

YTU Mechanical Engineering Department
Heat And Thermodynamics Division
Spec. Laboratory- Radiation Heat Transfer Lab. Report

Lab. Date:

Number:

Lab. Instructor:

Name Surname:

Group/Sub-group: /

Place of Lab.: E1 Block – Thermodynamics Laboratory

Course Topic: Radiation Heat Transfer

Subject: The determination of emissivity of the plates in radiation heat transfer

Devices and Materials :

- Radiation heat transfer experimental setup
- Emissivity is to be found in black, gray and mirror surface plates
- Radiometer
- Thermocouples

Required:

For different plates;

1. Calculate the values of emissivity according to different temperatures by using both radiometer and Stefan-Boltzmann approach,
2. Calculate the average value of emissivity,
3. Draw the graphical distribution of the emissivity on the temperature
4. Evaluate the results.

Experimental Study:

1. Emissivity calculation by using the value of radiometer :

Emissivity calculation by using Stefan-Boltzmann approach:

The average of calculated emissivities:

2. Results :



Surface Temperature	Radiometer R [W/m ²]		Ambient Temperature	q [W/m ²]		Emissivity, ε		Average Emissivity, ε _{ave}	
	Black Plate	Grey Plate		T _A [K]	Black Plate	Grey Plate	Black Plate	Grey Plate	Black Plate
T _s [K]									

3. Discussion:

4. The graphical distribution of the emissivity on the temperature:

