



HI TECMETAL GROUP

Company Profile

Our Brite Braze division was founded in 1984 as a job shop welding company in order to support Allied Signal Aerospace fabrication needs. Today, we have grown to be a full service fabricator and manufacturer. Our capabilities include component design, job shop welding and the full fabrication of complex assemblies. Our innovative approach to addressing specialized and difficult fabrications is one of our biggest assets.

Nadcap AEROSPACE WELDING SERVICES

TIG GTAW (Gas Tungsten Arc Welding)

MIG GMAW (Gas Metal Arc Welding)

PTA (Plasma Transferred Arc)

Brazing & Soldering (Torch, Furnace and Induction)

In House AWS Nadcap Personnel & Procedures (Qualified to perform job to your exacting requirements)

HTG is proud of its Nadcap Weld Accreditation for TIG and Resistance Welding. ISO 9001:2008 certified for metal fabrication services. Services include short & long run sheet metal fabrication, welding & assembly.

Services include short & long run sheet metal fabrication, welding & assembly. Metal components produced include aircraft braking system components, aircraft fuel management assemblies, metal brackets, metal enclosures, boxes, chassis, food processing equipment, food chopper and blade assemblies, aircraft pump components, motorcycle brackets and brake fittings, support brackets, electrical contacts. Industry served including aerospace, medical, electronics, vending, construction, military, aviation, equipment manufacturers, boating, food equipment, agriculture, automotive, recreation vehicles and marine.

Welding services including prototype, resistance, robotic, on-site robotic, & seam. Equipment includes 3 spot welders up to 200 KA, TIG & MIG welding. Industry served including aerospace, food equipment, medical, electronics, vending, construction, military, aviation, equipment manufacturers, boating, restaurants, printers, agriculture, automotive, recreation vehicles, & lighting. ISO 9001:2000 certified. HTG is Compliant with AWS D17.1, Mil-Q-9856 & Mil-STD-45662, & ISO 9002 specifications.

The HTG Advantage

HTG has a distinct advantage in the market place. HTG has several niche businesses that enable us to combine resources and special processes in order to handle the total metal joining and treatment needs of our customers. Components that require welding, assembly, brazing and heat treating can be managed and processed by HTG. HTG has the people and know-how to handle process flow map and co-ordination, expediting of product plant to plant and act as a “one stop shop”. By marrying our people, equipment and customers with our technical know-how and unique process disciplines, we can be a valuable resource to our customers. Our customers save time by not have to expedite multiple vendors. Also, parts to not have to travel as far. Our customers have no and freight costs for shipping parts to several suppliers to complete the work that needs to be done. HTG saves our customers time and money by providing out-sourcing services.

Here are two examples that will illustrate our uniqueness:

Both of these parts require extensive welding and brazing in the fabrication process. HTG provides the total service package.



Figure 1 Aircraft Bleed Air Fabrication GTAW Welded and Hydrogen Brazed



Figure 2 Stainless & Inconel Heat Exchanger GTAW & Nickel brazed

HTG Welding Approvals cover the manufacture and maintenance (inc repair) of aircraft components made of these materials:

Metals welded

- Titanium
- Steel
- Stainless
- Aluminum Alloys
- Nickel Alloys
- Chrome-Moly
- Inconel
- Invar
- Inconel
- Carbon Steel

Our Welding Authority specifically covers the following types of welding:

Type 2 – Brazing & Soldering

- Carbon and Alloy Steels
- Corrosion and Heat Resisting Steels
- Brass and Copper

Type 5 - Gas Tungsten Arc

- Aluminum Alloys
- Carbon & Low Alloy Steels
- Corrosion & Heat Resisting Steels
- Nickel and Titanium Alloys

Type 6 – Resistance and Spot Welding



Welding & Brazing Applications

Mig Welding, Tig Welding, Brazing and Spot & Resistance Welding
Brite can weld all metal groups including Steel, Stainless Steel, Aluminum, Inconel and Titanium.

Examples of Products that we weld:

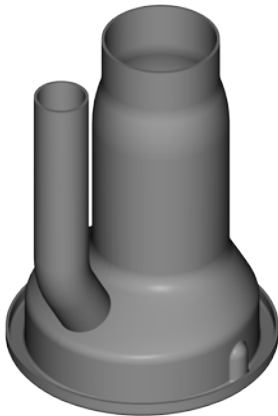
- Air-conditioning components
- Aircraft braking system components
- Aircraft stand-by power generator components
- Air freight handling equipment
- Aircraft fluid control components
- Automotive stampings & screw machine components
- Brake System Components
- Catalytic Converters
- Chill Plates
- Clamps
- Construction Equipment
- Diesel engine components
- Defense & Military parts
- Electrical Bushings and Conductors
- Electrical Circuit Breaker Components
- Exhaust systems
- Fuel rails
- Food Cutters & Blades
- Food & beverage equipment components
- Fabricated Food trays
- Gun parts
- Heat exchanger shell & tube
- Heat sinks
- Hose assemblies
- Hydraulic Accumulators
- Hydraulic fittings and fluid system parts
- Marine hardware
- Medical Components Instruments & Devices
- Missile Fins
- Mufflers
- Pulleys – Automotive
- Oil tanks
- Recreational vehicle components
- Refrigeration compressor components
- Sensor devices
- Stationary Power Distribution Components
- Surgical Tools & Devices
- Truck components
- Transportation equipment
- Turbo-charged transmission components
- Turbine Compressor wheels
- Tube Fittings
- Tubular Components

