

UNITED STATES PATENT AND TRADEMARK OFFICE

SERIAL NO: 79/021358

MARK: TRUWELD



CORRESPONDENT ADDRESS:
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225 ASYLUM STREET
HARTFORD, CONNECTICUT 06103

GENERAL TRADEMARK INFORMATION:
<http://www.uspto.gov/main/trademarks.htm>

APPLICANT: TRUMPF GmbH + Co.
KG

CORRESPONDENT'S REFERENCE/DOCKET
NO:

N/A

CORRESPONDENT E-MAIL ADDRESS:

REQUEST FOR RECONSIDERATION DENIED

ISSUE/MAILING DATE:

Applicant is requesting reconsideration of a final refusal issued/mailed on December 28, 2006.

After careful consideration of the law and facts of the case, the examining attorney must deny the request for reconsideration and adhere to the final action as written since no new facts or reasons have been presented that are significant and compelling with regard to the point at issue.

In applicant's request for reconsideration, the applicant argues that the markets for the goods of the parties are different. In response, the examining attorney refers to the attached excerpts showing that the consumers of the applicant and registrant's products are the same. The attached excerpts evidence that those providing welding services offer both stud welding and laser welding and use both stud welding and laser welding machines/equipment.

The marks are nearly identical and the goods of the parties are related. Accordingly, applicant's request for reconsideration is *denied*. The time for appeal runs from the date the final action was issued/mailed. 37 C.F.R. Section 2.64(b); TMEP Section 715.03(c). If applicant has already filed a timely notice of appeal, the application will be forwarded to the Trademark Trial and Appeal Board (TTAB).

/Daniel Brody/
Trademark Examining Attorney
Law Office 115
U.S. Patent and Trademark Office
(571) 272-9724

STATUS CHECK: Check the status of the application at least once every six months from the initial filing date using the USPTO Trademark Applications and Registrations Retrieval (TARR) online system at <http://tarr.uspto.gov>. When conducting an online status check, print and maintain a copy of the complete TARR screen. If the status of your application has not changed for more than six months, please contact the assigned examining attorney.

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 - Philosophy
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Search



Home : English : People and Technology : Technologies : Welding

- The Company
- Industrial Supply
- Architectural Constructions
- Airport Products
- Artwork
- People and Technology
 - People

Welding / Joining

In addition to welding we offer of course other methods of joining, like glue, rivets, stud welding and clinching.

We have the following machines for welding and joining:

- People
- Technologies
- Materials
- Construction
- Quality
- Purchasing
- Employment opportunities
- Services and Downloads
- Contact

- Laser welding station Starweld 90, Spot 0,4 - 1,6 mm ø
- ELEMEG Straightening and riveting machine
- Clinch pliers 6 Bar / 90 PSI
- Rivet tools
- Wobble riveter
- Resistance welding from 15 - 150 kVA
- Spot pliers 14 kVA
- Stud welding machines

Other technologies:

punching/laser cutting | lathing/milling/drilling | bending/circular bending | deburring/grinding
welding/joining | surface finishing | painting/coating | assembling

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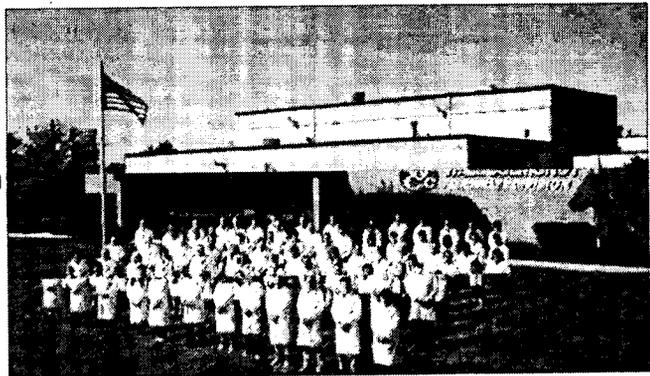
Wall Colmonoy Corporation

Making metals work harder since 1938

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- Contacts
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Since 1955, Aerobrazee has been providing quality, service to customers in aerospace and commercial industries. Now Owned by Division maintains even more diverse capabilities, along with Nadcap accreditation for special process approvals for the major aircraft turbine-engine and abroad. WCC Aerobrazee is also a licensed FAA Repair Station (GE5R880M).



ISO-9001, AS-9100, Nadcap
 940 Redna Terrace
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Business Development Manager
513-842-4212

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Turbine Engine Component Overhaul and Repair

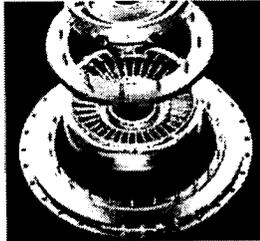
Our Cincinnati plant specializes in overhaul and



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- Contacts
- Site Map
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- Site Map
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- Contacts
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- Contacts
- Site Map
- Tech Resources
- Cincinnati Services
- Dayton Services
- Oklahoma Services
- About Us
- News
- Careers
- Contacts
- Site Map

repair of helicopter and other aviation turbine engine components, but is also well qualified to overhaul marine and land-based turbine parts.



An important part of turbine service is the ability to work with 'exotic' materials—superalloys, titanium, Inconel, Hastelloy, and so on—and to consistently process these parts with appropriate tools, coatings and processes.

In addition to brazing, thermal coating, welding and heat treating capabilities, we also perform complex machining, EDM, plasma cutting, grinding, honing, sheet metal fabrication and tool and die design

an authorized and construction. We are FAA/JAA/CAA approved and

are an approved supplier to leading aerospace manufacturers and major engine overhaul facilities. Our capabilities include turbine nozzle flow testing, hydrostatic pressure testing, automated CMM measurement, and a full spectrum of metallographic, spectroscopic and non-destructive testing methodologies.

If you have a manufacturing, service or overhaul application that might benefit from our unique combination of capabilities and experience, please [call or e-mail](#) us with a general description of your needs and we'll get back to you promptly.

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- Careers
- news
- Careers
- Contacts
- Site Map
- Contacts
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Aerobrazing Capabilities

Brazing, Coating and Heat Treating

◆ Vacuum & atmospheric brazing and





Alabama Specialty Products, Inc. (ASPI) is a materials processing firm that has been meeting the needs of its customers around the world for the past 26 years. Combining the resources of its company divisions, ASPI offers a wide variety of products and services.

Divisions:



- Corrosion monitoring products
- Materials evaluation
- Precision machining



- Laser job shop services
- Laser systems & equipment



- Tissue slicing products
- Research on manufacturing processes

Information Center:
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Divisions of Alabama Specialty Products

Metal Samples Company

Metal Samples Company is a precision machine shop that specializes in the manufacturing of products for corrosion monitoring and materials testing. A wide range of CNC and other conventional machinery gives us the ability we need to machine even the most difficult of alloys.

Metal Samples Corrosion Monitoring Systems

Metal Samples Corrosion Monitoring Systems offers the most complete line of corrosion monitoring equipment available today.

