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Flow Induced By Fire in A Compartment

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TABLE OF CONTENTS

	Page
List of Figures	iv
List of Tables	v
Abstract	viii
Nomenclature	ix
INTRODUCTION	1
DESCRIPTION OF THE EXPERIMENT	1
ANALYSIS OF EXPERIMENTAL DATA	2
THEORETICAL ASPECTS	4
DISCUSSION OF RESULTS	5
CONCLUSIONS	8
ACKNOWLEDGEMENTS	9
REFERENCES	9
APPENDIX A. Summary of Experimental Results	23
APPENDIX B. Listings of Intermediate Results	27
APPENDIX C. Radiation Error Associated with Opening Gas Temperature Measurements	90

LIST OF FIGURES

		Page
Figure 1.	Experimental arrangement	10
Figure 2.	Room opening configurations with dimensions in m	11
Figure 3.	Gas burner locations with dimensions in m	12
Figure 4.	Fire-induced flow dynamics	13
Figure 5.	Doorway velocity profiles for W = 0.74 m, H = 1.83 m, Q = 62.9 kW, and flush burner in positions A and B	14
Figure 6.	Gas temperatures for W = 0.74 m, H = 1.83 m, Q = 62.9 kW, and flush burner in position A	15
Figure 7.	Opening mass flow rate as a function of ventilation parameter for fixed fire strength and flush burner in positions A, B, and C	16
Figure 8.	Opening mass flow rate as a function of fire strength for fixed doorway opening and fush burner in positions A, B, and C	17
Figure 9.	Doorway mass flow rate in kg/s for raised burner in various locations, Q = 62.9 kW, W = 0.74 m, and H = 1.83 m	18
Figure 10.	Correlation of opening mass flow rate with idealized flow model	19
Figure 11.	Entrained mass flow rate per unit density as a function of entrainment height for fires located away from walls	20
Figure 12.	Entrained mass flow rate per unit density as a function of entrainment height for fires located near centers of walls	21
Figure 13.	Entrained mass flow rate per unit density as a function of entrainment height for fires located near corners	22
Figure B-1.	Sensor locations with dimensions in m	33

LIST OF TABLES

		Page
Table A-1.	Summary of experimental results	24
Table B-1.	Key to intermediate results	32
Table B-2.	Corrections for opening thermocouples near or above neutral plane and attendant percent changes in mass flux	34
Table B-3.	Test 10; 2/6 door, 62.9 kW, location A	35
Table B-4.	Test 11; 3/6 door, 62.9 kW, location A	36
Table B-5.	Test 12; 4/6 door, 62.9 kW, location A	37
Table B-6.	Test 612; 4/6 door, 62.9 kW, location A	38
Table B-7.	Test 13; 5/6 door, 62.9 kW, location A	39
Table B-8.	Test 14; 6/6 door, 62.9 kW, location A	40
Table B-9.	Test 18; 6/6 door, 62.9 kW, location A	41
Table B-10.	Test 710; 6/6 door, 62.9 kW, location A	42
Table B-11.	Test 810; 6/6 door, 62.9 kW, location A	43
Table B-12.	Test 16; 7/6 door, 62.9 kW, location A	44
Table B-13.	Test 17; 8/6 door, 62.9 kW, location A	45
Table B-14.	Test 22; full window, 62.9 kW, location A	46
Table B-15.	Test 23; 2/3 window, 62.9 kW, location A	47
Table B-16.	Test 30; 2/3 window, 62.9 kW, location A	48
Table B-17.	Test 41; 1/3 window, 62.9 kW, location A	49
Table B-18.	Test 19; 6/6 door, 31.6 kW, location A	50
Table B-19.	Test 20; 6/6 door, 105.3 kW, location A	51
Table B-20.	Test 21; 6/6 door, 158. kW, location A	52
Table B-21.	Test 114; 2/6 door, 62.9 kW, location B	53
Table B-22.	Test 144; 3/6 door, 62.9 kW, location B	54
Table B-23.	Test 212; 4/6 door, 62.9 kW, location B	55

