Good research paper about heat transfer: convection for the external surface of a...

Business

Introduction

Building simulation methods should focus on the effect that occurs between convective heat repulsion between external air circulation and the given wall surfaces. This study will take a closer look on the effects of heat transfer on a brick surface. A tetrahedral mesh will be used to scertain for the effects that are caused on the walls. A brick wall is known for its thermal characteristic of absorbing heat. Therefore, this thermal property will also be studied in this study. Most authors have attributed this norm to behavior of the different correlations that are used to estimate the exact value of the convective heat transfer coefficients. However, a definitive research study has established that the choice of convective heat transfer coefficients values is the factor that causes the 20-40% differences of energy requirements (Theerthan et al. 16).

Objective of the Study

This study evaluates the resultant effect of convectional currents of air or wind around a given surface. This study also aims to find out what are the real causes of this behavior of air on such surfaces. The study seeks to establish appropriate techniques used to prevent such an effect from taking place on the given surfaces. this study also seeks to ascertain the thermal properties of a brick wall. Factors affecting the brick wall is also taken into consideration in this study.

Type of the Surface;

This study performed on a tetrahedral mesh surface measuring two meters in length. The wind velocity regulated at 10m/s. A tetrahedral mesh is

chosen due to its homogeneous distribution of its surfaces. Therefore, this property allows the air velocity to pass through the surface homogenously; thus, biases in terms of air passing through a given part of the surface will not be experienced; this s due to the convectional currents of the air that allows a smooth flow of the air over a given surface.

Three-prism layer placed near the physical surfaces. This provides a platform of exact estimation of the wind velocity and cross analysis of the consequential effects of the effects of the convectional effects of the air. This is also in line with the behavioral design of how the air rotates around this surface and the consequential effects that it brings along with it. Velocity regulation through an increase or decrease gives different results that can be analyzed independently (Chien-Hsin, 19). The case of an increase in the velocity of the air, some extra heat felt from these surfaces. This extra heat is caused by the hydraulic effect that is from at the mesh surfaces. Therefore, this results to undesirable destruction effect on the surfaces of the wall. A long-term analysis of this effect yields

In this study, the heat transfer coefficient that is to be used is;

$H = q/\sum T$

Heat transfer coefficient is defined as the consequential proportionality term between the heat flux and the driving force (thermodynamic) for heat flow, for example, a temperature difference. This study aims to ascertain the temperature difference that is brought about by the difference in the convectional heat flows.

Option 1

The first option that is used to reduce the convection effect is by reducing the velocity of the air and increasing the temperature. The velocity of the air can be reduced to 5m/s, while the temperature can be increased from 5k to 10k. This produces desirable results. A sensitivity analysis of this option shows that; increased in temperature reduces the effects that are caused by the currents on motion; this, therefore, reduces the consequential effects of the heat transfer. In this study, the smooth perforations in the mesh allow free circulation of the air around it irrespective of the speed, this shows that, air circulation is free from any possible distraction by any material (Lachi, 814).

The new heat transfer coefficient can be as follows;

$H= q/\sum 2T$

This means that the eventual effects of heat transfer on air circulation will not be experienced due to the reduced velocity. Velocity increases the potentiality of an object being revolved around the currents; therefore, any chances of perceived corrosions on the wall can easily be reduced by the small perforations on the wall. Heat transfer is a technical procedure that needs a person with a clear understanding of physics and properties of thermodynamics.

Option 2

A sensitivity analysis of this study shows that, pressure results when the air velocity runs through the perforations. This generates some turbulence; the extent of this turbulence is too extensive and can easily result to corrosion if

it can in contact with the walls. Therefore, a possible heat transfer across the smooth perforations of the tetrahedral mesh generates a force that cannot be easily contained.

The best technique or rather the appropriate option to apply in this scenario is by reducing the air pressure. This will result to cognitive reduction of the turbulence force. Therefore, regulating the perforations on the tetrahedral mesh to be a little wider gives a clear analysis of how this effect can be reduced. The heat transfer coefficient gives that all the thermodynamics properties must be followed to the later. Therefore, in applying this technique, than less corrosion of the wall surfaces can be experienced.

The most effective heat transfer coefficient for this option is;

$H= (q/\sum 3T)\times(jd/\mu)$

This coefficient is a clear analysis of how this effect can be reduced appropriately. Thus reducing the possible wall surfaces corrosion; also, constant replacement of the tetrahedral mesh will yield appropriate results.

Works Cited;

Chien-Hsin, Chen. " Combined Effects Of Joule Heating And Viscous Dissipation On Magnetohydrodynamic Flow Past A Permeable, Stretching Surface With Free Convection And Radiative Heat Transfer." Journal Of Heat Transfer 132. 6 (2010): 19.

Lachi, Mohammed, et al. " Alternative Models For Transient Convection Heat Transfer In External Flows Over A Plate Exposed To A Variable Heat Flux." International Journal Of Thermal Sciences 43. 8 (2004): 809-816.

Theerthan, S. Ananda, and Jaywant H. Arakeri. " Planform Structure And Heat

Transfer In Turbulent Free Convection Over Horizontal Surfaces." Physics Of Fluids 12. 4 (2000): 16-17.