CABLE Conductor Manufacturing Prize

Team Name:	*Clean Carbon Conductors*
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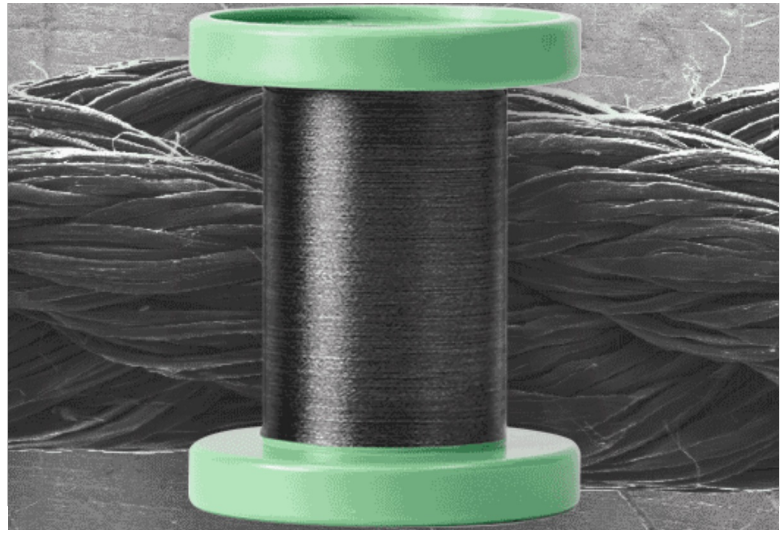
Submission Title:	Advanced Carbon-Negative Materials



Description of Material

- Galvorn carbon nanotube (CNT) conductors are the highest conductivity commercially available CNT materials in the world.
- DexMat's primary target market for Galvorn conductors is ACSR transmission cables. The total market size for ACSR power transmission lines was $30B in 2022.
- Our material is competing in Contest 3: Beat a Conductor System, as Galvorn can improve ACSR cables from 43.7% to 45.5% IACS.

Fabrication Approach

- Galvorn fibers are produced by extruding solutions of CNTs through small holes and winding the resulting filaments under tension, very similar to the Kevlar production process
- We expect to achieve significant conductivity improvements in Galvorn fibers by using significantly longer, defect-free CNTs, by improving CNT alignment in the fibers, and by electrochemically doping the constituent CNTs with halogen compounds

Potential Impact

- Developing a CNT conductor that conducts as well as aluminum while being 2 times lighter will revolutionize materials for power transmission lines, automotive, aerospace, and electrical motor industries
- CNT conductors can be produced with net-zero CO_2 emissions and production will be cost competitive with Cu and Al at scale
- Using CNTs to displace Cu, Al, and steel could reduce CO2 emissions by up to 3 GT per year