Abstracts

Coefficient of Wind Force and Its Estimation Using the Small Plane Model Assuming a Difference in Tree Form

by

Kohji FUKUDA, Motohiro SUGIYAMA, Ryosuke OHKAWA and Katsumi HIRAOKA
(Received on Mar. 31, 2004, accepted on June 16, 2004)

Abstract

A series of wind tunnel tests has been performed on the small plane model assuming a difference in tree form. The small plane model is manufactured with a tree crown part using plywood and plastic board (the form of each of five boards, whose area ranges from 144.5cm² to 450cm², differs) and a trunk part using vinyl chloride rod. Testing was conducted by making a steady wind act gradually from a wind velocity of 4m to 22m, and the rate of acceleration, which disturbed the flow of air artificially at each wind velocity, was measured. The wind force coefficient, $C_D$, of each small plane model was calculated from the experiment result, and the relationships between $C_D$ and wind velocity, $C_D$ and the aspect ratio of the plane model, and $C_D$ and a dominant frequency were investigated. It was shown that the coefficient of wind force can be presumed from the area and the aspect ratio of the plane model by formulating and arranging these relationships.

Keywords: Wind tunnel tests, Coefficient of wind force, Small plane model, Re-vegetation, Tree

---

Changes of gas contents in $\gamma$-iron on oxidation

by

Tokio TAGUCHI*1

(Received on Mar. 31, 2004 & accepted on Jun. 29, 2004)

Abstract

This experiment purpose study changes of gas contents in $\gamma$-iron on oxidation. $\gamma$-iron was oxidized under atmospheric pressure and 1273K. The treatment times were $5.4 \times 10^3$, $1.08 \times 10^4$, $1.8 \times 10^4$ and $2.88 \times 10^4$ seconds. In a previous paper, it was reported that nitrogen is absorbed at about $1.08 \times 10^4$ seconds by the material. In this study, however, nitrogen was absorbed within $1.8 \times 10^4$ seconds in the $\gamma$-iron. The difference between the previous study and this study is probably due to the oxygen present in the specimen. Oxygen potential and oxygen in the specimen might prevent nitrogen from being absorbed by the $\gamma$-iron. Nitrogen is absorbed by the $\gamma$-iron because the oxygen potential above of the specimen might decrease with oxidation time. The thickness of oxidation scale obey the parabolic law.

Keywords: $\gamma$-iron, oxidation, nitrogen, gas contents

*1 Educational Support Center

---

Proceedings of the School of Engineering,
Tokai University, Series E