Rotary Core Barrel

Scientific Application

The Rotary Core Barrel (RCB) is a rotary coring system designed to recover core samples from firm to hard sediments and igneous basement. The RCB is crucial for oceanic crustal hard rock studies.

Operation

The RCB inner core barrel free falls (or is pumped) to the bottom of the hole through the drill string and latches into the RCB Bottom-Hole assembly (BHA). The BHA, including the bit and outer core barrel, is rotated with the drill string while the inner core barrel remains stationary. The main RCB bit trims the 2.31-in. core. The inner barrel can hold a 9.5-m core and is retrieved by wireline.

Features

Rugged Design

The RCB BHA, bit, and inner core barrel assembly have a rugged design for use in abrasive and fractured hard sediments and igneous basement. This leads to longer bit survival, greater coring depths, and fewer mechanical failings.

Drilling with Center Bit

A center bit can be used to drill the hole without attempting to recover core. Drilling is faster than coring, allowing deep objectives to be reached in less time. The center bit can be interchanged with a core barrel for spot coring at any time.
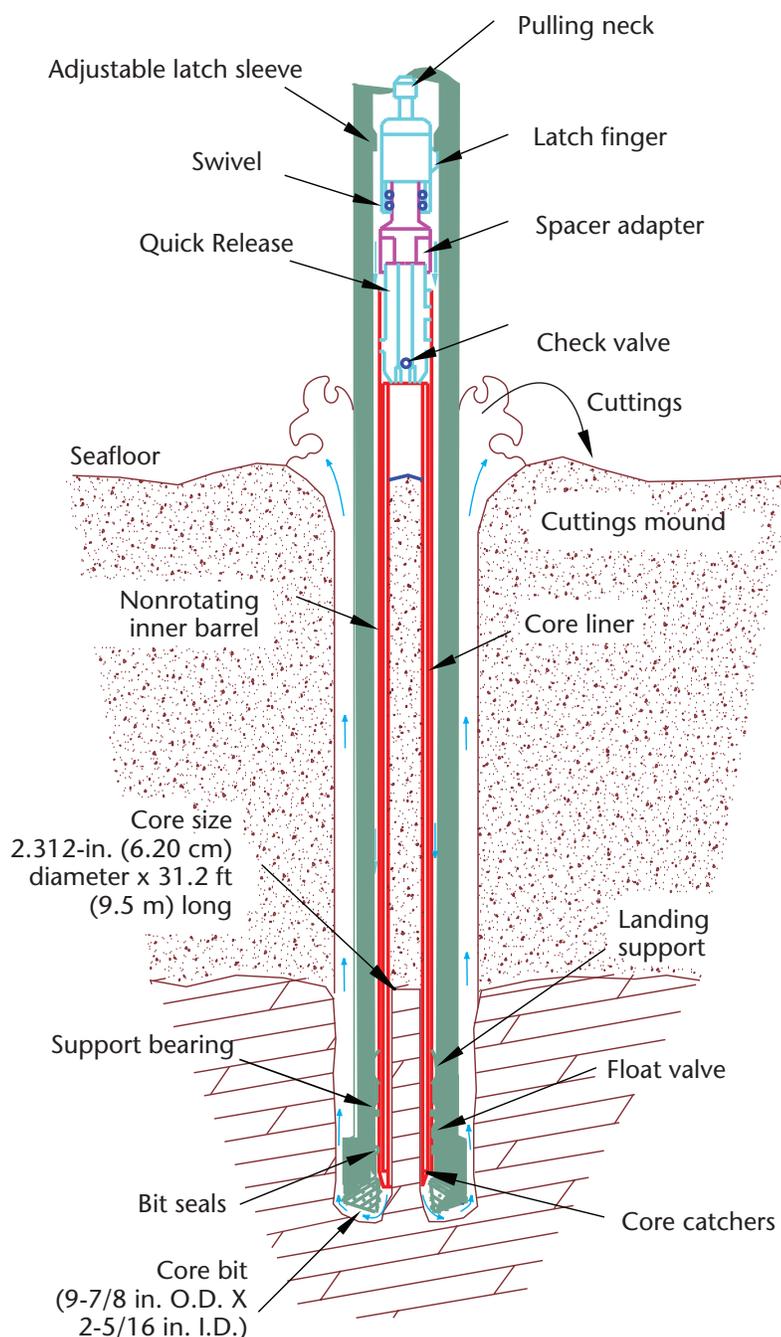
Schematic of the RCB coring system in coring mode.

Wireline Logging with Bit Release

A Mechanical Bit Release (MBR) can be operated by wireline to drop the bit in the hole or on the seafloor and provide a fully open BHA for logging. Wireline logs can then be run after coring without making a pipe trip to install a logging bit.

Specifications

Core Diameter:

5.87 cm (2.31 in.)

Maximum Core Length:

9.5 m   (31.16 ft)

Typical Operating Range

Formation

Firm to very hard sediments and igneous basement

Depth Range

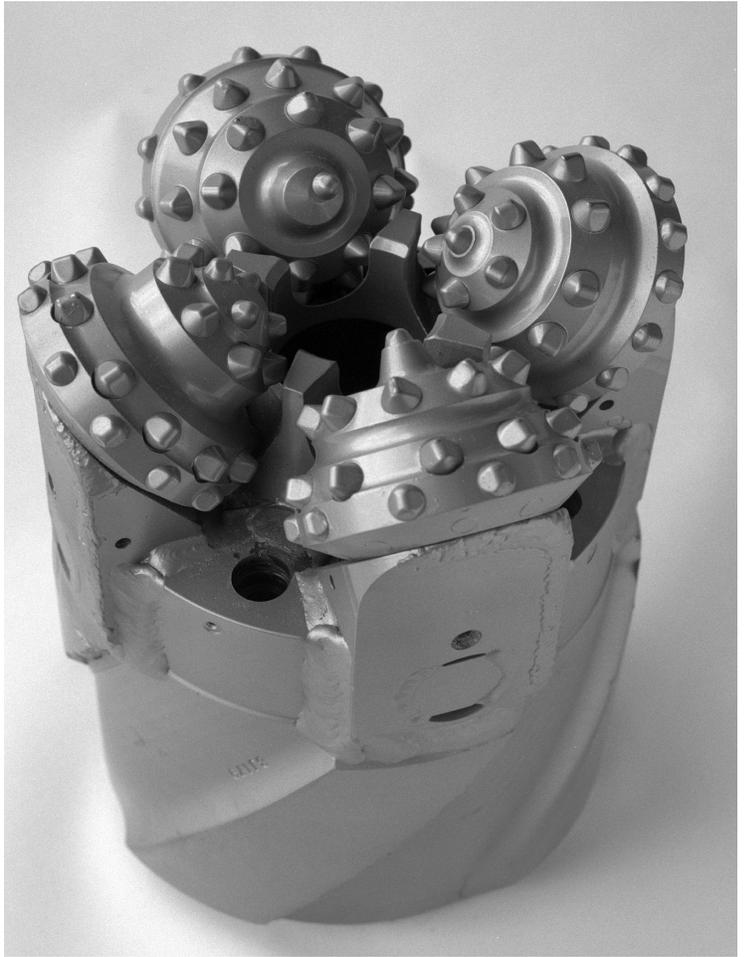Seafloor through igneous basement

Mean Recovery

35% depending on formation

Rate of Penetration

0.8 to 4.0 m/hr, depending on formation

Limitations

Does not recover soft sediments or granular formations (such as sand, fractured rock, or rubble)

RCB coring bit (shown upside down).