

The Prototype Playbook

A guide for mechanical prototyping and low-volume builds, from
EVT to production launch.

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Instant quotes | Instant DFM feedback | Live Part Status

Four numbers to know before you build

70-80%

of a product's
manufacturing cost is
locked in during design

3-8

prototype loops before
most hardware is
production-ready

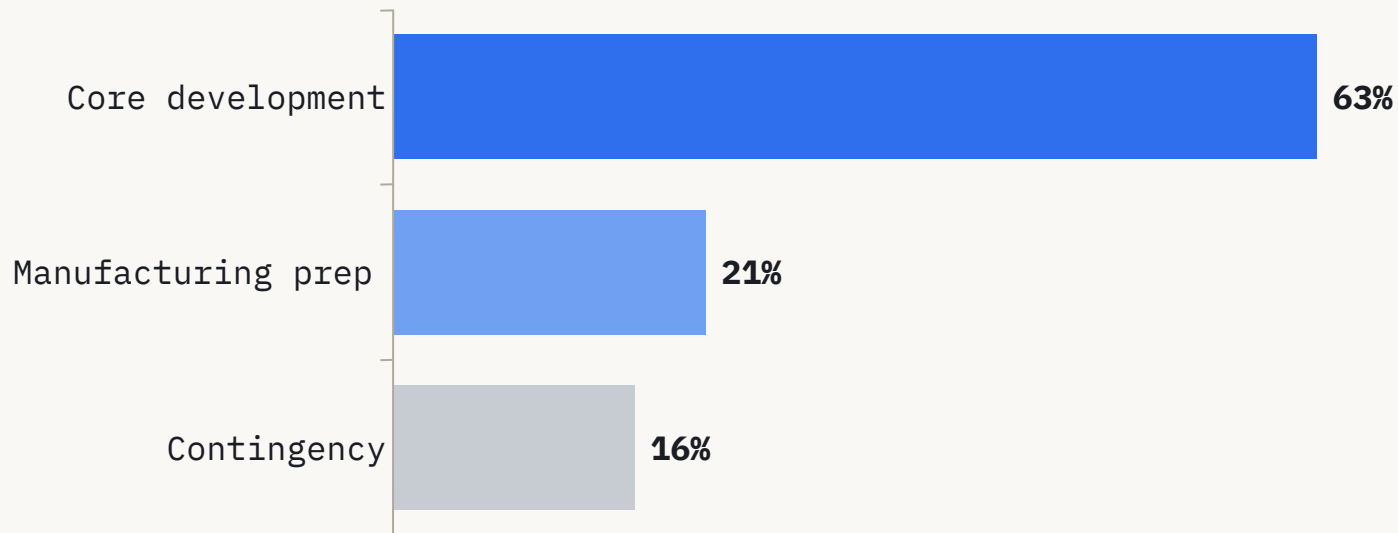
10x

The rule of 10 states
that it's roughly 10x
more expensive at each
stage. \$1 at design,
\$10 in prototyping,
\$100 in production &
\$1,000 after it ships