Table B-24. Test 242; 5/6 door, 62.9 kW, location B..... 56

Table B-25. Test 410; 6/6 door, 62.9 kW, location B..... 57

Table B-26. Test 210; 6/6 door, 62.9 kW, location B..... 58

Table B-27. Test 310; 6/6 door, 62.9 kW, location B..... 59

Table B-28. Test 240; 7/6 door, 62.9 kW, location B..... 60

Table B-29. Test 116; 8/6 door, 62.9 kW, location B..... 61

Table B-30. Test 122; full window, 62.9 kW, location B..... 62

Table B-31. Test 224; 2/3 window, 62.9 kW, location B..... 63

Table B-32. Test 324; 2/3 window, 62.9 kW, location B..... 64

Table B-33. Test 220; 6/6 door, 31.6 kW, location B..... 65

Table B-34. Test 221; 6/6 door, 105.3 kW, location B..... 66

Table B-35. Test 514; 2/6 door, 62.9 kW, location C..... 67

Table B-36. Test 544; 3/6 door, 62.9 kW, location C..... 68

Table B-37. Test 512; 4/6 door, 62.9 kW, location C..... 69

Table B-38. Test 542; 5/6 door, 62.9 kW, location C..... 70

Table B-39. Test 610; 6/6 door, 62.9 kW, location C..... 71

Table B-40. Test 510; 6/6 door, 62.9 kW, location C..... 72

Table B-41. Test 540; 7/6 door, 62.9 kW, location C..... 73

Table B-42. Test 517; 8/6 door, 62.9 kW, location C..... 74

Table B-43. Test 622; full window, 62.9 kW, location C..... 75

Table B-44. Test 522; full window, 62.9 kW, location C..... 76

Table B-45. Test 524; 2/3 window, 62.9 kW, location C..... 77

Table B-46. Test 541; 1/3 window, 62.9 kW, location C..... 78

Table B-47. Test 520; 6/6 door, 31.6 kW, location C..... 79

Table B-48. Test 521; 6/6 door, 105.3 kW, location C..... 80

Table B-49. Test 513; 6/6 door, 158. kW, location C..... 81

Table B-50. Test 160; 6/6 door, 62.9 kW, location AR..... 82

Table B-51. Test 161; 6/6 door, 62.9 kW, location BR..... 83

Table B-52. Test 162; 6/6 door, 62.9 kW, location CR..... 84

Table B-53. Test 163; 6/6 door, 62.9 kW, location DR..... 85

Table B-54. Test 164; 6/6 door, 62.9 kW, location ER..... 86

Table B-55. Test 165; 6/6 door, 62.9 kW, location FR..... 87

Table B-56. Test 166; 6/6 door, 62.9 kW, location GR..... 88

Table B-57. Test 167; 6/6 door, 62.9 kW, location HR..... 89

Flow Induced by Fire in a Compartment

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ABSTRACT

Fifty-five full-scale steady-state experiments were conducted to study the flow induced by a simulated pool fire in a compartment under conditions characteristic of the developing fire. The mass flow rate through the door or window opening and bounds on the fire plume entrainment rate are presented as a function of opening geometry, fire strength, and fire location.

The characteristics of the measured opening flow rates are explained by a simple hydrostatic model based on temperature distribution. A good correlation between the measured results and the idealized flows, taking into account the complete temperature distribution, is demonstrated.

Entrainment results for fires near walls are in reasonable agreement with results from free-standing plume models. Except for the smallest openings, fires in other locations entrain at a rate two to three times the rate predicted by these models. This phenomenon is attributed to room disturbances caused by the opening flow and is similar to the behavior of a fire plume in a cross wind.

Key Words: air flows; compartment fires; entrainment; flow rates; fire plumes; opening flows

Nomenclature

A_o	Opening area
C	Opening flow coefficient
c_p	Specific heat
g	Gravitational acceleration
H_o	Opening height
$\dot{m}_a$	Rate of air flow
$\dot{m}_e$	Rate of mass entrained by fire
$\dot{m}_g$	Rate of gas flow from room
$\dot{m}_j$	Rate of hot layer gas mixed into air stream
$\dot{m}_{pt}$	Rate of mass entrained by a point source plume
N	Height of neutral plane
Q	Rate of energy release
T_a	Temperature of gas in surrounding area
T_ℓ	Average temperature of lower gas layer
T_o	Temperature of gas on vertical centerline of room opening
T_u	Average temperature of upper gas layer
T_r	Temperature of gas in room
T_∞	Ambient temperature
v	Velocity of gas in opening
W_o	Opening width
Z	Vertical coordinate
Z_e	Entrainment height
Z_i	Thermal interface height
θ	Fire plume angle
ρ	Density of gas in opening
ρ_a	Density of gas in surrounding area
ρ_ℓ	Average density of gas in lower layer
ρ_∞	Ambient density

Introduction

The flow of air and gases in room fires has a significant bearing on the development and state of the fire. In developing fires it controls the temperature and heat transfer and thereby influences the spread of the fire. In the fully involved fire stage, after flashover, the rate of air flow is known to control the rate of fuel mass loss, i.e., the ventilation controlled fire. Simple theories have been developed (Kawagoe[1*], Thomas et al[2]) for buoyancy driven flows in fully developed compartment fires, and by Rockett[3] and others for the developing (smaller) fire period. The latter model serves as a basis for more elaborate systems (zone) models which predict the entire developing fire process (e.g., Emmons[4]).

