



BRAHMWORKS

Design.Manufacture.Innovation.

FOUNDER TOOL · FILLABLE PDF

DFM / DFA Checklist

A pre-tooling review by process — sheet metal, moulding, machining, PCBA, harness, assembly, test, and packaging

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PRODUCT / PROJECT

TEAM / FOUNDER

DATE / REVISION

2026

Bangalore · Hardware product design & engineering

brahmworks.com/resources

00 How to use this checklist

Review by process, on one design revision, with the people who will make the parts.

1 Run it before tooling is ordered

Changes are cheap in CAD and expensive in steel. Review before tool kickoff or the first production order.

2 Review with the people who make it

Walk the list with your toolmaker, fabricator, PCB assembler, or contract manufacturer. Their process limits win.

3 Tick OK or N/A — honestly

OK means checked on the current revision. N/A means the process is not used. Anything else stays open with a note.

4 Qualitative on purpose

Minimum wall, draft, bend radius, trace and space depend on material, process, and supplier. Use their capability data.

5 One owner and date per process

One person signs each section. The date ties the review to a specific design revision.

6 Roll up the risks

Carry every open item to the risk summary, agree the mitigation, and sign off before releasing for tooling.

Not exhaustive. Your product will add checks — write them in the notes. Skip a whole process with N/A if you don't use it.

Fields are fillable in Adobe Acrobat / Reader, Chrome, Edge, and macOS Preview. Save a copy per design revision.

Sheet metal · Injection moulding

Tick OK when the current revision meets the check, N/A when the process is not used. Anything else stays open with a note.

01 Sheet metal

OWNERDATE

OK	N/A	CHECK	NOTES / ACTION
☐	☐	Inside bend radius chosen relative to material thickness and the fabricator's tooling	
☐	☐	One bend radius used across the part where possible (fewer tool changes)	
☐	☐	Holes, slots, and cut-outs kept clear of bend lines	
☐	☐	Bend relief added where a bend meets an edge or another bend	
☐	☐	Flange lengths checked against the press-brake tooling	
☐	☐	Clinch / PEM hardware matched to the sheet material and thickness	
☐	☐	Finish (powder coat, plating, anodise) specified, with masking and coating build-up allowed for in fits	
☐	☐	Flat pattern and bend allowance agreed with the fabricator	

02 Injection moulding

OWNERDATE

OK	N/A	CHECK	NOTES / ACTION
☐	☐	Uniform nominal wall thickness, with gradual transitions	
☐	☐	Draft on faces in the direction of pull (more for textured surfaces)	
☐	☐	Undercuts removed, or justified and agreed with the toolmaker (slides / lifters)	
☐	☐	Ribs thinner than the wall they join, to limit sink and voids	
☐	☐	Bosses cored out and supported by ribs or gussets, not tied to thick walls	
☐	☐	Radii on internal corners; sharp internal corners avoided	
☐	☐	Gate, parting line, and ejector locations agreed and kept off cosmetic faces	
☐	☐	Material grade, colour, and flame / UV needs specified; shrinkage considered	
☐	☐	Snap fits designed for the material's strain limits and assembly direction	
☐	☐	Surface texture / finish called out against a reference the toolmaker uses	

Machining · PCB / PCBA

Tick OK when the current revision meets the check, N/A when the process is not used. Anything else stays open with a note.

03 Machining

OWNERDATE

OK	N/A	CHECK	NOTES / ACTION
☐	☐	Internal corner radii compatible with standard cutters	
☐	☐	Deep, narrow pockets and thin walls avoided or justified	
☐	☐	Tight tolerances only where function needs them; general tolerance standard called out	
☐	☐	Standard hole and thread sizes; practical thread depths	
☐	☐	Features reachable in as few setups / orientations as possible	
☐	☐	Datum scheme defined and consistent with function and inspection	
☐	☐	Surface finish specified only where it matters	
☐	☐	Stock material and size considered; material certificate needed?	

04 PCB / PCBA

OWNERDATE

OK	N/A	CHECK	NOTES / ACTION
☐	☐	Fiducials placed (global, and local for fine-pitch parts)	
☐	☐	Test points on key nets for in-circuit, flying-probe, or functional test	
☐	☐	Land patterns per manufacturer / IPC guidance	
☐	☐	Fab-house design rules (trace/space, drill, annular ring) checked against their capability	
☐	☐	Polarity and pin 1 marked clearly on silkscreen	
☐	☐	Panelisation, rails, and tooling holes agreed with the assembler	
☐	☐	Spacing for AOI, rework, and tall parts not shadowing others	
☐	☐	Single-sided / reflow-only placement where possible; through-hole minimised	
☐	☐	Thermal relief to planes; via-in-pad filled or capped if used	
☐	☐	Programming / debug access available after assembly	
☐	☐	Single-source and long-lead parts flagged, with alternates in the BOM	

Cable & harness · Assembly & fasteners

Tick OK when the current revision meets the check, N/A when the process is not used. Anything else stays open with a note.

