

Figure S1. Single-walled carbon nanotube dimensional representation of atom positions in x - z direction and x - y direction with value of length in z -axis equals to 25.409 Å and diameter in x - y axis equals to 9.548 Å.

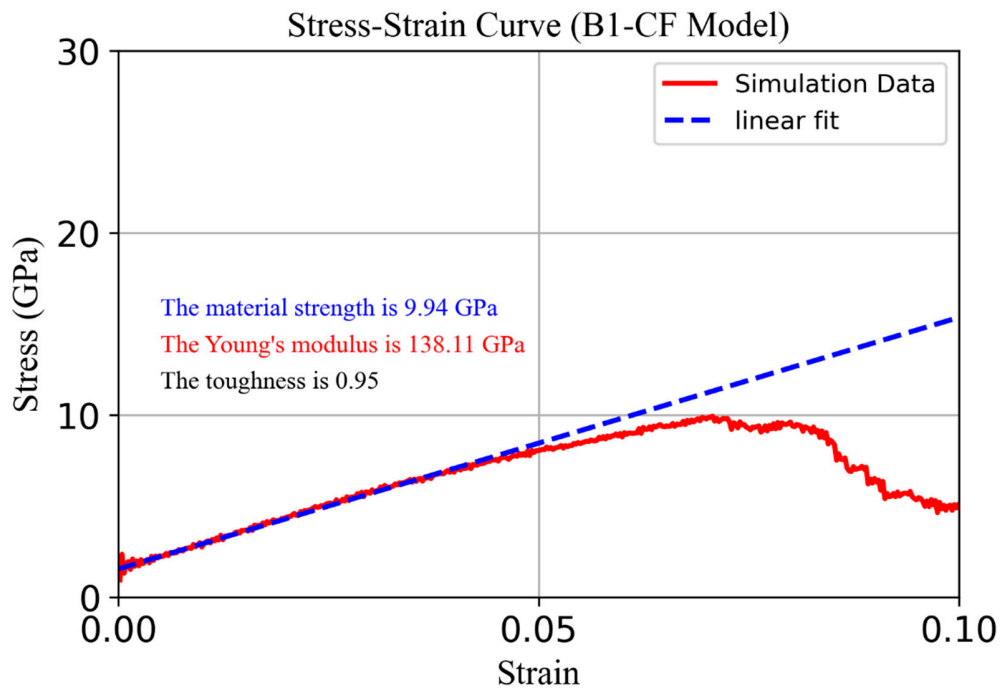


Figure S2. Stress-strain curve and mechanical properties of Carbon fiber model B1 with 1.64 g/cm³ density and 70% graphene regions. Young's modulus equals 138.11 GPa, yield strength 9.94 GPa, and toughness equals 0.95.

