We are focused on a positive, cooperative, environment that is quality driven by strategic alliances, steadfast commitments, and innovative manufacturing solutions.

Established 1968

ISO 9001:2008
I provide efficient and innovative friction welding, CNC machining and turn-key manufacturing solutions for your projects, of high quality and on time delivery.

Bob Magnus
Owner of Spinweld
I am working for you, building growth opportunities, strategic relationships, and long term solutions.

Linda Puerto
Operations Manager
I facilitate and ensure that Spinweld’s operational process fits your needs while supporting our mission; planning, quoting, quality, costing, and delivery.
ISSUE – Improved Part Performance, Weight Reduction

Customer Complaints  NCM  Field Failures  In-process Testing  Audits  Suggestions

Product / Part Made

Acme Inc.

Engineering Change Request

Pre-approval
- Assign class type
- Issue ECO Number

Controlled Parts Effected?

Yes

Engineering Change Request to Certification Body

No

Vendor / Partner

Notification

Acceptance

Solution

Investigation, Communication
- Solution Documented
- Testing Complete

Insufficient Information

Distribution

Customers

Doc Control/Eng
- Final Approvals
- Complete Documentation
- Distribute Information

Notification

Approval

Insufficient Information

Certification Body

ISSUE – Performance, Dock to Stock Capabilities

On Time Performance

<table>
<thead>
<tr>
<th>MTD On Time Performance</th>
<th>Avg Days Early/Late MTD</th>
<th>YTD Initial Promise OTP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early: 0</td>
<td>AVG Late: 8.5</td>
<td>Early YTD: 22</td>
</tr>
<tr>
<td>On Time: 9</td>
<td>AVG Early: 0</td>
<td>On Time YTD: 146</td>
</tr>
<tr>
<td>Late: 2</td>
<td></td>
<td>Late YTD: 9</td>
</tr>
</tbody>
</table>

MTD OTP: 81.82%

YTD OTP: 82.49%

Quality

| Qty of Parts Received MTD: 346 |
| Qty of Parts Rejected MTD: 0   |

Quality Rate MTD: 100.00%

Vendor MTD Rating:

| Qty of Parts Received YTD: 4,420 |
| Qty of Parts Rejected YTD: 15   |

Quality Rate YTD: 99.66%

ISSUE – Cost Savings, Reduce Lead Time

Manufacturing Process

Purchase Order

Discuss Changes with Customer

Terms Acceptable?

Yes

No

Customer

Order

Write Traveler

Material in stock?

Yes

No

Scrap Parts

Corrective Action

Corrective Action

Rework Possible?

Yes

No

Material Vendor

Tooling Vendor

Material

Tooling

Machine Parts

Inspection

Pass Process needed?

Yes

No

Clean & Pack

Quality Product

Ship to Customer

Send for heat processing

Fail Inspection

Inspection

Fail

Pass
RESOURCE !!

- Marrying, joining, or bonding of materials
- Create **FRICITION WELDING** zone of mixed metal properties
- Weld union can be stronger or as strong as parent material
1. Similar & Dis-Similar Materials

2. Single & Multiple Bonding Joints

3. Metal Joining Configurations You Never Thought Were Possible

Commonly Welded Materials
- Carbon Steel
- Alloy Steel
- Stainless Steel
- High Speed Steel
- Non-Ferrous
  - Aluminum
  - Brass
  - Bronze
  - Copper

Other Weldable Materials
- Carbide
- Inconel
- Monel
- Nickle
- Titanium
- Tantalum
- Tungsten
- Molybdenum

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HEAT AFFECTED ZONE (HAZ)

Stainless Steel

Aluminum

Friction Welding

Conventional Welding

Base Material

Heat Affected Zone 1

Heat Affected Zone 2

Fusion Zone

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HEAT AFFECTED ZONE (HAZ) in Friction Welding

1. Less extensive, narrower width HAZ than conventional, 1mm to 3mm in length depending on material and diameter
2. No surface contamination, free of gas porosity and oxide inclusions
3. Solid state process – metal is generally melt free & avoids grain growth
4. Retains similar mechanical properties as base material depending on process temperatures, cooling rate, post-weld treatment
TEST VALIDATIONS

DESTRUCTIVE
- Bend
- Dye Penetrate
- Metallography
- Acid Etch
- Peel
- Burst
- Tensile
- Hardness
- Torsion

NON-DESTRUCTIVE
- Ultrasonic
- Dimensional
- X-ray
- Pressure
- Visual
- Hardness

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ISO 9001:2008
Friction weld assembly

Water burst test at 3,150 psi plus

Destructive bend test

Carbon Steel

weld union

weld union

Carbon Steel

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ISO 9001:2008
SOLUTION !!

