

© **DESTEC**  
ON-SITE SERVICES



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## DESTEC ON-SITE SERVICES

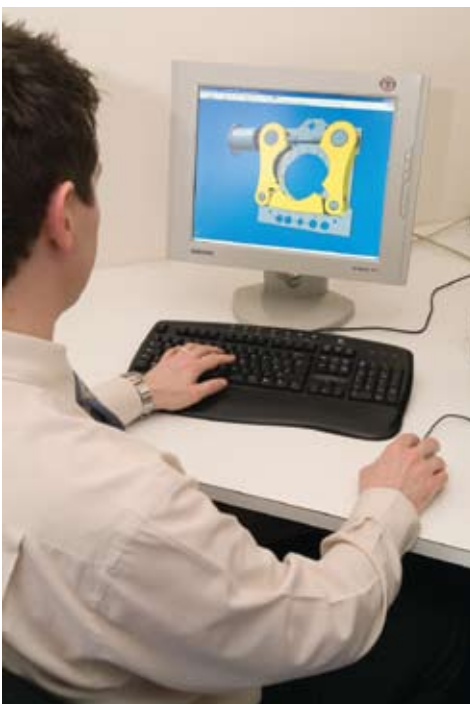
**Destec engineering has specialised in on-site machining for over 30 years.**

Our wide range of versatile in-house designed and manufactured portable machine tools are well equipped to take on problems where accuracy and a good surface finish are paramount. Over the years we have added other associated on-site services, bolt tensioning, on-line leak sealing, polymer coating and repairs, and welding. Our world-wide service successfully operates throughout all industries including chemical/petrochemical plants, offshore, power generation, renewable energy, nuclear, marine, steel, mining, ports, docks and harbours.

By using multi-disciplined trained technicians, the client benefits by having less personnel on site.

- ON-SITE MACHINING
- REGENERATOR & VESSEL HEAD REMOVAL
- BOLT TENSIONING
- ON-LINE LEAK SEALING
- DESIGN AND MANUFACTURE OF SPECIAL PURPOSE MACHINE TOOLS
- POLYMER COATING AND REPAIRS
- OVERLAY WELDING
- ULTRASONIC TESTING

The Destec site services are backed by a full team of engineers equipped with Finite Element Analysis and specialised in-house generated computer programmes.



**DESTEC OPERATE A 24 HOUR SERVICE**



# ON-SITE MACHINING

## Destec's On-site machining services can make significant savings on heavy plant construction, modifications and maintenance.

Heavy Plant and associated equipment vary so much in design, layout, size, age, conditions and even locations that any one factor can have a significant bearing on how a machining problem is tackled, especially during breakdowns. Plant maintenance departments will attend to whatever first-aid they can manage, but with the recognised advantage of calling in specialist services time can be saved and costs reduced.

The advantages are significant when compared with the alternative which could otherwise involve stripping down, transporting to a machine shop, returning to site, re-assembly, as compared to taking a special purpose machine to the job.

Our engineers co-operate with clients on new plant and modifications, to give the most viable solutions for on-site machining. The service division offers a rapid response for maintenance and breakdown situations.

Destec on-site machining includes:

Most of the machines and equipment used have been designed and manufactured by Destec Engineering Ltd. Maximum versatility and adaptability combined with accuracy and a good surface finish ensure most In-Situ operations can be handled effectively and quickly.

Destec Engineering has carried out hundreds of conventional and unusual machining contracts on vessel and heat exchanger closures, pipework flanges, nozzles, valve seats, offshore wind turbines etc. incorporating all types of profiles, such as spigots, recesses, tapers, grooves ranging from a fine to a gramophone surface finish.

**Let Destec Engineering solve your site machining problems with our "Men and Machines".**



### Facing

Destec portable machines are equipped with variable speeds and automatic feeds to give good accurate surface finishes. Power feed tool posts can be set for tapers, profiles, spigots, and boring.

### Oval Facing

For manways including spigoted joints. Destec's purpose built machines generate true ellipses and machine to both fine and "Gramophone groove" finishes.

### Boring

Precision in line boring in any plane.



### Pipe Cutting and Weld Preparation

Destec's patented tooling system will cut the thickest pipes in the hardest materials.

### Milling

Universal milling machines that cut in any position with large feed ranges to limit set ups.

### Keyway Cutting

Direct on to shafts with minimum clearance required.

### Drilling and Reaming

We have portable equipment to cover all diameters and depths.



