

IAF MATERIALS AND STRUCTURES SYMPOSIUM (C2)
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THE DEVELOPMENT AND COMMERCIALIZATION OF UNIQUE AND SCALABLE CARBON
NANOTUBE SHEETS WITH HIGH PERFORMANCE AND LOW COST**Abstract**

Carbon nanotubes (CNT) have a revolutionary potential to change the world. This is reflected by the projected growth of its global value, with an addressable market size of up to 1 billion dollars in 2022. Because many industries require carbon sheet materials as thermal, electrical, electrochemical, or mechanical components in their devices, CNTs can offer outstanding solutions to drive up performance, given their outstanding mix of large microscopic surface areas, special surface functionalities, physical features, and thermal properties, enabling them to outperform any of their market competitors. However, there has been no effective utilization of CNT commercially and on large scale in the market. The reason for this current standing is because the CNT industry is challenged by the high cost, non-scalable fabrication methods, and the powder nature of these materials. Thus, we have solved these issues by inventing a highly unique, facile, and scalable fabrication method to produce high throughput CNT sheets with large and tunable length, tailored properties, and with no binders. We are also able to produce composites of materials through our method, expanding the opportunities sought even further. Moreover, our method is capable of controlling alignment of the fibers which is critical for performance, and can be implemented into a roll to roll continuous process which is important for scalability. The process is also environmentally friendly and does not require high energy intensive steps. All of these aspects which were carefully and iteratively developed over the course of 4 years of research at Masdar Institute (A part of Khalifa University) resulted in a patent application on the technology, and forming a startup Fabcast Solutions. The startup is currently in its incubation phase at the Khalifa Innovation Center in Abu Dhabi, UAE. We seek collaboration and strategic partnerships to co-develop and validate our sheets for specific applications, including sensing, space, electromagnetic interference (EMI) shielding, thermal, and electrochemical applications. The performance of our CNT sheets have been validated internally in the lab for flow battery applications, offering unprecedented performances for electrodes in electrochemical applications. Currently, the sheets are being developed for space applications, as thermal components, and for EMI shielding. To build confidence and attract investment, all of our products are being validated at external entities.