AAVID THERMALLOY

HDDC
High Density Die Casting

RoHS ✓ Compliant

HIGH DENSITY DIE CASTING

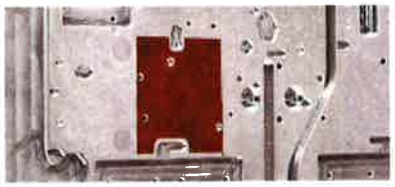
HDDC is a process developed by Aavid with its University partners to manufacture near net shape parts with better mechanical and thermal properties compared to die castings.

The process is particularly well suited to making high performance heat sinks and liquid cold plates using aluminum alloys with high thermal conductivity. New process controls during solidification enable fine grain structure with near zero porosity.

3D Shapes of Air Cooled Enclosures

EMBEDDED INSERTS

Aluminum, copper, graphite or other solids with lower CTE than Aluminum can be embedded directly into the part. The process yields a strong mechanical bond with almost no interfacial gap or porosity.



DIE CAST VS. HDDC

comparison for 40-60mm high finned heat sinks:

Features	Die-casting	HDDC
Fin Geometry (Plate, pin, embedded etc.)	All Types	All Types
Minimum enclosure wall thickness (mm)	2-4	1.5-3.5
Minimum fin to fin spacing (mm)	5	3-4
Minimum fin tip thickness (mm)	2.5-3.0	1.0-1.5 plate fin; 2.0 pin fin
Minimum fin tamper angle (degree)	1.0-1.5	1.0
3D near net shape rating (5 is best)	5	4
Surface quality rating (5 is best)	2	4
Leak tight rating (5 is best)	2	5
Aluminum Alloys	ADC 10-12 or 3xxx	1xxx, 6xxx, 3xxx
Thermal Conductivity (W/m K)	90-120	190-240
Porosity (%) and Grain Structure	3-7 	0 

THIN AND HIGH ASPECT RATIO FINS

Smaller minimum enclosure wall thickness, smaller minimum fin spacing, fin thickness and draft angles result in higher cooling fin densities and lighter enclosures.

ENHANCED POST FORMING PROCESSES

Machining without exposing porosity, brazing, and porosity free welding processes enable leak tight complex assemblies. Wet surface finishing processes like anodizing and electroplating can be done without electrolyte retention in surface porosity.

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