

IN-SITU (UK) LTD



SHAFT & JOURNAL SPECIALISTS

GLOBAL ON-SITE MACHINING



Crankshaft Machining

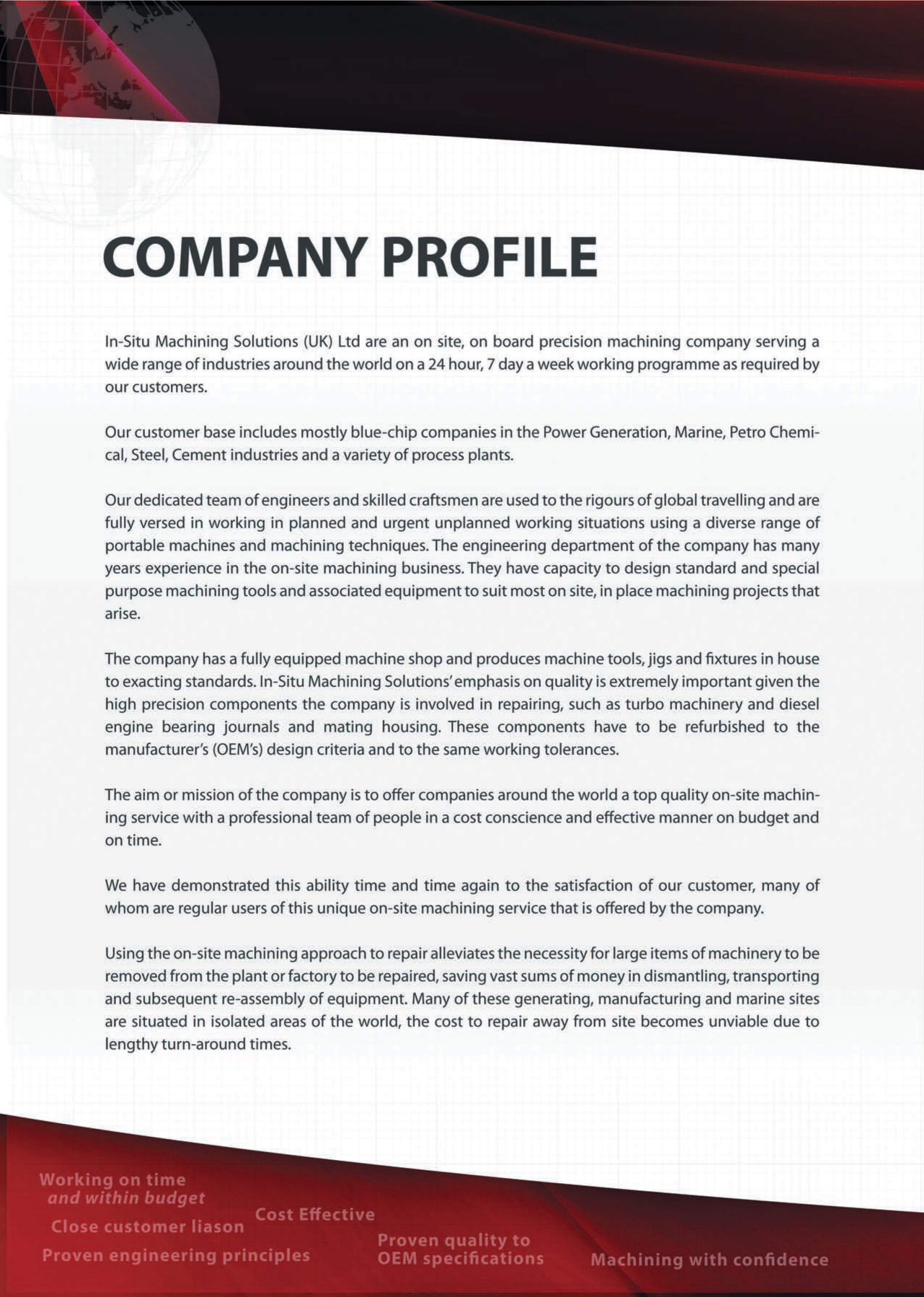
Crankshaft Machining Journal Machining Engine Line Boring Line Boring Liner Landing Machining

Journal Machining

g Machining Metal Stitching In-Situ Plating Laser & Optical Alignment

g Line Boring Liner Landing Machining

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COMPANY PROFILE

In-Situ Machining Solutions (UK) Ltd are an on site, on board precision machining company serving a wide range of industries around the world on a 24 hour, 7 day a week working programme as required by our customers.

Our customer base includes mostly blue-chip companies in the Power Generation, Marine, Petro Chemical, Steel, Cement industries and a variety of process plants.

Our dedicated team of engineers and skilled craftsmen are used to the rigours of global travelling and are fully versed in working in planned and urgent unplanned working situations using a diverse range of portable machines and machining techniques. The engineering department of the company has many years experience in the on-site machining business. They have capacity to design standard and special purpose machining tools and associated equipment to suit most on site, in place machining projects that arise.

