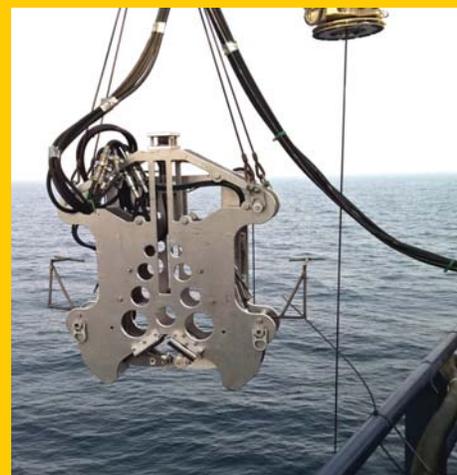
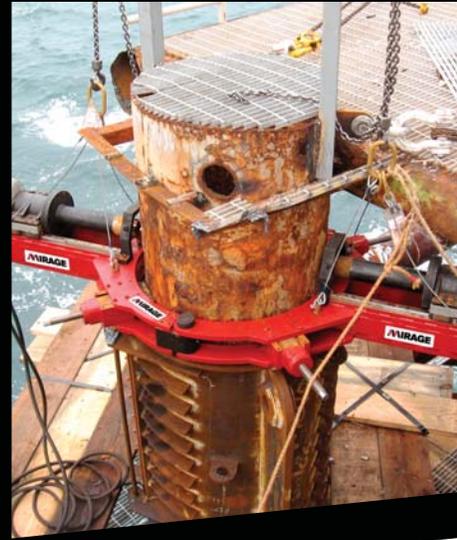


ENERPAC 

PORTABLE MACHINE TOOLS FOR DECOMMISSIONING CASE STUDY PACK



THE RIGHT TOOL MAKES ALL THE DIFFERENCE

INTRODUCTION

Thank you for downloading this Case Study Pack. The examples we've included represent just a few of the many applications our Portable Machining Tools are used for every day. If you have any in-situ machining projects in mind, our specialists located throughout the world will be happy to guide you towards the right tool for the job.

Mirage Portable Machine Tools from Enerpac

Since the Mirage product line joined the Enerpac range of Industrial Tools, we've made sure these legendary products remain true to the winning designs trusted by engineers for decades. Whether you need a machine tool for flange facing, milling, pipe cutting, beveling, drilling, tapping, or decommissioning, you can place your trust in the same build quality and precision enjoyed by onsite engineers for decades.

CONTENTS

- Pile Cutting with a Diamond Wire Saw
- Offshore Platform Decommissioning
- Subsea Wellhead Removal
- Subsea Pipe Cutting
- Machining Tools Overview
- More Tools from Enerpac

PILE CUTTING WITH A DIAMOND WIRE SAW

Customer:

OPEC Systems

Location:

Hamilton, Australia



Product: MDWS Diamond Wire Saw

Customer Requirement: Our customer, OPEC Systems, was involved in a major regeneration project in Hamilton, Australia. OPEC was contracted to carry out the demolition of various wharf structures, which included the removal of over 1500 piles. The pile types varied, some with timber concrete sleeves and others made from steel casings filled with concrete. Many were more than 3.3 ft (1 meter) in diameter.

Solution: OPEC deployed three full-time dive crews to use a range of innovative underwater cutting tools. One of the key pieces of equipment was the MDWS1638 Diamond Wire Saw, which was used to cut through 200 steel and concrete piles.

The MDWS1638 used on the project has the capacity to clamp onto the piles using hydraulic clamping jaws. It can cut diameters from 16" to 38" (40-80 cm) and uses an automatic feed.

The hydraulically powered saw is one of three different sized variants in the Enerpac Mirage line-up. Each is capable of quickly cutting through dissimilar materials and can resist compressive forces.

In addition to providing the Diamond Wire Saw, also supplied was a diesel-driven hydraulic power pack, hydraulic hose kits, and a control panel to operate the saw from a safe distance.

The project lasted for 4 months, and the Diamond Wire Saw was in continuous use almost every day.



The Diamond Wire Saw cutting through a pile.



One of the steel and concrete piles.



Lifting a cut steel pile from the water.

OFFSHORE PLATFORM DECOMMISSIONING

Location:

The North Sea and
The Gulf of Mexico



Products: DDU Double Drill Unit, BS3248SS Band Saw

Customer Requirement: An offshore oil platform is a tough and hazardous environment to work in and can therefore present difficult challenges to overcome. Decommissioning an offshore platform is no easy task and can require a combination of innovative thinking and customized engineering solutions.

