

THE AAD MILLION YEAR ICE CORE (MYIC) DEEP DRILL SYSTEM

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The Australian Antarctic Division (AAD) deep drill is an electromechanical cable-suspended drill based on the US IDP FORO3000 drill design, a derivative of the Hans Tausen family of drills. The drill system has been developed for the Million Year Ice Core (MYIC) Project and was built in-house at the AAD with collaborative input from US Ice Drilling Program and the University of Grenoble and other in the drilling community. The drill is designed to recover 3-m long 98mm diameter cores and is built to operate to ice depths over 3 km and at temperatures $<-50^{\circ}\text{C}$.

In the 2024-25 season and Inland Station support camp was established for the MYIC project at Dome Concordia North (DCN), 75.0422S, 123.6312E (ice thickness 3064 m). The site is ~9 km NE of Concordia Station and 45 km NE of the European Beyond EPICA Oldest Ice site at Little Dome C. MYIC field operations in 2024-25 included installation of the above-ground drill shelter along with completion of the drill incline trench, core processing line. Pilot drilling and reaming operations were completed using a modified Eclipse drill. Pilot drilling took 4.5 days to 150 m. Reaming was completed in 3 steps to 120 m in a further 6 days. In the coming 2025-26 season the program aims to install the fiberglass bore casing and drill fluid handling system and set up and commence drilling with the AAD deep drill system. Drilling to bedrock is scheduled for completion in 2028-29.

This presentation will provide an overview of the AAD deep drill design, build and capabilities and discuss some of the challenges experienced.

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