The company has a fully equipped machine shop and produces machine tools, jigs and fixtures in house to exacting standards. In-Situ Machining Solutions' emphasis on quality is extremely important given the high precision components the company is involved in repairing, such as turbo machinery and diesel engine bearing journals and mating housing. These components have to be refurbished to the manufacturer's (OEM's) design criteria and to the same working tolerances.

The aim or mission of the company is to offer companies around the world a top quality on-site machining service with a professional team of people in a cost conscience and effective manner on budget and on time.

We have demonstrated this ability time and time again to the satisfaction of our customer, many of whom are regular users of this unique on-site machining service that is offered by the company.

Using the on-site machining approach to repair alleviates the necessity for large items of machinery to be removed from the plant or factory to be repaired, saving vast sums of money in dismantling, transporting and subsequent re-assembly of equipment. Many of these generating, manufacturing and marine sites are situated in isolated areas of the world, the cost to repair away from site becomes unviable due to lengthy turn-around times.

**Working on time
and within budget**

Close customer liason

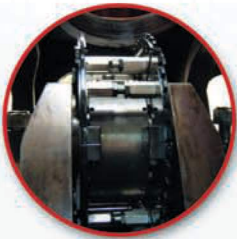
Proven engineering principles

Cost Effective

**Proven quality to
OEM specifications**

Machining with confidence

OUR SERVICES



**Crankshaft
Machining**



**Journal
Machining**



**Engine Line
Boring**



**Line Boring -
General**



**Liner Landing
Machining**



**Metal
Stitching**



**Laser Optical
Alignment**



**Other
Services**

**GLOBAL ON-SITE
MACHINING
SPECIALISTS**

CRANKSHAFT MACHINING

In-situ machining Solutions (UK) Ltd offer this unique machining technique to customers around the world using a range of specialist orbital turning machining equipment to repair damaged crank-pin and main journals of diesel engines and reciprocating compressors.

Our highly skilled and motivated machining supervisors and technicians offer a precision on-site, on-board and off-shore machining service led by a dedicated management team. As a result the company is well respected as being one of the leading on-site machining companies in this field of in-situ crankshaft repair performing in many industrial sectors around the world.



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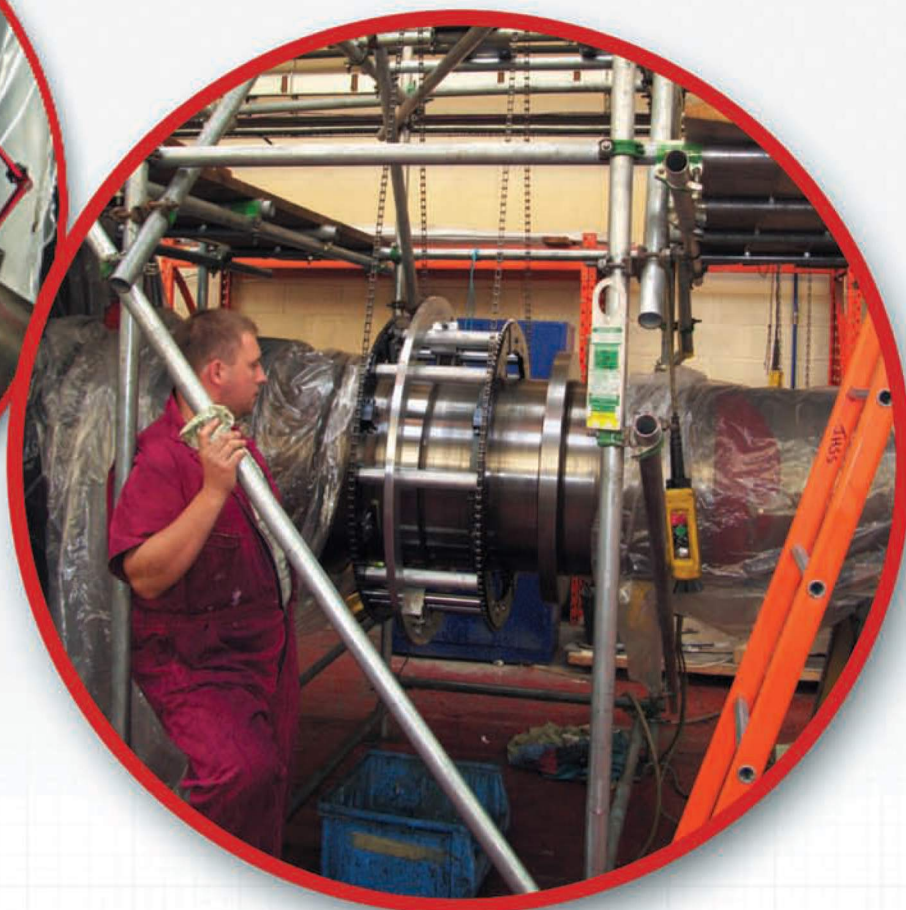
In excess of 20mm can be machined from damaged crankpins and journals to remove induced hard surfaces as high as HB 650 together with the reforming of damaged fillet radii if required and peen straightening of bent crankshafts.