Our engineering team developed a solution for offshore decommissioning customers that uses portable machining tools to drill, pin, and cut through multiple casing strings.

Multiple casing strings are the pipes used to deliver oil and gas up to the deck of the platform. They can contain many layers of steel and grouting to provide the strength needed to withstand the high pressures involved. Removing these when they're no longer required involves drilling holes to insert lifting pins at the top of the section to be removed, and also cutting through the casing at the bottom of the section.

Solution: Drilling Lift Holes into the Multiple Casing Strings

Any tool used to drill or cut through layers of steel and concrete needs to be both powerful, robust, and practical to use in such a challenging environment.

The DDU Double Drill Unit was designed specifically for this purpose. The unit features a split joint which allows the unit to clamp around and lock onto the casing string. When secured, the drilling can start via the feed system, which may be operated either manually, or using the auto-feed which allows the operator to remain in a safe position. The unit allows simultaneous drilling from both sides, and typically, a lifting hole in a 48" diameter multiple casing string can be drilled in approximately 15 minutes. The process is a fast, efficient, and cost-effective cold cutting method to allow lifting pins to be inserted.

Cutting the Multiple Casing Strings

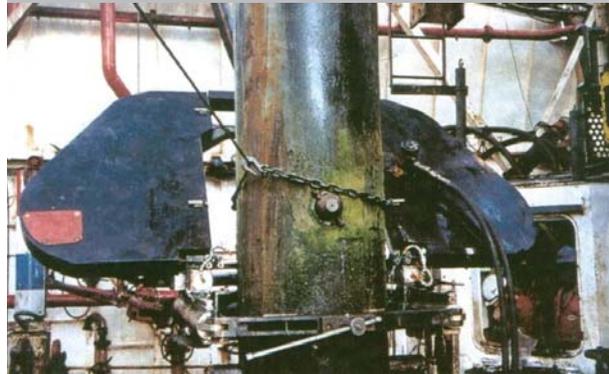
Before the casing strings can be lifted, they need to be severed. This is done using the BS3248SS Band Saw. The saw clamps to the casing strings with a mechanical vice jaw, and the blade is fed into the casing string using the auto-feed system. Cutting all the way through a 48" (1.2 m) casing string can be completed in approximately 40 minutes. The BS3248SS Band Saw provides a fast, efficient, and cost-effective cold cutting method for cutting multiple casing strings with or without grouted annuli.

The band saw can be mounted onto a purpose-designed frame at a 45-degree angle to allow use in restricted spaces. Alternatively, it can be mounted onto an ROV.

The system has been used extensively in The North Sea and The Gulf of Mexico to cut multiple casing strings and piles in both surface and subsea applications.



The DDU1636 machine in-situ drilling 6" pins.

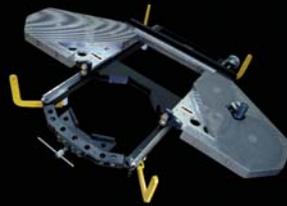


The band saw in position cutting 30" multi-string casing

SUBSEA WELLHEAD REMOVAL

Location:

Gulf of Mexico



Product: Mirage BS3248 Band Saw

Customer Requirement: A customer in the Gulf of Mexico needed to remove a subsea wellhead at a depth of 7,000 ft. The project required the cutting of an X-70, 36" diameter pipe, with a wall thickness of 2" just above the mud line.

Although a Diamond Wire Saw would be capable of making the cut, this would not be the best solution, as it may require the wire rope to be changed part way through the cut. At such a depth, this would add an additional 12-15 hours to the project time.

Solution: It was decided that a 48" heavy-duty band saw adapted for deep-water use would be the best solution.

To prove the technology, a test cut was carried out topside using a standard Mirage Portable Band Saw. This took just 18 minutes to cut through a 36"x 2" WTH pipe.

Following the customer's approval to proceed, our engineering team designed and manufactured the exact configuration needed to allow the band saw to be used for this subsea application.

Key challenges were as follows:

- Adaptation of the BS3248 for deep-water use, including the development of ancillary equipment compatible with an ROV (remote-operated vehicle).
- Developing a frame design and cantilever arrangement to enable access to the pipe situated underneath the main wellhead assembly.
- All equipment was to be designed to require 100% NDT, Pull Testing.
- Testing the rig in water needed to take place before delivery of the final package to the customer.

