Heat Sink Technology Selection & Ordering Guide

P&A International — choosing a heatsink process and ordering a custom design · www.pa-international.com.au

Use this to brief us on a custom heat sink. Share what you can and one dedicated engineer returns a proposed thermal design and indicative pricing, typically within 48 hours. A drawing, reference part or sample is just as welcome as a full specification.

1. Thermal brief

- Power to dissipate (W) and the heat-source size / location
- Maximum allowable component or case temperature, and ambient range
- Airflow: natural convection, or forced air with the CFM available
- Orientation in service and any acoustic limits on fans

2. Mechanical & interface

- Envelope: maximum height, footprint and fin direction
- Mounting method, keep-out zones and attachment hardware
- Base flatness and the thermal-interface material (TIM / gap pad)
- Any embedded heat pipes or vapor chamber for spreading

3. Process, finishing & volume

- Preferred process if known (see the selector overleaf)
- Finish: black / clear anodise, chromate, paint; machining and tapped holes
- Annual volume or call-off pattern and target unit cost
- Free off-tool samples are provided before mass production — note the sample quantity

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

Heat Sink Process Selector

Match the process to fin density, geometry, volume and cost

Process at a glance

Process	Best for	Trade-off
Extrusion	Low cost, long straight fins, high volume; integrates heat pipes or liquid circuits	Fin aspect ratio and width limited by die/press
Bonded fin	Tall, dense fins and large footprints beyond extrusion limits	Thermal interface at the fin bond; higher cost
Skived / swaged	Very high fin density from one billet, excellent base contact	Fin fragility at extreme density
Stamped / forged	Low-cost stamped, or dense forged pin-fin for compact / LED coolers	Geometry constraints; forging tooling cost
Heat-pipe assembly	Moving and spreading heat from concentrated, high-power sources	Added assembly step; design-in required

Design factors

Decision	Rule of thumb
Natural vs forced	Natural convection needs more fin area and vertical fins; forced air allows denser fins — tell us the airflow.
Fin orientation	Fins should run along the airflow / vertically for buoyancy; state the mounting orientation.
Spreading	Large base with a small, intense source → add heat pipes or a vapor chamber across the fin field.
Interface	Base flatness and the TIM often matter as much as the fin design — specify both.
Heat pipes	Stand-alone or assembled into the heatsink; see our heat pipe page for pipe-level detail.

How we work: P&A International is an engineering-led contract manufacturer. One dedicated engineer designs your heat sink, 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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