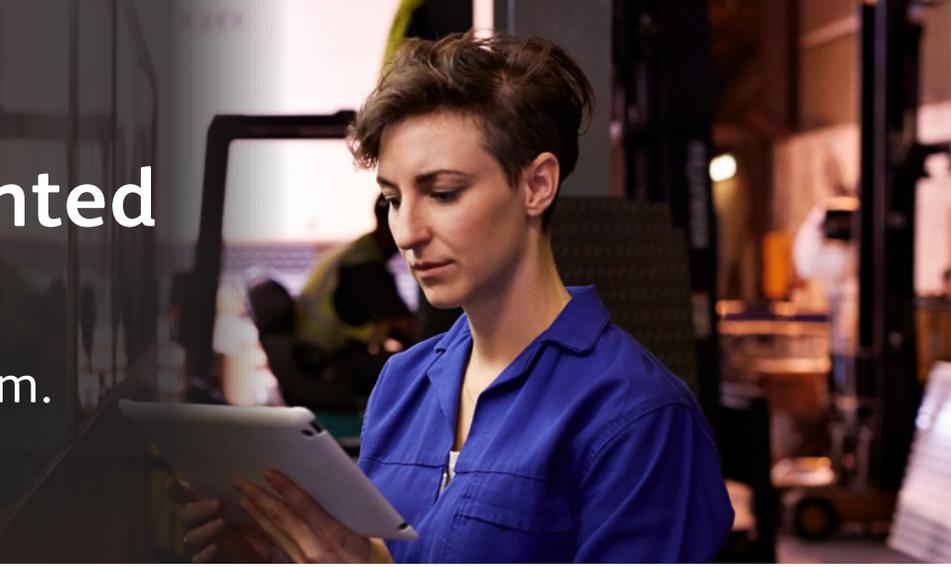


Aluminum-Printed CPU Cooler

No supplier? No problem.



CHALLENGE

A commonly used CPU cooler is made of eight different components typically sourced from several different suppliers. It includes a nickel plate with multiple machined fins bolted to a separate plastic piece to create a water channel through those fins. It's a combination of machining, injection molding and assembly processes.

When just one of those suppliers becomes unavailable, it delays production.



Industrial CPU Cooler



SOLUTION

The assembly was replaced with a single part printed with the Xerox® ElemX® 3D Printer in a high-strength aluminum alloy. This optimizes performance and design by eliminating the need for multiple parts and suppliers. For example, the gaskets and seals are no longer necessary in the new design and are eliminated, reducing complexity and part count.

- There are two side channels connected by thin walls (1.2 mm wide fins).
- The bottom surface is printed directly on the build plate for a smooth finish.
- The printed aluminum CPU cooler has equivalent performance and conductivity as the copper device.



3 Quarter View of the Aluminum 3D Printed CPU Cooler with custom internal channels

Aluminum-Printed CPU Cooler



RESULTS

The CPU cooler is a complex, watertight liquid heat exchanger with custom cooling paths. This replaces the original assembly with a single printed component in under 2 hours, with a total weight of 126 grams.

Instead of sourcing eight different parts and assembling them together, the CPU Cooler eliminates long lead times, supplier difficulties, and unforeseen challenges in the supply chain. Available in under 2 hours, the CPU cooler is ready for immediate installation. The ElemX 3D Printer is capable of improving part performance with unique, internal channels, which would be impossible to machine and challenging with other metal AM processes.

It takes advantage of additive manufacturing by optimizing the design for improved performance. Furthermore, ElemX uses easy-to-handle metal wire as the feedstock. This means that there is no need to deal with problems typically associated with removing metal powder from tight channels, which is labor-intensive and often incomplete. Channels with debris or particles within them defeat the purpose and are likely to cause performance issues while in use.



Mass: 126 Grams
Print Time: 1 Hour, 50 Minutes
Material: Al 4008

PROCESS	LEAD TIMES	COST PER PART
Off the Shelf Assembly	Weeks – Undetermined (Inventory Risk)	\$285
ElemX	On-demand, Print time < 2 hrs	\$250

LOOKING FORWARD

Printing with the Xerox® ElemX® 3D Printer enables engineers to optimize existing products for better performance and get parts in hand faster than ever before.

Supplier out of business?
No problem, print it on the ElemX 3D Printer.

Faster Parts in Hand
Reduce inventory and risk

Part Consolidation
8 Components = 1 Printed Assembly

Optimized Performance
Internal channel designed for better cooling



For more information, visit www.xerox.com/3dprinting.