Integrated Systems
• Laser Welding
• Laser Cutting
• Laser Marking
• Micromachining
• Resistance Welding

• Seam Sealing
• Gloveboxes
• Reflow Soldering & Bonding
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AMADA MIYACHI AMERICA Company Profile

AMADA MIYACHI AMERICA is a leading manufacturer of equipment and systems for resistance welding, laser welding, laser marking, laser cutting, laser micromachining, hermetic sealing, projection welding, and hot bar soldering and bonding. The company provides products to a wide range of markets, including the medical device, battery, electric vehicle and solar industries, as well as global electronics, automotive and general industrial markets.

Since 1948, AMADA MIYACHI AMERICA has worked to achieve one goal: to solve our customer’s manufacturing challenges. Knowing there is no one solution that fits all, we strive to provide our customers with innovative and reliable manufacturing technology solutions so that we may be their single source provider.

AMADA MIYACHI AMERICA sells, distributes, services and supports the sales of all AMADA MIYACHI group branded products: Miyachi Unitek, Miyachi Peco, Miyachi Eapro and Benchmark, ensuring you get the best technology solution to fit your budget and your specific application.

Our headquarters is located in Monrovia, California with state-of-the-art facilities for developing, producing and servicing the solutions offered to our worldwide customer base. A global company, AMADA MIYACHI AMERICA also has sales offices and applications laboratories located in Detroit, Michigan; El Paso, Texas; and Sao Paulo, Brazil.

Company timeline

1948 Unitek Corporation founded in Pasadena, CA to manufacture orthodontic appliances.
1950 Weldmatic Division organized; produced a complete line of electronically operated resistance welders for missile, aircraft, electronics, and metal working industries.
1965 Moved into current Headquarters location in Monrovia, CA.
1971 Unitek Equipment Division established.
1978 Unitek Corporation acquired by Bristol Myers Squibb. Development and patent of force firing systems critical to small parts welding.
1987 Unitek Corporation acquired by 3M.
1988 Divested from 3M as Unitek Equipment Division of KVA Holdings Corp.
1991 Name changed to Unitek Equipment Inc.
1994 Acquired by Miyachi Technos and reorganized as Unitek Miyachi Corporation with merger of Miyachi America Company.
1994 Established Integrated Systems division
1995 Acquired Weld-Equip companies in Holland, Germany and France, and Miyachi Technos Europe in Germany.
1995 Received ISO 9001 Certification.
2000 Acquired Peco Welding Systems, GmbH.
2001 Acquired Benchmark International, Inc.
2005 Renamed Miyachi Unitek Corporation, consolidated Benchmark International to California.
2008 Reorganized European companies into single entity: Miyachi Europe Corporation.
2010 Opened applications lab in Wixom, MI.
2011 Opened sales office and applications lab in Brazil.
2013 Miyachi Corporation acquired by AMADA CO., LTD.
2014 Renamed Miyachi America Corporation.
2015 Reorganized as AMADA MIYACHI AMERICA, INC.
Automotive applications require across-the-board manufacturing technologies including resistance and laser welding, projection welding, hermetic sealing, and hot bar reflow soldering. AMADA MIYACHI AMERICA’s best in class products provide process stability with power feedback and monitoring options, as well as industrially proven reliability.

Part tracking and traceability has become a reality of modern manufacturing. AMADA MIYACHI AMERICA also offers a range of laser marking, engraving products, including integrated systems, for direct part marking with text, graphics, bar codes and data matrix codes.

Our technologies are used in a wide variety of automotive applications including sensors, switches, dashboard electronics, lighting components, brake shoes, and more.

Medical

The challenges of today’s medical device manufacturing applications - small, single-use devices in high demand with ever-increasing reliability requirements - are pushing the need for more sophisticated manufacturing technologies, and AMADA MIYACHI AMERICA, in consult with medical device industry expert customers, is leading the way with our comprehensive range of technologies. Our equipment is used in medical device manufacturing facilities around the world to build medical device components for cardiology, neurology, laparoscopy, arthroscopy, oncology, wound closure, and more.

