



**INDIAN INSTITUTE OF TECHNOLOGY BOMBAY  
MATERIALS MANAGEMENT DIVISION  
Powai, Mumbai - 400076**

PR : 1000017021  
Rfx : 6100000695

**Technical Specification**  
**Multiphase relative permeameter**

Bench top system should be able to determine both liquid/liquid and gas/liquid steady and unsteady relative permeability of core samples under confinement. Liquid phases include water, brine and oil. Gaseous phases include CO<sub>2</sub>, N<sub>2</sub>, air, He, CH<sub>4</sub>. The system should be high pressure resistant with temperature control module for the gas/liquid and the sample. The system should be able to operate automatically and manually with precise control of flow and pressure. User friendly operation including manual, MS Excel spreadsheet calculation template using dedicated computer and software is required. System should be plumbed and tested in factory/workshop as per mentioned application and calibration to be demonstrated during installation.

**Core Holder**

1. Confining pressure tolerance: up to 7500 psi
2. Confining pressure loading: Hydrostatic
3. Pore pressure tolerance: up to 6000 psi
4. Temperature range: Ambient up to 100 °C
5. Core diameter: One (1) 1 inch, 1.5 inch , or 54 mm diameter , interchangeable parts
6. Core length: 1 to 4 inches
7. Core holder: Hassler type
8. Sleeve: Viton
9. One hydraulic hand pump for applying overburden pressure in core holder (up to 5000 psi)

**Plumbing**

1. Valving and piping: 316SS or better
2. Pressure tolerance: up to 7500 psi
3. Non - corrosive material
4. Automatic valve controls
5. Humidified gas delivery system allowing system to be used for gas/water unsteady-state relative permeability studies.

## **Injection pumps**

1. Maximum injection pressure up to 7500 psi
2. Flow rate: Constant rate operation ranging between 0.1 to 10 ml/s
3. Flow rate and volume accuracy:  $\pm 0.1\%$  of set point
4. Rate and volume repeatability:  $\pm 0.05\%$  of set point
5. Pressure accuracy:  $\pm 0.1\%$  of full scale
6. HPLC pump with operation at rates from 0.1 to 10 millilitres per minute and pressures up to 6,000 psi.
7. Constant rate and constant pressure mode

## **Fluid accumulators**

1. 2 floating piston SS316 fluid accumulators of 2 litre each for storing injection fluids. Rated pressure: 6000 psi
2. Thermocouples with minimum of  $\pm 1^\circ\text{C}$  resolution (Temperature range: Ambient to  $100^\circ\text{C}$ )

## **Other specifications and requirements**

- Core holder and accumulators designed to 4:1 safety factor and tested to 1.5x working pressure.
- Back pressure regulator for safety purpose
- Computer/laptop to operate the rig
- Software for easy data acquisition and operation, logging and interpretation
- Spare parts for 3 years operation
- Proof of calibration
- Warranty for three years period

## **Other terms and conditions :**

- A similar facility must have been supplied and functional, preferably in India. User reports to be provided and performance demonstration may be sought.