### Thread Cutting and Tapping

Screw cutting of internal threads in either smooth bores or the rectification of damaged threads. We also machine tap when required.

### Trepanning

Machines can be adapted for trepanning to reduce machining cost and down time.

### Regenerator and Vessel Head Removal

Destec have machines designed and developed in house to machine through large vessel heads including refractory linings.

### Welding

Welders are available for on-site weld overlay work.



## REGENERATOR & VESSEL HEAD REMOVAL

In 1996, Destec Engineering performed a world first when it commenced preliminary cutting to remove the Regenerator Head at the Coryton refinery, UK - 25 days in advance of day 1 of the planned turnaround start date, allowing the head to be lifted on mechanical day 2.

Cutting of both the vessel shell and internal refractory was carried out dry, from the outside, and included all necessary weld preparation ready for reinstatement of the head.

The dry cutting operation is carried out using portable milling or grinding equipment running on two circumferential, parallel rails, fixed either side of the cut line. The method is relatively quick, with very little post operative cleaning - unlike water jet cutting, which can take as long as 10 days to 'mop-up'. Thus, the method effectively reduces overall plant down time and is very environmentally friendly.

Destec has continued with development of the technique and equipment, and in 2006, with the number of projects carried out well into double figures, the company carried out a Regenerator Head removal at Fawley Refinery, UK. At 17m diameter, 22mm wall thickness and 125mm refractory lining thickness, this is the largest Destec has undertaken so far, and one of the largest undertaken anywhere in the world.

The dry cutting method developed by Destec is now readily available for use anywhere in the world and the growing number of satisfied customers who have benefited from this unique system extends from the UK and Europe through the Middle East.



## ULTRASONIC TESTING

**Ultrasonic Testing is a non-destructive testing method that is based on ultrasonic waves for detecting internal defects in materials, or for measuring wall thickness and detecting corrosion.**

Ultrasonic testing will find internal corrosion, pitting and general erosion in most metals. Generally used for thickness surveys on pressure vessels, pipelines, storage tanks, ships hulls, rail wheels & axles, turbine blades plus many more applications.





# SPECIAL PURPOSE MACHINE TOOLS

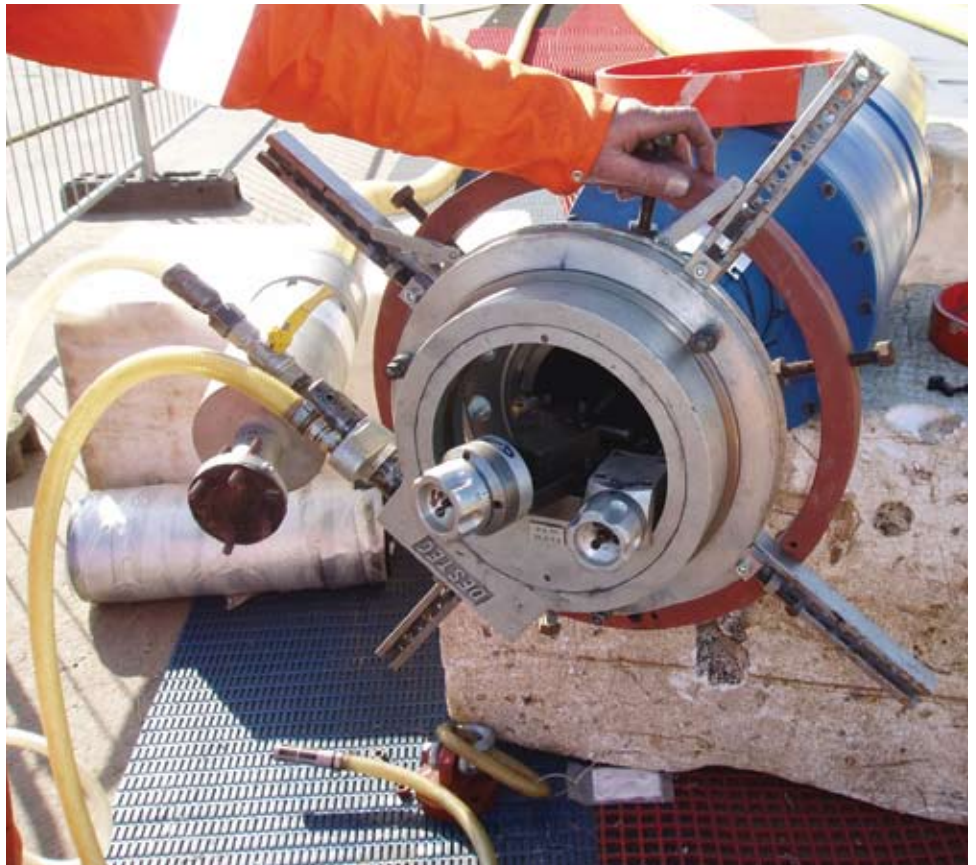
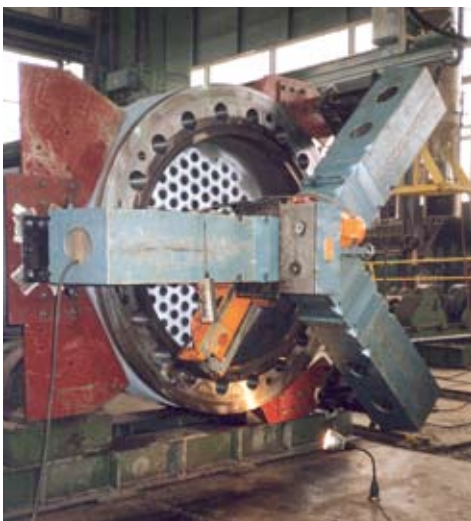
**Destec Engineering has designed, developed and built a wide range of special purpose machines for the oil, petrochemical and nuclear industries.**

