

Understanding Key Vacuum Brazing Process Parameters for Aluminum, Ceramic Brazing, And Compression Brazing.e

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Successful vacuum brazing relies on proper technique and the correct materials and furnace capability to continuously control the brazing cycle (vacuum level, heating/cooling rates, temperature, time, and purity of quenching gases). Experience has shown that better than ninety percent of all brazing problems occur because of a violation of one of these fundamentals of brazing:

1. Properly designed braze joints appropriate to the service condition to be encountered.
2. Appropriate cleaning and surface preparation of workpieces before brazing
3. Proper joint fit-up (gap clearance at brazing temperature, flatness, squareness, burrs, etc.)
4. Right brazing filler metal (BFM) selection, as well as use of good BFM preparation and application practices
5. Appropriate assembly and fixturing
6. Properly designed vacuum furnace brazing cycle (brazing temperature and time, heating and cooling rates, etc.)
7. Adherence to process standards requirements for specific control and maintenance of vacuum furnace equipment
8. Knowledgeable inspection of finished brazed assemblies.

The most crucial characteristic of any braze alloy is the ability to "wet" a surface and flow freely over it. To secure good wetting, absolute cleanliness is essential. The vacuum furnace used for brazing operations requires adherence to specific industry standards for brazing processes. Before use, vacuum furnaces should be checked for instrument accuracy, temperature accuracy, temperature uniformity, and leak rate.