

Extended Core Barrel

Scientific Application

The Extended Core Barrel (XCB) coring system is used in sedimentological, climate, and paleoceanographic studies.

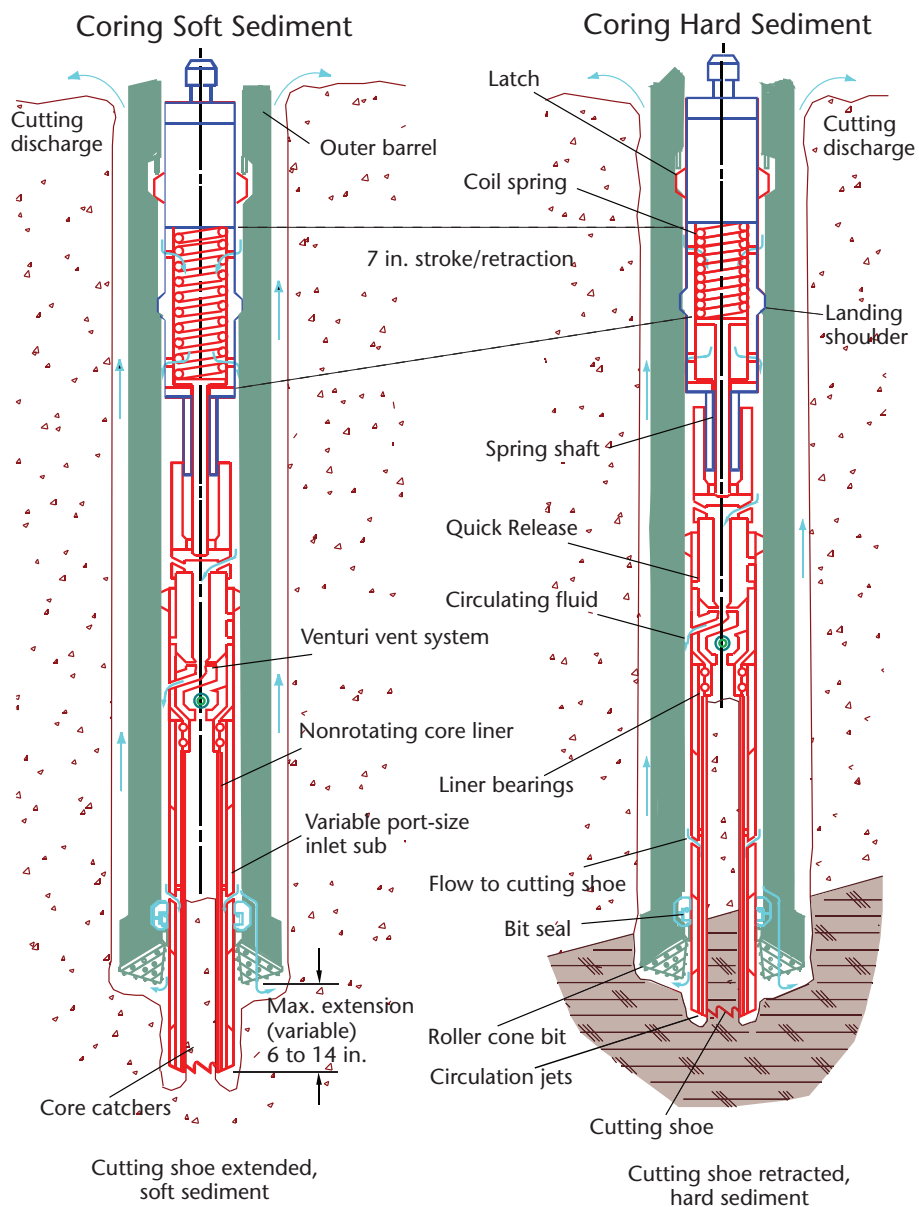
Operation

The XCB is used to recover 9.5 m long core samples from soft to moderately hard formations. The XCB is typically deployed when the formation becomes too stiff to piston core (i.e., upon piston coring "refusal") or when it is not hard enough to permit efficient recovery with the Rotary Core Barrel (RCB). The XCB relies on rotation of the drill string to advance the hole, and the XCB cutting shoe trims the core sample at the same time.