Electronic Components

The fine control featured in AMADA MIYACHI AMERICA’s resistance and laser welding technologies is well suited to electronic component manufacturing applications requiring precision, low heat input, and low (or no) force welding solutions.

The high speed, non-contact clean laser marking or laser engraving process is well suited to high quality direct part marking on ever decreasing component sizes.

Common applications include hard drive read/write armatures, hard disk assemblies, electrical connectors, lead frame assemblies, relay terminal connections, batteries, and more.

Batteries

There are many process requirements in battery manufacturing. Depending on the size, type, and capacity, these requirements include both internal and tab-to-terminal connections, can and fill plug sealing, and external connections. Several joining options may be considered including both resistance spot and laser welding. The decision to use one technology or the other is determined both by the type of weld required and production requirements.

Laser marking is also used for branding and serialization. AMADA MIYACHI AMERICA has extensive experience welding and marking batteries including Lithium Ion, Nickel-Metal Hydride, Lead Acid, Nickel-Cadmium and Alkaline in all sizes.

Aerospace

Our aerospace manufacturing customers produce a variety of high technology parts for aircraft/aircraft engines, guided missiles, spacecrafts, propulsion units, and more including batteries, sensors, hybrid packages displays, and jet engine honeycomb manufacture and repair.

AMADA MIYACHI AMERICA’s laser welding, laser marking, resistance welding, hermetic sealing and hot bar reflow soldering equipment is uniquely suited to these applications and has been used in the manufacture of aerospace parts for more than 60 years. Precision control, closed-loop feedback, and weld quality tools ensure reliable and durable welds and marks for these demanding applications.

.. and more

- Automation
- Consumer Electronics
- Contract Manufacturing
- Defense
- Energy/Utilities
- Heating Elements
- Home Appliance
- Lighting
- Motors & Coils
- Photonics
- Semiconductors
- Sensors
- Solar
- Tools
- Universities/Research
Standard Equipment and Integrated Systems Solutions by Technology

**Resistance Welding**
- Weld most metals
- Thermocompression bonding
- Fine wire welding
- Coil and stud welding
- Sheet metal welding

**Laser Welding**
- Weld metals and plastics, dissimilar materials and thin foils
- Implantable device seam sealing
- Tool assembly
- Catheter assembly
- Battery manufacture
- Automotive sensors and assemblies

**Integrated Systems**
- Turn-key semiautomated systems
- Laser welding
- Laser marking
- Laser cutting
- Laser ablation

**Laser Marking**
- Marking of metals, plastics, and ceramics
- Engrave, ablate, anneal, bleach/foam
- Cutting or welding of thin metals
- Direct part marking
- Corrosion resistant marking
- UDI marking to comply with FDA regulations
- Wire stripping
- Surface cleaning or roughening

**Laser Cutting and Micromachining**
- Cut Nitinol, CoCr, stainless steels and polymers
- Burr free cuts with femtosecond laser
- Tube diameters from 0.01 - 1 in (0.254 - 25.4 mm)

**Hermetic Seam Sealing & Gloveboxes**
- Weld Kovar, stainless steel, mild steel and more
- Parallel seam sealing
- Lid handling, placement, alignment and welding
- Controlled atmosphere welding
- Transistor outline (TO) packages
- Rectangular hybrid modules
- Gas and pressure sensors
- RF and photonic devices

**Hot Bar Reflow Soldering & Bonding**
- Hot bar reflow soldering
- ACF bonding
- Heat staking
- Flat panel to LCD

**Micro TIG Welding**
- Weld conductive metals - up to 0.197 in x 0.197 in (5 mm x 5 mm) area
- Weld dissimilar metals
- Bus bar welding
- Coil and terminal welding
- Coated wire welding
- Thin magnet wires
- Medical device: endoscope parts, catheter, guide wire, dental pipe
Our application engineers process parts in our in-house labs to determine the optimal product and process settings. The system is tailored to the customer requirements of production throughput, product flow, and quality based on specific application results. Our field service engineers install the system and verify functionality with a factory acceptance test along with any training needed.

