AVALON

CONTACT US

For technical queries, on-site demonstrations or a detailed ROI model,
reach out to our experts any time.

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RELIABILITY
Swiss engineering quality

BOLDNESS
Pushing boundaries underground

RESPONSIBILITY
Upholding safety & environmental standards

AVALON
ROTARY BIT

AVALON

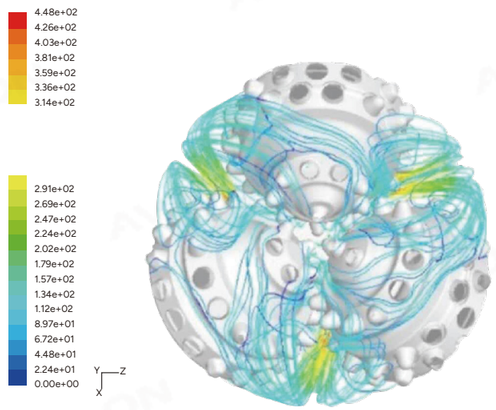
BLAST HOLE TRICONE BIT

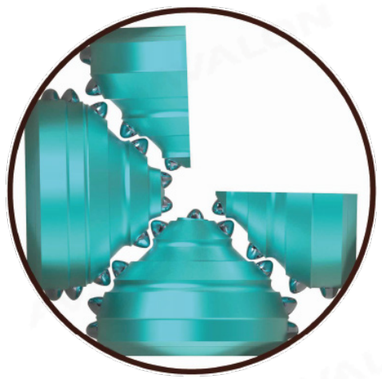
Swiss-Engineered Tricone Bits for Open-Pit Precision

Avalon designs and delivers high-performance blast hole tricone bits engineered for the demands of modern open-pit mining. Built around Swiss design principles and manufactured to exacting tolerances, each bit combines advanced metallurgy, precision insert geometry and optimised airflow to achieve maximum penetration with minimum downtime.

Our product range covers diameters from 6 ¼" to 16", with cutting structures calibrated to IADC codes 40 to 80 to match the specific hardness, abrasiveness and compressive strength of your formation. Whether you're drilling soft overburden or ultra-hard iron ore, Avalon tricone bits are configured to perform.

Continuous investment in R&D, materials science and performance simulation ensures that every Avalon bit integrates the latest advances in bearing capacity, seal durability and cutting structure stability. We don't just make tools—we deliver solutions designed to reduce cost-per-metre and keep you turning longer.