Our advanced orbital or planetary machining, superfinishing and polishing journal service is offered to all sectors of industry ie. Power generation, marine, steel, food production and petro chemical. We work closely with OEM's achieving the high tolerance demands required by manufacturers.

JOURNAL MACHINING

In addition to the renowned diesel engine crankshaft repair service that In-situ Machining Solutions (UK) Ltd offer, the company also provides customers with the facility to refurbish large damaged rotating components throughout industry globally.

The advantage of using this advanced orbital turning, grinding and honing technique that the company provides alleviates the necessity to remove the rotating part from it's housing or stator to repair damage to the journal or bearing surface.



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Any amount of material can be removed from damaged or worn diameters, pending customer and or OEM approval, to make good bearing surfaces, therefore bringing them back to serviceable condition.

Our highly trained machining teams work on a vast range of rotating elements such as turbine and alternator journals, hydrogen seal areas, slip rings, coupling diameters and similar items of plant which can be found in most heavy industries

A close working relationship with our customers and OEM's ensure a successful conclusion to all repair work that In-situ machining Solutions (UK) Ltd undertakes. We are a universally highly regarded company in this field and offer competitive commercial rates for this specialist on-site, on-board machining service.

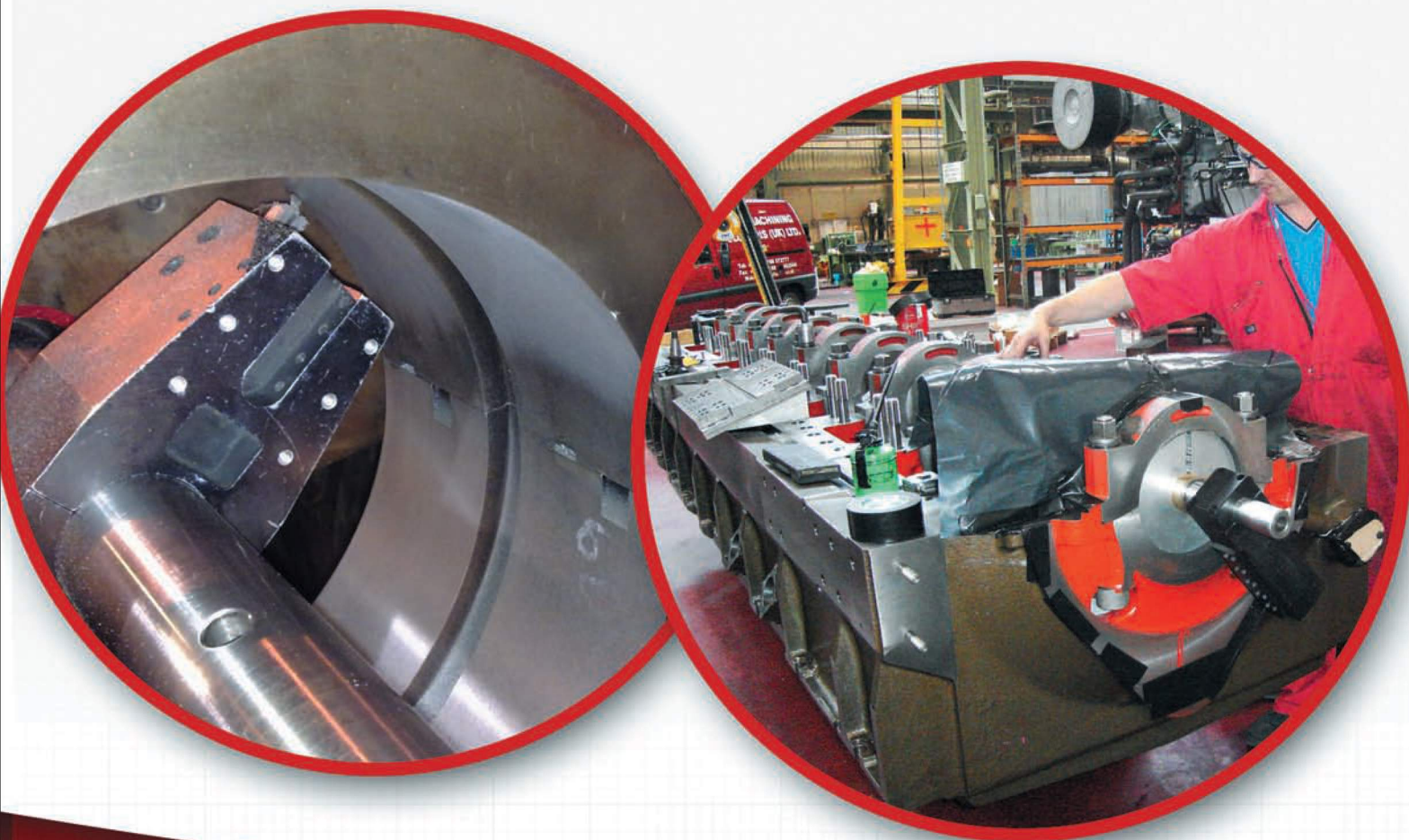
ENGINE LINE BORING

In-situ Machining Solutions (UK) Ltd are also accomplished in other areas of on-site, in-place machining work and examples of such work are illustrated in following pages of this brochure.

