



MANY PARTS. *One* PARTNER.

## B/E Aerospace Thermal & Power Management

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B/E Aerospace is experienced in all aspects of thermal management, and aluminum brazing is our specialty. As the leading thermal management company with best-in-class brazing technology, B/E Aerospace provides customers with single source brazed assemblies, and can deliver “*extra-capacity*” from one of our many brazing facilities when necessary.

## Brazing Defined

Brazing is a metal joining process that utilizes the inter-atomic attraction between two pieces of metal to form a bond that approaches parent metal strength. This is accomplished by “*wetting*” the metals to be joined with molten metal which, on cooling, forms the joint.

Joining metals at temperatures under 800°F is “*soldering*”, while “*brazing*” occurs at temperatures above 800°F. Welding differs from brazing in that the base metals to be joined are molten at the moment of joining.

## Benefits of Brazing

Brazing allows fabrication of flexible, high performance assembly and cold plate designs.

- ▲ Reduced cost, complex configurations relative to machinings
  - Use of folded fin stock for increased thermal effectiveness
- ▲ Optimum weight construction possible
  - Minimum wall thickness and corner radii
  - Thick-to-thin wall transitions superior to castings
- ▲ Extremely close tolerances held in brazing process
  - Uniform heating limits part distortion and movement
  - Minimizes the need for secondary machining operations
- ▲ Self-locating and modular tooling and fixturing utilized
  - Minimizes tooling costs and lead times
  - Allows cost effective, rapid introduction of engineering changes
- ▲ High strength and leak tight joints
  - Use in high stress environments
  - Hermetically sealed applications
- ▲ Uniform thermal and electrical conductivity
  - Superior EMI protection versus bonded or mechanically fastened approaches



Dip Brazed Chassis



Vacuum Brazed Coldplate for an  
Antenna Interface Unit

To learn more about our capabilities and brazing, please contact your B/E Aerospace representative or call:

— (603) 964-9780 —

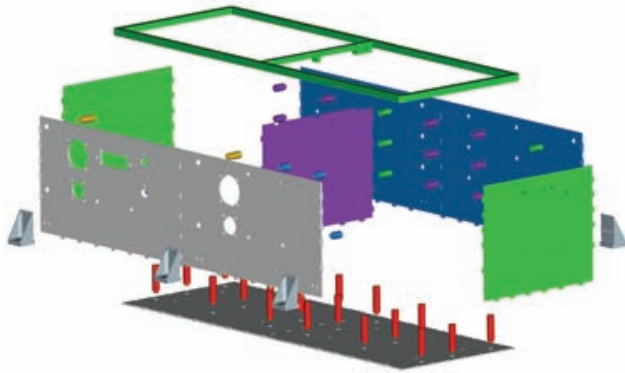
## Aluminum Dip Brazing

### Benefits

- ▲ Excellent for chassis, enclosures and air cooled applications
- ▲ Card guide tolerances of +/- 0.004 maintained during brazing
- ▲ Vertical braze joints possible through capillary action of braze alloy in salt bath
- ▲ Conducive to thick-to-thin wall transitions
- ▲ Proper design tolerances can minimize or eliminate secondary machining operations

### Design Guidelines

- ▲ General Tolerances of +/- 0.010; True Position > 0.028; Flatness 0.001 in/in and 0.015 overall recommended to eliminate secondary machining
- ▲ Fin densities of < 15 fins per inch and open flow path recommended for elimination of salt entrapment



Exploded State of a Dip Brazed Chassis

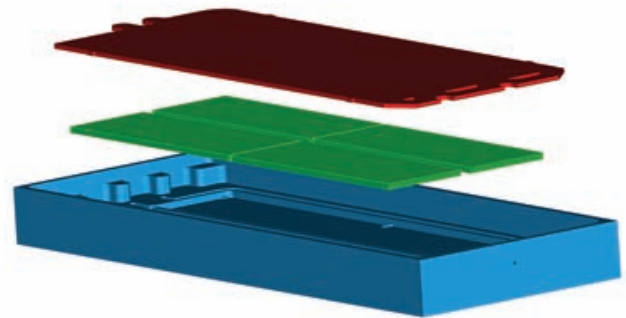
## Aluminum Vacuum Brazing

### Benefits

- ▲ Excellent for Liquid Flow Through (LFT), high density fin and heat exchanger applications
- ▲ Conducive to lanced offset fin stock and other high surface area cooling approaches
- ▲ Higher pressure and hermetic seal capability even in thin wall designs
- ▲ Can combine with various welding processes or structural bonding for design flexibility
- ▲ Fluxless process eliminates potential corrosion issues
- ▲ High batch rate oven runs depending on size and configuration

### Design Guidelines

- ▲ Standard tolerance limits - SEM-E Example: general +/- 0.002; True Position 0.004; Flatness 0.002 overall; skin thickness over fin 0.017"



Exploded State of a Vacuum Brazed Coldplate



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**B/E's Thermal & Power Management Group** is the market leader in the design, engineering, and manufacturing of customized, fully integrated, thermal management, power conversion, and interconnect solutions that address complex power management requirements.

To learn more about B/E Aerospace Thermal & Power Management, please visit us at:  
— [www.bethermalandpower.com](http://www.bethermalandpower.com) —