

A large, stylized graphic of a gear or circular mechanism, composed of several concentric rings and segments, rendered in shades of blue and orange, occupying the central and lower portions of the page.

ResDOCTM
Pressure Coring
Services

Company



Corsyde International GmbH & Co. KG is a German company based in Berlin and the leading service provider in various fields of pressure coring and pressure core analysis.

With our long-standing experience in this sector, we support clients' projects in the oil and gas industry as well as research institutions when it comes to the evaluation of deep reservoirs and geological formations.

Corsyde International is committed to the highest standards of Health, Safety and Environment and to the reliability of our equipment. The lean company structure and the expertise of our specialists

allows us to react to our clients' individual needs with a great degree of flexibility.

We stand out from our competitors by providing unique technologies which allow access to a pristine and representative »micro reservoir« on the surface.

By encapsulating the entire core pressure tight directly at the point of extraction, the original condition is preserved and an unaltered rock sample can be analyzed on-site. This provides our clients with immediate high-quality information of crucial formation properties.

The ResDOC™ System consists of the “LPC” Core Barrel to retrieve large-diameter pressure cores and the “PCAL” System for the analysis of retained reservoir fluids as on-site multi-disciplinary solution for oil & gas applications.

The LPC allows for sealing the extracted samples in a pressure vessel and therefore the in-situ conditions as well as all of the liquids and gases present in the core remain in their aggregate state. Its innovative design leads to an exceptional combination of large cores at high reservoir-pressures even from small diameter boreholes.

The isobaric recovery process prevents the fluids from expansion and hence hinders any kind of significant change of the mechanical, geo-physical and structural parameters of the sample.

Tripping out can be conducted at the highest possible rates without the need for rig time consuming tripping schedules as they are used in conventional coring to reduce structural damage of the core. Combined with well established low-invasion coring procedures, pressure coring

results in a core sample of highest quality and significant evaluation validity.

Complemented with the PCAL System this retained and preserved “micro-reservoir” is analyzed while the core and its containing fluids are never exposed to the environment throughout the entire process.

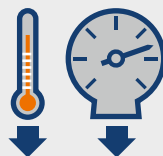
On-site pressurized analysis generates a first set of data, pressurized fluid samples and gas composition at different pressure stages within hours. The quantification of the fluids enables the determination of reservoir data like GIP, OIP, GOR, and others at the most accurate level.

Due to the controlled and slow process of pressure reduction, the original core retains a high degree of mechanical integrity providing superior quality for plugs used in subsequent RCAL and SCAL tests. The design and concept of ResDOC™ forms a basis for sophisticated analysis methods of pressure cores, like pressurized 3D-imaging and geo-technical analysis techniques to cover broader fields of application, maximize the analytical deployment spectrum and safe costs.

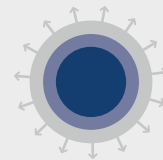
Advantages & Deliverables



FAST POOH SAVES RIG TIME



P/T LOGGING



HIGH CORE INTEGRITY THROUGH CONTROLLED AND SLOW DESPRESSURIZATION



WHOLE CORE BUBBLEPOINT DETERMINATION



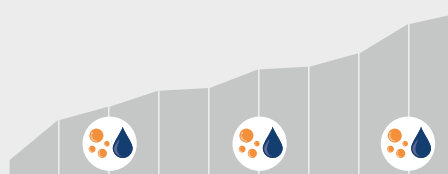
ACCURATE GAS VOLUME MEASUREMENT ON-SITE



ACCURATE FLUID VOLUME DETERMINATION ON-SITE



COMPOSITIONAL GAS ANALYSIS ON-SITE



GAS & FLUID SAMPLING AT DIFFERENT PRESSURE STAGES FOR LAB ANALYSIS

After the core is cut by conventional means, it is encapsulated in a pressure vessel.

All Liquids and Gases preserved

A special mechanism ensures that the captured pressure is maintained under varying temperatures.

Pressure Core is recovered under reservoir pressure

Pressure Regulation System (PRS)

Changes in temperature during the recovery process affect the pressure in the pressure vessel. The PRS controls and maintains the downhole pressure while pulling out of hole.

