

## DATASHEET

# STEADY STATE GAS PERMEAMETER TechPERM<sup>TM</sup> Series



(\* Picture Shown for representation purpose only, Actual product may vary in size appearance, etc. )

**2023**  
RESEARCH & DEVELOPEMENT



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HEAD QUARTERS,

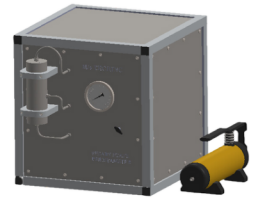
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India



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## TechPERM<sup>®</sup> Series



TechInc's Steady State Permeameter is a laboratory instrument used to measure the permeability of a porous material to a gas. Permeability is a measure of how easily a gas can flow through a material. It is an important property for many materials, including rocks, soils, membranes, and filters.

Steady State Permeameters work by measuring the flow rate of a gas through a sample of the material under a known pressure gradient. The permeability is then calculated using Darcy's law.

The sample setup is effortless and designed to work with a variety of samples. The software will fully control the instrument while running a test and in manual control. The data is automatically recorded and the reporting program will display the results for the test as well as export the results into Excel. The machine is robust and requires minimal maintenance for extended periods of time. The finest technology has been used in the production of this machine to provide the most accurate results.

This system is composed of a core holder, pressure sensors, accurate flow meters, a pressure reducer, Upstream Pressure Control Valve and an automatic pump for confining pressure. A computer latest configuration with Data acquisition system which makes automation of the instrument.

The versatile TechPERM determines both porosity and permeability to gas of plug-sized core samples. Specifically, porosity is determined from an isothermal nitrogen expansion and the application of Boyle's law and Charles' law. Gas permeability determination is achieved via the steady-state method, and subsequently the equivalent liquid permeability and slip is obtained by linear interpolation. The standard configuration consists of a control console, a quick-release Hassler core holder, a matrix cup and a data acquisition computer station enabling both manual and automatic operation. A hydrostatic high-grade stainless steel core holder can be provided for overburden pressure studies.



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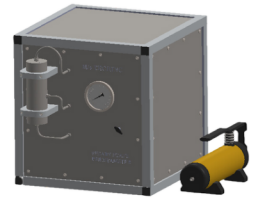
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# STEADY STATE GAS PERMEAMETER

## TechPERM<sup>®</sup> Series



**TAdvanced, Cost-Effective Device Designed for Easy Installation and Fast Operation**

The Tech Inc. TechPERM Steady State Permeameter is a robust solution for measuring gas permeability of a high permeability core sample under confining pressures up to 1,500 psi. Using the steady state method, the TechPERM calculates permeability by measuring the differential pressure and flow rate of testing media as it flows through a core sample. Innovative design allows for easy setup, use, and cleaning. Standard unit is compatible with nitrogen testing media (helium optional)\*.

**Versatile Device Supports High Permeability and Klinkenberg-Corrected Permeability**

The TechPERM measures gas permeability of high permeability cores using the steady state flow method. The gas at the entrance valve is initially pressurized. All valves are then opened, allowing the gas to flow through the core. At steady-state flow conditions ( $dP/dt=0$  and  $dq/dt=0$ ), the gas pressure and flow rate are measured and used to calculate the permeability using the integrated form of Darcy's Law for compressible fluids.

Permeability has been demonstrated to be a function of reciprocal pressure. The TechPERM is also able to calculate the Klinkenberg-corrected permeability using gas permeability measurements at different pressures.

**Preconfigured PC Includes Complementary, Advanced Tech Inc. Instrument M9175 Software**

Advanced, easy-to-use software is included free with each unit. No software installation or setup is required!

M9175 software is intuitive and compatible with all versions of Windows. A preconfigured computer, including all necessary hardware and software components, will be set up by Tech Inc. Instrument. The software comes preinstalled on the PC by a Tech Inc. Instrument technician for your convenience.



