



Vacuum Brazing

A Metal Alloy Joining Process

Vacuum furnace brazing is a unique joining process that results in strong, bright, clean and metallurgically consistent assembly with minimal distortion. Types of parts that can be joined through vacuum brazing include:

- Stainless steel instruments and part assemblies
- Aerospace parts
- Automobile parts
- Heat exchangers
- Scientific instruments
- Medical and dental instruments
- Capillary tubing assemblies

Memberships and certifications

- Comply with AMS 2759, AMS 2801, AMS H6875
- Member of Metal Treating Institute



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The Process

Vacuum furnace brazing is a three-in-one joining process. In one brazing cycle, three metal treatments occur simultaneously: heat treating, diffusion and brazing. Heat treating provides the metallurgical property—the right ductility—needed in the part assembly. Vacuum brazing creates a diffusion bond between the joined components that ensures the strength of the brazing joint. Brazing with the right alloy creates a continuous hermetically sealed bond and the correct metallurgical operating result.

Types of alloys used to join components include:

- Copper
- Gold/Nickel
- Pure metals
- Nickel
- Copper/Gold
- Silver
- Other special alloys

The Advantages

Since three metal treatments occur simultaneously when the whole assembly is heated, vacuum furnace brazing results in minimal distortion compared to localized joining processes. The result is a metallurgically consistent assembly which is strong, bright and clean.

Gas atmospheres can be used to enhance the vacuum brazing process. Nitrogen or argon not only prevent alloy evaporation, but also protect the part assembly from oxides and discoloration.

Vacuum brazing provides an assembly that meets required specifications. Many part assembly applications are suited for vacuum brazing. This includes parts made from stainless steel, copper, graphite, steels, stellite, ceramic, moly and tungsten or tantalum.

The Ability

Solar Atmospheres has the lab and production vacuum furnace capabilities to assure cost-efficient results for your brazing requirements, regardless of volume. If the application requires, we can assemble individual components before vacuum brazing to enhance your production capabilities.

Expert metallurgical consultation is available to determine the best joining process and braze material. Trial runs assure that you obtain the results you expect. Purchasing, assembly, storage of components and *Just In Time* shipments are available to make your in-house production more efficient. This includes the use of electronic KANBAN services if desired. Specialized services are available as required and include:

- Vacuum leak testing with a helium mass spectrometer
- Spot tig welding assembly of components before brazing
- Hydraulic and manual staking of components

Customized braze runs, strict quality control procedures and prompt shipment of your parts help ensure your satisfaction with every job.