Docket #: S19-225B

Octogrid Constructions And Applications Utilizing Double-Double Laminate Structures

Stanford researchers have developed a method to form orthogonal overlapping joints at the 4 corners of the starting square. In order to have constant height of each beam, inserts in the beams between the joints will be required. Finite lengths of unidirectional composite tapes must be engineered to staggered layup patterns to form strong cross-plied joints and inserts to maintain constant beam heights. Further reduction in weight can be achieved if beams are made with sandwich core, and/or the skins of the beams are tapered as then approach their ends. For tapered skin, the finite length tapes will have variable lengths. This octogrid composite laminate structure will be lighter, stronger, and lower in cost compared to conventional laminate structures. The inventors demonstrate with finite element model that the octogrid structure demonstrates improved bending and torsional rigidities with weight savings of up to 66%, relative to solid circular or elliptical structures carrying the same load.

Stage of Development
Ongoing research

Applications

- VTOL with 8 motor/propeller, backbone of propeller, intersecting wing/fuselage frame, electric generator rotor for wind turbine.

Advantages

- Simple design and manufacturing in tooling and resin infiltration

- Interlocked joints for rigidity and strength
- Amenable to both automation and hand layup
- Weight and cost savings

Patents

- Published Application: 20220363019
- Issued: 11,752,707 (USA)

Innovators

- Stephen Tsai
- Surajit Roy
- Chuanxiang Zheng

Licensing Contact

David Mallin

Licensing Manager, Physical Sciences

Email