A dedicated system engineer oversees each project working closely with the customer and our experienced technicians to ensure on-time delivery with all needed functionality. The system undergoes rigorous testing, with each and every customer invited to our facility to oversee the system acceptance tests.

**Integrated Systems at a Glance**

- First system built in 1994
- More than 1,000 systems sold (standard and custom)
- Large team of dedicated system engineers, and system assemblers
- Mechanical, electrical and software engineers
- Project manager assigned to every system
- Concept 3D renderings
- Clear acceptance criteria determined at start of project – no surprises
- Project timelines with major milestones
- Conveyor systems
- Robotic, pick and place, load/upload
- Single operator, semi-automated, fully automated
- Process commitment
- Detailed compliance response documents
- Applications engineers run customer samples before PO and shipment in ensure quality
State-of-the-Art Facilities

- Main entrance and lobby
- Technical center (application & sample evaluation)
- In-house machine shop
- System engineering
- Standard product assembly
- Product showroom
- Customer-specific acceptance labs
- Product endurance lab
- Integrated system assembly

7
In-House Capabilities

1. Safety Enclosures
2. Laser/Resistance Processing
3. Custom Tooling
4. Multi-axis Motion
5. System/Process Monitoring
Safety Enclosures
- Standard or custom
- CDRH Class 1
- Glovebox/atmospheric
- Dual channel safety interlocks

Custom Tooling
- Standard or custom
- Fully integrated
- Designed for process and production
- Manual/pneumatic/servo

System/Process Monitoring
- Parameter collection
- GO/NO GO

Laser/Resistance Processing
- Fiber/YAG lasers
- Nano, pico and femtosecond lasers
- Hot bar power supplies & thermodies
- Resistance welding power supplies
- Inverter, linear DC, AC and cap discharge

Multi-axis Motion
- Linear XYZ
- Rotary
- Compact work area
- Custom path
- Coordinated motion
- Additional axes as required

Vision

Robotics and Other Material Handling Options

Custom Software Development
Laser Welding Systems

TYPICAL APPLICATIONS

Medical
- Laser seam welding pacemakers

Automotive
- Laser welding device assembly

Battery
- Battery pack manufacture

Electronics/Aerospace
- Laser spot welding

1 Beam Delivery - Fixed/Flying/Galvo Scan

2 Monitoring Laser/System

3 Multi-axis Motion Systems

4 Cover Gas Delivery

5 Vision Systems/Teach Mode

6 Human-Machine Interface

7 Fiber/Nd:YAG

8 Tooling
Beam Delivery - Fixed/Flying/Galvo Scan
- Quick and precise positioning
- Multi-spot, seam welding for pulsed Nd:YAG or fiber lasers
- Modular designed focus heads
- On/off axis lighting
- Vision/cameras systems

Monitoring Laser/System
- Laser/process – power, energy, shot count, pulse duration
- Through lens viewing on axis
- Post weld verification
- Customer settable frequency of power verification
- GO/NO GO based on set levels

Multi-axis Motion Systems
- High speed, precision motion
- Linear and rotary stages, coordinated motion
- Galvo beam delivery options

Cover Gas Delivery
- Inert cover gas delivery
- Laminar flow nozzles
- On or off axis options
- Flexible delivery options
- Multi-gas options

Vision Systems Teach Mode
- Locates weld location
- Identifies part fit up issues prior to welding
- Adjusts for manufacturing tolerances
- Point and click positioning
- Allows for part to part variation

Human-Machine Interface
- Intuitive operations
- Security operator/enter move
- Simple screen designs
- Multi-level passwords