WELDING SERVICES

Our NADCAP Accredited Weld Shop Specializes in Aerospace Certified TIG Welding of Aluminum, Stainless Steel, and Low Carbon Steel. With Over 26 years of Combined Experience HTG can provide High Quality Welding with Very Reasonable Lead Times. We Offer Complete Fabrication contract manufacturing services [build complete] . In addition, we offer specialized job shop welding referred to as “Subcontract Weld Services” or “Weld Only” with customer Supplied Details

HTG also offers Spot-Welding Services and we are certified to the most demanding possible standard in the aerospace industry. Our Nadcap Accreditation in Welding ensures that our customers receive the highest Quality of Welding workmanship available. From Weld only operations to Full Fabrication and Welding, we can offer solution for your product fabrication needs. HTG specializes in two fields:

1. building to print for our customer's proprietary designs,
2. providing our own unique part numbers and products per our customers' requests.



Resistance Welding of Aircraft Component

Figure 3 Build to Print Welded Housing - Aerospace Application

As a company with over 26 years of experience, HTG Brite Brazing continues its commitment to providing Quality, Integrity and Service as a fabricator to the metals industry. Only through constant attention to detail and continuous improvement to quality enables us to maintain the highest standards of service, quality and integrity in all our work. Our drive and focus is to give our customers service beyond what they expect. We are also a cost effective supplier.

Today we are an ISO 9001-2001 registered company NADCAP (National Aerospace Defense Contractors Accreditation Program) accredited for welding. We are customer certified to do a wide range of manufacturing special processes with such as Lockheed Martin, Northrop Grumman, Boeing, Goodrich Aerospace and many others.

Several design considerations should be taken into account for economical and efficient welding. Many of these apply to other joining methods, and all apply to both subassemblies and the complete assemblies.

Recognize and analyze the design problem up front before the work begins: When we quote a job that requires metal joining, our Engineers review blueprint designs to assure that the part will meet and perform well under expected and worst-case conditions. Considerations include:

What is the most economical method to build the part?

1. Can the part be made to print?
2. Is the part designed correctly to yield parts of high integrity?
3. How, when, and how much should the part be joined {brazed or welded}?
4. Are there methods that can be suggested for product improvement that consider reduced cost-effective product or process re-design?
5. Will other joining methods, such as brazing, offer equal or better performance?

Consider Fit, Form and Function:

The most elegant design is useless if the parts cannot be made efficiently. Welders or Brazers cannot always fabricate what designers think up. Designers should spend time with the experts and consult our manufacturing engineers during the design stage to become familiar with the challenges of translating drawings into products.

Our Engineers must not only consider design and material requirements before they quote or process a job; they also have to take the actual brazing or welding processes into account. Because methods and manufacturing procedures affect both braze & weld quality, our engineers must make certain that they the part can be made to print. Variables such as distortion induced by welding must be considered at the onset. The quality of welds is ultimately our responsibility once we accept the job.

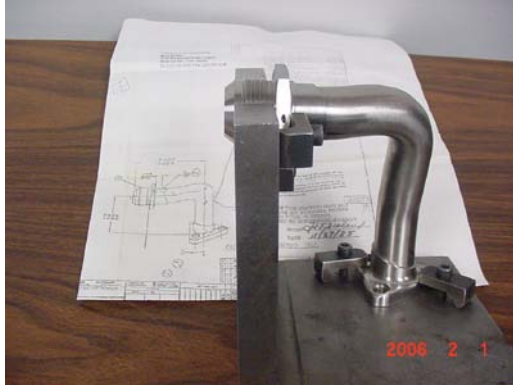
Use jigs, fixtures, and positioners: Jigs and fixtures hold parts in correct alignment for welding. Our designers and manufacturing engineers specify the jigs, fixtures or positioners required. The cost of designing fixtures, creating fixture or jig blueprints, building the tools are all costs that are included in the cost of welding. HTG has engineers that design all tooling for each application which is generally unique.

Weld Fixtures

HTG builds its own high quality, cost effective weld fixtures. Our weld fixtures offer solutions that are robust, well designed for the application, and fairly priced. We concentrate our resources towards developing weld fixture solutions for each application.

Weld Fixture Design

Welding and Brazing Processes starts with good part and tooling design. HTG has design resources both in-house and longtime partnerships with experienced tool building design contractors. We use Auto Cad, design software.