The work is a natural progression from the in-house designed and built on-site portable machines, which have been used by Destec technicians over the last 30 years.

One notable example has been the design and build of a four head, hydraulically driven milling machine, to carry out the machining of shear panels on the underside of a 9,000 ton offshore services module. Machining 7 kms of groove, 25mm wide x 6mm deep in a cross pattern, the project was completed, on schedule, in nine weeks.

Destec has also built special purpose machinery in support of its Regenerator Head removal work - designing and building a cutting system, which proved instrumental in providing the fastest ever turnaround by the customer for a unit of that size.

Our engineering teams - backed up by the most modern design and manufacturing equipment - are always available for discussions on possible special purpose machine tool solutions.



# ⊕ BOLT TENSIONING

**We have the experience and equipment for all bolt tensioning on site.**

Hydraulic tensioners can be used with extended bolts as shown in the photograph of a power station boiler circulating pump flange. This method gives very controlled bolt stress levels as required when using conventional flat faced joints.

The Ratchet Torque tensioner uses standard sockets and is one of the fastest methods of tightening heavy bolting.

Low Height Torque tensioners are used where access is limited and can be used with only one bolt diameter clearance at the end of a bolt. High pressure power packs with reverse flow facilities drive the double acting cylinders of the torque tensioners for rapid bolt tightening.



**Hydraulic Tensioner**



**Ratchet Tensioner**



**Low Height Tensioner**

Lubricant	Recommended Bolting Torques			
	A193-B7 A320-L7		A193-B7M A320-L7M	
	Oil	PTFE	Oil	PTFE
Bolt Size	Nm (lb. ft.)	Nm (lb. ft.)	Nm (lb. ft.)	Nm (lb. ft.)
1/2" -13 UNC	74 (55)	53 (39)	57 (42)	40 (30)
5/8" -11 UNC	145 (107)	103 (76)	110 (81)	78 (58)
3/4" -10 UNC	252 (186)	178 (132)	192 (142)	136 (100)
7/8" -9 UNC	401 (296)	283 (209)	305 (225)	216 (159)
1" UNC	596 (440)	421 (311)	454 (335)	321 (237)
1 1/8" UN	862 (636)	606 (447)	657 (485)	462 (341)
1 1/4" UN	1198 (883)	837 (618)	912 (673)	638 (471)
1 3/8" UN	1609 (1187)	1121 (827)	1226 (905)	854 (630)
1 1/2" UN	2106 (1554)	1462 (1079)	1605 (1184)	1114 (822)
1 5/8" UN	2695 (1988)	1866 (1377)	2054 (1515)	1422 (1049)
1 3/4" UN	3385 (2497)	2338 (1725)	2579 (1902)	1781 (1314)
1 7/8" UN	4183 (3085)	2883 (2126)	3187 (2351)	2196 (1620)
2" UN	5096 (3760)	3506 (2586)	3883 (2864)	2671 (1970)
2 1/8" UN	6134 (4525)	4213 (3108)	4674 (3448)	3210 (2368)
2 1/4" UN	7304 (5388)	5008 (3695)	5565 (4105)	3816 (2815)
2 3/8" UN	8614 (6354)	5898 (4351)	6563 (4841)	4494 (3315)
2 1/2" UN	10071 (7429)	6888 (5081)	7673 (5660)	5248 (3871)
2 5/8" UN	10571 (7798)	7221 (5327)	8902 (6567)	6081 (4486)
2 3/4" UN	12178 (8984)	8311 (6131)	10250 (7565)	6998 (5163)
2 7/8" UN	13940 (10283)	9504 (7011)	11739 (8660)	8003 (5904)
3" UN	15864 (11703)	10806 (7971)	13359 (9855)	9100 (6713)
3 1/4" UN	20227 (14921)	13757 (10148)	17033 (12565)	11584 (8546)
3 1/2" UN	25324 (18681)	17200 (12688)	21326 (15731)	14484 (10684)
3 3/4" UN	31211 (23024)	21173 (15619)	26283 (19389)	17830 (13153)
4" UN	37947 (27993)	25716 (18970)	31956 (23573)	21655 (15975)



