

Quick Facts

Company
BAE Systems

Industry
Military

Challenge
Design a flexible yet durable copper-brass radiator for the Bradley that performs under the most strenuous operating conditions.

Solution
API custom designed a copper-brass radiator that passed the military's tough field tests on its first try. The combat-proven radiator maintains a return rate of less than 0.5 percent.

API Supplies Copper-Brass Cooler for Battle-Tested Fighting Vehicle

Military fighting vehicles are designed to operate in the most demanding environments under the harshest conditions. Introduced in 1981 by the US Army, the Bradley is among the infantry fighting vehicles serving on the front lines today. Through the years, the US Army has made improvements to the Bradley, and its design remains one of the best in the world.

In order to protect the fighting vehicle's engine and critical systems, components in the Bradley are completely enclosed in a heavily armored compartment. Every component on the vehicle has to pass the military's demanding durability and endurance field tests.

Copper-brass technology is the standard material used to construct components on the Bradley due to its extreme tolerance, excellent heat transfer quality and corrosion resistance. It also has a high melting point and exhibits the maximum allowable stress and internal pressure. In addition, copper brass is easy to fabricate and is field repairable, which is critical for infantry fighting vehicles.

In 1993, API Heat Transfer (then known as General Thermodynamics) custom designed a copper-brass radiator for the Bradley vehicle that performs very well under extreme conditions. Since the effective cooling air temperature is much higher than that of ambient in harsh conditions, the cooling system design for the fighting vehicle is very different from ones designed for commercial vehicles.

API engineers worked closely with a defense contractor to design the radiator for the Bradley fighting vehicle, and the custom product passed the military's tough field tests on its first try. Since then, thousands of Bradley vehicles have been built with the API radiator with a return rate of less than 0.5 percent.

There are several reasons why API's copper-brass radiator continues to be specified for the Bradley. In addition to its superior performance under the most strenuous operating conditions, the radiator was selected for its design flexibility and durability. In adverse conditions, if there is not a clean water source or coolant around, the radiator will operate with dirty water to get it out of a bind, which is critical in defense applications.



Verified Supplier for Military's Reset and Remanufacturing Programs

API's copper-brass radiator is designed to outlast the Bradley's usable lifespan. This is the military's expectation, and API performs endurance tests on all of its coolers to ensure that its products meet this expectation.

API's first-draft article tests have a **99.5% pass rate**, which is a testament to API's engineering and manufacturing expertise.

As a verified supplier, API regularly provides new components or replacement copper-brass parts to the military when it wants to restore a Bradley to pre-combat conditions.

The company also provides replacement copper-brass radiators for the military's remanufacture program, designed to return infantry fighting vehicles to full "zero miles" condition while installing upgrades.

Dependable Track Record for Performance and Delivery

API maintains the designs for the components and parts it engineers and can quickly build them to order in batches or small quantities. API's first-draft article tests have a 99.5% pass rate, which is a testament to API's engineering and manufacturing expertise.

All of API's copper-brass parts and coolers are manufactured in the US in its Franklin, Wisconsin plant, and the company's employees take pride in their work.

"Our team on our shop floor knows what they are producing and how critical it is for one of our brothers or sisters," said Jeff Szafran, sales manager, Americas, for API Heat Transfer. "It is mandatory that we design and manufacture the best products we possibly can to keep our military personnel out of harm's way."

About API Heat Transfer

For more than 40 years, API has sold heat exchangers and coolants for military and defense applications directly to federal sites and to America's largest defense contractors.

Our team has the practical knowledge and experience needed to design, engineer, and manufacture custom and semi-custom copper-brass coolers and parts for new and reset military vehicles.



To learn more about our products or review other case studies, **contact us:**

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