05 Cable & harness

OWNERDATE

OK	N/A	CHECK	NOTES / ACTION
☐	☐	Connectors keyed / polarised so they cannot be mated wrongly (poka-yoke)	
☐	☐	Wire gauge and insulation rated for current, voltage, length, and environment	
☐	☐	Lengths include routing and service loop; bend radius respected	
☐	☐	Strain relief at connectors and where cables exit the enclosure	
☐	☐	Harness drawing with pin-out tables, connector and terminal part numbers	
☐	☐	Crimp tooling and pull-test expectations agreed with the harness supplier	
☐	☐	Routing clear of sharp edges, heat sources, and moving parts	
☐	☐	Labels or colour coding defined for assembly and service	

06 Assembly & fasteners

OWNERDATE

OK	N/A	CHECK	NOTES / ACTION
☐	☐	Part count reduced; parts combined where function allows	
☐	☐	Fastener types and sizes standardised (fewest drivers on the line)	
☐	☐	Top-down / single-direction assembly where possible	
☐	☐	Self-locating features; parts fit only one way (poka-yoke)	
☐	☐	Tool and hand access checked for every fastener and connector	
☐	☐	Screws into plastic matched to boss design; inserts where service repeats	
☐	☐	Assembly sequence and work instructions drafted	
☐	☐	On-line adjustment and calibration avoided, or fixtured	
☐	☐	ESD-sensitive steps identified and controlled	

Test & serviceability · Packaging

Tick OK when the current revision meets the check, N/A when the process is not used. Anything else stays open with a note.

07 Test & serviceability

OWNERDATE

OK	N/A	CHECK	NOTES / ACTION
☐	☐	Design for test: test points, debug access, and firmware test modes	
☐	☐	End-of-line functional test defined with pass / fail criteria	
☐	☐	Test fixtures and jigs identified early, with an owner	
☐	☐	Serial number and traceability (label, firmware read-out, records)	
☐	☐	Field-replaceable parts reachable without damaging the enclosure	
☐	☐	Firmware update path defined for units in the field	
☐	☐	Battery access, replacement, and safe handling considered	
☐	☐	Diagnostics / error logs available to support and returns	

08 Packaging

OWNERDATE

OK	N/A	CHECK	NOTES / ACTION
☐	☐	Protects the product in transit; drop / vibration test method chosen	
☐	☐	Pack size checked against carton and pallet efficiency	
☐	☐	Labels: product, regulatory marks, barcode, serial, origin	
☐	☐	Accessories, manuals, and kitting order defined	
☐	☐	Lithium battery shipping requirements and documents identified	
☐	☐	Moisture / ESD protection where the product needs it	
☐	☐	Material choices and recyclability considered	
☐	☐	Unboxing order and inserts reviewed with real users	

09 Risk summary & release sign-off

Carry every open item here. Decide the mitigation, name an owner and a date, then decide whether the design is ready for tooling.

#	RISK / OPEN ITEM	PROCESS / PART	IMPACT H / M / L	MITIGATION / DECISION	OWNER	DUE	CLOSED
1							☐
2							☐
3							☐
4							☐
5							☐
6							☐
7							☐
8							☐
9							☐

READY FOR TOOLING?

Decide on the revision reviewed — not on the next one.

- ☐ Yes — release for tooling / production order
- ☐ Yes, with the open items above tracked to closure
- ☐ No — rework and review again

DESIGN REVISION REVIEWED

REVIEWED BY

Design, the maker of each part, and whoever owns cost and schedule.

NAME	ROLE / COMPANY	DATE

Next steps with BrahmWorks

Open items are normal. The point is to find them before tooling, not after the first shots.

Where is the design today?

- ☐ Prototype — design still changing
- ☐ Pre-tooling — about to order tools
- ☐ Pilot — first parts or boards in hand
- ☐ In production — fixing yield or cost issues

THE OPEN ITEMS YOU WANT A SECOND PAIR OF EYES ON

Talk to us

brahmworks.com/contact →

Share the checklist, the CAD or drawings, and the process each part is planned for. We will review it with you before steel is cut.

WHAT TO BRING

- This checklist with open items noted
- CAD / drawings at the revision you reviewed
- Supplier feedback you already have

DFM / DFA

brahmworks.com/dfm-dfa →

Design for manufacture and assembly reviews, process selection, and supplier-ready drawings.

Resources for founders

brahmworks.com/resources →

More fillable tools, playbooks, and guides for hardware founders — including the Hardware Founder Toolkit and the Product Anatomy Workbook.

Partner, not vendor. We review with your suppliers, not around them — and change the design where it makes the build easier.