**Note:** Torque figures have been calculated using formula in API 6A 17th Edition Appendix D with co-efficients of friction of 0.08 for PTFE coated bolts and 0.12 for oil or grease lubricated bolts.



## ON-LINE LEAK SEALING

**Destec's experienced technicians using proven leak sealing systems will keep your plant operational and reduce running costs through wastage.**

- SEAL LEAKS AS HIGH AS 6000 lb/in<sup>2</sup> (414 BARS) PRESSURE AND TEMPERATURES UP TO 600°C.
- DESTEC SEALING COMPOUNDS ARE AVAILABLE FOR WATER, STEAM, AIR AND PETROCHEMICAL PRODUCTS.
- A FULL RANGE OF CLAMP ADAPTORS ARE AVAILABLE FOR FLANGES TO LIMIT ON-SITE DRILLING.
- DESTEC'S RANGE OF GLAND PACKING MATERIALS GIVE POSITIVE SEALING WITHOUT STEM SEIZURE.
- THE ON-SITE TECHNICIANS ARE BACKED UP BY AN EXPERIENCED TEAM OF PRESSURE VESSEL AND PIPING ENGINEERS, AND AN EXTENSIVE MODERN EQUIPPED MACHINE SHOP.



**DESTEC OPERATE A 24 HOUR SERVICE**

### Quality Assurance

Destec, with over 30 years of on-site service work to the power generation and petrochemical industries, operate a quality system to ISO 9001 approved by all major companies. Qualified engineers check all site work where modifications may occur, e.g. flange clamping and boxing, and if required, calculations can be provided for the client. Detailed records of actual work carried out on-site by the technicians are kept as a permanent record.

### Engineering & Design

All specialised hardware in leak sealing is designed to meet the requirements of the appropriate pressure vessel standard, i.e. BS 5500, ASME V111 Div 1, etc. Alloy bolting (A193-B7) is the minimum requirement on clamps and fabrication is carried out by coded welders.



Initial Leak



Leak Seal Box Fitted and Sealant Being Injected

Leak Cured

## POLYMER REPAIRS & COATING

**The range of engineering polymers available to design and maintenance engineers should not be ignored.**

These products are at the leading edge of technology and offer permanent solutions to many problems.

Corroded components can be rebuilt even intricate ones for example, tube sheets, pump volutes, and valves.

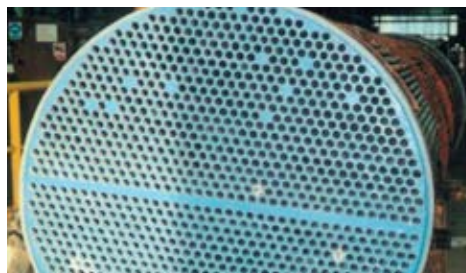
Coatings applied to new components can enhance performance by improving corrosion and erosion resistance. Low friction coatings applied to pumps and piping increase efficiency and make power savings. The efficiency of the polymer coating depends on the quality of the application. Destec technicians have many years experience and are approved contractors.



Before Treatment



Before Treatment



After Treatment



After Treatment



## The Speciality Service.

DESTEC ENGINEERING operates 24 hours a day, 7 days a week, 365 days a year on a Global basis and is able to mobilise to site within a matter of hours. Technicians and Engineers are available 24 hours a day for a rapid response to meet your requirements.

Call us on: **01522 791 721** or email us at:  
**[sales@destec.co.uk](mailto:sales@destec.co.uk)**

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