Fiber/Nd:YAG
- Position based firing
  - Proprietary process for laser seam welding
  - Even spacing of pulsed laser even around 2D/3D corners or curves
  - Fastest processing speeds accounting for stage motion

Tooling
- Critical to successful welding
- Custom design integrated with workstation
- Collaboration between mechanical, electrical, and application engineer
Laser Marking Systems

TYPICAL APPLICATIONS

Medical

Automotive

Aerospace

Electronics

Medical tools & instruments

Aluminum castings

Ablation PTFE Coating/Stainless Steel

Bleaching of 14% glass filled nylon
Marker Motion
- Integrated marker motion controls up to 4 axes
- Step and repeat jobs
- Circumferential marking around cylinder
- Adjustable focus position for multi-level marking

Mark on the Fly
- Marking while part is moving for highest part throughput
- Speeds up to 750 ft/ min

Bar Code Readers
- 1 and 2D barcode reading for job select, and information upload
- Read verification
- Full network communications
- Router bar code determines the marking schedule

Integration
- Ethernet, RS-232, Direct, I/O
- TCP/IP, Ethernet IP
- Proven record to integrate into production lines

Production Handling Software
- Serialization via database
- Custom strings
- VDI compliant

Vision
- Optical character recognition
- Part presence and orientation
- Machine path offset
- Fixture allowance
- Precise mark location

Material Handling
- Shuttle moves part into and out of enclosure
- Single and dual stations
- Through conveyor
- Robotic load

Material Handling
- Multi-station rotary dial
- 2 station shuttle
- Flow through conveyor
- Reduce cycle time
- Process part during next part load
Resistance Welding, Bonding and Reflow Soldering Systems

TYPICAL APPLICATIONS

Medical
Spot welding pacemaker

Automotive
Projection welding radiator connector

Battery
Battery pack assembly

Electronics
Thermocompression bonding coil wire to terminal
### Power Supplies
- Energy: 5A-200kA
- Built-in process monitoring
- Data export features
- Closed loop control
- High/mid frequency inverters
- Linear DC
- AC weld controls
- Capacitive discharge welder

### Weld Heads
- **Servo Controlled**
  - Precise force and position
  - 0.5-100lbs
- **Pneumatic Controlled**
  - Low inertia-Force fired
  - 0.5-1500lbs
- **Opposed/Series Configuration**
  - Force and displacement options

### Monitoring
- Process development
- Process optimization
- Production control
- Monitor process trends
- Data logging/traceability
- Set process limits
- SPC and Run charts
- Track: current, voltage, power, resistance, force, displacement

### Vision
- Part location & orientation
- Electrode to part detection
- Electrode condition check
- Weld quality check
- Barcode reading
- Dimensional inspection
- Character recognition

### Motion Systems Options
- Rotary dial systems
- 2 station index
- Through conveyor feed
- Manual load/unload
- Lift & carry
- Robotic load/unload

### Motion/Automation/Tooling
- Multi-axis systems
- Parts handling
- Custom tooling
- Up to 5 axes of programmable motion
- Stages: 6”–24”

### Controls
- CNC motion
- GBM code programming
- Ethernet TCP/IP
- Profibus/Modbus
- RS232/RS485
- Digital I/O
- PLC/computer HMI interface
Laser Tube Cutting

TYPICAL APPLICATIONS

Medical

- Laser cutting cannula tubing
- Stents
- Laser cutting flexible tubing
- Hypo tube

1. High Precision Stages
2. Fiber or Femtosecond Laser
3. Auto Tube Loader
4. Easy Maintenance
5. Single Screen User Interface
6. Open Workspace
7. Engineered Composite Base
8. Compact Footprint
1. **High Precision Stages**
   - 2-4 axes of motion
   - Rapid acceleration linear stages
   - Axes configuration options
   - XY cutting option

2. **Fiber or Femtosecond Laser**
   - 200 W fiber laser
   - Up to 40 W femtosecond laser
   - Multiple wavelengths
   - Wet and dry cutting