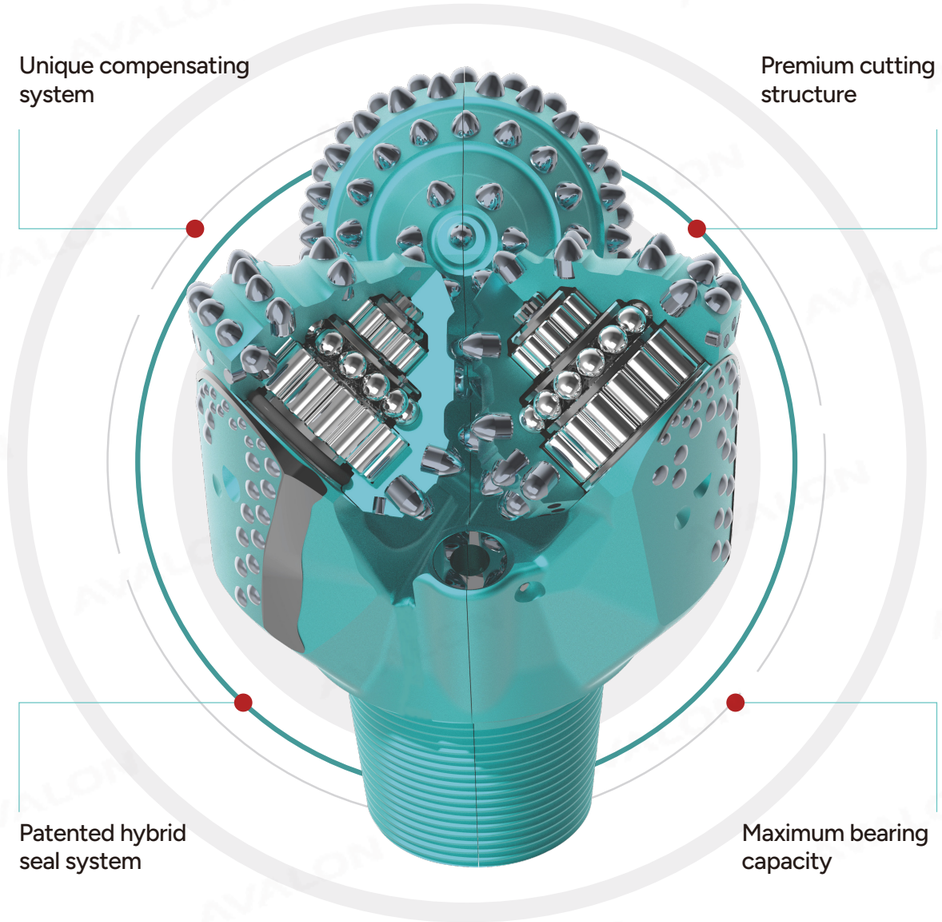


Avalon rotary bits are engineered from the inside out to maximise durability under the harshest downhole conditions. Each unit is available in sealed or open bearing configurations, both designed to extend service life and reduce unexpected failures in abrasive formations.

We adapt every component to your operational context. Through our integrated CAD-based development workflow, Avalon engineers tailor cutting structure geometry, insert layout and bearing-to-seal ratios based on your site's geological profile. Selective carbide grades, balanced seal interfaces, and rapid-turnaround heat treatment protocols come together to create a tool that's not only robust—but precisely fit for purpose.

APEX SERIES

Premium Blast Hole Tricone



Avalon Apex-Series bits are built for one purpose: to outperform in high-duty mining environments. Every component, from bearings to inserts, is modelled using our in-house Finite Element Analysis (FEA) and Computational Fluid Dynamics (CFD) tools to optimise heat dissipation, insert wear, and weight-on-bit response.

DESIGN DRIVEN BY DATA

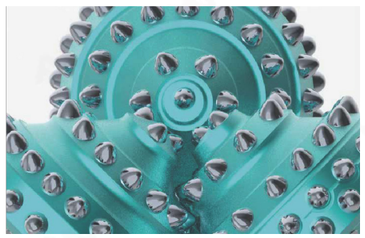
Avalon's Automated Design System (ADS) unifies CAD modelling, simulation and detailing into a single workflow—accelerating development while improving accuracy. Every bit is digitally stresstested before production, ensuring optimal airflow, bearing alignment and structural integrity.

Bit Simulations

Advanced CFD simulations optimise airflow through the bit body to enhance cuttings evacuation and cooling of internal components. FEA modelling defines safe operating thresholds for weight-on-bit (WOB) by mapping stress distribution under dynamic loads.

Maximize Bearing Capacity

Bearing geometry and load paths are digitally tuned to maximise service life. Internal software tools allow engineers to compare configurations, evaluate heat and stress tolerances, and refine designs for maximum bearing efficiency under varying conditions.



Cutting Structures

Each bit's cutting profile is designed using variable insert shapes, grades and densities. By fine-tuning row spacing and eliminating dead zones, we deliver structures that are either highly aggressive or exceptionally tough, depending on the application.

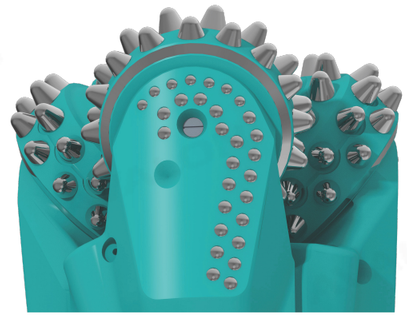
CUSTOMIZED FEATURES

Tough nose

A reinforced nose profile protects the bit centre against premature erosion and eliminates coring in fractured or abrasive formations. This extends the lifespan of the bit and improves drilling stability, especially in hard rock.

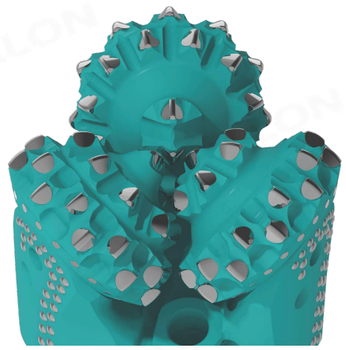
Bevel welding

Bevel-welded shoulders shield the gauge row from erosion and allow for a higher insert count closer to the shirttail. This design significantly improves wear resistance and preserves diameter accuracy over extended runs.