On-site line boring of large generating and marine diesel engine and compressor main bearing bores which have been damaged by engine failures and the like lend themselves to this very convenient and competitive repair procedure.

The company has a range of in-line boring machines and associated laser and optical alignment tooling and accessories to cover most engine types requiring engine bedplate rejuvenation whether they be the conventional bedplate layout or the under-slung type of engine.

Repairs carried out by our experienced personnel can take the form of repairing individual main bearing pocket bores or the whole line of bores.



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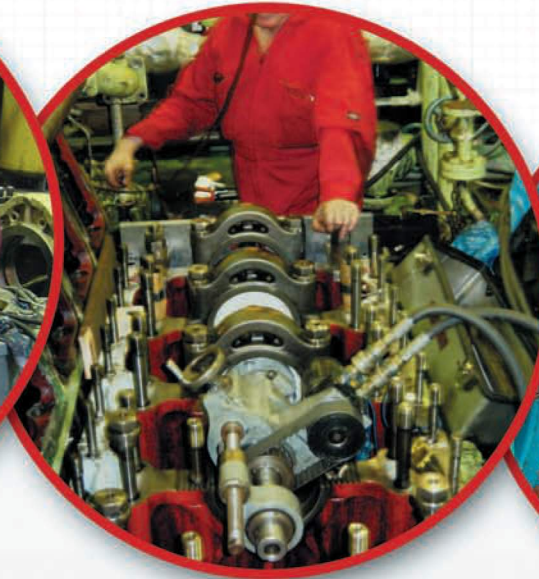
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Working closely with the engine manufacturers, owners or both, a defined workscope is formulated and the work administered in accordance with OEM design standards.

There are various ways in which to repair these bores and it very much depends on the maker's preferences. Often bores are machined oversize, thermal sprayed and finally bored to standard size. Though rarely used selective plating is another means of repair, again bores are machining oversize, electro-plated before machining to standard sizes.

Sleeving of main bearing bores is a method often adopted to repair damaged bores, this procedure requires the bores to be machined to allow the fitting of a make-up sleeve and secured with a series of radially fitted screws prior to machining to design size. An allowance is left in the sleeve for final machining to standard size.

In each of the above repair methods it is only the lower half bearing bore that requires attention in the case of a conventional bedplate and the upper half bore of the under-slung engine type.

The mating bearing caps can be reused, but more often than not, new bearing caps are provided by the manufacture with the half bore having an allowance left in the bore for final machining on assembly.

Associated repairs and procedures allied to bedplate main bearing bore work would take the form of advanced metal stitching of heat induced cracking, milling of bearing cap fit location and possible make-up plating to remove fretting and wear, etc.

