

ABSTRACT

A study has been made of temperature and velocity profiles, in air flow in a rectangular channel, downstream of a heat source of finite width. The static pressure profiles across the channel and across the heater have also been studied.

A heater which occupied one-sixth of the flow area was used as the heat source. Two different flow rates (34 fps, 44 fps) and two different heat rates (1.17 kw, 1.37 kw) were used in this study.

The results show that:

1. The enthalpy flux varied across the channel. The enthalpy flux profiles became broader as the distance from the heater increased.
2. Velocity of the flow was not affected by a heat source, but the mass flux varied across the channel due to variation in density.
3. Under the conditions studied, static pressures did not vary across the channel. Pressure variations in the flow direction were the same for heated and unheated flow.

EFFECT OF A FINITE HEAT SOURCE ON DOWNSTREAM
TEMPERATURE AND VELOCITY PROFILES FOR A
TURBULENT FLOW IN A RECTANGULAR CHANNEL

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CERTIFICATE OF APPROVAL OF THESIS

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