

SYNTE SERVICE CAPABILITY

Vacuum Brazing & Heat Treatment Services

OEM processing and process-support capability based on customer drawings, materials and technical requirements.

Define samples, process route, inspection and production release before parts enter service processing.



Brazing

Aluminum & high-temperature

Heat treatment

Quench / anneal / temper

Trials

Process development

Production

Project-defined batches

Use this document to

Screen the application, compare reference configurations, identify the engineering variables that change the proposal, and define measurable quotation and acceptance inputs.

Current online reference

<https://syn-v2.com/vacuum-furnace-systems/heat-treatment-vacuum-brazing-services/>

All published values are reference data for preliminary selection. Final configuration, supply scope and acceptance conditions are controlled by the project proposal and technical agreement.

01 / SCOPE

Processing capabilities

Services cover development trials and defined production routes for industrial components, thermal assemblies and precision workpieces.

Vacuum brazing

High-vacuum joining, aluminum brazing, stainless-steel brazing and compatible high-temperature assemblies.

Vacuum quenching

Hardening routes for tool, mould, high-speed, alloy and compatible steels.

Annealing & tempering

Stress relief, bright annealing, tempering and property adjustment under controlled conditions.

Solution / aging

Solution treatment, aging, dehydrogenation and compatible thermal cycles.

Fixture support

Brazing fixture design, custom tooling, assembly-positioning and batch-support fixtures.

Process development

Cycle review, sample planning, representative trials, recorded variables and decision evidence.

Typical industries

Automotive, aerospace, electronics cooling, industrial heat exchangers, server liquid cooling, communications, tooling/moulds, advanced materials and energy equipment.

02 / BRAZING

Vacuum brazing application map

Joint design, preparation, filler placement, fixture and acceptance must be reviewed together before a production route is released.

Application group	Examples	Critical review items
Thermal management	Cold plates, heat sinks, manifolds, coolers, radiators	Flow path, alloy/filler, leak test, flatness and cleanliness
Heat exchangers	Condensers, evaporators, intercoolers, EGR and plate-fin units	Core/fin stack, fixture, joint coverage, leak/pressure evidence
Precision assemblies	Antennas, waveguides, bellows, stainless and alloy assemblies	Joint clearance, distortion, surface and dimensional inspection
Advanced materials	Carbide, ceramics, diamond tools and compatible dissimilar joints	Wetting route, interlayer, chemistry and joint-strength method

Brazing release sequence

01	02	03	04	05
Drawing review	Material / filler	Fixture	Trial cycle	Inspection
Joint and critical features	Compatibility and cleanliness	Gap, support and distortion	Thermal/vacuum evidence	Leak, strength and dimensions

Do not omit

Filler designation and form; joint clearance; cleaning method; leak/pressure/strength test; dimensional datums; areas where appearance or discoloration is controlled.

03 / HEAT TREATMENT

Heat-treatment service definition

The starting metallurgical condition and test method are required to turn a furnace cycle into a measurable part result.

Process	Typical objective	Required definition
Vacuum quenching	Hardness, strength, wear resistance and clean surface	Grade, section, austenitizing, quench route, hardness and distortion
Annealing	Softening, stress relief, structure or bright surface	Starting state, thermal route, atmosphere and property target
Tempering	Hardness/toughness balance and residual-stress control	Incoming hardness, setpoint/soak, repeat cycle and final target
Solution / aging	Phase control and mechanical-property development	Alloy condition, solution/cooling/aging route and test method
Dehydrogenation	Hydrogen reduction in compatible components	Material, prior process, temperature/time limit and verification

Inspection examples

Hardness and location map; metallography; dimensions/distortion; surface condition; batch chart; atmosphere/vacuum record; witness sample or material test when agreed.

04 / WORKFLOW

Trial-to-production control

Separate development work from released production. Each stage should have a defined decision and evidence package.

01	02	03	04	05
Intake	Technical review	Trial plan	Trial / inspection	Production release
Drawing, material and target	Process, fixture and risks	Samples and pass limits	Recorded cycle and results	Frozen route and traceability

Control point	What to agree
Customer-supplied material	Quantity, identity, incoming condition, damage/shortage handling and return of surplus
Fixtures/tooling	Ownership, drawing approval, life, maintenance and storage
Nonconformance	Notification, hold, investigation, rework limits and disposition authority
Traceability	Batch/part identity, process record, inspection record and retention
Packaging/logistics	Cleaning, corrosion/impact protection, labeling, shipment and release documents
Change control	Variables requiring customer approval before route, material, fixture or equipment change

05 / RFQ

Information required for service quotation

Send readable drawings and a measurable acceptance method. Where the process is not yet qualified, identify the request as development rather than production.

Part identity

Drawing/revision, part name, material grade and starting condition.

Joint / process

Filler, heat-treatment route, current specification and known constraints.

Quantity

Samples, batch size, annual demand, delivery cadence and spare quantity.

Fixture

Available tooling, loading orientation, critical support and dimensional risk.

Acceptance

Leak, strength, hardness, metallurgy, dimensions, surface and record method.

Delivery

Required timing, packaging, traceability, document language and shipping boundary.

Direct enquiry

Email info@synthe-corp.com or WhatsApp +86 155 3785 7393. Current service page: <https://syn-v2.com/vacuum-furnace-systems/heat-treatment-vacuum-brazing-services/>