Friction Weld Bend Test

304L SS

Ti 6AL-4V

weld union

Friction Weld Peel Test

304L SS

Ti 6AL-4V

Friction Weld Torque Test

60 ft lb

304L SS

Ti 6AL-4V

weld union

SOLUTION !!

Friction Welded Part

Inconel

Aluminum

Friction Weld Break Test

Inconel

Aluminum

CNC Machined Part

Inconel

Aluminum

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RESOURCE !!

- Superior Welds
- Increased Design Options
- Parts made of Different Metals
- Easily Automated Weld Process
- Parts Welded with no Visible Seam
- Odd Shaped Parts Produced at Lower Cost
- R&D, PPAP, First Run, Short Run, Large Volume

- Process is at least twice – and up to 100 times – as fast as other welding techniques
SOLUTION !!

• CAREFUL EVALUATION WITH SALES, ENGINEERING, & PRODUCTION

- Raw Material Selection
- Process Operations
- Weld Placement
- Geometry
- Tolerance
- Component Performance

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ISO 9001:2008
CLIMATE CONTROLLED MFG. FACILITY

Established 1968

ISO 9001:2008
SPINWELD’S WHY

• Established in 1968, Spinweld plays an integral role as a strategic, tier 1, Friction Welding job shop of engineered metal components for all Metal Fabrication Industries; critically essential for engineering, purchasing, or manufacturing to stay current with cutting edge materials, techniques, and processes. Are you in search of Spinweld’s RAS?

• Resource – value add service, growth potential, and strategic alliance

• Alternative – tool for solving engineering designs and process challenged projects

• Solution – compete in today’s highly competitive environment
SPINWELD’S WHAT

OPPORTUNITIES:  R&D, Prototypes, Low & High Volume Production

Cost savings, Weight reduction, Improved part performance, 100% full strength union of similar or dis-similar materials, Dock to stock capabilities

SPINWELD’S HOW

ASSETS:  45,000sq. ft., Climate Controlled, ISO 9001-2008

•  Friction Welding – Skilled associates, 100% solid state, full strength bond, join similar dissimilar materials, multiple machines, all sizes for maximum efficiencies

•  CNC Machining – Skilled associates, multiple machines, all sizes for maximum efficiencies

•  Turn-Key Solutions – One source point, dock to stock, inventory control

FACILITIES LIST

- 45,000 sq. ft
- Short & Long Run’s
- Prototypes
- Research & Development

- (6) 250 Ton. Machines
- (6) 90 Ton. to 180 Ton.
- (1) Modified 125 Ton. Direct

- Warehouse & Inventory Control
- Assembly & Packaging
- (2) Drive Up & (2) Drive In Docks
- Flexibility & Expandability

- 1/8” to 5.0” Dia. Solid
- 1/4” to 16” Dia. Tube or Burn Out
- 25’ Over all length

- Weld Similar & Bi-Metals, Thin Walls, Solids, Tubes, Rounds, Squares, Shapes - Rough, Semi & Finished Parts

- 15.9 TOTAL FRICTION WELDING SQ. INCHES

ASSETS

Production Assets:
(5) CNC Machines, (3) CNC Saws, (1) big bore manual lathe, Furnace, Tool Room Supporting Equipment, 10 Ton & (3) 1 Ton Cranes, (2) Fork Trucks, 20,00 lbs 30’ Panel Truck

Service Assets:

Friction Welding & CNC Quality Control Assets

TESA Digital Height Gage, OPG Optical Comparator, Ultrasonic Flaw Detector, Tachometer RPM Gage, Pressure Gage, Thermal Range Gage, Photomicrography, Hardness Tester, Polishing & Etching

Granite Surface Table, Gage Blocks, Gage Pins, Height Gages, Calibers, Bore Gages, Micrometers Depth & Bore, Indicators, Bench Centers, Roll Out Tables, Thread Ring / Plug Gages

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WHAT ISSUE ARE YOU WRESTLING WITH !!

Resource!

CALL TO DISCUSS

Alternative!

Solution!

Web Site: www.spinweld.com
Email: info@spinweld.com

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Waukesha, WI 53186

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