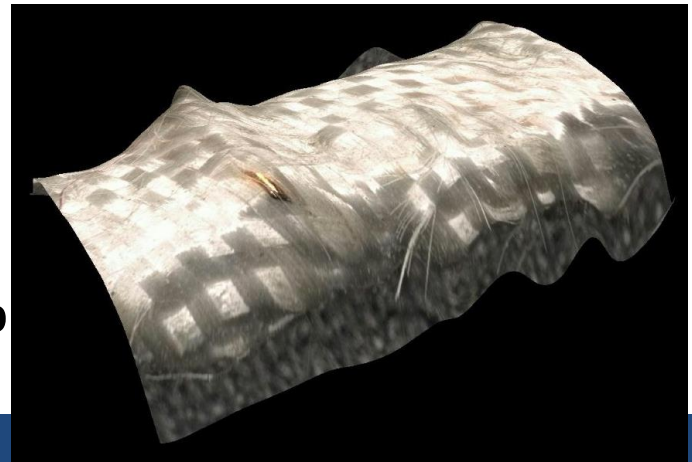
LBL Cable

Parameter	Unit	Value
Conductor Type	-	RRP 132/169
Strand Diameter	mm	0.6
Cu:non-Cu ratio	-	1.17
Number of Strands	-	11
Cable Width	mm	4
Cable Thickness	mm	1.1

Annealed C101 99.99% pure Cu ribbon 50 μ m thick x 3.175 mm running parallel to the cable at the top and the bottom



OUTCOME – The Cu tape developed periodic small folds which create a sharp corner that pokes through the E-glass



M3 - First High- C_p Cable Fabrication (2)

- Repeated experiment with 100 μm Cu tape and same 50 micron E-glass and 50% overlap \rightarrow The tape pops on the inner radius of a 10 $\frac{3}{4}$ inch spool when bent.
- The bend experiment was repeated each week to account for possible relaxation of the materials. None occurred significantly.