Tube Fabrication Weld Fixture

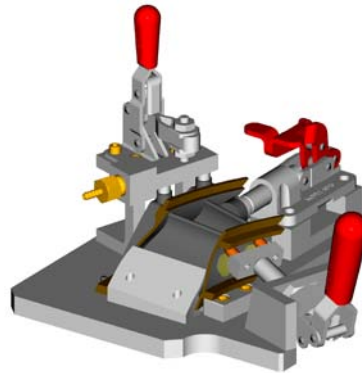


Illustration of Turbine Vane Weld Fixture Design

Specify welding procedures: Our customers do provide weld specifications and possibly welding procedures. If procedures are provided, our engineers will review all specifications and procedures during our quoting process. Our responsibility is to produce acceptable-quality welds at the lowest overall cost. Once, we receive a Purchase Order we develop Weld Procedures and Weld Schedules for our shop floor personnel to follow. The engineered procedures are tailored to the application and spell out exactly what welds are to be made and how they are to be made. Procedure variables include the brazing and welding processes, conditions, and operation details; joint details; filler metal and shielding gas (if any), and safety.

Different procedures produce different weld qualities, such as strength only, commercial, or code quality. Strength-only procedures produce the highest welding speeds at the lowest costs. Appearance and quality are not important in these applications. Defects and imperfections are acceptable as long as the welds perform satisfactorily under service conditions. Tests should be specified to confirm performance of strength-only welds.

Aerospace - quality procedures produce higher quality levels and appearance. Such welds are crack free and pressure tight. They look good and meet joint strength requirements. However, commercial-quality welds may have minor defects. Weld quality is defined in our internal procedures.

Certified aerospace quality welds must be free of defects and pass nondestructive testing. In practice, this usually means welds that are free of cracks and have limited porosity, undercut, or other flaws.

Control and correct distortion: During welding, localized heating causes temperature variations, which may cause residual stress and permanent distortion. Our tooling designers must control and correct distortion. One of the best techniques to lessen distortion is restrained assembly, in which jigs or fixtures restrain the parts rigidly so they cannot move. The use of jigs and fixtures reduces distortion, but stress may build up within the joints and may increase the chance of cracking.

Designers design parts so welds are made near the part's neutral axis, because weld-shrinkage forces away from that axis may cause angular distortion. The presetting assembly method will reduce distortion.

Distortion also can be reduced by avoiding over heating the components, as well as by using subassemblies.

Specify heat treatment: Stress in most welded materials can be relieved by heating them while restraining them in the desired position. The weld materials relax, relieving some of the residual stress. However, the structures must be heated uniformly, and cooling must be slow so that stresses do not redevelop. Stresses in large structures are not easily relieved through heat treatment. Local stress relief is sometimes possible but may be impractical due to the large heat sink afforded by these structures. Stress relief is critical for dimensional stability in parts that will be machined. If structures contain much residual stress, they will move and distort when the machining process begins removing material. **HTG has equipment to provide the stress relief operations after welding if required.**

Consider cleaning and inspection: Parts must be clean prior to welding in order to avoid the possibility of bad welds. After welding, Parts may require clean up based on the weld procedures in place. Certain joints are inherently difficult to inspect. Design critical joints so they can be inspected with confidence. For example, fillet welds and spot welds are difficult to inspect. With spot-welding of aerospace products, weld inspection techniques are generally established. Pull or peel testing are common methods of inspection provided by HTG. Full-penetration, butt-joint welds are much easier to inspect by standard methods.

Our inspection criterion is included in the shop procedures that enable our personnel to know what is required. Our inspectors first examine welds visually. Surface discontinuities give useful information about workmanship are reviewed. We do not produce shoddy-looking welds or welds that contain internal discontinuities. Thus, visual inspection often is followed by more revealing inspection techniques, such as ultrasonic or radiographic testing. This is determined by the specification and procedures that are being followed.

As an industrial process, the cost of welding plays a crucial role in manufacturing decisions. Many different variables affect the total cost, including equipment cost, labor cost, material cost, and energy cost. For manual welding methods, labor costs generally make up the vast majority of our total cost. As a result, many cost-saving measures are focused on minimizing operation time. To do this, welding procedures with high deposition rates can be selected, and weld parameters can be fine-tuned to increase welding speed. Mechanization and automation are often implemented to reduce labor costs, but this frequently increases the cost of equipment and creates additional setup time. Material costs tend to increase when special properties are required.

HTG would like to play an important role for you by providing you services that meet your brazing, heat treating or welding needs. We solicit your inquires; and, we welcome the opportunity of reviewing your needs. Send us an RFQ with blueprints and will quickly determine if we have a process or application that will work for you.

Contact us at quoteteam@htg.cc

Or call: Terry Profughi, President 216 426 6688

SHOWCASE OF PARTS WELDED BY HTG



Welded Hydraulic High Pressure Fitting



Aerospace Tubular Fabrication - Braking Systems