70%+

of hardware startups
never reach mass
production

Where the budget actually goes



Why hardware companies fail

97%

die or become a zombie
company

24%

raise a second round of
funding

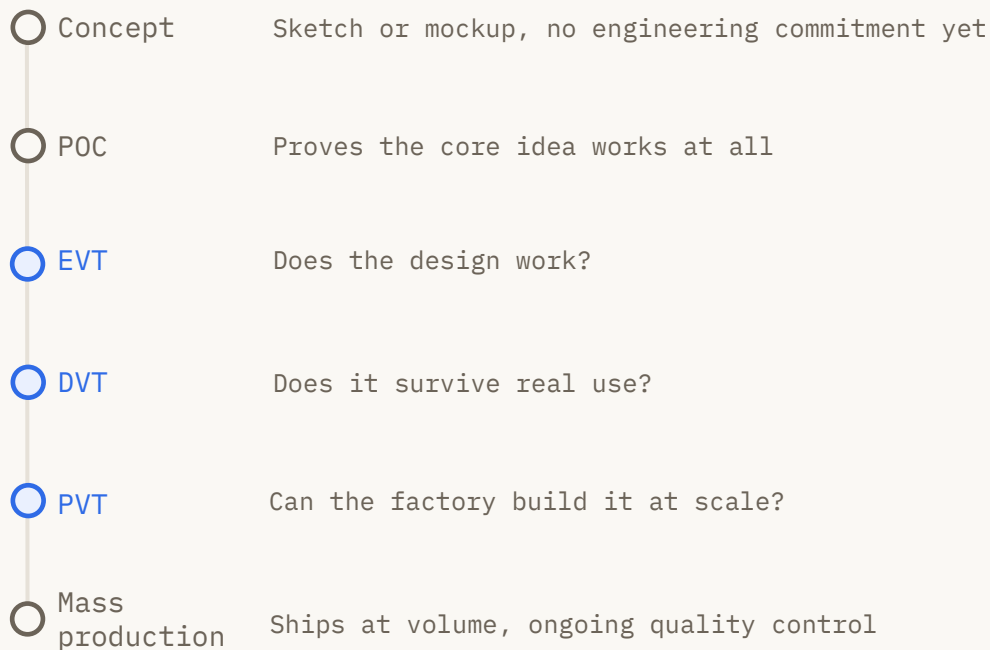
42%

fail from prolonged
development timeline

34%

fail from poor
product-market fit

Concept to mass production, in six steps



EVT, DVT, PVT at a glance

	EVT	DVT	PVT
Goal	Does the design work?	Does it survive real-world conditions?	Can the factory build it at scale?
Typical build	20-50 units	50-200 units	Production-representative units
Confirm before moving on	Core functions work; major flaws identified, not necessarily fixed yet	Design survives real conditions; the build process itself is proven	Factory repeats the build reliably; documentation ready for sign-off
Typical duration	2-4 weeks	4-8 weeks	4-6 weeks

Prototyping methods compared

Method	Best volume	Tooling	Lead time
Laser cutting	1 to 1,000+ (2D only)	None	1-3 days
3D printing	1-50	None	Hours-days
CNC machining	1-500	None	Days
Vacuum casting	10-200 / mold	\$200-1,000	1-2 weeks
Rapid tooling (Injection Molding)	500-5,000	\$2,000-15,000	2-4 weeks
Production (Injection Molding)	1,000-10,000+	\$20,000-100,000+	4-8+ weeks

What a 10 unit EVT build actually costs

Method	Parts/unit	# of Units	Cost/Unit	Subtotal
Laser cutting	5	10	\$15	\$750
3D printing	10	10	\$12	\$1,200
CNC machining	20	10	\$62	\$12,400
Vacuum casting	15	10	\$138	\$20,700
				\$35,050

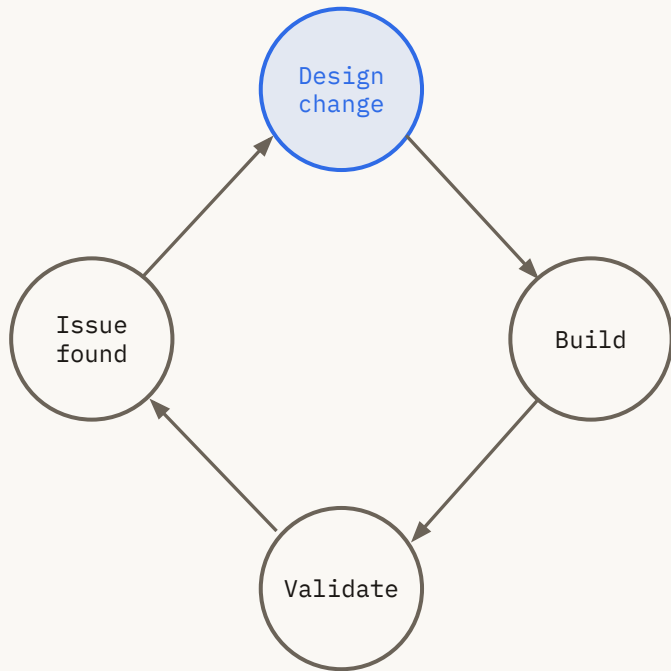
If you have a round of EVT that needs 10 units made then your total cost will be \$35,050. The cost per unit for vacuum casting includes tooling.

