

BLACKTECHSTARTUP EDUCATION

Hardware Capital Readiness: BOM, Manufacturing, QA, Certification & Margin

Build the production evidence behind a hardware story: BOM, tooling, suppliers, yields, certification, QA, warranty, freight, capacity, working capital and backup supply.

A working prototype answers “can it work?” Capital readiness asks a different set of questions: can the company source it, make it repeatedly, pass required testing, ship it, support failures and finance the inventory cycle at a gross margin that survives scale? Hardware diligence is operational because a single unavailable component, bad yield assumption or certification delay can consume an entire round.

Know what weak and strong look like

READINESS AREA	WEAK / DILIGENCE RISK	STRONG / INVESTOR-READY
BOM	Prototype purchase history treated as production cost.	Revision-controlled BOM includes component, quantity, supplier, lead time, MOQ, unit cost and alternates.
Yield	Assumes every unit built becomes sellable.	First-pass yield, rework, scrap and test-failure costs measured by build.
Certification	“We will certify after launch.”	Applicable safety/radio/environmental/industry tests mapped to product and market with owner/date/budget.
Capacity	Manufacturer quote implies unlimited output.	Line/tool capacity, cycle time, labor, test bottleneck and ramp schedule validated.
Working capital	Gross margin modeled without inventory timing.	Deposits, payment terms, freight, duties, inventory days, receivables and cash conversion modeled.

Turn the BOM into a control system

Assign every part a manufacturer part number, approved vendor, cost, lead time, MOQ, lifecycle/status, substitute and criticality. Freeze BOM revisions per build so quality issues can be traced to actual inputs.

Separate quoted cost from landed cost

Add component cost, fabrication, assembly, test, packaging, freight, duties, warehousing, payment processing, warranty reserve and expected scrap/rework. A “\$80 BOM on a \$200 product” is not a 60% gross-margin business.

Measure manufacturing quality at each build

Track first-pass yield, rework rate, scrap rate, defects per unit, return/warranty rate and failure modes. Require corrective-action ownership when defects repeat.

Map certifications and regulatory gates early

The exact requirements depend on product and market. Build a compliance matrix before tooling or enclosure decisions become expensive. Include lab lead time, redesign buffer, documentation, labeling and re-test risk.

Design supplier and capacity contingency

Identify single-source parts, tooling ownership, manufacturer changeover cost and long-lead components. For each critical item, decide whether to dual-source, buffer inventory, redesign or accept the risk consciously.

Run the diligence stress test before investors do

Do not rehearse an answer. Rehearse the evidence. Give yourself a short diligence window and try to produce the underlying records without rebuilding the story from memory. A clean result is reproducible, tied to a source system or signed document, and consistent with the numbers elsewhere in the company.

➔ **BOM:** Put the underlying records on screen and prove this standard: Revision-controlled BOM includes component, quantity, supplier, lead time, MOQ, unit cost and alternates. If the

evidence still looks like this weak state—Prototype purchase history treated as production cost.—record the gap, name an owner and give it a due date instead of explaining it away.

→ **Yield:** Put the underlying records on screen and prove this standard: First-pass yield, rework, scrap and test-failure costs measured by build. If the evidence still looks like this weak state—Assumes every unit built becomes sellable.—record the gap, name an owner and give it a due date instead of explaining it away.

→ **Certification:** Put the underlying records on screen and prove this standard: Applicable safety/radio/environmental/industry tests mapped to product and market with owner/date/budget. If the evidence still looks like this weak state—"We will certify after launch."—record the gap, name an owner and give it a due date instead of explaining it away.

→ **Capacity:** Put the underlying records on screen and prove this standard: Line/tool capacity, cycle time, labor, test bottleneck and ramp schedule validated. If the evidence still looks like this weak state—Manufacturer quote implies unlimited output.—record the gap, name an owner and give it a due date instead of explaining it away.

→ **Working capital:** Put the underlying records on screen and prove this standard: Deposits, payment terms, freight, duties, inventory days, receivables and cash conversion modeled. If the evidence still looks like this weak state—Gross margin modeled without inventory timing.—record the gap, name an owner and give it a due date instead of explaining it away.

Do the math investors will do

Hardware margin bridge: $\text{Net sales} - \text{landed COGS} - \text{expected warranty/returns} = \text{contribution before overhead}$. Example: \$250 selling price; \$95 components/assembly; \$12 freight/duties; \$8 test/packaging; \$10 expected warranty/returns = \$125 contribution, or 50%. If prototype scrap is 12% and your model assumes 2%, the model is not yet evidence-backed.

Build the evidence investors can verify

✓ Revision-controlled BOM with supplier/alternate data

✓ Manufacturing flow and capacity model

✓ Build history with yield/rework/scrap metrics

✓ Certification/compliance matrix

- ✓ Landed-cost and gross-margin bridge
- ✓ Warranty/return/failure log
- ✓ Working-capital model and supplier-payment calendar
- ✓ Top-10 supply-chain risk register with mitigation

Questions an investor may ask

- ? Which components are single-source or allocation-constrained?
- ? What was first-pass yield on the last three builds?
- ? Which certifications gate commercial shipment?
- ? Who owns the tooling and test fixtures?
- ? How much cash is tied up before a customer pays?

30-day repair sprint

- 1 Days 1–5: freeze BOM and reconcile prototype/quoted costs.
- 2 Days 6–10: build landed-cost and yield model.
- 3 Days 11–15: map certifications/testing and lead times.
- 4 Days 16–20: validate manufacturer capacity and tooling ownership.
- 5 Days 21–25: model inventory/payment/receivables cash cycle.
- 6 Days 26–30: close the top supply/quality risks and assemble the manufacturing diligence pack.

Research behind this guide

Use the primary and authoritative sources below to verify current rules, market conditions and technical guidance. Terms and regulations can change.

U.S. Department of Energy — Adoption Readiness Levels



SBA — Manage Your Finances



SEC — Ready to Raise CAPITAL



NSF — I-Corps Commercialization Program



Andreessen Horowitz — A Primer on Factory Economics for Startups



Important: This guide is educational information, not individualized legal, tax, investment, employment, security or compliance advice. For decisions with material legal or financial consequences, use a qualified professional who can review your facts.

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