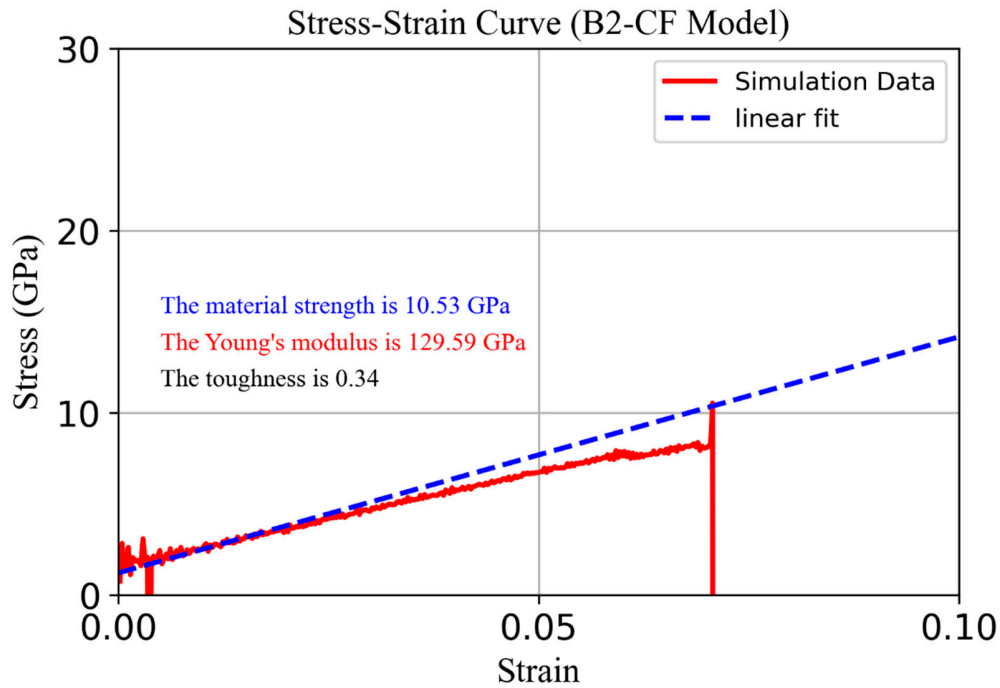


Figure S3. Stress-strain curve and mechanical properties of Carbon fiber model B2 with 1.63 g/cm³ density and 71% graphene regions. Young's modulus equals 129.59 GPa, yield strength 10.53 GPa, and toughness equals 0.34.

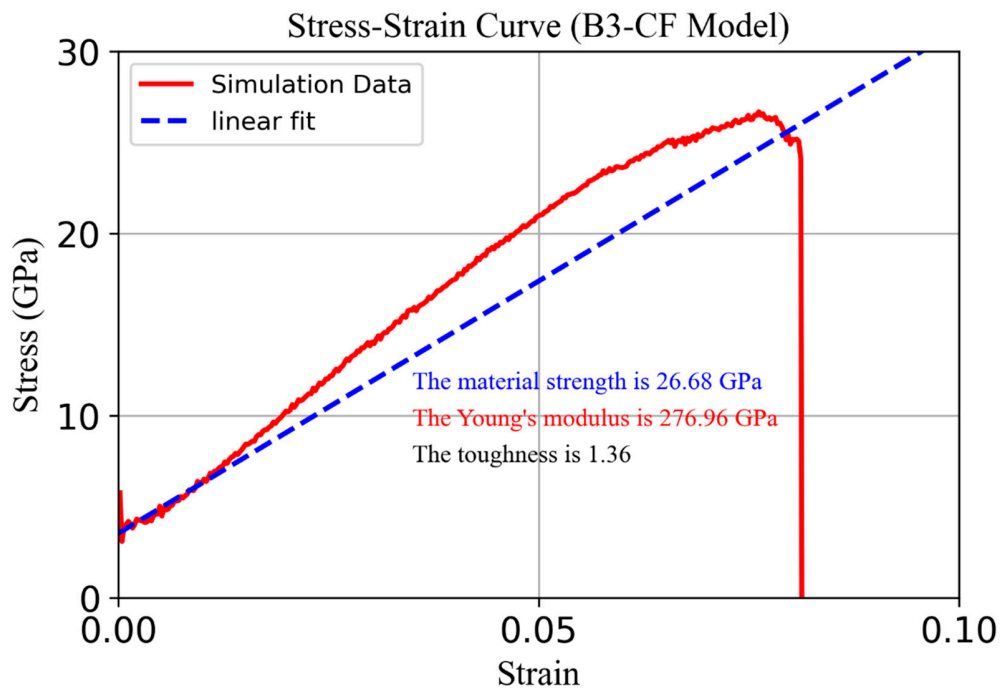


Figure S4. Stress-strain curve and mechanical properties of carbon fiber model B3 with 1.68 g/cm³ density and 84% graphene regions. Young's modulus equals 276.96 GPa, yield strength 26.68 GPa, and toughness equals 1.36.