How many prototype loops, by industry



Where prototyping actually goes wrong

- Manual quoting commonly takes 2-3 weeks for a full assembly, 3-5 days per part
- Every design change needs to be validated with a prototype
- Each design loop compounds cost: 15-40% reported increase per iteration
- Mismatched revision control wastes entire iterations



Do you need DFM for prototypes? Yes, a different kind

Prototype DFM

Can this be made at all, fast enough to test it?
Optimizing for speed and learning, not unit cost.

Production DFM

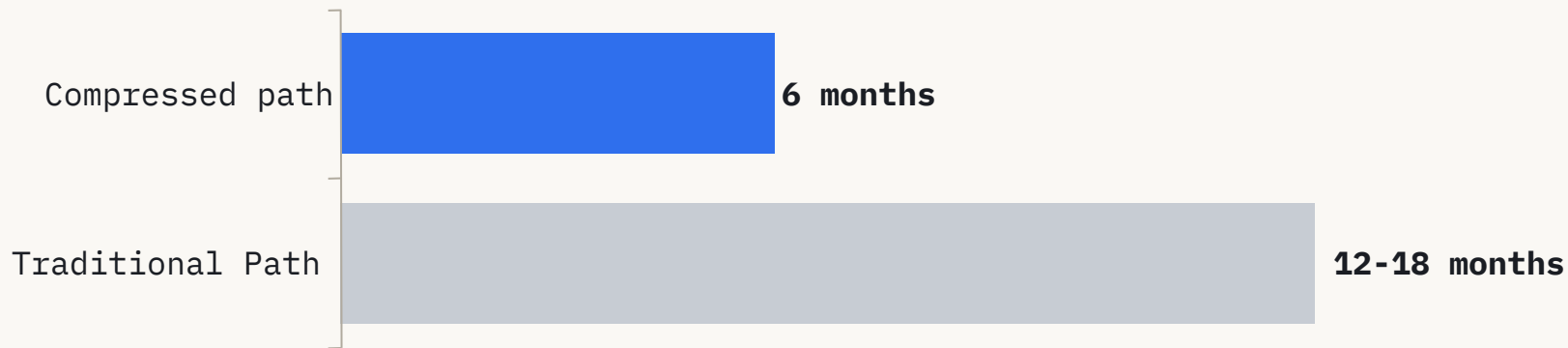
Can this be made at the lowest cost, at volume,
every time? Optimizing for repeatability and
quality at scale.

Process	Prototype DFM asks	Production DFM asks
CNC	Does it fit in a standard vise, no custom fixture?	Can it run at optimized cycle time?
Sheet metal	Does it bend without cracking?	Does the nest minimize scrap across a full sheet?
Injection molding	Do the snap-fits engage, does the form check out?	Will the mold eject cleanly, and can it reach 300,000 shots?
3D printing	Does it print without supports wrecking a critical face?	Is orientation tuned for strength and print time?

Five things to get right

-  Write a one-page test brief before every prototype round
-  Lock revision naming before parts ship
-  Bring DFM review in before tooling, not after
-  Build certification (FCC, CE, etc.) into the development schedule
-  Budget the full 12-18 month journey, not just the design phase

12-18 months, or faster



Traditional: 12-18 months, slow quoting, disjointed suppliers, late DFM feedback

Compressed: instant quotes, faster design feedback, better supply chain matching

Spend your time on design, not waiting.

OpusFab connects companies from design to production. Get instant quotes, instant DFM feedback, and live status on every part after you've purchased. Now, you can focus on design, iterate quickly, and launch products quicker.

12 yrs

Production experience

28

CNC machines

280K sq ft

Assembly space

Get started

Hello@opusfab.com