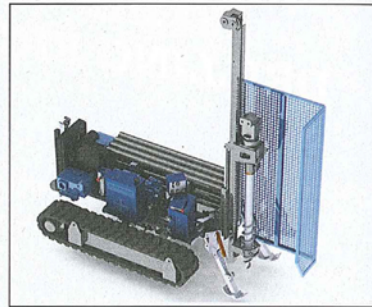


Dando Mintec
12.8 drilling in
Sumatra,
Indonesia

Far right: the
angle-drilling
Terrier with
tracked
compressor unit

Far right: Dando
designers use
Solidworks 3-D
modelling
software. Here is
the Multitec 4000
with expanding
tracks



Engineered solutions

Drill sites can be found in and around tough terrain, restricted-access sites and fragile ecosystems. Here we look at how Dando's engineers tackle these challenges

Dando Drilling International has been well versed with demanding conditions since 1867, when the company shipped its first water boring rig to Abyssinia (Ethiopia). However, time has not stood still at the UK-based factory as the manufacturer continues to develop equipment to tackle problematic terrain.

"Along with our proven range of standard rigs, many of our builds are customised to a unique situation," explains Dando engineer Rupert Coler.

"We don't restrict our customers to a one-size-fits-all approach. We enjoy the challenge of new designs. It's what makes the job interesting."

Martin Fitch-Roy, CEO of Dando, believes that a skilled, engaged and creative design team is key to Dando's ability to develop equipment that meets the needs of an evolving industry.

"Over the years we have fostered a close relationship with the University of Brighton engineering department," he says. "We have been lucky to have some of their brightest young graduates join our engineering-design team. Many of our newest

rigs over the last year are the result of their creative collaboration with our experienced drillers and the customer."

FRAGILE ENVIRONMENTS

The Dando Multitec 4000 rig is an example of such collaboration.

Exploration in jungle or forest can be slow, especially as preserving the environment is becoming a frequent prerequisite. This is the kind of terrain in which one Dando customer is conducting exploration drilling for diamonds in Sierra Leone.

The design brief was for a lightweight, track-mounted rig to wireline core HQ at depths of between 50m and 100m. Drilling is initially through gravel and decomposed bedrock before reaching the target kimberlite.

As access is through the forest, a rig with a small footprint was preferred to navigate between closely spaced trees. Designed as a lightweight, powerful package, the Multitec 4000 only exerts 3.5psi of ground pressure – less than half that of a human foot. This helps protect delicate surface features and fauna.

The rig design is modular,

allowing for easy customisation as needed. There is a variety of options for engines, rotary heads, winches, rod storage and radio or umbilical remote tracking.

Another customer has recently ordered a Terrier model. Dando's smallest track-mounted rig is being built specifically for rotary air-blast (RAB) drilling to depths of 30-40m in the jungle of West Africa. Sloped terrain and formations require an angle-drilling approach, so the Dando design team has modified the regular Terrier mast with a hydraulic dump to cater for this.

A compressor unit to supply air for RAB drilling has been mounted on a separate track system. At only 80cm in width, the Terrier is able to negotiate narrowly spaced trees, reducing the need for clearing and ensuring a low environmental impact.

MUD IN THE TROPICS

With more than 30 years' experience supplying and developing rigs to retrieve mineral samples in the thick mud of the Indonesian jungle, Dando has continued to improve its Mintec range of rigs to ensure that wet-season ground

"We don't restrict our customers to a one-size-fits-all approach. We enjoy the challenge of new designs. It's what makes the job interesting"

conditions do not slow down drilling operations.

The Mintec 12.8 is a medium-sized mineral-exploration rig capable of wireline coring, reverse circulation (RC) and RAB drilling. Eighteen of these rigs are in use across Kalimantan and Sumatra.

In the hot and often slippery tropical conditions, the rig features a powerful C15 CAT engine to power the crawler unit, hydraulics and Ingersol Rand 900cfm/300psi compressor. The CAT tracks are uprated to take the full 550hp, and single-bar grousers clear the mud and maintain drive.

