Aluminum investment castings help make possible the competitive edge your engineering team seeks when developing the next air superiority jet fighter and the most fuel efficient aerospace engines. Our production capabilities — and engineering team’s insights — enable us to manufacture thin-wall, highly complex shapes for use in critical applications where strength and durability are most important. These advantages give your design groups the opportunities to rethink expensive, multi-part assemblies as single-piece, lightweight aluminum investment castings.

- **ALUMINUM INVESTMENT CASTINGS MAKE POSSIBLE...**
  - Superior military aircraft performance
  - Light weighting for man-portable systems
  - Fuel-efficient aircraft
  - High-strength missile bodies

Aerospace turbine engines produce power so great that they lift tons of weight into the air over distances of thousands of miles. The right mix of fuel and air is the lifeblood that makes the turbines spin from departure gate to touchdown. Sending the correct amount of fuel to the efficient engine is an aluminum fuel metering unit produced by Alcoa. Possessing intricate passageways and one of the most detailed exteriors, a fuel metering unit gets the fuel where it needs to be at all times.
YOU WANT BEST IN CLASS...
WE'RE RESPONDING

With each new aircraft design, engine manufacturers seek to deliver faster rates of climb and cruising speeds, greater ranges and reduced cost of ownership. They also look to Alcoa to deliver on the promise of aluminum to lightweight critical components. Alcoa responds with aluminum engine components — such as front fan frames and fuel metering units — that contribute to fuel economy and environmental friendliness.

Alcoa’s investment casting technology provides thin-wall sections and serpentine passageways in different axes with its innovative pouring techniques. When business jet builders call for more performance, engine manufacturers look to Alcoa aluminum castings as a key enabler.

Alcoa is committed to providing products and services of the highest quality and reliability. Our facilities and processes are approved by all major aerospace and defense contractors, and a variety of customers servicing commercial and industrial markets. In addition, many facilities hold ISO and Nadcap certifications.

Front fan frame for a commercial jet engine

AH-64 Apache helicopter

> THE WORLD’S MOST CAPABLE COMBAT HELICOPTER

The AH-64 Apache, the U.S. Army’s premier combat helicopter, tilts the course of conflict when it engages the enemy at terrain-hugging heights over a 300-mile combat action radius. Aluminum investment castings — strong and durable — offset the weight of armament in several key component systems: the Hellfire missile body and chin-mounted target acquisition pod. The aluminum interface housing secures systems vital to Apache mission success. Alcoa stands with the AH-64 Apache warfighters to ensure that the world’s most capable combat helicopter meets their needs today and beyond.

Ah-64 interface housing

AH-64 Apache helicopter

> ALCOA CASTING LEADERSHIP
- Thin walls
- Cored shapes
- Intricate passageways
- Lightweight and durable
- Complex surface and interior features
- High-mechanical properties
- Large envelope casting

Aluminum front fan frame
Mounted on top of several types of combat vehicles — including Humvees and MRAPS — is a simple housing cast by Alcoa from lightweight aluminum. Yet the casting ably protects the sophisticated surveillance electronics and optics that make up the LRAS … considered by some to be the U.S. Army’s premier reconnaissance and surveillance system operating on the modern battlefield. Alcoa is proud that our advanced casting technologies deliver the right combination of light weight for mobility and strength for durability to deliver 24/7 operation in the harshest environments.

Today’s smart munitions speed to their targets relying on nonstop operation by the most complex electronics systems packed securely within their high-strength, aerodynamic bodies. The U.S. Navy’s Tactical Tomahawk cruise missile is no exception.

It’s hard to imagine an activity in which the words “design” and “tradeoff” are more often paired than aircraft development. Take the F-35 Lightning II, the most powerful single-engine fighter in history. Alcoa expertise in metals and manufacturing is helping strike seemingly impossible balances of speed, safety, payload, fuel efficiency, stealth, reliability, affordability, and producibility.

The plane’s multiple missions require designers to pack an extraordinary range of capabilities into a rigorously limited envelope. Working to eliminate weight, Alcoa has found ways to deliver bigger, better, faster results in the quest for a lighter fighter. One contribution is the one-piece, aluminum engine nacelle investment cast by Alcoa.

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