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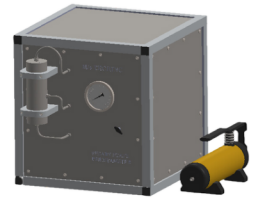
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This intuitive, user-friendly software automates testing and accurately records results from the unit to the PC, simplifying the testing workflow. Valves are automatically opened and closed, and almost all other testing procedures are fully automated step-by-step from start to finish. The user only needs to make very minimal regulator adjustments during testing, maximizing workflow efficiency. TechPERM software automatically measures, collects, and calculates data for the user. It can also calculate Klinkenberg-corrected permeability using gas permeability measurements at different pressures.

Data is saved in .csv file format and can be conveniently exported to Excel or any other spreadsheet software for further manipulation and analysis.

The software also generates charts and reports. In particular, Klinkenberg and low permeability data have special chart views for easy comparison.

**Tabletop Device Easy to Clean and Maintain**

This device fits easily on a standard tabletop or lab workbench. The chassis of this device is easy to wipe down. Cleanup between tests is quick and easy.

**The Tech Inc. Instrument Quality Promise**

The Tech Inc. TechPERM Steady State Permeameter is a powerful testing tool, allowing the user to analyze permeability precisely and accurately for numerous applications, including core flooding, permeability, core analysis, and more. Engineered with the latest in core technology, this reliable, long-lasting testing device features modern features and a design that have been successfully used by laboratories and large corporations worldwide.

Custom pressure, automation, specifications, and other solutions are also available! Contact Tech Inc. Instrument to learn more. Our team is readily available to answer any questions you may have and guide you to find the ideal custom solution for all your testing needs.



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# STEADY STATE GAS PERMEAMETER

## TechPERM<sup>®</sup> Series



Tech Inc. Instrument is an ISO 9001:2015 certified company

- Permeability measurement range from 0.01 mD to 15 D.
- Measures high permeability cores using steady flow method.
- Calculates Klinkenberg-corrected permeability based on multiple tests.
- Calculates grain density, inertial coefficients, and rock compressibility.
- FREE advanced, user-friendly software, compatible with all versions of Windows, included with each unit.
- Intuitive operation—user friendly, step-by-step software. Automates almost entire testing process, maximizing workflow efficiency.
- Software handles all control, measurement, data collection, calculation, and report generation.
- Easy-to-clean and minimal maintenance required.
- Compatible with nitrogen testing media (helium optional).
- Quick confining pressure build up and release.
- Easy to load, remove, and change core samples.
- Hassler-type core holder.
- Pressure transducer accommodates high differential pressure.

TECH INC  
Incubating Technologies



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## APPLICATIONS



Steady State Permeameters are used in a variety of industries, including:

- **Petroleum engineering:** To measure the permeability of reservoir rocks to oil and gas. This information is used to estimate the flow rates of oil and gas from the reservoir and to design production wells.
- **Geotechnical engineering:** To measure the permeability of soils to water and air. This information is used to design foundations, dams, and other structures.
- **Materials science:** To develop new materials with desired permeability properties, such as membranes for gas separation and filters for water purification.
- **Quality control:** To ensure that materials meet their specified permeability requirements.
- **Petroleum industry:** Steady State Permeameters are used to measure the permeability of rocks to oil and gas. This information is used to assess the potential of a reservoir and to design production strategies.
- **Petrochemical industry:** Steady State Permeameters are used to evaluate the performance of membranes used in gas separation and purification processes.
- **Environmental industry:** Steady State Permeameters are used to measure the permeability of soils and sediments to gases such as methane and carbon dioxide. This information is used to assess the risk of groundwater contamination and to design remediation strategies.
- **Food packaging industry:** Steady State Permeameters are used to ensure that packaging materials are effective at protecting food from spoilage. This is important for maintaining the quality and safety of food products.