Features

Compatibility

The XCB uses the same bottom-hole assembly (BHA) as the Advanced Piston Corer (APC). Both tools are interchangeable depending on formation and no time is spent for pipe trips.



Schematic of the XCB. The XCB shoe extends 6 to 14 in. ahead of the bit in soft formations and retracts ~7 in. (inside the main bit) in hard formations.

Cutting Shoe

The XCB uses an integral cutting shoe to trim the core. The shoe is positioned ahead of the main core bit, which reduces core “washing” (i.e., core damage caused by water jets from the main drill bit nozzles). This improves core recovery and reduces core disturbance in soft to moderately hard formations.

A unique retraction device allows the XCB to retract inside the BHA to reduce failures when hard formations are encountered.

Nonrotating Core Liner

An inner core barrel swivel allows the core to remain stationary relative to the formation as the bit rotates, thereby reducing the transfer of rotary torque to weakly laminated formations. This reduces “biscuiting” (artificial layering), which is a type of core disturbance caused by transferring rotary torque to the core.

Specifications

Core Diameter

5.87 cm (2.31 in.)

Maximum Core Length

9.5 m (31.16 ft)

Typical Operating Range

Formation

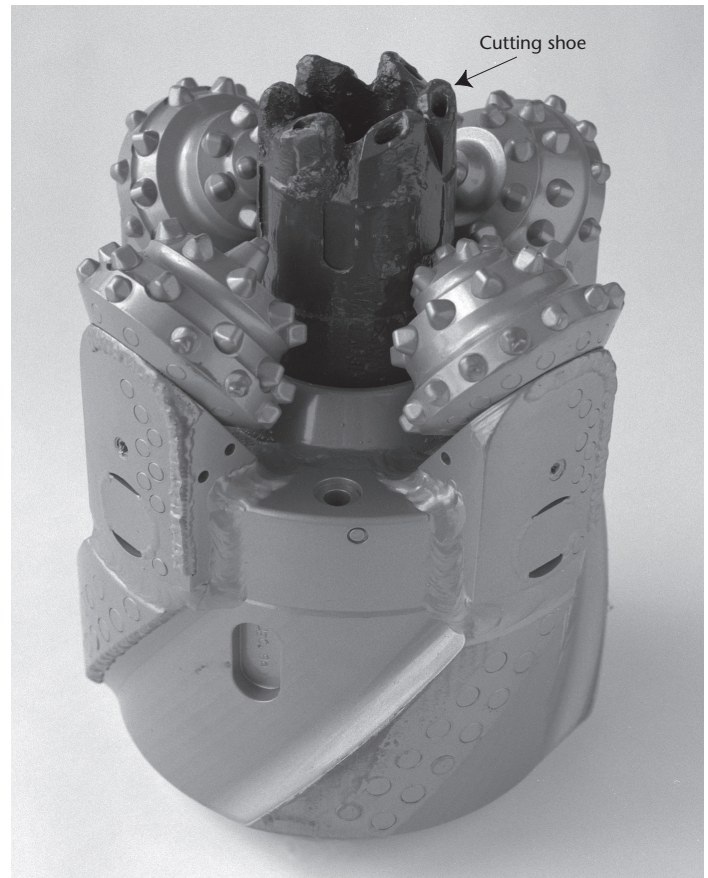
Soft to medium firm sediments

Depth Range

Typically from APC refusal to ~400 to 700 m below seafloor (mbsf) in sediments. Can core top of igneous basement (destroys shoe).

Rate of Penetration

Typically 12 to 30 m/hr.



XCB coring shoe extending through APC/XCB bit (shown upside down).

Limitation

Does **not** recover ooze or very soft sediments, granular formations (such as sand), fractured rock or rubble, or hard igneous formations.