

EXECUTIVE *Report*

Celebrated Aircraft Loader System Boasts Brazed Copper-Brass Radiator



The renowned Tunner aircraft loading system now incorporates a newly designed copper-brass radiator. In manufacturing the radiators, the CuproBraze process is used to braze the joint at the header plate-to-core interface and to enhance the rigidity of the fins.

A new design of a copper-brass radiator has been developed for retrofit and use on the renowned Tunner aircraft loading system. These heat exchangers are the first of their kind for military use. The CuproBraze® process is utilized in their manufacture to braze the joint at the header plate-to-core interface and to enhance the rigidity of the fins.

CuproBraze Passes Muster

Systems & Electronics Inc. (i.e., SEI, a major defense contractor) and RADAC Corporation jointly completed a successful First Article inspection on two sample radiators that were developed by RADAC.

According to a congratulatory letter addressed to RADAC from SEI staff engineer Fred Rockwell, “The integrity of the brazed joints demonstrated by the 200-percent proof pressure was outstanding. The visual surface quality of the brazed joints exceeded our expectations, the fillet radii being free of excess braze material and the surface roughness being less than 125 RMS. Our detailed and in-depth dimensional and functional inspection resulted in all the units being 100-percent compliant.”

Put the Load on Me

RADAC Corporation was among the first heat-exchanger manufacturers in the USA to adopt CuproBraze technology. A previous report describes RADAC’s experiences in mastering this new technology for brazing copper fins and brass tubes into high-quality heat exchangers for a wide range of aftermarket and OEM applications [1].

Its strategy has paid off well, as evidenced by the many orders that it continues to receive for CuproBraze products. Success breeds more success, and it wasn’t long before RADAC attracted the attention of Systems & Electronics Inc.

SEI asked RADAC to develop a new radiator because the radiators that had been in use before were not meeting specifications. (There were manufacturing difficulties as well as inherent limitations with the previous design, which was a soldered radiator.) In the words of Mr. Rockwell, “the company had been experiencing specific and recurring problems with the former design.” The loading system was performing magnificently but the previous radiator design was not meeting the same quality expectations.

According to Mr. Rockwell, RADAC assisted SEI in “identifying, addressing and closing multiple and formidable design and production challenges.” He further wrote, “the efforts of the shop and inspection personnel to embrace and employ new quality control methods in developing the Tunner radiators was nothing short of outstanding.”

As a result of its cooperation with SEI, RADAC was added to SEI’s listing of Approved Suppliers of Radiators built at RADAC’s Dayton facility.

The Tunner Legacy

The Tunner radiator can be more fully appreciated with respect to 60K Aircraft Cargo Loader/transporter (Tunner), designed by and built for the United States Air Force (USAF) to serve at airbases worldwide.

The Tunner is appropriately named after William H. Tunner, who is widely regarded as the father of

The International Copper Association, Ltd. (ICA)

is the leading organization for the promotion of the use of copper worldwide. The Association's twenty-nine members represent about 80 percent of the world's refined copper output, and its six associate members are among the world's largest copper and copper alloy fabricators. ICA is responsible for guiding policy, strategy and funding of international initiatives and promotional activities. With headquarters in New York City, ICA operates in 28 worldwide locations through a network of regional offices and copper development associations.

For general mailing information about the CuproBrazed process or ICA's CuproBrazed consulting services, please contact International Copper Association at mrosario@copper.org. For technical information contact cuprobrazed@copper.org. For European inquiries contact ndc@eurocopper.org.

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See www.cuprobrazed.com for additional materials suppliers, equipment makers and heat exchanger manufacturers.

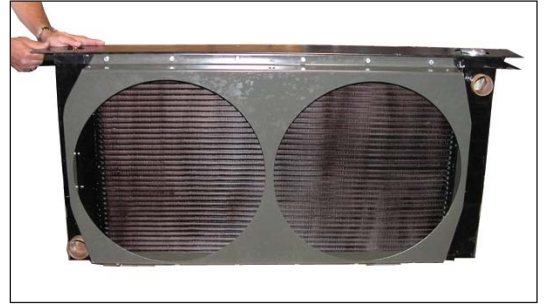
the airlift. Among his many accomplishments, Lieutenant General Tunner directed the Berlin Airlift in 1948-49, coordinating U.S. and British airlift efforts to supply the necessities of life to inhabitants of Berlin. His autobiography also chronicles the history and use of airlifts [2].

Manufactured by Systems & Electronics Inc. for both military and commercial applications, the Tunner has a maximum payload of 60,000 pounds or 30 tons (i.e., 27,200 kg or 27.2 metric tons). Its deck is adjustable for pitch, roll, side shift, and yaw; and it features a powered deck conveyor for moving cargo. The deck height is variable from 39 in. to 18.5 ft (0.9 m to 5.6 m). These functions are powered by a 350 horsepower (261 kilowatts) V6 turbo-charged diesel engine.

RADAC to the Rescue

The solutions proposed by RADAC included 1) the use of CuproBrazed technology, which produces stronger joints than those obtained by soldering, 2) a high level of quality assurance in the manufacturing process, and 3) an improved mounting system that allows air to flow smoothly across the radiator core. The performance issues of the Tunner's cooling system are now history, thanks to the superior performance of the new CuproBrazed design.

"The Tunner is just one example of how CuproBrazed allows us to offer superior products," says Jim Cornwell, VP of manufacturing at RADAC. "There are many other examples but the Tunner radiator is special because it could be used to airlift much needed supplies in the wake of natural disasters such as tsunamis, hurricanes and earthquakes. Our investment in CuproBrazed technology allowed us to offer SEI the best technology available today for heat exchanger cores. RADAC is proud to be making radiators for the Tunner."



Front and rear views of a Tunner radiator made using CuproBrazed technology are presented in the top and bottom pictures, respectively.

References

1. International Copper Association, "RADAC Focuses on Aftermarket Demand for Brazed Copper-Brass Products," *CuproBrazed Executive Report* Number 35.
URL: www.kellenpr.com/clientnews/pdf/CuproBrazed_35.pdf
2. Tunner, William H., *Over the Hump* (New York: Duell, Sloan, and Pearce, 1964).



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