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# STEADY STATE GAS PERMEAMETER

## SPECIFICATIONS



Permeability Range:	0.002 mD to 20 Darcy
Core Length:	Up to 3 inch
Core Dia:	1 to 1.5 inch
Flow pressure:	Custom as required. Constant rate or constant mean pressure.
Confining Pressure:	0 to 10,000 psi
Confining pressure System:	Manual Pump
Pressurizing Gas:	Clean, dry, compressed air or non-flammable, non-corrosive gas
Pressure Transducer Accuracy:	0.05% at full scale
Mass Flow Transducer Range:	10 cc/min – 10L/min Thermometer: $\pm 0.1^{\circ}\text{C}$
Flowmeter accuracy	1 % FS
Wetted Materials:	Stainless steel, Viton, Teflon
Power Requirements:	110/220 VAC, 50/60 Hz



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# STEADY STATE GAS PERMEAMETER

## FEATURES



- Values recorded and reported through TECHINC software.
- Simple sample setup
- Core holder designed to remove operator error during loading process
- Designed to work with variety of samples.
- Software will fully control the instrument while running a test and can be manually controlled too.

## TEST TYPE

- Permeability

## REPORTED VALUE

- Darcy Value

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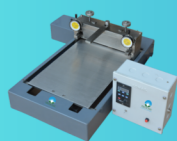
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# YOUR ASSOCIATES IN MEMBRANE RESEARCH

## MEMBRANE MAKING EQUIPMENT



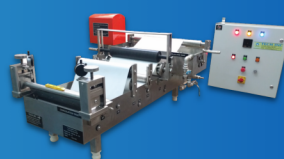
**FLATSHEET MEMBRANE  
CASTING MACHINE**



**FLATSHEET MEMBRANE  
CASTING MACHINE WITH  
HEATING FACILITY**



**FLATSHEET MEMBRANE  
ROLL CASTING MACHINE**



**FLATSHEET MEMBRANE  
ROLL CASTING MACHINE  
WITH HEATING FACILITY**



**HOLLOW FIBER  
MEMBRANE CASTING  
MACHINE**

## MEMBRANE TESTING EQUIPMENT

### MEMBRANE TEST SKIDS



**MD TEST SKID**



**MBR TEST SKID**



**RO TEST SKID**



**PERVAPORATION  
TEST SKID**



**FO TEST SKID**



**UF TEST SKID**

### MEMBRANE STIRRED CELLS



**HIGH PRESSURE  
STIRRED CELL**



**LOW PRESSURE  
STIRRED CELL**

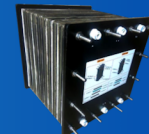
### MEMBRANE TEST CELLS



**HOLLOW FIBER  
TEST CELL**



**FO TEST CELL**



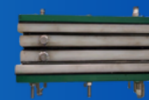
**STACK CELL**



**MD TEST CELL**



**PERVAPORATION  
TEST CELL**



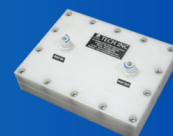
**STACK CELL**



**RO TEST CELL**

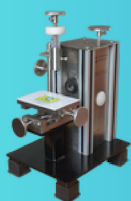


**CIRCULAR TEST  
CELL**



**DERLIN RO  
TEST CELL**

## MEMBRANE CHARACTERIZATION EQUIPMENT



**CONTACT ANGLE  
MEASUREMENT**



**MEMBRANE STRENGTH  
TESTER**



**CAPILLARY FLOW  
POROMETER**

## MEMBRANE MATERIALS

### CHEMICALS

- PES
- PVDF
- PS
- CA/CTA
- PAN

### ADDITIVES

- PVG
- PEG
- GRAPHENE OXIDE
- CNT
- TiO<sub>2</sub>
- LiCl

### SOLVENTS

- NMP
- DMAC

## MEMBRANES



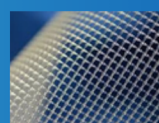
**FLATSHEET**

- MICRO FILTRATION FS & HF
- ULTRA FILTRATION FS & HF
- NANO FILTRATION FS & HF
- REVERSE OSMOSIS FS & HF
- FORWARD OSMOSIS FS & HF
- MEMBRANE DISTILLATION FS & HF
- MBR FS & HF
- GAS SEPARATION FS & HF



