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Manufacturer & Exporter · Ambala, Haryana, India

PRODUCT DATA SHEET
Catalogue reference for product evaluation

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Radiation Heat Transfer Module | ThermoFlux - 7049/3

Category: Thermodynamics Lab Equipment · **Country of Origin:** India

Product Overview

The Radiation Heat Transfer Module ThermoFlux - 7049/3 is a laboratory module for verifying the fundamental laws of thermal radiation through direct experimentation. This radiation heat transfer module provides a 300 W electrically heated plate reaching approximately 460°C, seven metal specimens in stainless steel, aluminium, and copper across multiple surface finishes (135 x 145 mm each), and an aperture plate assembly for view factor experiments. Students verify the inverse square law, Stefan-Boltzmann Law, Kirchhoff's Law, emissivity, absorptivity, and geometric view factor relationships. Operation requires the Heat Transfer Service Unit ThermoFlux - 7049/3.

View this product online: https://scienticoindia.com/product/radiation-heat-transfer-module-thermoflux-7049-3/



Request a model-specific quotation
Include quantity and delivery country.

Technical Specifications

Radiation Heat Transfer Module ThermoFlux - 7049/3, Technical Specifications

Parameter	Value
Model	ThermoFlux - 7049/3
Heated Plate Power	300 W
Heated Plate Max. Temperature	Approx. 460°C
Specimen Face Dimension (W x H)	135 x 145 mm
Stainless Steel Specimens	1x bright (oxidises over time at high temperature)
Aluminium Specimen 1	1x matt anodized on both sides
Aluminium Specimen 2	1x painted on both sides (high-temperature paint)
Aluminium Specimen 3	1x matt anodized with one painted side
Copper Specimen 1	1x nickel-plated
Copper Specimen 2	1x bright (oxidises over time)
Total Specimens	7
Aperture Plate	Two plates, insulation on one side, insulated side faces heated surface
Required for Operation	Heat Transfer Service Unit ThermoFlux - 7049
Scope of Delivery	1 experimental module, 1 instruction manual

Technical Data

Heated Plate

Parameter	Value
Electrical Power	300 W
Maximum Temperature	Approx. 460°C

Stainless Steel Specimens

Specimen	Surface Finish	Dimension (W x H)
1	Bright, oxidises over time at high temperature	135 x 145 mm

Aluminium Specimens

Specimen	Surface Finish	Dimension (W x H)
1	Matt anodized on both sides	135 x 145 mm
2	Painted on both sides (high-temperature paint)	135 x 145 mm
3	Matt anodized with one painted side	135 x 145 mm

Copper Specimens

Specimen	Surface Finish	Dimension (W x H)
1	Nickel-plated	135 x 145 mm
2	Bright, oxidises over time	135 x 145 mm

Aperture Plate

Parameter	Value
Number of Plates	2
Insulation	On one side of each plate
Orientation During Experiment	Insulated side facing heated surface

Key Features

Key Features

- **Heated Plate:** 300 W, maximum temperature approx. 460°C, electrically heated radiant source
- **Radiation Heat Transfer Specimens:** 7 metal specimens across three materials: stainless steel, aluminium, and copper
- **Specimen Dimension:** 135 x 145 mm, uniform across all specimens
- **Stainless Steel:** 1 bright specimen, oxidises over time at operating temperature
- **Aluminium:** 3 variants: matt anodized both sides, painted both sides (high-temperature paint), matt anodized with one painted side
- **Copper:** 2 variants: nickel-plated and bright (oxidises over time)
- **Aperture Plate:** Two plates with one insulated side each, used for view factor and geometry experiments
- **Laws Demonstrated:** Inverse square law, Stefan-Boltzmann Law, Kirchhoff's Law, view factor geometry
- **Measurable Parameters:** Radiation intensity, surface emissivity, absorptivity, surface temperature, heat exchanged between surfaces
- **Required for Operation:** Heat Transfer Service Unit ThermoFlux - 7049/3

Experiments

- Demonstrate that the intensity of radiation on a surface is inversely proportional to the square of the distance from the radiation source, illustrating the inverse square law for thermal radiation

- Illustrate that the intensity of radiation increases with the fourth power of the source temperature, demonstrating the Stefan-Boltzmann Law
- Show that the intensity of radiation recorded by the radiometer is directly related to the radiation emitted by a source, influenced by the view factor between the radiometer and the source
- Measure the emissivity of radiating surfaces with various finishes, including polished and grey (silver anodized), in comparison to matt black
- Demonstrate how the emissivity of radiating surfaces in close proximity affects their surface temperatures and the amount of heat exchanged
- Validate Kirchhoff's Law, which states that the emissivity of a grey surface equals its absorptivity of radiation received from another surface when in thermal equilibrium
- Illustrate that the exchange of radiant energy between two surfaces depends on their geometry, specifically the extent to which each surface can see the other

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Construction and Design

The Radiation Heat Transfer Module ThermoFlux - 7049/3 is built around a 300 W electrically heated plate as the primary radiant source, capable of reaching approximately 460°C. Seven metal specimens, each 135 x 145 mm, are supplied in three base materials across a range of surface treatments to enable direct comparison of emissivity and absorptivity values. Stainless steel is supplied as a single bright specimen that naturally oxidises over time at high operating temperatures, introducing a changing surface condition for observation. Three aluminium specimens cover matt anodized on both sides, high-temperature painted on both sides, and matt anodized with one painted side. Two copper specimens cover nickel-plated and bright finishes, the latter also subject to oxidation over time.

This radiation heat transfer module includes an aperture plate assembly of two plates, each with insulation applied to one face. During experiments, the insulated face is oriented toward the heated surface to control the radiation geometry and support view factor investigations. The radiometer measures radiation intensity at the specimen surface for all quantitative experiments. All measured outcomes are compared against the predictions of the governing radiation equations, including the inverse square law, Stefan-Boltzmann Law, and Kirchhoff's Law. The module connects to and operates through the Heat Transfer Service Unit ThermoFlux - 7049.

Scope of Delivery

- 1 experimental module
- 1 instruction manual

Required for Operation

- Heat Transfer Service Unit ThermoFlux - 7049

Ordering & Delivery

- Send the product name, quantity, delivery country and destination with your enquiry.
- Production schedule, freight, payment terms and export documents are confirmed in the written quotation.

Frequently Asked Questions

Q1: What radiation laws and principles does the ThermoFlux - 7049/3 cover?
The module covers the inverse square law, the Stefan-Boltzmann Law (intensity proportional to the fourth power of temperature), Kirchhoff's Law (emissivity equals absorptivity at thermal equilibrium), view factor geometry, and the relationship between surface finish, emissivity, and heat exchange.

Q2: What specimen materials and surface finishes are supplied?
Seven specimens are supplied across three materials. Stainless steel: 1 bright specimen. Aluminium: matt anodized on both sides, painted on both sides with high-temperature paint, and matt anodized with one painted side. Copper: nickel-plated and bright. All specimens measure 135 x 145 mm.

Q3: What is the aperture plate used for in this radiation heat transfer module?
The aperture plate assembly consists of two plates, each with insulation on one side. The insulated side faces the heated source during experiments. It is used to control and vary the radiation geometry for view factor investigation experiments.

Q4: What is the maximum temperature reached by the heated plate?
The electrically heated plate is rated at 300 W and reaches a maximum temperature of approximately 460°C.

Q5: Is additional equipment required to operate the ThermoFlux - 7049/3?

Yes. The Heat Transfer Service Unit ThermoFlux - 7049 is required for operation. It provides the power supply, instrumentation, and display functions for the module.

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