Alabama Laser Technologies

Alabama Laser Technologies offers laser job shop services. Our laser technology allows us to hold exceptionally tight tolerances on intricate shapes and contours that could not be achieved using other machining techniques.

Alabama Laser Systems

Custom and standard laser cutting and welding systems, as well as beam delivery equipment and specialized laser R&D services.

Alabama Research and Development

Alabama Research and Development provides a range of engineering services, conducts research on manufacturing processes, and designs and develops new products and instrumentation. Our product line includes tissue slicing equipment for use in pharmacology, toxicology, and biochemistry research.

Alabama Specialty Products, Inc.

152 Metal Samples Road

P.O. Box 8

Munford, AL 36268

Phone: (256) 358-4202

Fax: (256) 358-4515

E-mail Addresses

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Alabama Laser (Job Shop) - alt@alspi.com

Alabama Laser (Systems) - als@alspi.com

Alabama Research and Development - ard@alspi.com



ALABAMA
SPECIALTY
PRODUCTS, INC.

Metal Samples
Alabama Laser Technologies

Alabama Specialty Products, Inc. -- Machining Equipment

Laser Systems (Cutting - Welding - Marking)

ALS Express 3000W CO₂ Laser Cutter (5' x 10') - 2 systems
ALS Express 6000W CO₂ Laser Cutter (5' x 10')
ALT 1000W CO₂ Laser Cutter (2' x 2')
ALT 3000W CO₂ Laser Cutter (5' x 10')
Bystronics 2800W CO₂ Laser Cutter (5' x 10')
Mitsubishi 1600W CO₂ Laser Cutter (4' x 4')
Mitsubishi 2000W CO₂ Laser Cutter (5' x 10')
BLM-Adige LaserTube LT652 CO₂ Laser Cutter
BLM-Adige LaserTube LT712D CO₂ Laser Cutter
Lumonics 2200W CO₂ 5-Axis Laser System (6' x 8')
Lumonics 400W YAG Laser System (2' x 2')
Lumonics 550W YAG Laser System (2' x 2')
Laservall Laser Marking System
Trumpf Trumatic 6000 Laserpress

Tolerances: ± .005 -- Welding & 3-D capabilities

Production Machines

Bihler Multicenter MC 120 - stamping/forming press

Electronic Discharge Machines (EDM)

Machines listed include maximum material size: width, length, and height.

Mitsubishi Wire EDM Machines

200H - 30" x 52" x 10.4" (14.5" with extension)
90G - 24" x 30" x 6"

Mitsubishi RAM/Sinker EDM Machines

M35K - 31" x 21" x 10" (with small rotary attachment)
EA12E - 35.4" x 21.7" x 9.84" (with auto tool changer)

9UG - 24" x 30" x 6"
90H - 24" x 30" x 6"
FA30 - 52" x 40" x 20" (with auto threader)
FX10K - 31" x 22.5" x 7" (with auto threader)

EA12E - 35.4" x 21.7" x 9.84" (with auto tool changer)

Tolerances: $\pm .0002$ (wire EDM) - Intricate shapes and sizes

Press Brakes

Amada (Robotic) 125 ton x 10 ft.
Amada 35 ton x 4 ft.
Amada 60 ton x 6 ft.
Amada 80 ton x 8 ft.
Amada 110 ton x 10 ft.
LVD 80 ton x 8 ft.
Press brake 10 ton x 2 ft.

Tube Bender

BLM-Adige DYNAM3 FNC Tube Bender

Presses

Trumpf Trumatic 6000 Laserpress
Trumpf TC500R CNC Punch Press
Trumpf TC2000R CNC Punch Press
Trumpf TC5000R CNC Punch Press

Bench Hole Press
U-Bend Fixture
Greenerd 15 ton Hydraulic Press (2)
Ruper Whitney Hard Brake

Milling Machines

Bridgeport EZ-Trac Vertical Mill (2)
Bridgeport w/DRO (3)
Bridgeport Vertical Mill
Bridgeport Mill (EZ-TRAC 3-axis)
Hitachi CNC Mills (2)
Froc Vertical Mill
Hurco VM1 CNC Mill

First Brand Vertical Mill w/DRO
Enco Vertical w/DRO
Kearney & Trecker Vertical Mill
HAAS Vertical Mill VF3 40"
HAAS Vertical Mill VF4 50"
Hardinge CNC Vertical Mill

Lathes / Screw Machines

Okuma LB15 CNC Lathe
CNC Lathe - 4 axis capabilities (2) (five spindles)
Hitachi CNC Lathe
Wasino CNC Lathe (five spindles)
Clausing Colchester 15" Lathe
Harrison 11" Lathe
Citizen L20 Screw Machine - 3/4" capacity
Citizen L25 Screw Machine - 1" capacity

Harrison 21" Lathe
Clausing Colchester 13" Lathe
Romi 13" Lathe
Hardinge Lathe
South Bend Lathe
Pipe Threader
Hardinge Turret Lathe
Hitachi Spiki CNC Lathe

Citizen L25 Screw Machine - 1" capacity
Citizen B12 Screw Machine - 1/2" capacity (2)

Hitachi Seiki CNC Lathe

Disc Grinders

Gardner Vertical Disc Grinders (2)
Gardner Horizontal Double Disc

Mattison Horizontal Double Disc

Surface Grinders

Harig 6 x 18 Surface Grinder
Okamoto 6" x 18" (2)
Okamoto 12" x 36"

Mattison Surface 12" x 40"
Blanchard Surface Grinders (4)

Cylindrical Grinders

Jones & Shipman CNC Cylindrical Grinder (2)
Sturler Form 550 CNC OD Grinder

Centerless Grinders

Royal Master Thru-Feed

Royal Master Crush Form

Thread Grinders

Ex-Cell-O Thread Grinder

Miscellaneous Finishing

Time Saver Sanders (2)
Roto Finish
Sweco Vibro Deburr
Ultramatic Deburring Tub
Rosemontt Vibratory Deburring Tub
Morrison Polishing

Engis Flat Lapping Machine
Sundstrand Vertical Belt Sander
Hammond Belt Sander
Acme Belt Sander
Nova Vibratory Bowl
Steelmaster Flat Deburring Machine

Shears

10" Summit
Houdaille Hand Shear (2)

Hand Shear (3)

Drill Press

2 Spindle Drill (2)
2 Spindle Drill (2)

Radial Arm Drill (2)
Single Arm

3 Spindle Drill (2)
Dehoff Gundrilling Machine

Sip Jig Bore

Saws

Powermatic Band-Vertical Saw
DoAll Horizontal Band Saw
DoAll Vertical Friction Saw
Buehler Wet Abrasive Saw (2)
Everett 10" Dry Abrasive Saw
Kasto Circular Cold Saw

Daito Band Saw
HEM Production Horizontal Band Saw
Everett 16" Wet/Dry Abrasive Saw
Everett 28" Abrasive Saw
Dewalt Miter Saw