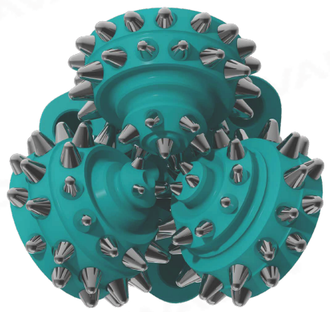


TCI Steel Structures

Our TCI cutting structures combine special-shaped tungsten carbide inserts with hardfacing grooves for high-impact drilling. By adjusting insert projection, spacing and shape, we create a cutting profile tailored to formation hardness—bal - ancing penetration speed with structural integrity.



IADC	APPLICATION	OPERATING PARAMETERS	
		Rotating Speed (RPM)	Weight On Bit(lb/in)
Series 40	Soft	70 - 140	1000 to 4000



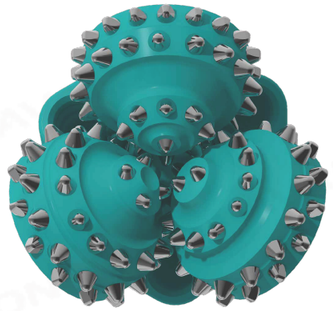
Cutting structure:

Large diameter, long projection and widely spaced chisel, or conical inserts. Designed for maximum penetration in soft formations

Application:

Soft formations such as siltstone, shale, and soft limestone with 1,000 to 15,000 psi compressive strength.

Series 50	Soft to Medium	60 -120	2000 to 5000



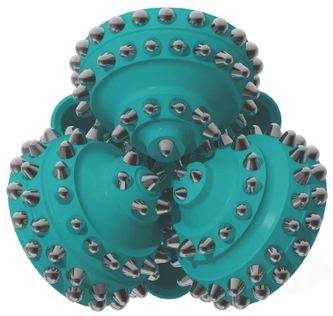
Cutting structure:

Long projection and moderately spaced chisel, or conical inserts. Designed for high rates of penetration in soft formations hard formations.

Application:

Soft to mediumhard formations such as shale, sandstone , medium granite, and certain marble with 10,000 to 35,000 psi compressive strength.

Series 60	Medium to Hard	50 -110	3000 to 6000



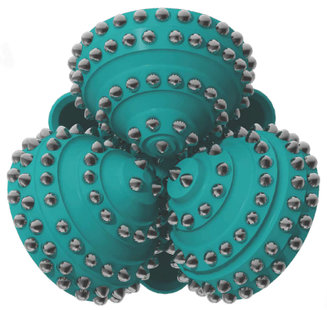
Cutting structure:

Medium projection and densely spaced conical or double conical inserts. Designed for high rates of penetration in medium to hard, and abrasive formations.

Application:

Medium to hard, and abrasive formations such as hard shale, hard limestone, quartzite, and basalt with 25,000 to 50,000 psi compressive strength.

IADC	APPLICATION	OPERATING PARAMETERS	
		Rotating Speed (RPM)	Weight On Bit(lb/in)
Series 70	Hard	50 - 90	3500 to 7500



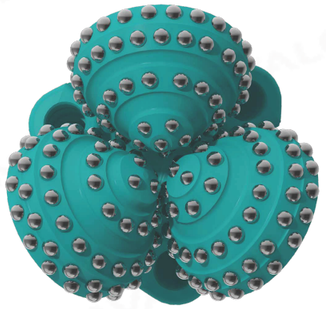
Cutting structure:

Short projection and densely spaced conical or double conical inserts. Designed for high rates of penetration in hard and abrasive formations.

Application:

Hard and abrasive formations such as hard quartzite, taconite, and banded ore with 35,000 to 60,000 psi com pressive strength.

Series 80	Extremely Hard	40-80	5000 to 8000



Cutting structure:

Minimum projection and densely spaced round top inserts. Designed for tough drilling application in extremely hard and abrasive formations.

Application:

Extremely hard and abrasive formations such as very hard chert, quartzite, and hematite ore with 50,000 psi and harder compressive strength.

Common Pin Connection

BIT DIAMETER	PIN TYPE
6 1/4" ~ 6 3/4"	3 1/2" API Reg.
7 5/8" ~ 9"	4 1/2" API Reg.
9 7/8" ~ 13 3/4"	6 5/8" API Reg., 6 BECO (Available)
14 3/4" ~ 16"	7 5/8" API Reg., 7 BECO (Available)