Breakdown of the Project

- Development of a steel frame to deploy the band saw, control panel, compensator, hot stab holster, and crash cage. The frame also included an engineered mud mat to suit the specific site's mud conditions.
- Development of a cantilever frame, to allow the band saw assembly to be mounted to the wellhead underneath the main structure.
- Design of the ROV control panel.
- Development of a 4-function hydraulic manifold. This was used to route hydraulic power to the motor, clamp, and emergency blade cutter. It also included 3-speed feed circuits to vary the feed motor speed for cutting through the top and bottom crowns of the pipe.
- Design and manufacture, in the time required and within budget, a high-volume compensator to accommodate the 7,000 FSW pressure differential.

Project Outcome: The wellhead was removed successfully, and all equipment performed as expected. Although the band saw can make fast cuts, a decision was made to carry out a much slower cut - over 3 ½ hours. This was to ensure a successful and single complete cut, therefore eliminating any need to retrieve the band saw for blade replacement.



Initial test cut carried out topside.



The frame assembly under construction.



The manifold installed in the frame.



Testing the rig underwater.

SUBSEA PIPE CUTTING

Location:

Saudi Arabia



Product: MDWS Diamond Wire Saw

Customer Requirement: As part of a pipeline decommissioning project, our customer needed a way to remove a 1,680 ft (512 m) length of 'Super Duplex' stainless steel pipe from the seabed. The pipe was at a depth of 164 ft (50 m) and measured 12 inches (305 mm) in diameter with a one-inch wall thickness.

Solution: The product used was an MDWS Diamond Wire Saw. These can be deployed using an ROV, but due to the relatively shallow water depth this wasn't necessary. Instead, the saw was lowered from the ship and operated on deck using a 3-circuit hydraulic controller and observed using a remote camera.

The Diamond Wire Saw used on this project uses a diamond wire rope traveling a speed of 3,937 ft (1200 m) per minute. The auto-feed rate was set at 0.3 in (7.6 mm) per minute.

Project Outcome: The whole pipe section was removed successfully by making a total of 22 cuts over 72 hours. All pipe sections were around 75 ft (23 m) long and were raised to the deck. With the pipe removed, the customer was able to construct a new pipeline.



Lowering the MDWS into the sea.



The first two pipe sections recovered from the seabed.



Viewing the cutting operation on-screen.

THE ENERPAC RANGE OF MIRAGE PORTABLE MACHINE TOOLS

Developing the industry standard products for flange facing doesn't just happen by accident. It comes from decades of innovation, expertise, and a culture of continuous improvement.

The legendary performance of Mirage Portable Machine Tools lives on through Enerpac. Whether you need a machine for flange facing, milling, pipe cutting, beveling, drilling, tapping, or decommissioning, you will benefit from the same build quality and precision enjoyed by on-site engineers for decades.



Flange Facing Machines



Decommissioning Saws



Orbital Milling Machines



Drilling and Tapping Machines



Portable Linear Milling Machines



Genisys Portable CNC Machine



Machining Power Packs



Clamshell Cutters



Hot Tapping and Line Stop Machines



Pipe Isolation and Testing Tools



MORE TOOLS FROM ENERPAC

Backed by a global legacy of ultra-reliable quality and superior precision, Enerpac is pushing the industry forward with a wide range of advanced Industrial Tools that ensure our customers operate safely and productively every day. It isn't about being compliant, or "as good" as the next guy; we outpace the competition by delivering technically superior solutions that are easy to get, safe to use and built to outlast.

Visit enerpac.com
for more product solutions.



Cylinders

Lifting Products

Pumps

Control Valves

System Components

Presses

Pullers

Specialty Tools

Cutters

Bolting Tools

Flange Maintenance

Heavy Lifting Technology

Portable Machining

FLUID POWER SOLUTIONS[®]

Find a location near you!



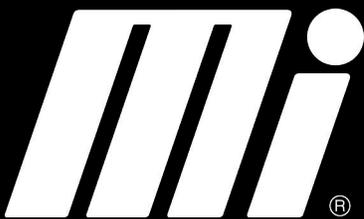
Mi Fluid Power Solutions

Looking for specialized solutions for fluid power operations? Talk to the experts at Mi Fluid Power Solutions for expertise related to hydraulic power units, gearbox, and cylinder repair.

To view locations, scan QR Code or go to: qrco.de/bd4Ofp



© 2022 Motion



MORE CHOICES. MORE INVENTORY. MORE EXPERTISE.