Heat Pipe RFQ Checklist

P&A International — custom heat pipes, vapor chambers & heat-pipe heatsink assemblies · www.pa-international.com.au

Share as much of this as you can with your enquiry and we will return a proposed design and indicative pricing, typically within 48 hours. A drawing, reference part or competitor sample is just as welcome as a full specification.

1. Thermal requirement

- Heat load to be transported (W) — per pipe and total for the assembly
- Heat-source size and location (die / TEC / IGBT footprint, mm)
- Maximum allowable temperature at the source, and ambient temperature range
- Target thermal resistance (°C/W), if already calculated
- Cooling mode at the condenser end: natural convection, forced air (airflow in CFM), or liquid

2. Heat pipe geometry

- Diameter (3–12 mm typical) or flattened thickness, and overall length
- Bend geometry: 2D or 3D routing, bend angles and radii (or attach a STEP/drawing)
- Flattening requirements — which sections, final thickness
- Orientation in service: condenser above evaporator (gravity-assisted), horizontal, or against gravity

3. Assembly & integration

- Stand-alone pipes, or a complete assembly (fin stack, extrusion, baseplate, vapor chamber)
- Attachment method: solder, thermal epoxy, press-fit or machined-in groove
- Mechanical envelope: height, footprint, mounting points, keep-out zones
- Surface finish: nickel plating, anodised fins, painting, laser marking

4. Project & commercial

- Application and operating environment (LED luminaire, telecom, industrial drive, consumer device…)
- Annual volume or call-off pattern, and target unit cost
- Sample quantity needed — free off-tool samples are provided before mass production
- Any reliability or test requirements: thermal cycling, life test, RoHS/REACH documentation

Email this checklist with your drawing to **support@pa-international.com.au** or use the quote form on the page. One dedicated engineer reviews every enquiry.

Heat Pipe Selection — Quick Reference

Which wick, which form factor, when to use a vapor chamber

Wick type

Wick type	Strengths	Watch out for
Sintered powder	Works in any orientation, including against gravity; highest capillary pressure; best for compact, high-power designs	Highest cost of the three
Grooved (axial)	Low cost, low thermal resistance when gravity-assisted or horizontal; good for long straight runs	Performance drops sharply against gravity
Mesh / fiber	Good all-rounder; tolerant of bending and flattening	Lower power limit than sintered

Form factor & integration

Decision	Rule of thumb
Round vs flattened	Flattening increases contact area but reduces capacity — typically 10–30% derating depending on final thickness. Keep flat sections as short as the design allows.
Bending	Each bend costs capacity (roughly 5–10% per 90° bend). Keep bend radius ≥ 3× pipe diameter where possible.
Heat pipe vs vapor chamber	Heat pipes move heat from point A to B; vapor chambers spread heat from a small, intense source across a large fin area. High heat-flux die + large heatsink → consider a vapor chamber or embedded-pipe spreader plate.
Capacity	Single pipes transport up to 600 W depending on diameter, wick and orientation; multiple pipes share the load in high-power assemblies.
Orientation	If the evaporator must sit above the condenser, specify sintered wick and state the angle in your RFQ — it drives the whole design.

How we work: P&A International is an engineering-led contract manufacturer. One dedicated engineer designs your heat pipe or assembly, free off-tool samples with quality-assessment reports are provided before mass production, and volume is produced through our vetted partner-factory network — every supplier is ISO 9000 certified or better.

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