**Material Sourcing & Handling for MBT Particle Forge**

**1. Strategic Sourcing of Seed Materials**

Goal:

Ensure reliable, high-purity starting materials for quantum chip experiments—both for immediate proof-of-concept (graphene, transition metal dichalcogenides, silicon) and for more ambitious MBT particle synthesis.

**A. Immediate-Use Materials**

* Graphene:
  + Vendors: Graphenea, ACS Materials, 2D Semiconductors
  + Form: Monolayer films on copper/nickel foil or Si/SiO₂ wafers
  + Purity: ≥99.99%, minimal grain boundaries/defects
* TMDs (MoS₂, WS₂, etc.):
  + Vendors: HQ Graphene, 2D Semiconductors
  + Form: Mechanical exfoliation crystals or CVD-grown films
  + Purity: ≥99.99%
* Silicon (for benchmarking):
  + Vendors: University wafer suppliers (e.g., UniversityWafer, SiQuest)
  + Form: 4” or 6” Si wafers, orientation ⟨100⟩ or ⟨111⟩, test-grade

**B. Photonic Materials (For Light/Matter Conversion)**

* Laser Source:
  + Vendors: Thorlabs, Edmund Optics, Newport
  + Type: Femtosecond/pulsed or continuous-wave, wavelength tunable
* Mirror & Cavity Coatings:
  + Vendors: CVI Laser Optics, Edmund Optics
  + Spec: Dielectric or metallic, >99.5% reflectivity, vacuum compatible

**2. Handling and Storage**

* Storage:
  + Store all 2D materials and sensitive substrates in nitrogen or argon glove boxes if available; otherwise, vacuum-sealed containers.
  + Avoid direct handling—use tweezers with anti-static coating and clean-room gloves.
  + Keep materials out of direct sunlight, moisture, and dust at all times.
* Contamination Control:
  + Dedicate workspace and tools to prevent cross-contamination.
  + Regularly clean vacuum chambers with isopropyl alcohol and bake out to minimise outgassing.
  + For laser systems, use dust-free wipes and regularly inspect optics for debris.

**3. Documentation & Supply Chain Traceability**

* Record batch numbers and supplier information for every material used.
* Keep certificates of analysis for all seed materials to ensure traceability for publication or patenting.

Summary Statement:

Robust material sourcing and contamination control are foundational to reproducibility and device performance. The MBT approach is “open-source ready”—all vendors listed are internationally available, and handling protocols are compatible with university, startup, or major industry lab standards. This transparency accelerates both replication and scaling.