Engineering Department

Team of Engineers (Metallurgical, Electrical, Mechanical, Aeronautical)
CAD/CAM
Hameg Oscilloscope
Fluke Multimeter
Huntron Switcher
OR/CAD; for circuit design & P.C. board layout
Metallurgical Microscope
Micro Hardness Testing Machine (Weld Analysis)
GE Fanuc PLC/CNC Development Packages (custom machine tool building or automation projects)
Research Labs

Quality Assurance Inspection Equipment

Nikon Vision System (12" x 8") (54 to 250X mag power)
Fabrivation (48" x 72")
Surface Plate Granite (36" x 48")
Layout Plate (32" x 60")
Brown & Sharpe PFx CNC, 5-axis Coordinate Measuring Machine
Mettler Balance (3)
Rockwell Hardness Tester (2)
Federal "Pocket-Surf" Profilometer (2)
Gage Master Optical Comparator
J & L Comparator, CNC 30"
Sunnen Bore Gages (Full compliment)
Starrett Super Mics w/electronic amp (accuracy to .000005")
Standard metrology measuring and test equipment
Taylor Hobson Profilometer
Z' Mike Laser Bench Micrometer (accuracy to .000010")

Hones

Sunnen Vertical CV616
Sunnen MBB 1660

Sunnen MBB 166U
Barnes Honing Machine 244

Welding

Lincoln Square Wave Tig 350
Airco Heliwelder IV
Airco Memory Arc Mig 350
Panasonic WX300 tig welder
Pro-Weld Stud Welder
Resistance Welder

Thermal Arc PAK10 Cutting System
Plasmafix Plasma Welder
Lincoln Square Wave 355 TIG Welder
Pro System 1000 Robotic Welder
Panasonic Mig Welder (J)

Heat Treating

Large Harrop Heat Treat Oven
C & G Plasma Tracer
Blue M Temper Oven

Keith Electric Kiln
Solder Melting Pot

Blast Finishing

A-bec Portable
Zero Large Tumble

Trin-Mac Small Tumbler
Trin-Mac Large Cabinet

Marking

Luma Electric Etch
Auto Rotary Stencil
Mecco Auto Stencil

Mathews Stencil
Mecco Cylindrical
Electro-Chemical

Clean & Package

Ultrasonic Cleaner
Skin Pack Machine

Torex Parts Dryer

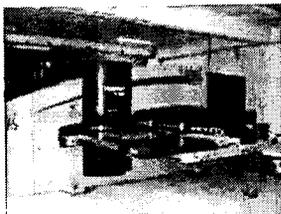
Alabama Specialty Products

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Enabling Contract Manufacturing and Outsourcing. Optimizing Results.



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Sheet Metal Equipment Overview

- Presses- ranging from conventional hand-operated to 250-ton, semi-automatic models
- CNC machines
 - o High speed turret punch presses (up to 6mm thick sheets)
 - o Press brakes up to 110 tons for sheets up to 8mm thick and 3m spans
 - o Laser cutting (up to 20mm mild steel and 10mm stainless steel)
 - o Waterjet cutting (up to 100mm; more for some materials)

About Outsourcing

Our Value Proposition

Products and Services

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Vendors- Join Our Network

Employment Opportunities

Site Map

- o Waterjet cutting (up to 100mm; more for some materials)
- o Vertical machining centers
- o Turning milling machining centers
- Welding- capable of mild steel, stainless steel, and aluminum
 - o Spot welding
 - o Stud welding
 - o TIG welding
 - o MIG welding
 - o Laser welding for dissimilar metals and hermetic sealing
- Powder coating paint shop and baking oven (conveyorized)
- Screen printing and marking (conveyorized)
- Jig and fixture development equipment

Equipment Images

A sampling of Abante's sheet metal forming and finishing equipment follows.



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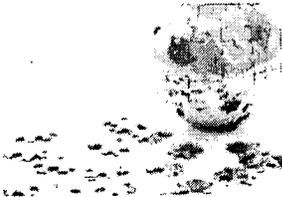


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Abante

Enabling Contract Manufacturing and Outsourcing. Optimizing Results.



About Outsourcing

Search Site:

Welcome to Abante Services

At Abante, we offer contract manufacturing and outsourcing services to companies of all sizes, within broadening range of industries and applications.

OUR SERVICES

Our customers look to us for a wide range of services, from business process outsourcing (BPO) func industrial / manufacturing applications. We also help our customers improve their supply chains with alternatives through our sourcing expertise. However, we don't just provide strategic opportunities t

Our Value Proposition

Products and Services

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Abante Services

One Plastics Road
Corry, PA 16407

...through our outsourcing expertise. However, we don't just provide strategic opportunities to customers, we also help them control risks and improve reliability, through our active management of outsourcing execution and with our logistics support.

OUTSOURCING'S RISKS VERSUS REWARDS

The benefits of outsourcing are generally well-known. But, even with all its competitive advantages:

- Because of complications and barriers, too often only the largest companies consider outsourcing
- Even the largest companies, with all their resources, often do not engage in outsourcing due to perceived risks

OUR MISSION

At Abante Services, our mission is to bring outsourcing to those that are unserved, including those that are unable or unwilling to engage in outsourcing on their own. We optimize results and mitigate risks for customers by developing or refining specific execution models and by managing the overall process.

In summary, we enable outsourcing and manage execution to optimize results, including the mitigation of risks.

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[Product Guide](#) > [Robotics](#) > [Applications by Industry](#) > [Metal Fabrication](#) > [Welding and joining](#)

Welding & Joining

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Welding & joining procedures to suit your manufacturing process

ABB robotic welding & joining functionalities guiding you to superior results.

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Standard Products

- [IRB 140](#)
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Products & Services only

Documentation and downloads

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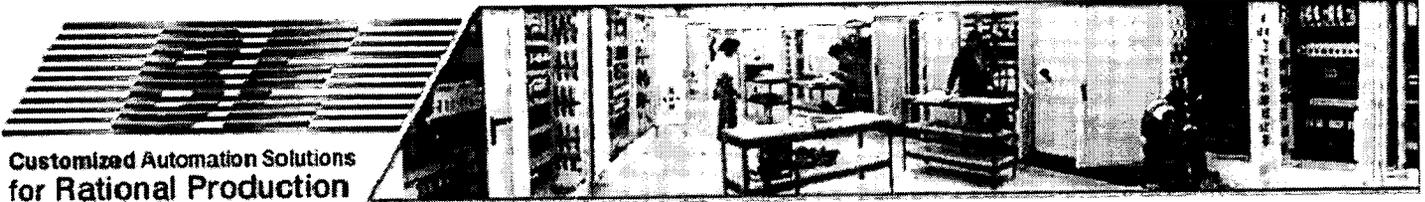
Brochure

- Arc Welding - Complete automation packages for industrial applications English 1.86 MB
- FlexArc - more than a welding cell English 4.86 MB

Data sheet

- IRB 1600ID English 0.41 MB

Reference case study



News



Profile



Services



Partnerships

Services

Tell us your problem, we offer the solution.