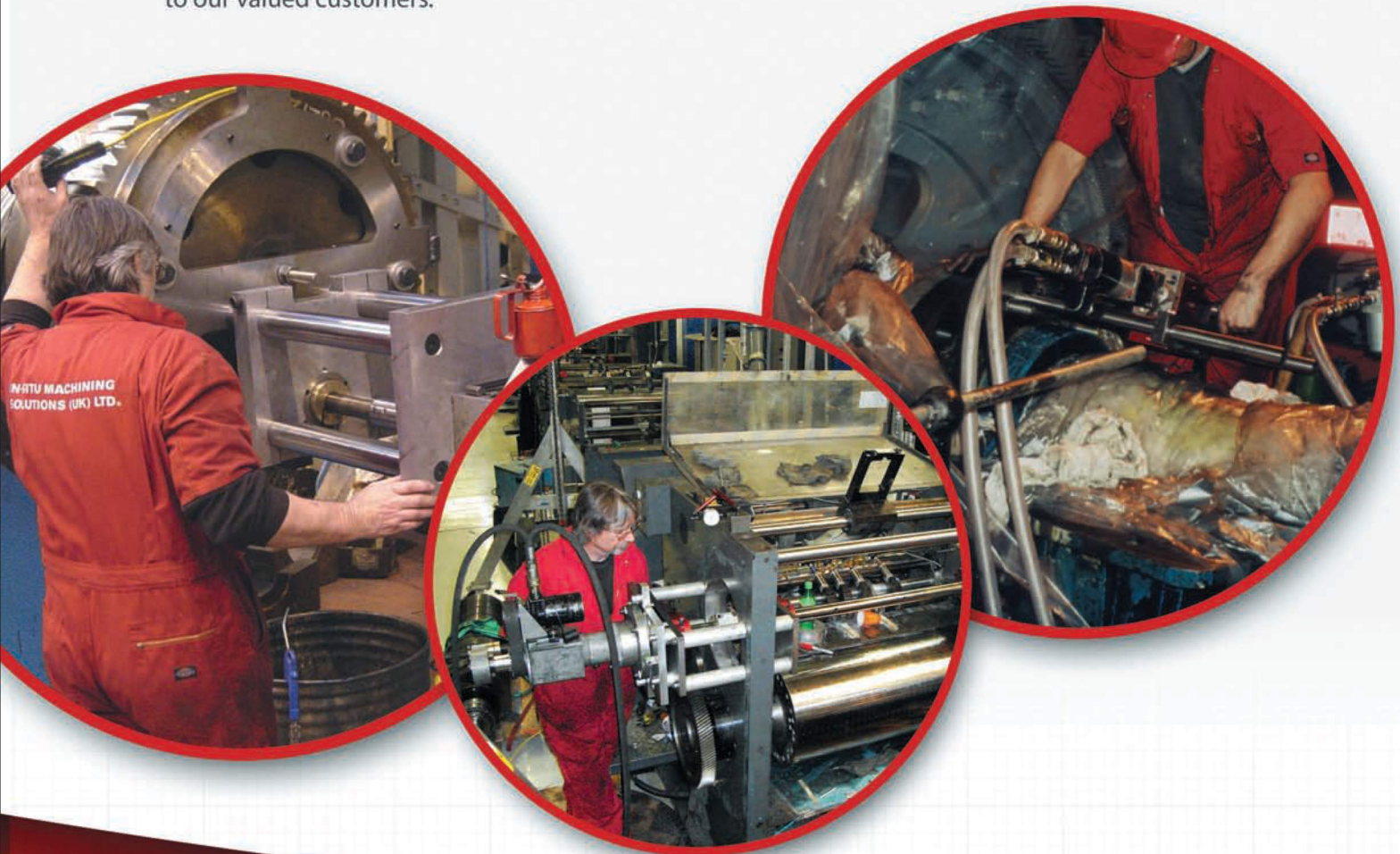
LINE BORING - GENERAL

In-situ Machining Solutions (UK) Ltd have a range of portable boring and facing machines to cover a whole range of repair or modification projects on-site/in-situ whether they be in emergency or planned maintenance situations.

Power generation, marine at sea, on and off-shore, steel, paper, food processing, general heavy engineering companies are some of the industries we operate in.

A sample of component which benefit from this service would be diesel engine cylinder blocks, steam, gas and hydro casings, electrical stator frames, marine stern tube, rudder pintle bore work, coupling hole aligning and line boring, paper and card machine frames, the list is endless.

The company has the ability to design and produce special purpose equipment, jigs and fixtures to enable all forms of line boring operations to be successfully undertaken. Our management and engineering teams work endlessly in pursuit of ongoing improvement in all the activities undertaken, particularly machining methods and product quality to enable the benefits to be passed on to our valued customers.



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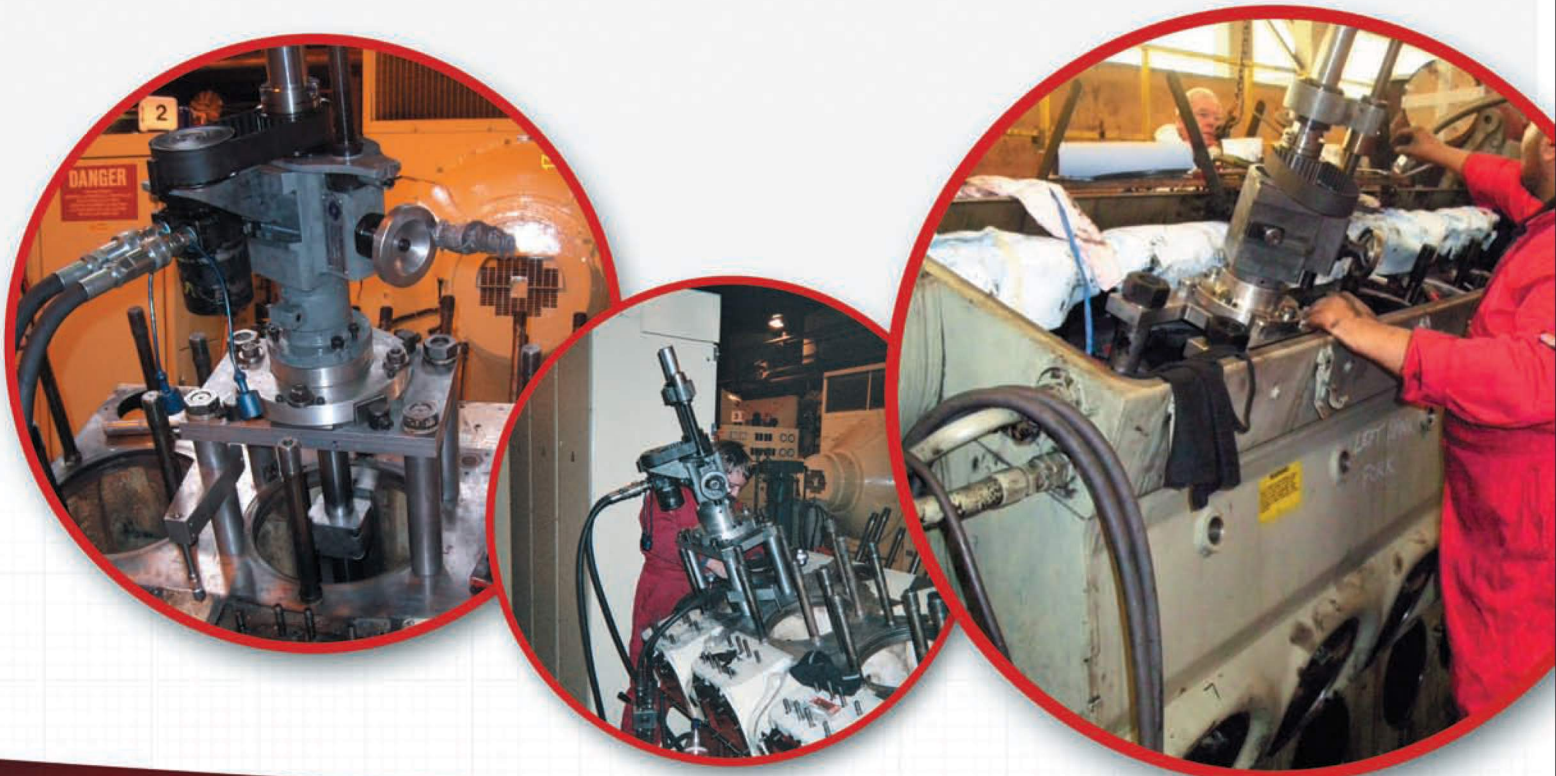
LINER LANDING MACHINING

