VINCI TECHNOLOGIES
Laboratory and field instruments for Petroleum Industry

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Porosity and permeability measurement

Coreval 700

The Coreval 700 is a fully automated permeameter and porosimeter dedicated to measure the porosity and permeability to helium/nitrogen of plug sized core samples at multiple confining pressures ranging from 400 psi to 10,000 psi. The instrument is provided with a data acquisition and calculation computer station. Permeability measurements can be made using the unsteady state pressure drop method. This data is used to determine the equivalent liquid permeability, slip and turbulence factors. Equivalent air permeability at a user specified pressure is also computed. Porosity and pore volume measurements are made using the Boyle's and Charles' law technique. Rock compressibility factor, fracture volume and real pore volume can also be computed.

Benefits:

- Large range of permeability
- Automatic pressure calibration
- Overburden pressure up to 10,000 psi
- Accurate data acquisition
- Fully automated

Measurements:

When the unsteady state mode is selected, the reservoir, manifold and sample are filled with gas.

After a few seconds for thermal equilibrium, the outlet valve is opened to initiate the pressure transient. When the upstream pressure has decayed to about 85 % of the fill pressure, during which time a smooth pressure profile is established throughout the core sample, data collection is started. The instrument employs an upstream gas manifold that is attached to the coreholder.

An upstream gas reservoir of calibrated volume is connected to, or isolated from, the calibrated manifold volume by means of a valve. An accurate pressure transducer that measures gauge pressure is connected to the manifold immediately upstream of the core holder. The outlet port from the coreholder is vented to the atmosphere through an outlet valve.

	Transducer calibration	Volume calibration	Real time	Measure	Calculs

	Graph	Measures

N°	Name	Kair(mD)	K∞(mD)	b(psi)	β(ft⁻¹)	φ(%)	V grain...	Grain ...	Bulk de...	V...	V...	...	...
0	20B	297,923	284,259	2,019	23 292 441,578	18,438	22,306	2,621	2,138	5...	2...	7...	...
1	1000	201,613	191,676	2,177	51 013 322,5	17,383	50,503	2,618	2,163	1...	6...	2...	...
2	801A	1,172	0,9	12,729	187 218 568 5...	7,977	25,229	2,598	2,391	2...	2...	0...	...
3	95B	0,11	0,052	46,123	373 786 199 0...	6,618	26,646	2,595	2,423	1...	2...	0...	...

Results:

- Klinkenberg permeability
- Air permeability
- Slip factor b
- Inertial coefficients (α and β)
- Real Pore volume
- Porosity
- Grain volume
- Grain density
- Rock compressibility
- Fracture volume

Specifications:

- Permeability range: 1µD to 10D
- Porosity range: 0.1 to 60%
- Max pore pressure: 250 psi
- Length: 0.5 to 3 inch
- Diameter: 1.0 inch, 1.5 inch or 30 mm
- Confining pressure : 400 psi to 10,000 psi
- Temperature : ambient
- Temperature accuracy : +/- 0.1 °C
- Pressure transducer accuracy: 0.1% F.S.
- Helium : 400 psi
- Nitrogen: 500 psi
- Air : 100 psi (dry)
- Power : 110/220 VAC, 50/60 Hz

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