20 years in the automation business have given us the expertise to manage and solve a vast number of production problems. We encourage you to contact us and tell us what your problem is, that way we're most capable of offering you a viable solution. If you need a clear resume of our services, it includes:

- Design and manufacturing of control panels for the automation of machines or quality control devices.
 - Industrial electrical installations, such as lighting, power supply and data processing.
 - Electric and electronic maintenance to machines; welding, plastic injection, presses, etc.
 - Retrofit of tooling machines equipping them with computerized numeric control (CNC).
 - Design and manufacture of Special machines.
- Supplier of all type of European spare parts especially electric and electronic type



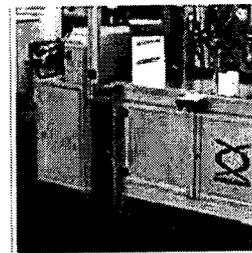


Gallery



Contact

- Supplier of all type of European spare parts especially electric and electronic type.
- Measurement and regulation systems and instrumentation.
- Control systems for environmental pollution water treatment and water potabilization.
- Spot welding and stud welding equipment supplier, technical advisor and service.
- Representatives for several activities related companies.



Welding Equipment

Weld process automation, specialized technical assistance and equipment commercialization

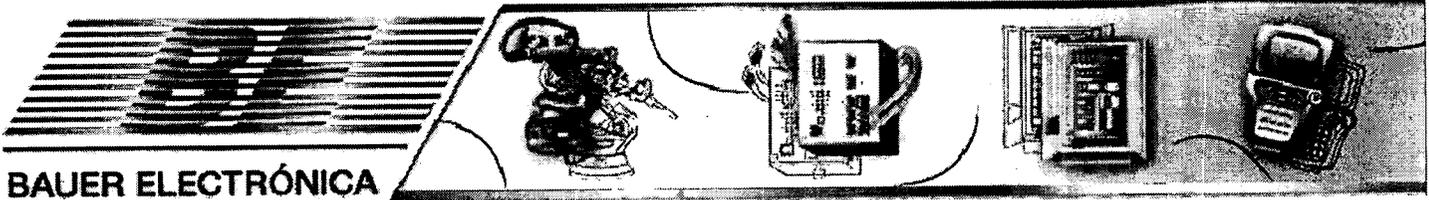
Arc Welding

MIG MAG (GSMW), MIG Bazing, Pulsed MIG; TIG and Automatic TIG; Plasma Welding, Bra Cutting, Laser Welding and Cutting, Orbital Welding, Stud Welding and Nut Welding.

Electrical Welding

<http://www.bauer.com.mx/services.htm>

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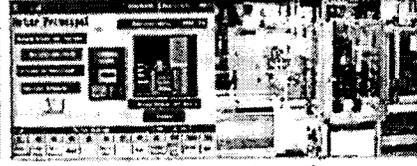
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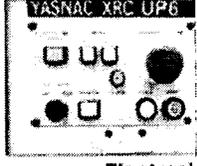
Welding Technology



Industrial Ethernet



Customized Automation



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Cloesen Industriële
Robotprogrammatie &
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Robot services

Robot systems

Due to our experience of many years, we are acquainted with the following robot types and controls:

- KUKA: RCM1,2,3 ; KRC32; KRC1 & 2
- ABB: S2, S3, S4
- FANUC: RH, RJ1, RJ2, RJ3
- COMAU: C3G

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- COMAU: C3G
- Volkswagen: VR S1, VKRC

Expertise

Our robot experience includes product handling, palletisation, punching, sealing, stud welding, mig & mag welding, resistance welding, laser welding, laser cutting and clinching. For all these applications we can develop standards or integrate newly developed standards in existing systems.


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Contact

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Cirrus Laser Ltd - Company Web Page - Microsoft Internet Explorer provided by USPTO

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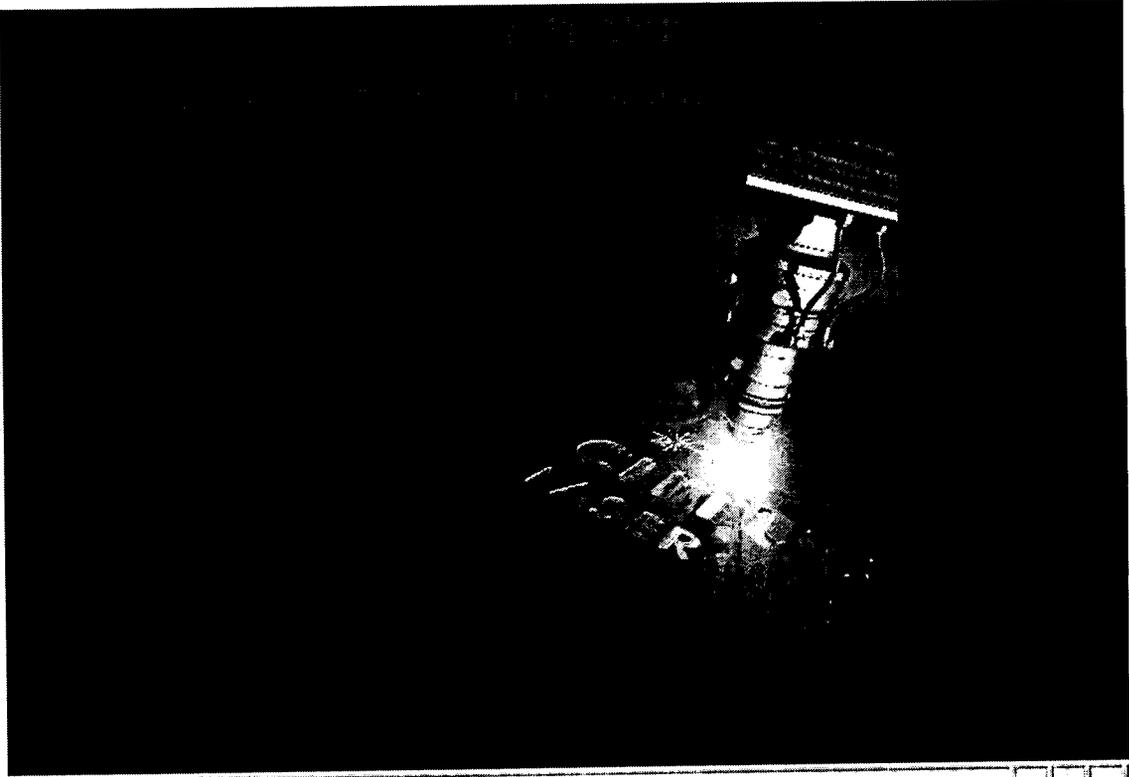
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Company Information

Cirrus Laser Ltd has been one of the leading laser cutting and laser welding job shops in south of England for over 14 years.

