



Elemex

Controlled flushing when you need it most





ELEMEX

No one expects foundation drilling to be easy, particularly in sensitive formations where the risk of displacement and overdrilling are always a concern.

Any kind of disturbance can knock a project back, lead to unwanted downtime and spiralling costs. Air when released from the front of the pilot in conventional DTH drilling, tends to escape to the surrounding soil in sensitive formations, increasing the risk of sudden settlements and overdrilling.

But controlled flushing is achievable, thanks to a solution developed by TerraRoc which has transformed foundation drilling and is now the preferred system for minimizing the risk of settlement and overdrilling in surrounding structures.

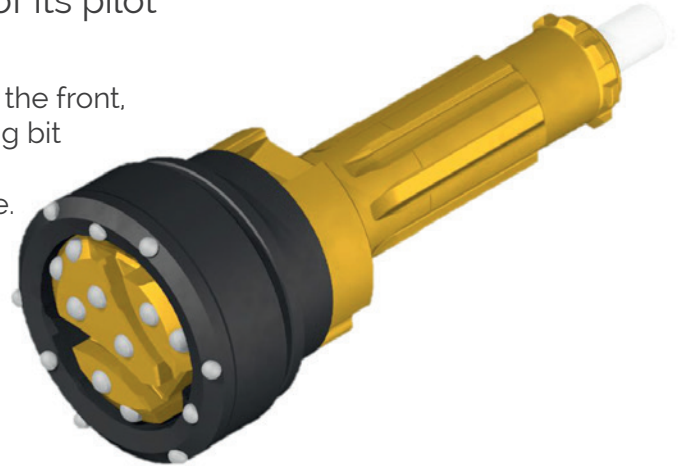
The solution is Elemex. Controlled flushing when you need it most.

How it works

Elemex is a casing advancement system that releases air on the side of the pilot bit. It controls the flow of air through the unique design of its pilot and ring bits.

The air feed hole is on the side of the pilot, instead of the front, which redirects the air against the inner wall of the ring bit thus decreasing the kinetic energy of the air. The ring bit is extended and directs the air flow across the face. This controls the spread and intensity of flushing on the area that matters, preventing air escape and damage to the surrounding formation.

Elemex has a unique bit face design and extended ring bit that minimizes air loss into the surrounding formation.



Elemex



Conventional

The locking mechanism in the pilot of the Elemex system redirects the air within the drilling area. This decreases the air pressure just enough to get an efficient flushing. The intensity of the air that reaches the surrounding soil is significantly lower.

A conventional DTH drilling system directs the compressed air from the air feed holes straight into the ground with a high intensity, causing the air to rapidly escape to surrounding foundations.

Because air is not released from the face of the pilot bit, Elemex would be the preferred safe system when working in highly sensitive ground conditions.

ELEMEX
Safe system
for sensitive
areas



Why Elemex?

The driller is in full control. Elemex leads to more efficient drilling programs and safer drilling. It reduces overdrilling, excessive soil removal and flushes out cuttings so they don't escape and weaken the nearby ground.

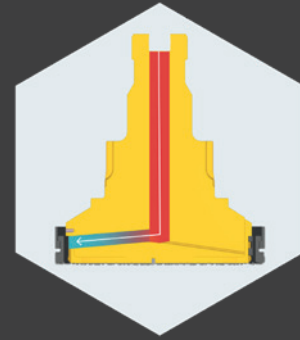
Advantages

- Minimum air escape, more control
- Reduce drilling time and issues of over-drilling
- Better flushing and improved drilling rates
- Higher service life for pilot
- Less material removed.

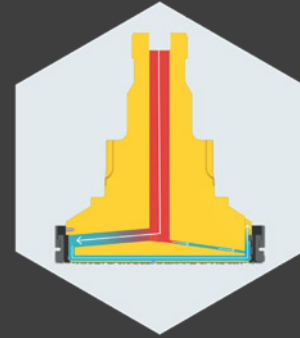
Where Elemex is in its element

Elemex is part of a total overburden drilling solution used in both DTH and top-hammer drilling. Deployment of Elemex depends primarily on drilling conditions on site. Here are four scenarios where Elemex is preferred to conventional drilling.