- Preservation of downhole (in-situ) conditions
- No core fracturing due to pressure changes
- No limitations in tripping speed saves rig time

Bypass and Protection System (BPS)

A special 3rd outer tube barrel allows permanent mud circulation at any time and protects the pressure vessel from wear.

- Permanent mud circulation (well control)
- Minimize mud contact with core
- Fail-safe protection system

Feature

Unit Length	25.8 ft. (7.85 m)
Recommended hole sizes	7 7/8" to 8 1/2"
Outer Barrel OD	6 1/3" (160 mm)
Core diameter	3 1/3" (85 mm)
Pressure Core Length	10 ft. (3 m)
Test-Pressure	15,000 psi (1035 bar)
Max. Operating Pressure	10,500 psi (725 bar)
Max. Operating Temperature	300°F (150°C)
Premium thread connections	
Corrosion & H ₂ S resistant	
Design according to international standards	
Drilling procedures similar to conventional Double Tube Core Barrels	



Activation Sub

A drop ball releases mechanisms to seal the core in the pressure vessel and activates the PRS.

Sensor Unit & Degassing Ports

In order to extract all gases and liquids from the pressure core vessel, degassing or analysis systems can be attached to the degassing ports. Temperature and pressure are constantly monitored at all times (RIH, coring, POOH, degassing).

- Safe and fast pressure vessel access for data acquisition
- Continuous pressure & temperature monitoring of the core

Pressure Vessel

The pressure vessel keeps the core under downhole conditions and maintains of all:

- Liquids
- Gases
- Core material

Core Head Section

The Core Head Section comprises the coring bit and the bottom valve of the pressure vessel and provides for:

- High core quality (low core contamination)
- Large core diameter & high pressure rating
- No core loss in unconsolidated formations while tripping out

The controlled degassing of the pressure core allows sampling and analysis of all gases and liquids contained in the core at reservoir pressure.

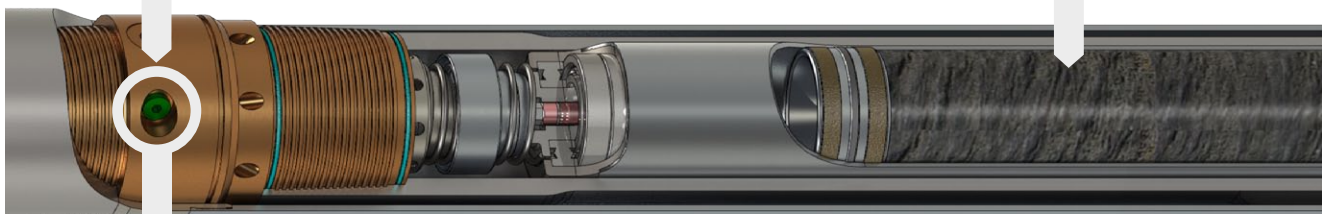
The knowledge of reservoir parameters is crucial for the optimal development of oil and gas fields.

Unprecedented results & high core integrity

Analysis of Pressure Cores reduces uncertainty in reservoir engineering

Ports for sampling of all fluids by controlled reduction of pressure.

The Pressure Core contains the original content of fluids and gases at near reservoir pressure.



Minimum Stress Depressurization

- Slow and controlled pressure relief avoids pressure induced cracking of the core
- Active temperature control of the Pressure Core
- Determination of whole core bubble point at reservoir temperature



Volume determination Measurements

- Precise determination of the volume of all gases
- Sampling and determination of all remaining liquids after depressurization



Fluid sampling

- Sampling of pressurized liquids and gases at different pressure levels
- Sample cylinders are certified for shipping by international standards
- Sample cylinders are H₂S resistant according to NACE standards

Conventional core handling & processing

- Marking, cutting & packing of core in shock resistant core boxes

Compositional gas analysis on-site

- Gas chromatography allows for a detailed determination of gas composition
- System allows for inline measurements and from gas samples
- Results are available on-site
- Precise, reliable and reproducible data.



Conventional & Unconventional Reservoirs

Fast Tripping Speed

Original Content

More Precise Data

Better Results

Fast & Reliable

Analysis

Price Competitive

Conventional Oil & Gas

Shale Oil & Gas

Tight Oil & Gas

Coal Bed Methane

Gas Hydrates

Carbon Capture and Storage

Natural Gas Storage

Scientific Drilling

Enhanced Oil Recovery

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