As well as many years' experience in welding materials for aggressive applications, including diamond saw blades & core drills for the construction industry, Cirrus Laser Ltd has extensive experience with welded products both in sheet form (flat) or tube form (rotary).

The Company has three laser systems all able to hold high tolerances and accurate repeatability.

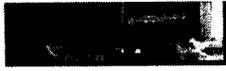
Most traditional materials are held on-site to support rapid prototyping and fast turnaround. Cirrus Laser Ltd hold accounts with many specialist suppliers to enable quick delivery on standard material.



All Laser systems are fully CNC operated and offer final tolerances comparable to other precision fabrication techniques. High tolerance combined with high throughput can significantly reduce *your* costs.



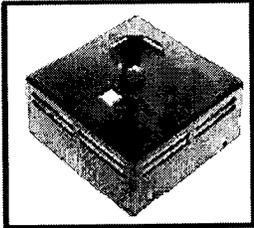
Cirrus laser Ltd can generate your parts from a wide variety of requirements, ranging from a rough sketch or sample part right through to :



own CAD drawings downloaded to us via the Internet. We utilise the latest state-of-the-art Cad/Cam systems which are directly networked to our computer controlled laser systems.



Our laser systems can cut sheet sizes up to 4m x 2m. This enables Cirrus Laser Ltd to yield remarkably low cost large volume batch work or large components up to 4 metres long by 2 metres wide.



Since many customers prefer to purchase from a single source, Cirrus Laser Ltd can provide other processes such as folding, forming, plating, polishing, stud welding, marking and many more. All these processes give the customer a complete sub-contracted product.

Cirrus Laser Ltd provides every customer with the personal technical support necessary to assist the customer to achieve their finished part in the most efficient and effective manner.

Quite often the laser can offer more to the customer than the initial cutting or welding operation planned. For example instead of just profiling the shape, we can cut the holes to

http://www.cirrus-laser.co.uk/company_info.htm

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SERVICES

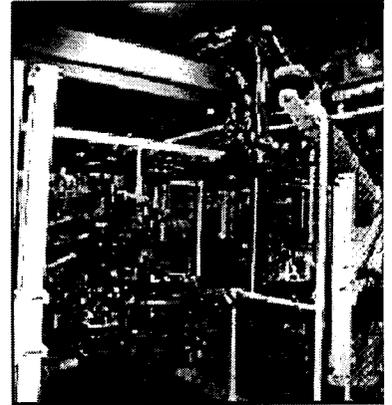
- Programming
- Start- Up
- Debug
- Production Support
- Cell Optimization



- Cell Optimization

APPLICATIONS

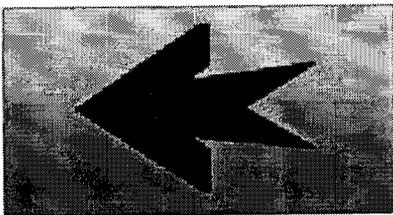
- Spot Welding
- Stud Welding
- Sealing
- Adhesive
- Coating
- Material Handling
- Palletizing
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- Laser Cutting
- Water jet Cutting



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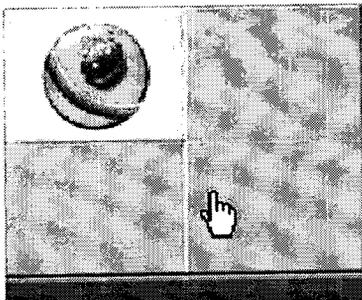
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Welding Machines

MISC offers a complete line of portable welding systems to meet even the most demanding of Mig, Tig, and stud welding performance requirements. We also offer custom designed systems for a variety of end use applications including fixed manual and automatic feed systems for high production environments.

Our full range of systems include portable equipment for electric arc, capacitor discharge and gas arc or short cycle stud welding processes. The offered series provide maximum portability and functionality in a compact space.

MISC offer a complete line of intelligent drawn arc welding systems using microprocessor based technology that has proven to be more reliable and repeatable than conventional solid state systems. This system can be custom designed to meet your specific requirements utilizing an extensive array of accessories and "add-on" components including special operation software, which can intelligently monitor, calibrate and troubleshoot your welding processes. Our offered system can be custom tailored to your specific needs — meaning you

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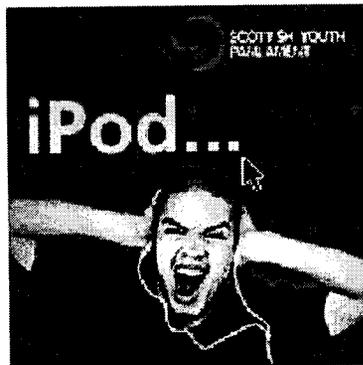
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**Make your
systems
manage
themselves**

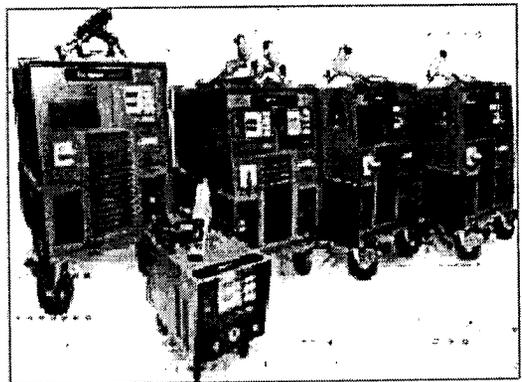


system can be custom tailored to your specific needs — meaning you don't pay for unwanted features or struggle with a system that does not have the exact performance features you need.

Although feature rich, the simplicity of MISC offered design requires minimal operator training and interface to effectively program and manage your welding processes. Using easy to read push buttons, operators can customize it to monitor up to 30 different parameters and can pre-set up to six different welding application conditions.

Features and Benefits

- Innovative User Interface
- Microprocessor controls and monitoring
- Built in diagnostics for up to 30 parameters
- Modular construction
- Six preset programs
- Patented two-wire gun circuitry
- Cooler gun operation
- Lock out features



Custom Designed High Production Systems

If you're a large volume OEM using stud welding in your manufacturing process then you need to talk to us! We can help you build the most cost effective high-production welding system

available. We've worked with large volume OEM customers around the globe to build stud welding systems that are second to none.

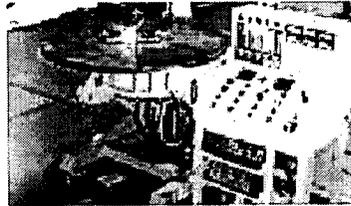
Our production systems incorporate stud welding guns, electronic/pneumatic feed mechanisms and solid state power / control units that perform reliably on close tolerance and high speed assembly lines. We've helped world leading OEMs build stud welding systems that not only solve oftentimes complex manufacturing problems, but save valuable time and dollars. We can provide fixed or robotic multiple guns and systems with either manual or automotive feed systems. Moreover, we can help you design and build a pre-engineered modular production system from in stock components that gets you up and running in no time. Typically, design and assembly lead times for complex modular production systems can range from six to nine months – we can cut that time to only a few weeks and can reduce your systems cost by as much as 75%!