Extreme wear and damage to Upper and Lower landing seal areas of large generator and marine diesel engines can be very successfully repaired on board and on site without the necessity to scrap the cylinder block.

In-situ Machining Solutions (UK) Ltd have the expertise gained over many years to reinstate damage to these areas of cylinder blocks caused by engine failure, severe wear or fretting corrosion to give 'as new' repair results.

Repairs usually take the form of light skimming of the Upper landing seal faces in the case of lightly worn surfaces and where these surfaces are badly worn or landing bores are such that the cylinder leaks water into the crank bays with inevitable damage the crankshaft and mating parts. Re-boring and facing of these sealing surfaces have to be undertaken to allow the introduction of make-up sleeves which are usually a shrink or press fit into the newly machined bores or faces.

Where broken parts or fracture occur in these seal areas, our advanced stitching system can be employed to rectify the problem and in conjunction with the make-up sleeve insertion procedure has proved invaluable and a very cost effective repair solution to OEM's and equipment owners alike.



METAL STITCHING

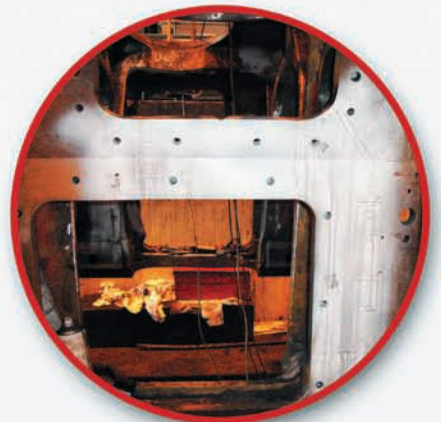
Metal stitching (also known as metalocking) are terms used to describe a method of repairing cracking or fractures in all forms of cast metals without the necessity to weld repair.

Cast iron is the most common material that requires this service and is one of the most difficult metals to repair by welding due to its open grain structure. It usually requires a preheating process prior to welding, which can cause additional stress related damage to the casting. Metal stitching has the advantage of being a cold repair process using a series of stitching pins and locks without applying damaging heat caused by welding and does not distort the casting during the repair procedure. Where none stressed areas of repair are involved it is only necessary to stitch along full length of the crack or fracture with a series of interlocking stitching pins.

In cases where high stressed areas are involved, toughened steel locks are introduced into the repair and installed at 90 degrees, at regular intervals along the length and bisecting the stitching pin line. In each case pins and locks are fully sealed to give leak free repair even under high pressure. This method of repair is extremely cost effective when considering that the large components that In-situ Machining Solutions are usually involved in salvaging do not have to be dismantled and removed from site for repair and saves castings from being reduced to the scrap yard.

The advanced metal stitching system that this company has adopted has been proven by a test laboratory to be extremely stronger than systems used by our competition, due to the tougher nature of the stitching pins and locks and sealing properties used in the process together with an engineered approach to each repair.

Our company has been involved in the reclamation of many large industrial and marine cast iron parts around the world proving our expertise to the satisfaction of our valued customers.



