

# AIRCORE DRILLING EXPLAINED

## What is aircore drilling?

Aircore drilling is used to bore holes into unconsolidated, soft ground conditions and in particular when safe and clean removal of sample material is paramount.

Aircore is used to drill the weathered regolith (loose, heterogeneous material covering solid rock) and transported overburden. It also provides a more representative sample of the ground as it prevents cross contamination.

Aircore drilling requires minimal site preparation and is usually completed in well under a day. It is relatively inexpensive and is often used in first pass exploration drill programs. It is generally limited to shallow depths of 50-100 metres and it is drilled using a smaller rig known as an Aircore rig.



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## How does aircore work?

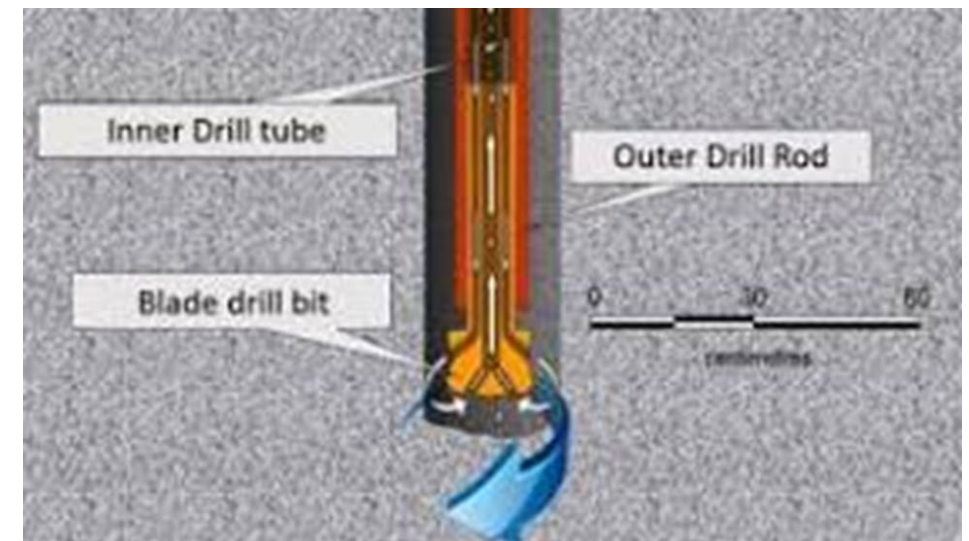
Aircore drilling uses a three-bladed steel or tungsten drill bit with a hollow drill rod to penetrate the weathered regolith (loose, heterogeneous material covering solid rock) and transported overburden and enable a fresh rock sample to be collected.

Aircore drilling uses a dual-tube rod system, where the inner tube is used to collect the cuttings, and the outer tube is used to provide compressed air to flush the cuttings out of the borehole. The drill bit is attached to a hollow drill stem, which is rotated and driven into the ground.

As the drill bit cuts through the ground, the compressed air flows through the outer tube and forces the cuttings up through the inner tube and out of the borehole.

This makes samples from aircore drilling less prone to contamination and results in a more effective analysis sample.

***And believe it or not, aircore drilling is actually an Australian invention. It was invented by Western Australian-based Wallis Drilling to solve a problem drilling mineral sands.***



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## Where is aircore drilling applied?

- Aircore drilling is a valuable method of drilling for Companies looking to reduce the risk of sample cross-contamination.
- It is commonly used in first-pass exploration drill programs on unconsolidated ground, with an optimal depth of 50-120 metres.

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## The advantages of aircore drilling

1. It eliminates the need for collaring holes.
2. Its ability to obtain representative samples of the material being drilled. This allows for a better understanding of the geology of the area being explored.
3. Due to its reliance on compressed air injection, samples from aircore drilling are less prone to contamination and results in a more effective analysis sample.
4. It boosts efficiencies and reduces costs. Aircore drilling is an efficient method for removing material.
5. It enables real-time sample collection, which speeds up drilling rates, resulting in reduced field costs.
6. Aircore drilling is also well-suited for projects that require large sample volumes, as the dual-tube system allows for quick and easy collection of cuttings.
7. Aircore drill rigs are also lighter in weight than other rigs, meaning they're quicker and easier to transport and also provide a reduced environmental footprint.

## The disadvantages of aircore drilling

1. It may be depth limited. Depending on a number of variables but predominately available air pressure, aircore drilling is usually limited to depths of 50 - 100m.
2. One major disadvantage is that it's not suitable for drilling through hard rock formations, as the drill bit can become easily damaged. While aircore drilling can drill through cap rock at the top of a hole using a hammer or tri-cone roller, aircore drilling is usually unable to penetrate fresh rock without the addition of hammer percussion optionality.

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**Movie of aircore drilling at Novo's Becher  
Project in the Pilbara District of Western  
Australia**