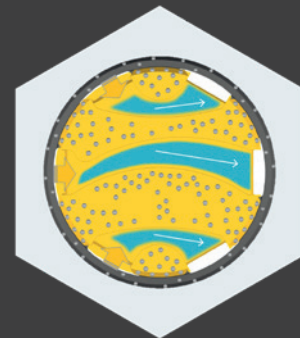
- Sensitive ground conditions where the risk of disturbance is high
- When conventional drilling with air could lead to over-drilling and excessive removal of materials
- When removal is prevented due to ground resistance forcing air out instead of up through the casing
- In urban settings where risk of settlement in nearby structures is a concern.



Compressed air flow descends in the normal manner.



Air is then directed through the side of the pilot into the ring bit and redirects the air flow.



The ring bit is extended and directs the air flow across the face.



The Elemex range

Elemex bits are available up to casing size 813 mm (32") diameter in different models and sizes, and in a wide range of wall thickness casings.

Designs are available for both permanent and retrievable casings. With the G2 version update, the same ring bit set can be used for both Elemex and Symmetrix, which allows customers to swap the pilot to suit.

Product Designation Codes

Elemex systems are named and numbered according to the casing type, casing size and ring bit inner diameter in both permanent and retrievable system designs.



TerraRoc is a market leader in geotechnical drilling consumables operating in Europe, North America and Asia. The company specializes in casing advancement systems, down-the-hole hammers and core drilling.

Three manufacturing plants in Finland, Scotland and the United States, supported by a global supply chain, provide a range of products, services and customized solutions for engineers to overcome the most challenging rock formations faced in drilling and excavation works.

Elemex makes its case

CASE STUDY 1 RESIDENTIAL, STOCKHOLM

The table below reports on settlement measured during drilling works on a foundation reinforcement project to replace damaged timber piles with new steel core piles in downtown Stockholm.

Basement floor settlement (millimetres) using conventional DTH and Elemex

System	point 1	point 2	point 3	point 4	point 5	Combined pile settlement
Conventional DTH	25	26	33	52	37	173
Elemex	11	10	9	16	12	58
Average reduction of settlement	56%	61.5%	72.7%	69.25	67.6%	66.5%

Conventional DTH and Elemex were deployed at two neighbouring buildings with matching conditions at each point. Elemex showed a significant reduction in settlement of the basement floor, with less displacement of soil surrounding the casing tip than conventional DTH drilling.

CASE STUDY 2 ROAD TUNNEL, TRONDHEIM

During construction of a 2.6 km road tunnel on the approach to central Trondheim, engineers came across 300m of loose, wet clay; 100m of which were vulnerable 'quick clay', typically found in Norway and Sweden. Several historic wooden buildings, close by, had to be removed until construction was complete.

With the risk of shocks to the clay, disturbance and possible damage to historic buildings, conventional piling to install retaining walls on either side of the tunnel's eastern gateway was not possible.

Clay was found to be between 9m and 23 m thick, with groundwater level approximately 1.5m below the surface. Sensitive conditions called for a safe drilling system that would not disturb the clay or lower the groundwater. The engineers agreed on Elemex.

Work began and casing was advanced with the Elemex pilot bit, driving the ring bit with gentle air flushing across the bit face. Each pipe was steadily pulled down through the clay until it reached the bedrock.

The pilot bit was then used to drill and flush into the bedrock and with the pipe securely installed, the inner drill string was removed leaving the pipe ready for cement injection. A total of 349 interlocking pipes were installed to depths ranging from 11 to 33 m and 1.2 to 4.6 m in solid rock.

Thanks to Elemex, the construction team was able to ease through the clay and into the bedrock in one operation using a resonance-free, vibro-rotation method that avoided problematic vibrations. The result. Watertight, load bearing retaining walls completed on time.

Customized Geotechnical Solutions.

Full range of drilling tools and consumables for casing advancement systems, down-the-hole hammers and core drilling, all customized to your needs.

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