Blood Collection Tube Manufacturing

Evacuated tube production with additive dosing, drying, assembly, evacuation, labelling and functional verification.

Preliminary engineering range; excludes land, finance cost, taxes and import duty. Final scope and price are confirmed at the feasibility gate.

- Indicative CAPEX: USD 4–11M
- Delivery: 14–22 months to validated production and packaging.
- Capacity: Tier 1: 20–50M tubes/year; Tier 2: 80–180M tubes/year; two shifts, tube mix and line speed dependent.

Process flow

Preliminary basis for zoning, equipment and validation.

- Tube and closure preparation or moulding
- Anticoagulant/additive formulation and precision dosing
- Controlled drying where required
- Cap assembly, evacuation and closure
- Labelling, lot coding and packaging
- Vacuum retention, draw volume, additive and functional testing

Facility & clean environment

2,000–5,000 m² gross; 600–1,600 m² controlled component, dosing and assembly areas, commonly ISO 8.

ISO 8 controlled assembly is typical; additive formulation/dosing receives dedicated environmental and contamination control. Sterile products require a separately validated sterilisation strategy.

- High-capacity power, chilled water for moulding, clean compressed air, vacuum, controlled HVAC, purified water for additives, backup power and sterilisation/logistics interface.

Equipment architecture

Vendor-neutral equipment classes; final URS is issued at feasibility.

- Injection moulding or tube-forming systems
- Precision additive dosing and drying equipment
- Automated capping and vacuum assembly
- Leak, vacuum and draw-volume inspection
- Labelling, packaging and dimensional QC

Capacity & programme

Tier 1: 20–50M tubes/year; Tier 2: 80–180M tubes/year; two shifts, tube mix and line speed dependent.

14–22 months to validated production and packaging.

- Capacity assumes stated shifts, qualified inputs, maintenance and validated yield.

Quality & regulatory route

ISO 13485 QMS readiness, product-specific performance, biocompatibility, shelf-life and local/CE registration pathway. Facility readiness typically 12–18 months.

- Approval decisions remain with the competent independent authority.

Critical risks & staffing

Indicative 45–110 FTE across moulding, formulation, assembly, QC, QA and maintenance; 8–14 weeks technical training.

- Additive dose non-uniformity
- Vacuum decay or closure leakage
- Incorrect blood-to-additive ratio
- Particle or moulding defects
- Shelf-life and label traceability failure

Feasibility gate

Operating economics are issued as a sensitivity model using local labour, utilities, materials, yield, utilisation and financing assumptions; they are not a guaranteed return.

Provide country, site, portfolio, capacity, budget, financing and target date.

- Nigeria — medical-plastics production programme
- Azerbaijan — medical-consumables localisation scope
- Türkiye — blood-tube equipment and process portfolio