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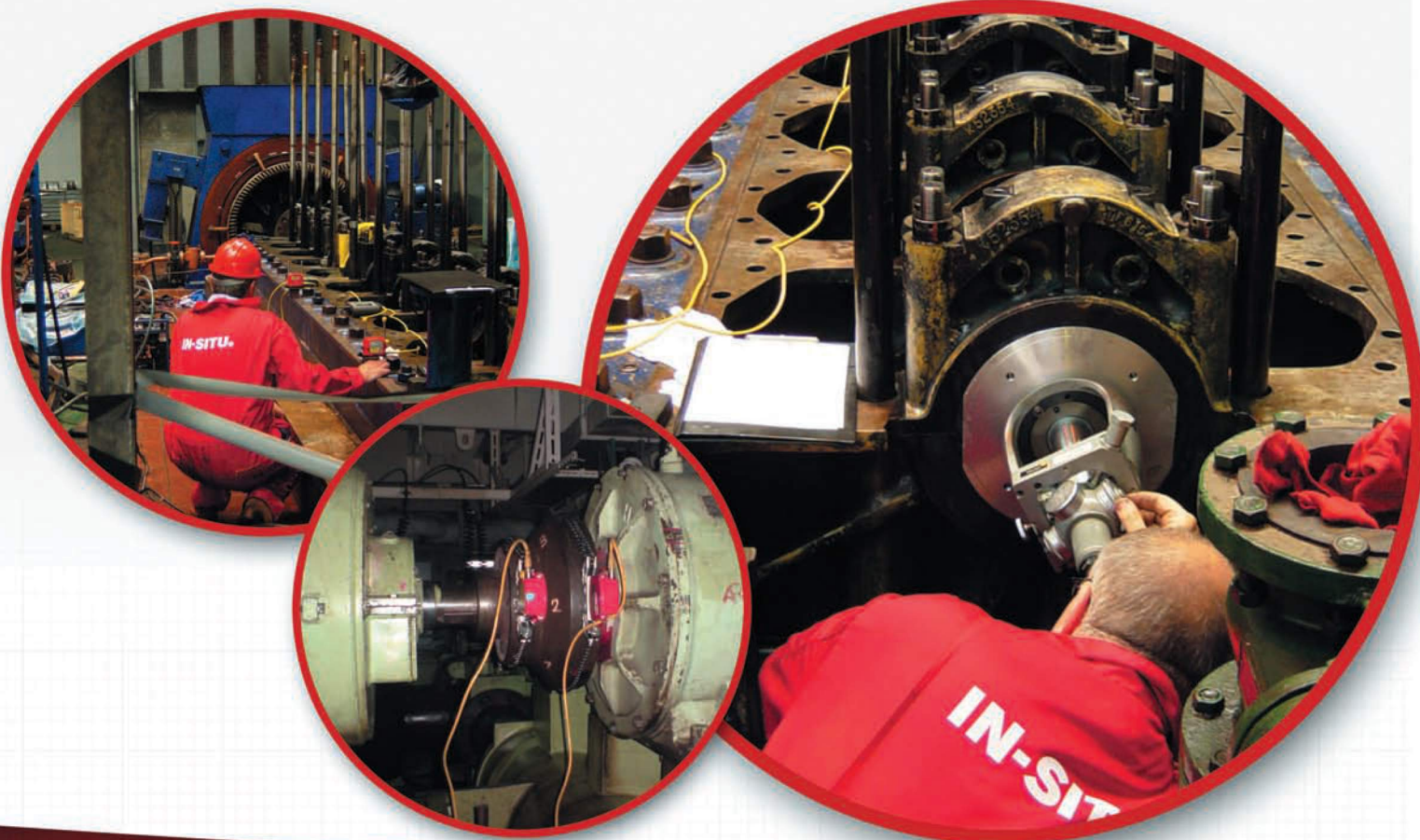
LASER & OPTICAL ALIGNMENT

Large generating and marine diesel engines often suffer damage to major items of plant which necessitates a machining operation to be carried out on site. Where extreme accuracy is crucial, particularly in the case of diesel engine bedplates, alignment of the main bearing bores is critical.

In-situ Machining Solutions (UK) Ltd have an alignment service in the form of laser and optical alignment systems to check bore, line accuracy.

These systems have also been successfully used on other areas of the engine such as engine base support rails and engine bed surfaces to verify flatness, and cam bore alignment. In addition to the straight line methods of alignment we also have a coupling alignment system which involves rotating mating shafts and adjustments where required to ensure the shafts run true to each other.

Where special fixtures and targets are necessary to overcome any given circumstance, we have the facility to design and produce these as part of the overall service.



OTHER SERVICES

In-situ Machining Solutions (UK) Ltd. provide customers with associated on-site services allied to the renowned specialised orbital journal work offered, namely.....