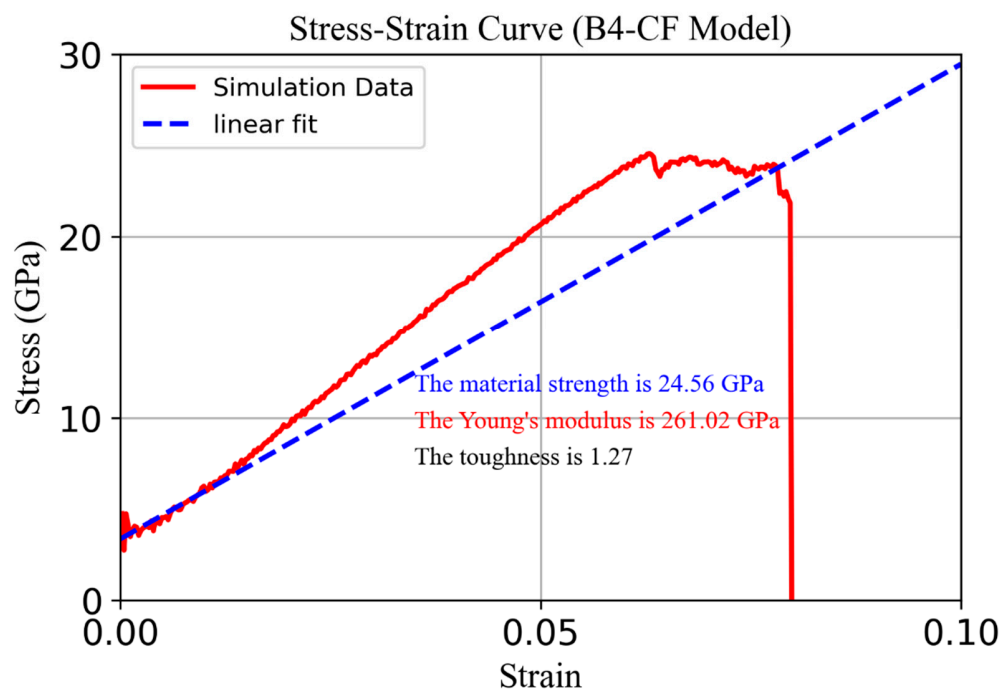


Figure S5. Stress-strain curve and mechanical properties of Carbon fiber model B3 with 1.69 g/cm³ density and 85% graphene regions. Young's modulus equals 261.02 GPa, yield strength 24.56 GPa, and toughness equals 1.27.

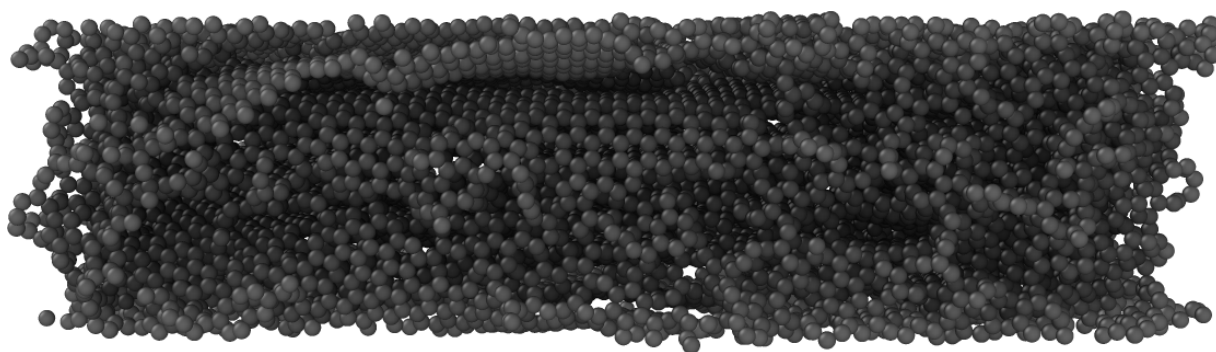


Figure S6. Carbon fiber model B1 visual representation of turbostratic arrangement.

