

Scientific Application

The Advanced Piston Corer Temperature (APCT) tool is an instrumented version of the coring shoe that is run on the Advanced Piston Corer (APC). It is deployed in soft sediments to obtain formation temperatures to determine the heat flow gradient and is essential in determining hydrocarbon maturity for pollution prevention purposes.

Tool Operation

The APCT is deployed on an APC inner core barrel and provides a precise in situ temperature measurement while adding only 10 min to each core barrel run. Typically, the tool is run starting at 30 m below seafloor (mbsf) and then run after every other core until four good readings are obtained. The shoe is hydraulically stroked 9.5 m into the sediment and remains stationary for ~10 min. The APC inner core barrel is then retrieved, the instrumented shoe is removed, and the data is downloaded into a computer.



Continuous temperature measurements are recorded with the APCT core shoe embedded in the sediment.

Design Features

1) Temperature Measurement Without Wireline Trip

The APCT sensor, electronics, and memory are contained in an annular cavity inside the APC coring shoe. *Benefit:* Temperature measurements can be obtained without a special wireline trip with a temperature tool.

2) Minimal Time Impact

The APCT tool is deployed on an APC inner core barrel and remains stationary for ~10 min in the sediment.



APCT shoe with pocket to accept electronics, memory board, and battery for temperature measurements while taking an APC core.

Benefit: The APCT provides a precise in situ temperature while adding only 10 min to each core barrel run.

3) Rapid Data Download

The instrumented shoe is removed as soon as the APC inner core barrel is retrieved, and the data are downloaded into a computer program for immediate processing.

Benefit: Hydrocarbon maturity evaluations can proceed during coring to avoid delays for data handling.

APCT Specifications

Motorola 68HC811 microprocessor 32K x 8 bit CMOS RAM data storage Real-time clock 14-bit analog-to-digital converter Platinum temperature sensor ±0.02°C accuracy

Typical Operating Range

-20°C to +100°C temperature measurement range

Limitations

Can only be used in soft sediments appropriate for piston coring

Can only be used in relatively stable sediments where danger of hole collapse is minimal