- Slip/collector ring orbital machining work
- Generator hydrogen seal face and diameter machining
- Journal Superfinishing and polishing
- Specialised milling work
- On-site grinding work
- Coupling hole reaming and line boring work
- Drilling and Tapping work
- Electro Selective plating in a wide range of materials
- Thermal spraying and machining to repair worn surfaces
- Heat treatment of damaged crankshafts
- Shrink fitting of components using liquid nitrogen
- On-site surveys undertaken and advice given



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CLIENT LIST



ALSTOM



Rolls-Royce®



MÆRSK

StenaLine

nexen



PLUS MANY MORE INCLUDING:

- British Energy
- Lafarge
- Condor Ferries
- A&P Group
- SSE
- Doosan
- Cammell Laird
- VT Group
- MSC
- James Fisher
- Thames Water
- Quartzelec

ACCREDITATION

- ISO 9001:2008 -
Quality Management System
- ISO 14001:2004 -
Environmental System
- OHSAS 18001:2007 -
Occupational Health & Safety System

In-Situ Machining Solutions (UK) Ltd

Unit 12
Prospect Park
Valley Drive
Rugby
Warwickshire CV21 1TF
England

Telephone: +44 (0)1788 572777

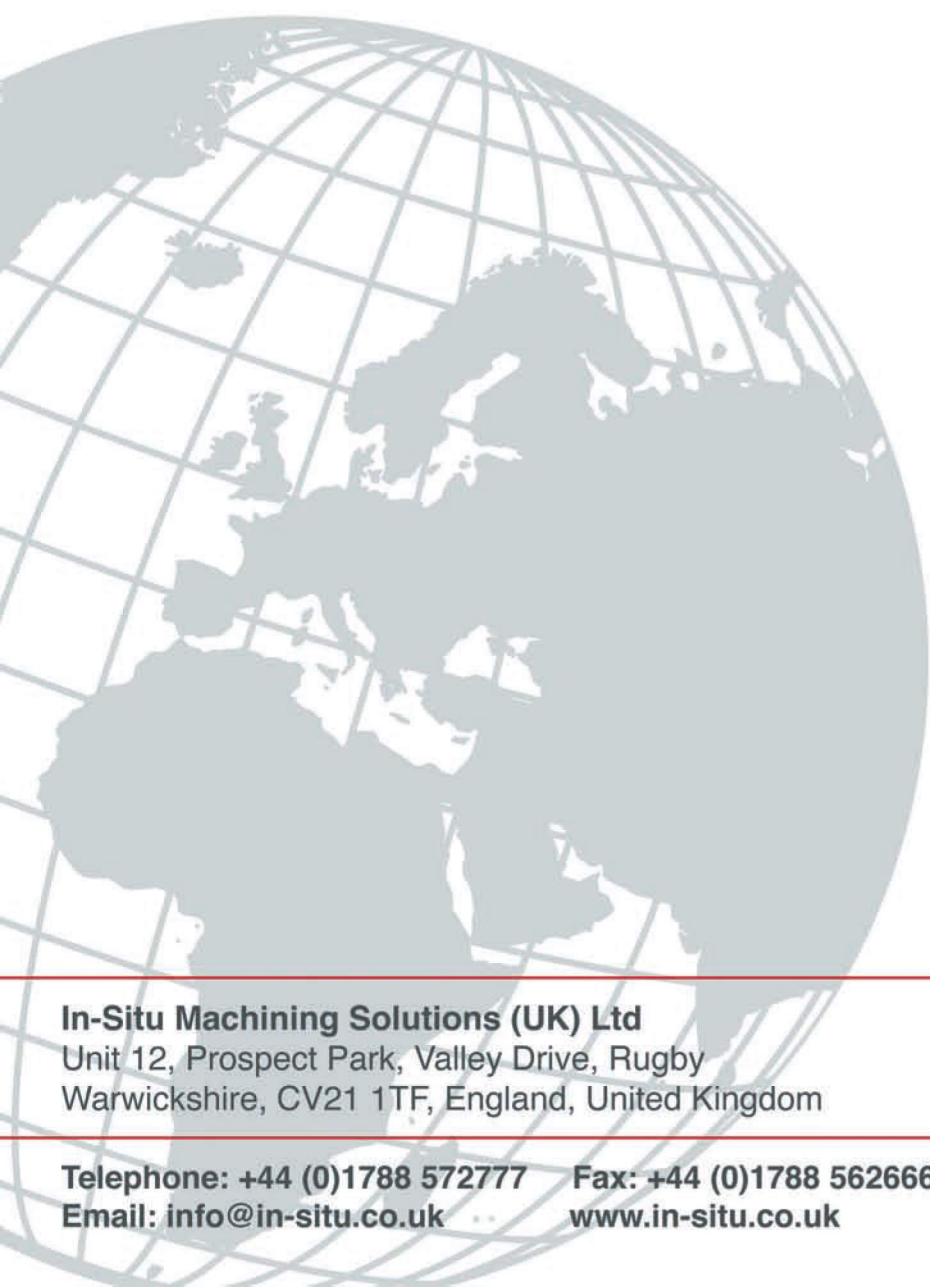
Fax: +44 (0)1788 562666

Email: info@in-situ.co.uk

Website: www.in-situ.co.uk



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In-Situ Machining Solutions (UK) Ltd
Unit 12, Prospect Park, Valley Drive, Rugby
Warwickshire, CV21 1TF, England, United Kingdom

Telephone: +44 (0)1788 572777 Fax: +44 (0)1788 562666
Email: info@in-situ.co.uk www.in-situ.co.uk

