

# Taking on the challenges facing mineral exploration with Dando

Since coming back into British hands in 2019, Dando Drilling International has been strengthening its global reputation as a leading manufacturer of drilling rigs and equipment for the mineral exploration, geotechnical, water well and offshore sectors

**E**stablished in 1867, Dando has become a symbol of great British engineering with its robust and versatile rigs used on every continent across the world. Now under a new management team lead by MD, Mark Jones, and with fresh investment through a consortium of investors, Dando is undergoing transformational changes to support, grow and streamline the company and better serve its customers.

This revitalisation of Dando comes at a time where various industries – mineral exploration in particular – are looking for more sustainable technologies which maximise efficiency while minimising environmental impact. All of these considerations have been incorporated into Dando's new rig design, due to be launched later this year.

*The compact Terrier rig can be used to carry out various types of drilling work in challenging locations*

## TRADITIONAL DANDO

Since the 1980s Dando has built a strong presence in the mineral

exploration sector, especially in South East Asia where the company has more than 35 years' experience supplying and developing rigs to retrieve mineral samples.

Traditionally, the mineral exploration sector in South East Asia is orientated around coal exploration as many of the countries use this form of hydrocarbon as its primary fuel source. Indonesia alone accounts for about two per cent of the world's total coal reserves.

Industry experts have consistently favoured Dando's heavy-duty, mid-sized, Mintec 12.8 rig for coal exploration due to its rotary air blast drilling (RAB), reverse circulation (RC) and wireline coring capabilities in remote locations.

In the initial phase of coal exploration, particularly in Indonesia, Mintec 12.8 rigs are used to perform open hole drilling, which uses RAB drilling methods, to confirm the area is coal-bearing. This method of exploration allows

users to identify the soft, black sedimentary rock fragments from the sample cuttings.

The Mintec 12.8's versatile, high-performance rotary head can then be loaded with a wireline drill string to retrieve 3m core samples and provide geologists with a definitive description of the geology.

Dando's mineral exploration rigs have been tailored to include climatically robust features to suit the challenges faced when drilling in the remote jungle regions of South East Asia. The Mintec 12.8 is one of the few rigs produced that can cope with uneven or loose terrain and slippery or sticky ground conditions. Through features such as a heavy-duty crawler track system, powered by a C15 CAT engine, there is increased traction on the wet clay-like ground.

Another challenge of working in South East Asia, and many other equatorial regions, is torrential rainfall, surface water and humidity, which is often at 100 per cent. This makes electronic components susceptible to water ingress, condensation and dust particles. To combat this, the Mintec 12.8 uses IP-68 enclosures for all electrical connections, a premium compared to the standard IP-65 used for dust and water ingress-resistant enclosures. It also uses top-quality hydraulic systems and controls as standard.

## DANDO IN INDONESIA

As the world shifts its energy consumption away from traditional sources such as coal, the uses of Dando's mineral exploration rigs have also started to change. Indonesia, in particular Sulawesi,



is home to large nickel laterite deposits.

In the last 10 years, nickel has become an increasingly important battery metal due to its ability to deliver higher energy density and greater storage capacity at a lower cost. As the world tackles the challenges of climate change the demand for nickel is expected to surge with electric vehicles becoming standard.

On hand to assist geologists is Dando's versatile Jackal 9000, a multipurpose drilling rig capable of performing various techniques including RC drilling, commonly used in nickel exploration.

In the preliminary stages of nickel laterite exploration, RC drilling is used to determine whether geologists are in a nickel-bearing region. Due to nickels' low concentration in laterite deposits, the Jackal 9000's RC capabilities ensure that retrieved drill samples remain uncontaminated.

Strong customer relationships and feedback has highlighted the need for smaller, safer and more compact rigs, such as Dando's Jackal 9000 or 4000 to minimise the environmental impact of the exploration work. The 9000 model can reach depths of up to 320m which is in the approximate target range of nickel laterite deposits, commonly found at depths of 50 to 300m across South East Asia.

A challenge in nickel laterite exploration is the varying lithology as the hard nickel ores are interbedded with softer clays, requiring frequent drill bit changes. The Jackal 9000's modular rig design allows for easy customisation as needed, ensuring a smooth interchange between rotary head motors or swivels to minimise downtime when drilling operations are altered—between coring and RC, for example. Additionally, a mast extension to allow the tripping of two 3m drill rods at a time increases efficiency when changing over tooling.

#### ALLUVIAL DEPOSITS

Alluvial mining has been around for centuries and was made famous in

the 19th and 20th centuries with the California and Colorado gold rushes.

Precious metals and minerals are deposited on the bottom of stream beds and are distributed according to their weight, with heavier minerals such as gold, copper and platinum often settling at the same time.

Although a simple process, alluvial mining is often unfeasible and brings technical challenges due to the soft and sandy bedrock which make drilling into the ground to retrieve samples almost impossible. Dando's renowned Terrier rig, however, has enabled mining companies such as Green Gold to successfully sample alluvial deposits, making them a potentially economic target. Using its duplex sampling system, which cases the borehole while simultaneously retrieving samples, the Terrier rig reinforces the wall of the well, preventing the sandy unconsolidated geology from collapsing in on itself.

#### OLD DOG, NEW TRICKS

Occupying a small footprint measuring only 80cm wide, the compact and extremely versatile Dando Terrier rig has also been useful for sampling tailing waste deposits from disused gold mines, with the fine sandy textures bringing challenges akin to alluvial deposits.

Highly toxic sodium cyanide, commonly used in the gold leaching process and its by-product disposed of in tailings, can result in substantial environmental impacts and public health risks if released into the environment. Sampling tailings deposits allows geologists to monitor toxicity levels and prevent hazardous waste from leaching into the environment.

In addition to cleaning up, companies such as Heritage Minerals and its Mount Morgan gold and copper project in Queensland, Australia, are sampling tailing deposits to recover considerable quantities

of material left due to inefficient historic mining technologies.

#### AHEAD OF THE CURVE

In a move to improve the industry, mining companies have been ahead of the curve with environmental and safety concerns, resulting in faster uptake of new technologies such as remote drilling and rod handling, which protect the environment and workers.

During the past year under new management, Dando has been revolutionising its drill rig manufacturing process ready for launch later this year.

Mark Jones, MD, says: "All new rigs will be designed with the environment in mind and from the manufacturing side, we are looking at how we can reduce our carbon footprint by clever use of design and material choice."

Dando's new rig design incorporates its 'bespoke' mantle while maximising the use of 'off-the-shelf' components enabling the company to accelerate the build and delivery time of its rigs.

Jones comments: "The past year has seen huge changes for Dando, and we're excited to see our hard work and innovation come into fruition as we work towards the launch of our new product range."

As part of the strategy to streamline manufacturing, Dando has also brought manufacturing capacity back in-house, securing its supply chain and therefore improving build times. Part of this was achieved through the acquisition of Unistates, a UK-based machining specialist which offers bespoke parts for multiple sectors, primarily the drilling industry, which has since been integrated into Dando as Dando Engineering.

Using its wealth of experience formed from over 150 years in the industry, Dando is applying innovation to its robust range of RC, coring and multipurpose rigs to create a sustainable model of rig manufacturing for the future. ♥

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