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# HEAT TRANSFER THROUGH LAGGED PIPE (EE-1559)

The setup is designed and fabricated to study lagging phenomenon in case of pipes. It consists of three concentric Pipes of small thickness as compared to diameter and are arranged concentrically, and closed with the help of two discs. Two different insulating materials fill the annuli between the cylinders compactly. Temperature Sensors are fitted to measure the temperature of pipe walls for radial outward heat flow measurement. Inside the inner pipe, a Nichrome wire heater is placed axially. Heat input the heater is given through a variac and measured by Digital voltmeter and digital ammeter. By varying the heat-input rates, wide range of experiments can be performed.

## EXPERIMENTS

- To estimate the actual rate of heat transfer through the composite cylinders from the measured interface temperature of the known value of thermal conductivity of the two insulating materials.
  To determine the effective thermal conductivity of the composite cylinders.
  To determine the theoretical temperature profile within the composite cylinders.

## UTILITIES REQUIRED

- Electricity Supply: 1 Phase, 220 V AC, 2 Amp.
- Table for set-up support

## TECHNICAL DETAILS

| | | |
|---|---|---|
| • G.I Pipe Inner | : | 5 cm dia. Approx |
| • G.I Pipe Middle | : | 10cm dia. Approx |
| • G.I Pipe outer | : | 15cm dia. Approx |
| • Length of Pipes | : | 60cm Approx |
| • Heater | : | Nichrome Wire |
| • Temperature Sensors | : | RTD PT-100 type (6Nos.) |
| • Control Panel | : | Digital Voltmeter : 0-300Volt.<br>Digital Ammeter : 0-200Amp.<br>Variac: 0-230V, 2A<br>Digital Temperature Indicator : 0-200.C, with multi-channel switch.<br>On/Off switch, Mains Indicator etc. |