Computerized Condensation in Drop wise & Film wise (Product Code: HMTC01)



Features

- Extensive range of Experiments
- Comprehensive teaching manual
- Three-year warranty
- Esthetically designed and finished Rig.
- High Quality instrumentation
- To compare Drop wise and Film wise condensation

Product Description

Condensation is the change in phase from the vapor state to the liquid or solid state. It can be considered as taking place either within a bulk material or on a cooled surface and is accompanied by simultaneous heat and mass transfer. Condensation plays a significant role in the heat rejection parts of the Rankine power cycle and the vapor compression refrigeration cycle, which generally involve pure substances. Dehumidification in air conditioning and the production of liquefied petroleum gases, liquid nitrogen and liquid oxygen and examples in which condensation in a mixture takes place. Condensation on cooled surface occurs in one of two ways: Film or Drop wise condensation.

In film condensation the liquid condensation forms a continuous film which covers the surface and takes place when the liquid wets the surface. This film flows over the surface under the action of gravity or other body surface, surface tension and shear stresses due to vapor flow. Heat transfer to the solid surface takes place through the film which forms the greatest part of the thermal resistance.

In Drop wise condensation the vapor impinges on the cool wall, reducing its energy and thereby liquidizing and forming drops which grow by direct condensation of vapor on the drops and by coalescence with neighboring drops until the drops are swept off the surface by the action of gravity or other body forces, surface tension and shear stresses due to Vapour flow. As the drops move they coalesce with other droplets in their path, sweeping a portion of the surface clean so that condensation can begin. The details of drop wise condensation are not completely understood bit it is known to take place under circumstance where the liquid does not wet the surface.

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Product / Component Specification

Water tank	Stainless steel approx. (App. 25 liters)
Glass column	ID-94mm x OD100mmx250mm height
Pump	Mono block with all necessary fittings
Digital voltmeter	0-300 volts AC
Digital ammeter	0-5 Amps AC
Digital temperature	0-300 Deg (K Type)
Thermocouple	K type
Stop watch	Digital
Protection	MCB
Steam Generator	Capacity : 8-10Ltrs Material of Construction : Stainless Steel Heater : 1.5KW
Pressure Gauge	Bourdon Type
Copper Tubes	2 No's (One with Natural Finish & other Ni-Polished) : Size : 19mm Dia & 170mm Length

Data Acquisition card

Analog Input	
Differential Channels	12
Resolution	12 bits
Sample Rate	200 Ks/s
Max Voltage	5 V
Number of Ranges	4
Simultaneous Sampling	Yes
On-Board Memory	5120 samples
Analog Output	
Channels	2
Digital I/O	
Input-Only Channels	30
Output-Only Channels	12
Timing	Software
Logic Levels	TTL
Maximum Input Range	0 V - 5V
Maximum Output Range	0 V - 3.3 V
Counter/Timers	
Counters	2
Max Source Frequency	84 MHz
Resolution	12 bits
Logic Levels	TTL
Total DC output Current on all I/O lines	130mA

Measurement of Temperatures at different points

Type Range Signal conditioning/transmitter Location	"K" 0-300°C Standalone Steam inlet temperature in drop wise
Type Range Signal conditioning/transmitter Location	"K" 0-300°C Standalone Specimen surface temperature in drop wise
Type Range Signal conditioning/transmitter Location	"K" 0-300°C Standalone Steam outlet temperature in drop wise
Type Range Signal conditioning/transmitter Location	"K" 0-300°C Standalone Steam inlet temperature in film wise
Type Range Signal conditioning/transmitter Location	"K" 0-300°C Standalone Specimen surface temperature in film wise
Type Range Signal conditioning/transmitter Location	"K" 0-300°C Standalone Steam outlet temperature in film wise

All the measured parameters from the sensor are connected to the computer

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