We've also patented a revolutionary drawn arc tack welding procedure for high speed production using robotic welding that is unmatched in our industry. In drawn arc tack welding, components are attached prior to final welding thus eliminating the old practice of manually positioning the components with guides or fixtures – meaning faster production times, tighter tolerances and lower defects.

Custom system and production lines

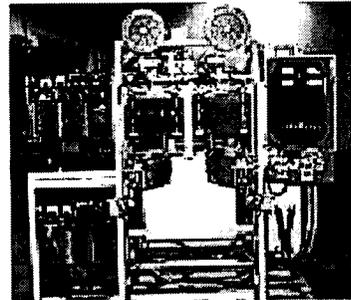


MISC specialists can recommend the best welding process for applications to suit



welding process for applications to suit your specific product need. Our engineers can help you to select and design a system to suit your specific requirements.

TIG/Plasma Welding System

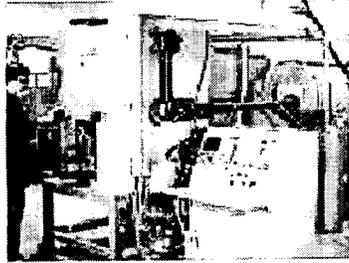


MIG, TIG and Plasma
MISC offers MIG, TIG and plasma welding systems to fit a wide variety of parts and materials depending on the application. Dual purpose systems (i.e. TIG and Plasma) can be supplied with programmable weld controls to provide the most versatile of welding systems. Pulsed MIG welding of thin sheet metal components is another area of MISC expertise.

Dual Station MIG Welding System

Resistance
If your interest is in acquiring a resistance welding system, MISC can readily service your needs.

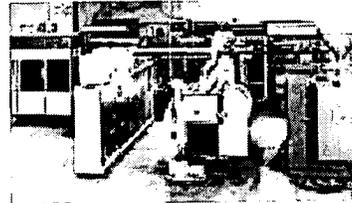
Laser



3.0KW CNC Controlled Laser System

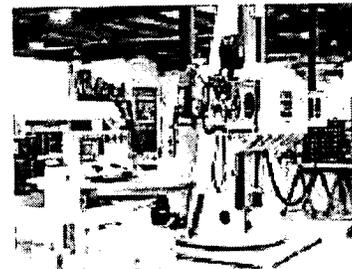
MISC has a wide variety of numerous laser welding cells, incorporating both high and low power Lasers. The appropriate Laser power source will be selected to meet your specific requirements.

Beam directing optics and gas dispersion components, as well as water chillers for mirror optics and focus head cooling, are selected to provide a complete packaged Laser System.



9.0KW Laser Integral Work Station

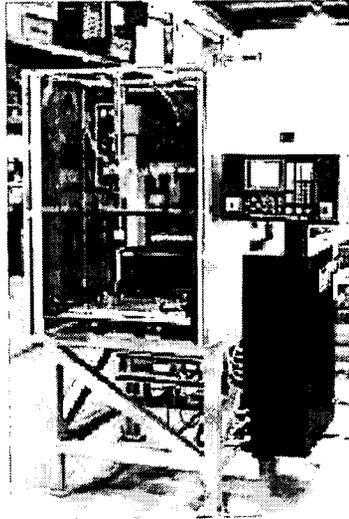
The Laser System can incorporate manipulation of the focus head and/or workpiece, or a combination of motions can be employed. All motions are CNC controlled for precision accuracy.



Ultrasonic Welding Systems For Plastics
The plastics industry is one of the fastest growing industries. To complement this growth, new methods for splicing, mounting, and/or attaching molded plastic product to parent components are an everyday challenge, and one that MISC has successfully met.

The welding and staking of plastic to

TIG/CWF/Plasma Welding Cell



CNC Controlled Single
Head Machine

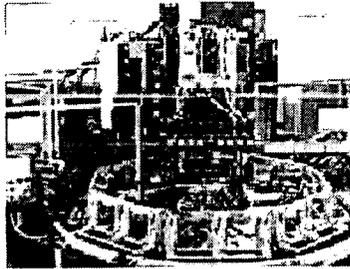
the welding and staking of plastic to plastic, or metal clips and studs to plastic, is readily accomplished through the use of ultrasonic techniques.

The introduction of ultrasonics to generate localized heat for welding and/or staking offers product engineers a variety of fastening methods when establishing product designs.

Manipulators/Positioners - Packaged Systems

With our expertise experience in the field of automatic welding, MISC welding engineering group can assist you in the proper selection and implementation of the latest "state-of-the-art" welding processes and equipment.

If you already have manipulators and/or positioners and wish to upgrade your systems, MISC can refurbish the "iron ware" and retro-fit with totally new control systems and welding apparatus.



(8) Station Dial Type Machine

Positioners, turning rolls, and other workpiece manipulating components can be interfaced with your existing manipulator to form a complete welding cell.

If you wish to purchase a totally new system, MISC offers our own manipulators and positioners and/or turning rolls to meet your exact process requirements.



Manipulator/Positioner TIG/CWF Welding Cell

Precision "aircraft quality" manipulators can be provided where lateral run-out is held within .005"/ft. of extension. Precision (hardened) travel ways and bearings assure smooth ram travel motion, powered via closed loop feedback drive system and special thrust bearing arrangement. If precision positioning for ram extension is needed, a ball screw and closed loop dc servo-ram drive system can be provided on special order. Powered column rotation with pneumatic powered anti-rotation lock can also be supplied as an "option"; otherwise, (3) manual locking cams are supplied as standard. Multi-strand (heavy duty) chain lift provides

strand (heavy duty) chain lift provides constant vertical travel at approximately 45 IPM, powered via a constant speed ac brake motor/gear reducer combination. A safety ratchet and pawl system prevents ram from falling in the event of chain breakage.

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Welding machines and joining machines encompass those devices that are numerous joining processes. These processes include:

- arc welding (MIG, TIG, stick, submerged arc)
- resistance welding
- laser welding
- electron beam welding
- stud welding
- orbital welding
- wave soldering
- hot dip brazing
- torch brazing
- induction brazing
- ultrasonic
- friction welding

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- friction welding

Welding machines and joining machines include the complete devices as well as power sources, monitors, and controllers used for welding, brazing and so

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Complete Welding Machine Systems

Welding machines and joining machines can be supplied as complete systems. Some come with a welding power source, and a weld monitor or controller.

A complete welding machine or joining machine system is comprised of a complete welding, surfacing, or cutting machine, equipment, or system. Also included are power source, torch or gun, cables, feeders, positioners, robots, or other machine components.

A power source for a welding machine or a joining machine provides a TIG gun, electrode holder, laser, electron beam gun or other welding unit with the required output power to melt material.

Welding monitors or controllers for welding machines are instruments that sense welding quality (nugget size or weld integrity) or output power supply variations. Also, welder controllers are used to adjust welding parameters and compensate for variations in weld quality or output power.