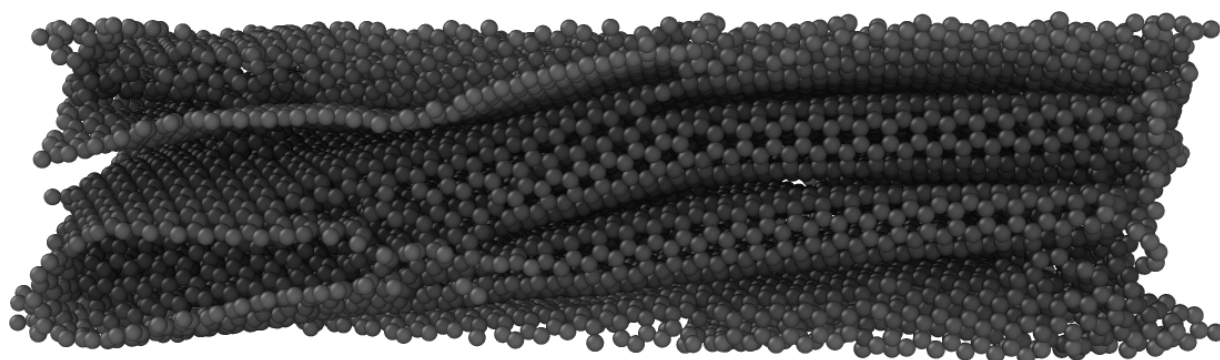


Figure S7. Carbon fiber model B2 visual representation of turbostratic arrangement.

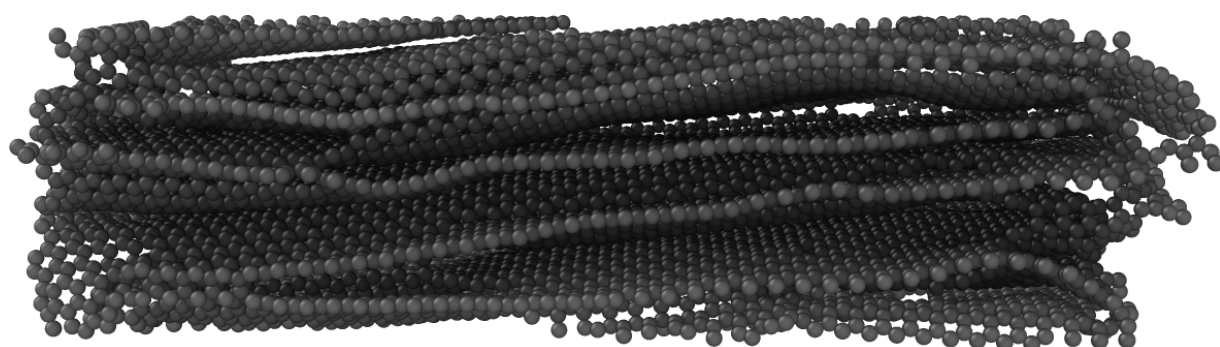


Figure S8. Carbon fiber model B3 visual representation of turbostratic arrangement.

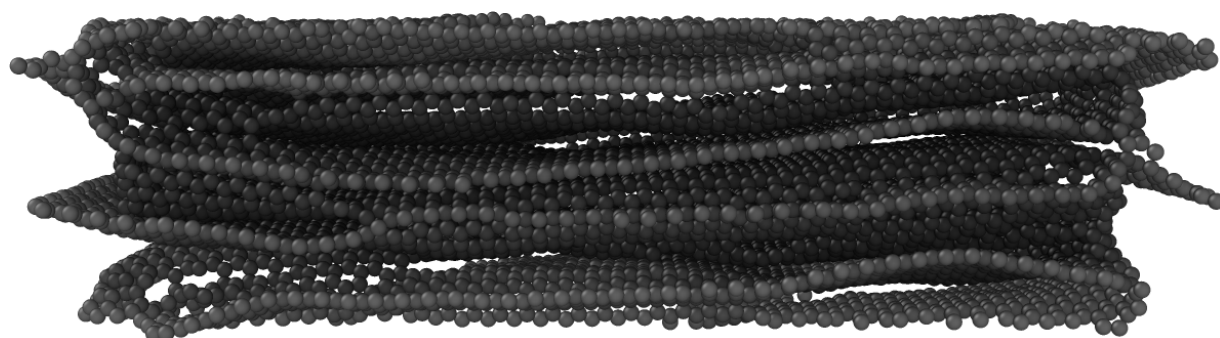


Figure S9. Carbon fiber model B4 visual representation of turbostratic arrangement.