**HOLLOW  
FIBER**

## SPACERS



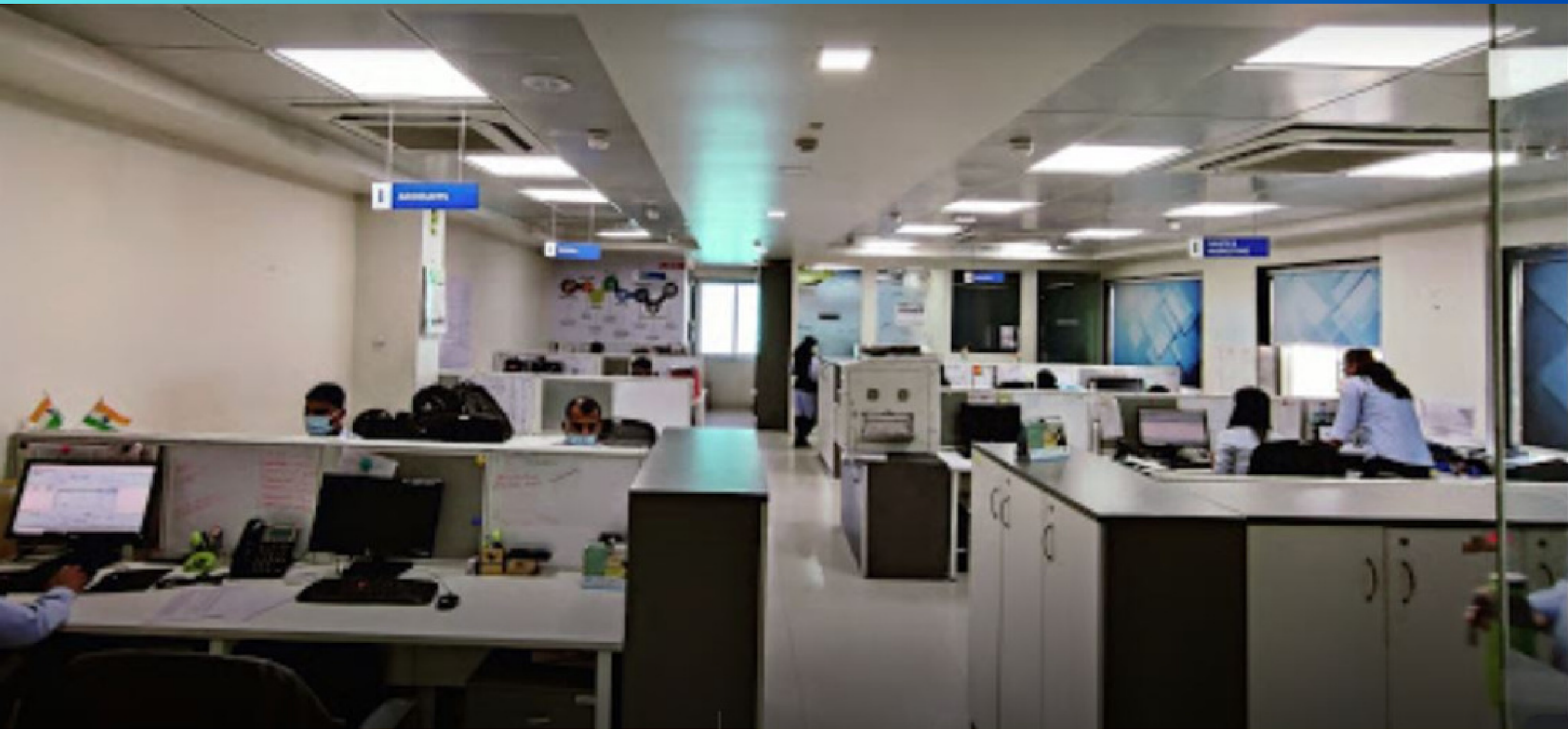
**FEED SPACER**



**PERMEATE SPACER**

## SUPPORT SHEETS





Tech Inc. Office

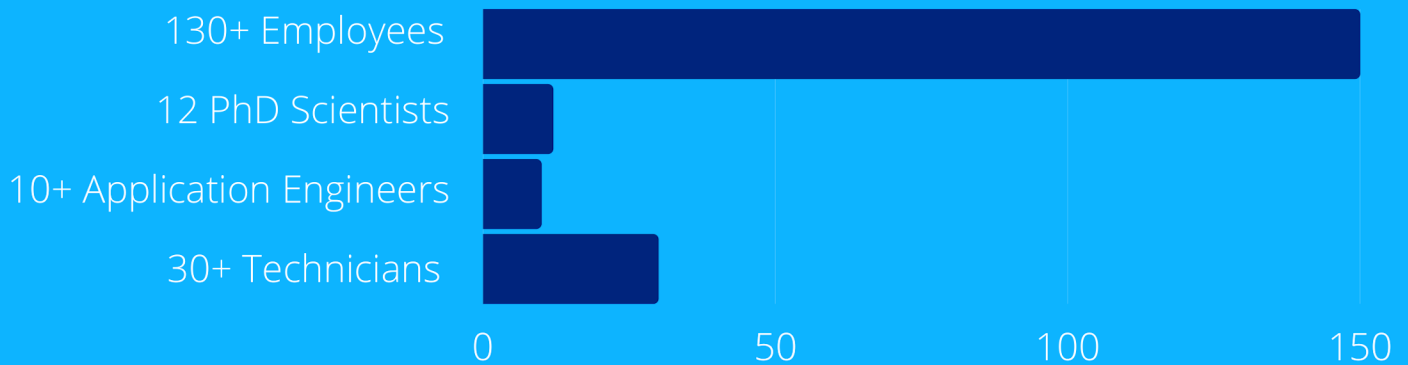


Tech Inc. Lab

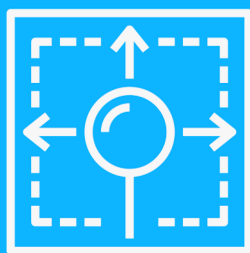




## Workforce

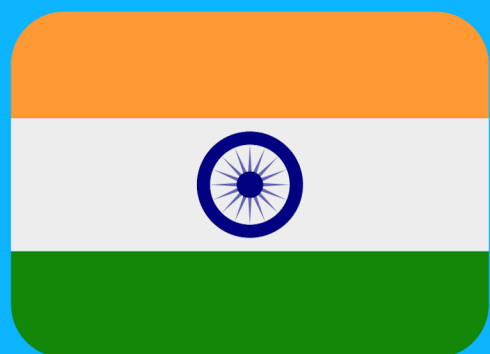


## Capacity



Factory FootPrint

>65,000 Sq.ft



# Our Facilities



Chennai, India

Facility 1 - Main Factory

Facility 2 - Equipment Factory

Facility 3 - Fabrication Factory

Facility 4 - Office



## Knowledge and Product Chart

### Membranes

#### Hydrophilic Membranes

MicroFiltration	MF
UltraFiltration	UF
NanoFiltration	NF
Forward Osmosis	FO

#### Hydrophobic Membranes

Membrane Distillation	MD
CO2 Sequestration	CO2

### COUNTRIES OF INSTALLATION





## OUR PRODUCTS

MEMBRANE MAKING EQUIPMENTS  
MEMBRANE TESTING EQUIPMENTS  
MEMBRANE CHARACTERIZATION EQUIPMENTS  
TEST CELLS  
FILM COATING  
AUTO SDI KIT  
SILTON SDI  
BATTERY COATING  
POROMETERS  
POROSIMETERS  
PERMEAMETERS  
FILTERS  
CHEMICALS  
MEMBRANES  
SPACERS  
SUPPORT SHEETS  
POWDERS  
MEMBRANES & MODULES

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