Among the arc or resistance-welding types that apply to welding machines and joining machines are:

http://www.rodovens.com/welding_articles/weld_machine.htm

7/5/2

- Flux Cored Arc Welding (FCAW)
- Gas Metal Arc Welding (GMAW)
- Multi-process
- Orbital / Tube Arc Welding
- Plasma arc welding
- Flash welding
- Projection welding
- Resistance seam welding
- Spot welding
- Shielded Metal Arc Welding (SMAW)
- stud arc welding
- Submerged arc welding (SAW)
- Gas Tungsten Arc Welding (GTAW)

Frictional or other fusion welding types that apply to weld machines and joining machines include:

- Electron beam welding
- friction welding
- Hot plate welding
- plastic welding
- Laser welding
- Oxyfuel welding
- Thermite or exothermic welding

- Inertite or exothermic welding
- ultrasonic or linear friction welding

You must consider output power specifications when looking into entire welding machine systems and/or joining machine systems, as well as the power supply for these machines. You need to be aware of the duty cycle, or the percentage of time the welding unit can remain on in a ten-minute period before powering off to prevent damage to components.

Check the output power capability specifications, which include AC output, AC/DC selectable output, and high frequency. Find out what the output current of the welding or joining machine system is. (This is the designed current rating of the welding unit or the current range monitored or controlled.) Also look at the output voltage range, which is the designed voltage range of the welding unit or the voltage range monitored or controlled.

Engine-driven generators, machine duty or corrosion resistance, multi-operation, and water-cooled are features that are common to welding and joining machines.

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TWI provides expertise and services in the following joining and related technologies

Adhesive bonding

Services: material selection, joint design, dispensing methods and curing techniques, degradation mechanisms and failure investigation, accelerated aging and lifetime prediction, mechanical and environmental testing, ND process development and support for manufacturing and product development, quality assurance, training and consultancy

Arc welding

Technologies: MIG, TIG, MMA, plasma, A-TIG, hot wire TIG, orbital TIG, micro-TIG, Twin wire MIG, robotic MIG and TIG, FCAW (gas and self shielded), SAW (single and twin wire and narrow gap), keyhole plasma, novel processes (including microwave plasma and moving contact arc welding)

Services: advice on process selection and procedures, procedure development, equipment development, consumables evaluation, weld monitoring, repair welding, manufacture of prototype fabrications, on-site consultancy and welding services

Brazing

Technologies: temperatures up to 1850°C, reactive & diffusion brazing, joint design, interlayer design

Materials: ceramics, metals

Facilities: vacuum and inert gas

Services: materials selection, joint design, training, troubleshooting

Ceramics and ceramic joining

Technologies: diffusion bonding, brazing, hot isostatic pressing, friction welding, adhesives, sol-gel processing, sputter coating

Materials: ceramics, glasses, composites

Services: materials selection, joint design, training, process development, troubleshooting

Composites

Technologies: polymer science, surface modification, curing, design, production and quality assurance, structural integrity, in-service performance and repair

Services: mechanical and environmental testing, NDT, analysis of materials and processes, joining and lifetime assessments, finite element analysis, failure analysis, process development and optimisation, investigations trials, contract R&D, training and certification

Cutting

Technologies: oxyfuel (acetylene, propane, petrol, hydrogen), plasma (gas and air), electron beam, laser, abrasive waterjet, microwave, underwater cutting techniques

Diffusion bonding

Technologies: uniaxial pressing, hot isostatic pressing, interlayers

Materials: ceramics, metals, glass, composites

Facilities: vacuum and inert gas vessels, radiant and induction heating, temperatures up to 1050°

Electron beam processing

Technologies: welding, procedure development, high vacuum, reduced pressure and out-of-vacuum EB welding, texturing and surfacing by EB; EB heat treatment and EB evaporation

Materials: steels, nickel alloys, titanium, aluminium alloys, copper alloys, magnesium alloys, reactive, high temperature and refractory metals, intermetallics

Services: joint and component design, feasibility studies, prototype plus special, small batch welding production; prototype EB machine and ancillary equipment design and manufacture; demagnetisation, finite element analysis of electromagnetic and electrostatic fields for gun column design; training and consultancy

Facilities: include several 100kW EB facilities, a 150m³ vacuum chamber, and six EB welding machines

Electronic Opto and sensor packaging

Technologies: die and substrate attachment (solder and adhesive), interconnection (wire/ribbon bonding, TA

flip chip bonding), encapsulation/protection (moulded, glob-top, potting), hermetic packaging, (laser welding and resistance seam sealing, soldering), surface mount technology (fine pitch, ball grid array). Through hole technology, MCM's, chip-on-board, ball grid array, optical components (precision alignment)

Services: contract R&D, feasibility studies, small volume production runs, reliability testing, NDT, failure analysis, production line troubleshooting, process/equipment/material selection, training, environmental testi

Engineering

Services: Fitness for purpose and weld life improvement - engineering critical analyses, fracture mechanics assessment and testing, failure investigation, fatigue life improvement profiling and peening, life extension, weld repairs and replacement, corrosion assessment, micromechanical modelling, damage accountancy cre fatigue and corrosion. Modelling, measurement and interpretation of structural behaviour - on site strain/stress measurement, fatigue cycle monitoring strain gauging, crack growth monitoring strain/clip gauging, specialist component testing of pipes, pressure vessels and wide plates, advanced stress and finite element analysis. Joining process design and fabrication validation - design advice, weld materials testing, distortion quantification and dimensional control, residual stress evaluation, analysis and measurement, weld process modelling, plastics and composites testing, microtechnology testing. Reliability engineering - inspection reliability assessment (POD data and RBI), inspection qualification (technical justification, trials), probabilistic analysis and limit state design, materials and flaw databases (distributions), expert elicitation

Facilities: universal test machines (0.1kN - 2000kN), fatigue machines, wide plate test facilities (axial and bi-axial), drop weight and instrumented drop facility, pressure vessel testing, environmental chambers

Equipment and consumables

Services: consumable development and assessment, equipment development (arc welding, electron beam, friction, resistance), equipment assessment (arc welding, electron beam, laser, friction, resistance, testing to standards, electro-magnetic compatibility, procedure development)

Friction welding

Technologies: rotary, radial, orbital and linear friction welding, friction stir and friction plunge welding, friction hydropillar processing and friction extrusions, third body friction welding, friction taper stitch and seam weldir

underwater friction **stud welding** and transformation hardening, thermic and explosive welding

Information services

Technologies: information available on joining and all related materials engineering technologies

Facilities: Library available to Members, extensive collection of books, journals, standards reports and video: document delivery service

Services: literature searches, Welding Abstracts, monthly alerting service, international joining related standards, technical enquiry service, company and business information, materials information, welding equipment and consumables information, best practice guides, corporate videos, seminars and conferences loans and photocopy service

Laser processing

Technologies: high power CO₂ and Nd:YAG **lasers for welding**, cutting and heat treatment; diode lasers for plastics welding; pulsed Nd:YAG lasers for microjoining and cutting; frequency multiplied Nd:YAG laser for precision processing

