

**HEAT TRANSFER ENHANCEMENT TO COOLING WATER PIPE BY A SURFACE  
COMBUSTOR HEATER EQUIPPED WITH A  
CONVECTION-RADIATION CONVERTER**

**ผู้รับผิดชอบโครงการ** : Sumrerng Jugjai, Surachai Sanitjai, Sontipee Aimmanee,  
Tinnakorn Boonprasert

**เผยแพร่ผลงาน** : RERIC International Energy Journal : Vol.20, No.2, December 1998  
pp. 91-105

This experimental study discusses the operation of a surface combustor heater (SCH) which has the potential to enhance heat transfer in fossil-fired industrial furnaces and equipment. The SCH is a combustion heater device involving relatively cold heat exchange surfaces (or tubes) embedded in a stationary bed of fibrous material in which a gaseous fuel is burned. The primary purpose of this experimental study is to apply porous medium technology or a convection-radiation converter (CRC) to a surface combustor heater (SCH) so as to enhance the rate of heat transfer to the cooling water pipe. The effects of various parameters, which are expected to control the performance of the SCH such as operating conditions and radiation properties of the porous bed, are clarified. The results show that the coupled CRC and SCH system yields a Nusselt number of about 15 times higher than that of a force convection only system.