3. **Automated Tube Loader**
   - Auto loading of tube diameters from 0.01"
   - Automatic wet connect on tube diameters > 0.07"
   - Up to 12 ft length

4. **Easy Maintenance**
   - Water system, fiber laser and electronics mounted on pull out drawers from front of system
   - System can be accessed remotely for factory support

5. **Single Screen User Interface**
   - All user information and functionality on a single screen
   - 3 level password protection

6. **Open Access to Workspace**
   - Main swing door provides complete access to entire workspace

7. **Engineered Composite Base**
   - Superior isolation damping over granite
   - 3D-load modeling allows design optimization
   - Integrated water/debris drains

8. **Compact Footprint**
   - System measures: 1956 mm (77") width x 787 mm (31") depth x 1524 mm (60") height
Laser Micromachining

TYPICAL APPLICATIONS

Medical

- Micro coax wire stripping
- Cannula drilling
- Thin material machining
- Catheter drilling

1. Vision
2. Control Software
3. Laser Sources
4. Laser Monitoring
5. Stage and Scan Head Motion Platforms
6. Debris Management
7. Tooling
Vision
- Off axis and through the lens
- Fiducial or feature recognition
- High resolution camera for minimal correction error

Control Software
- Simple graphical interface for machine path generation
- Import vector and bitmap files

Laser Sources
- Nanosecond
- Picosecond
- Femtosecond
- Any laser source can be integrated

Laser Monitoring
- Average power monitored
- GO/NO GO limits
- Beam profile verification

Stage and Scan Head Motion Platforms
- Stages or gantry options according to production needs
- Drive linear and rotary stages
- Galvo steered laser

Debris Management
- Localized airborne particulate extraction
- Femto/nano-second particulate capable
- Clean room options

Tooling
- Vacuum chucks
- Custom work holding
Hermetic Sealing and Glovebox Systems

**TYPICAL APPLICATIONS**

<table>
<thead>
<tr>
<th>Medical</th>
<th>Automotive</th>
<th>Aerospace</th>
<th>Electronics</th>
</tr>
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<tbody>
<tr>
<td>Laser seam welding pacemakers</td>
<td>Projection welding small TO devices</td>
<td>Resistance welding seam seal</td>
<td>Laser seam sealing</td>
</tr>
</tbody>
</table>
Glovebox Configurations
- 2 and 4 glove sizes (std)
- Custom configurations
- Eye-safe laser front glass available
- Aluminum or steel base
- Add-on extensions for storage or part preparation
- Stainless steel chamber

Monitoring
- Moisture monitor
- Helium sensor
- Oxygen sensor
- All glovebox data saved every 5 secs
- Settable sensor limits
- Exportable data
- Batch/lot reports

Controls
- Computer controlled
- PLC controlled
- Manually controlled
- Custom software
- Glovebox communicates with:
  - Laser
  - Sealer
  - Projection welder

Software
- High/Low setting for sensors
- Error messages
- Weld interlock for environment outside of limits

Welding Power Supplies
- Seam sealers
- Fiber lasers
- Nd:YAG lasers
- 25Khz high frequency Inverter
- Pulsar Series (CD projection welders)
  - 1K, 2K, 6K, 9K, joules

Gas Purification
- Single column
- Dual column
- Automated column change over
- Enables glovebox to reach ≤1 ppm of moisture and oxygen

Ovens/ Antechambers
- Wall heated
- Heated shelves (2-3 level)
- Interlocks
- Optional
  - Sliding shelves
  - Extra long ovens
  - Rear loading
Additional Systems

Conveyor Fed Laser Welding Systems

Robotic Welding Systems

Cap/Tube Laser Welding
Mini Atmospheric Chamber Laser Welding

Hot Bar Reflow Soldering and Bonding Systems

newhorizon desktop system

5 Axis Laser Welding Workstation

Jupiter custom bonding system