Materials: steels, aluminium alloys, titanium alloys, nickel alloys, ceramics, plastics, glasses and semiconductors

Facilities: range of flexible laser cells, capable of handling both large and small components for processing in one, two and three dimensions

Manufacturing

Services: strategy development and analysis, facilities planning, simulation, process cost estimation, comparison and improvement, equipment selection, problem solving, design and manufacturing reviews, JI I lean and agile manufacturing, independent technology, welding engineering support, quality system review and advice, health and safety advice

Materials engineering

Technologies: all engineering materials - ferrous and non-ferrous metals, plastics, ceramics and composites

Coatings with metal, ceramic and polymers, for corrosion protection, wear resistance and repair
Services: weldability of materials, influence of joining technology on materials performance; materials selecti failure analysis and remediation; expert witness and technical support; microstructural properties of materials welded joints, weld overlay and thermally sprayed coatings; materials analysis; corrosion testing and predicti corrosion performance of welded components, corrosion failure mechanisms, standards verification and evaluation, hydrogen measurement, fume assessments, on-site materials evaluation, chemical analysis
Facilities: environmental and sour service (H₂S) laboratories for R&D and QA testing with corrosion fatigue testing for riser girth welds, full-ring and constant load testing of tensile and beam specimens, autoclaves for elevated pressure/temperature studies of bent beam and tensile specimens, slow strain rate and corrosion fatigue testing in H₂S, pH measurement at elevated test pressures in H₂S / CO₂ environments, hydrogen autoclave. Electrochemical testing (DC and AC techniques) including 12-channel weld corrosion system (preferential weldment corrosion) and multiple exposure test equipment, crevice-free testing of welds, parent metals and coatings, CPT and CCT testing. Corrosion testing facilities, including direct exposure testing, sustained load cracking and dead-weight tensile testing (including below ambient temperature environment) and corrosion testing with cathodic protection. Extensive metallographic facilities, including metals and ceramics preparation, plastics sectioning, light and scanning electron microscopes, electron probe micro-analysis. Extensive chemical analysis facilities, specialising in weld metal / parent metal and plastics analysis:

Mechanical fastening

Technologies: riveting, clinching and threaded fasteners

Services: advice on process selection and best practice

Microjoining

Technologies: welding (laser, TIG, resistance, ultrasonic, friction, MIAF, diffusion bonding, cold/hot pressure anodic), soldering (wave, belt furnace, IR, hot gas, thermode, oven) brazing, adhesives (non conducting, thermally/electrically conducting, anisotropic), glass fusion

Services: reliability testing, NDT, failure analysis, production line troubleshooting, environmental testing, process/equipment/material selection, design and manufacturing support (feasibility studies, process optimisation, transfer to production), training

Non-destructive testing

Technologies: pulse-echo ultrasonics (manual and automated), TOFD ultrasonics, radiography, eddy current (manual and automated), liquid penetrant and magnetic particle inspection, thermography, elevated temperature UT, long-range low frequency UT, real time and digital radiography, phased array inspection, neural networks, mathematical modelling

Materials: ferritic steels, stainless/super duplex steels, copper, aluminium, plastics, carbon fibre, GRP, titanium

Facilities: standard UT, ECT, PT & MT facilities, PSP-3 P-scan, T-scan, Microplus TOFD, high frequency C-scan immersion system, PC based flaw detector, thermal imaging, microfocus and real time radiography, 400kV X-ray facility, Lizard EMA and ACFM systems, advanced modelling software

Services: specialist on-site inspections, independent third party assessment of data/reports, long-range ultrasonic testing, high temperature ultrasonic testing, inspection development for plastics and composites, adhesive joints and surface coatings, consultancy and procedure development; critical flaw sizing for input to ECA calculations, interfacing ECA with NDT capabilities, R&D projects, NDT contractor validation and supervision

Plastics welding

Technologies: welding by mechanical heating (spin, vibration, ultrasonic, friction stir, orbital), welding using external heat source (hot plate, hot bar, impulse, hot gas, extrusion, BCF); welding using electromagnetic heat source (resistive implant, induction, dielectric, microwave, infrared, laser)

Materials: unreinforced thermoplastics, short and continuous fibre reinforced thermoplastics, fabrics, plastics metals

Services: welding process selection, materials selection, process optimisation, design advice, feasibility studies, mechanical testing, brainstorming, production troubleshooting, training and certification, market surveys, non-destructive testing, finite element analysis

Product development

Services: conception, brain storming, product design, design for manufacture, prototyping and feasibility

studies, materials/process/equipment selection, factory layout, manufacturing implementation, troubleshooting training, funding sources and financial considerations

Resistance welding

Technologies: spot, seam and projection welding, resistance butt welding, flash welding, ERW and high frequency tube welding, capacitor discharge stud welding, weldbonding

Services: training, consultancy and troubleshooting

Facilities: a range of spot, seam and projection welding equipment

Robotic welding

Technologies: CIM, robotic MIG, TIG and laser welding, robotic resistance spot welding and mechanical fastening, robotic handling, portable robots, simulation and off-line programming, sensor systems for process control

Facilities: robotic welding cell

Services: equipment specification and selection, pre-production proving trials, simulation, performance optimisation, integration

Software

Services: off-the-shelf and contract software development for fabrication documentation, structural integrity analysis, technical expert systems, sales support software and multimedia training

Soldering

Technologies: wave, belt furnace, hot bar, thermode, laser, infra-red, hot gas, ultrasonic, lead-free soldering, screen printing, pick & place, surface mount, through hole, rework

Materials: metals, ceramics, glasses.

Services: contract R&D, feasibility studies, small volume production runs, reliability testing, NDT, failure analysis, production line troubleshooting, process/equipment/material selection, training, environmental testing

Surface engineering

Technologies: thermal spraying (HVOF, arc, flame) weld surfacing (arc processes, resistance, laser, friction, electron beam, spark deposition), sol-gel

Materials: metals & alloys, ceramics, composites, polymers

Facilities: four HVOF systems (JP5000, Diamond Jet, TopGun, HVOF wire)

Services: applications development, coatings analysis, wear & corrosion testing, consultancy, R&D, failure investigation

Technical appraisals & guidance

Services: product and process reviews, effective use of joining processes, best practice guides, fitness-for-purpose assessments, layout and materials handling, design, materials and consumables selection, skills training and qualifications, quality systems documentation and procedures, benchmarking, safety, welding fu and Health & Safety site services, technical seminars and workshops

Training & examinations

Services: theoretical and practical courses in materials joining, materials performance, microelectronics, non destructive testing, underwater inspection, welding technology and practical welder training. Available at Abington, Middlesbrough, Burton-on-Trent, Kuala-Lumpur or on-site worldwide. CSWIP, PCN, AWS, ASNT, EWF, BGAS-CSWIP examinations available. Also qualifications to industry or company standards

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