Sales manager Quentin Dulake elaborates on the choice of components: "Dando has a reputation for building strong rigs that are user-friendly, and this includes maintenance and servicing. This is a prime consideration when we choose components. We want to ensure that local support centres can maintain engines, hydraulics, track systems and compressors at short notice."

The Mintec 12.8 rig is powerful enough, even in these difficult conditions, to pull a skid of its own tooling. This reduces the number of support vehicles required, saving fuel and cost. Customers typically complete 300-400m boreholes using air flush, mud rotary, or a combination of both, in a single 20h shift.

The smaller Multitec 9000 is also used for coal exploration in Indonesia and is popular with drilling contractors looking for a low-cost solution to retrieving samples in difficult conditions.

With 10t of pullback, this rig with a small footprint is being used by one customer to retrieve HQ cores at between 100m and 200m. The 9000-series rig is capable of wireline coring in HQ to over 800m. The multipurpose rotary head can also provide the option of RAB and RC drilling.

THE CHALLENGE OF AFRICA

Remote areas of Africa pose a challenge for all machinery. Not only are the climate and terrain punishing, but also the distance

between population centres can be great. Strength, reliability and ease of maintenance away from facilities are therefore deciding factors for many customers.

Dando's deep-drilling Watertec 40 and medium-depth Watertec 24 and 12.8 have proven popular. Among recent sales, a Watertec 40 has been commissioned for a deep-well irrigation project in Chad and two more 40s are being

prepared for a buyer in Algeria.

The newly developed 102hp CAT-engined Watertec 9000 is available on a smaller 4x4 truck, tracks or on a purpose-built trailer. It can drill to depths in excess of 650m (down the hole and mud rotary), and at a fraction of the overall weight of the bigger rigs.

As many of Dando's customers are based in remote areas, its team of drill engineers needs to

"Remote areas of Africa pose a challenge for all machinery"



www.dando.com.au
 1800 634 634
 DANDO
 DRILLING & MINING EQUIPMENT



Above: the Multitec 9000, a mid-size rig capable of drilling HQ to over 800m

Above right: the dual-mast Terrier can carry out various drilling work from one compact rig



be on constant standby in case assistance is required. Drill engineer Stan Kirby recalls his recent travel: "I can find myself in remote locations with very limited access to tools and facilities, but the priority is to get the customer drilling quickly and safely."

CLOSER TO HOME

The rebounding UK geotechnical sector delivers its own set of challenges in terms of terrain and

access limitations. In response, the company's design team has set upon Dando's fleet of site investigation rigs.

The Terrier, able to access tight spaces and even track through a standard doorframe, is now available in a twin-mast version. The percussion mast is mounted alongside the small but powerful top-drive rotary mast and can be hydraulically slid into position over the hole.

This allows for a variety of drilling methods from a single unit. Engineer Harry Muggeridge explains the rationale behind his mast design: "You can now sample down to the bedrock and perform a standard penetration test (SPT) with the percussive mast and then slide the rotary mast across to take a core of hard rock down to 40 or 50m.

"Making the mast entirely out of aircraft-grade aluminium means very little weight is added and maintains the rig's manoeuvrability

and ease of transportation."

New to the range of geotechnical rigs, the Multitec 4000 has the option of a swing-in hammer attachment that allows for SPT and U4 testing. Despite the small footprint, the 50hp engine and versatile rotary head enable the rig to take wireline core samples to beyond 100m.

Dando has designed an expanding track system that overcomes access constrictions. With the tracks retracted to 90cm wide, this rig can move along narrow passages. However, when stability is required for drilling, the tracks are widened on hydraulic rams to 140cm.

The Multitec 4000 adheres to UK and European safety regulations and includes features such as full guarding incorporating a drop in rotation torque when open, remote-control tracking and a silent pack engine. The rig weighs less than 3t and can be legally towed on a standard trailer. ▼