Until now there has been no systematic experimental study of fire induced flows. This has been due in part to the difficulty of making accurate and sufficient velocity measurements to arrive at a mass flow rate for a door or window. The present study has addressed this problem using a steady-state full-scale fire experiment with sufficiently accurate velocity instrumentation and automated data collection. The focus of the study is the "small" fire characteristic of the developing fire stage. The results will show the effect of fire strength and location on flow rate through door and window openings. Also, an estimate of in-situ air entrainment rate by the fire plume will be presented. The objective is to determine the characteristics of these flows and to evaluate existing room fire flow theories dealing with opening and entrainment flows.

Description of the Experiment

The steady-state flow experiments were conducted in the room shown in Fig. 1. The lightweight walls and ceiling were covered with a ceramic fiber insulation board to establish near-steady conditions within 30 minutes following ignition of the 30 cm diameter porous plate diffusion burner. The burner was supplied with commercial grade methane at a fixed rate.

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* Superscripts in the text refer to references at the end of this report.

Movable bidirectional velocity probes and bare-wire thermocouples within the room opening measured the velocities and temperatures of the opening flows on a two-dimensional grid of 28 to 144 points depending on the size of the opening. A fixed array of aspirated thermocouples in the front corner of the room measured the gas temperature profile. A similar array of bare-wire thermocouples (not shown) measured the near-ambient temperature profile within the larger well-vented area outside the room. The locations of these stationary thermocouples were chosen to permit the computation of the static pressure differences which drive the opening flow. The facility and instrumentation are more fully described in a report by Steckler[5].

Forty-five experiments were conducted representing different fire strengths (31.6, 62.9, 105.3, and 158 kW), the door and window openings shown in Fig. 2, and the fire locations shown in Fig. 3. Ten additional experiments were conducted on selected configurations to examine the repeatability of the experiments and to determine the effect of ambient temperature on the results.

Analysis of Experimental Data

The steady flow induced by a fire in a compartment was viewed in terms of the model illustrated in Fig. 4. Air flows into the room at a rate $\dot{m}_a$, shears or entrains some gas from the hot upper layer at a rate $\dot{m}_j$, and mixes with it in the lower layer. The fire plume entrains gas from the lower layer and "pumps" it to the upper layer at a rate $\dot{m}_e$. Similar mass transport into the upper layer due to natural convection by the heated lower walls may be possible but will be considered negligible under these thermally stratified conditions. Under steady conditions the mass flow rate through the opening from the upper layer ($\dot{m}_g$) equals the fuel flow rate plus $\dot{m}_a$.

Opening mass flow rates were determined by integrating the local mass velocities (ρv) over the area of the opening either above or below the zero-velocity or neutral plane level (N). The local velocity (v) was obtained from the bidirectional

probe data and the local density (ρ) was established from the opening temperature data and ideal gas law. Representative velocity profile data are illustrated in Fig. 5. Typical opening temperature data are included in Fig. 6. For clarity, only the centerline temperatures within the opening (T_o) are shown. Nevertheless, this profile is representative of most off-centerline profiles as well.

To evaluate the in-situ entrainment of the fire plume, the rate of mass entrained ($\dot{m}_e$) and the vertical entrainment height (Z_e) must be determined. In the context of the room-fire flow model shown in Fig. 4 the entrainment takes place over the vertical distance between the top of the burner and the thermal interface at Z_i. This interface was estimated from the room temperature profile data (T_r) as the position of rapid temperature change between the lower and upper portions of the room. A typical room temperature profile is included in Fig. 6. This profile illustrates that diffusion and mixing often preclude a sharp designation for Z_i. Consequently, the entrainment height could only be determined within $\pm$ 8 to $\pm$ 50 percent accuracy. The fire plume angle (θ) shown in Fig. 4 was not measured but qualitative changes in θ with fire location were noted.

The rate of entrainment by the fire plume over Z_e cannot be directly determined. Therefore, we adopted the approach presented by Quintiere et al[6]. Referring to Fig. 4, if one defines a lower-layer control volume as the region between the floor and Z_i, excluding the fire plume, then under steady conditions the fire plume entrainment rate is given by

$$\dot{m}_e = \dot{m}_a + \dot{m}_j \tag{1}$$

Any overall heated-lower-wall entrainment effects are ignored in this equation. Although the opening flow rate ($\dot{m}_a$) was known, the available data permitted only an upper-bound estimate for $\dot{m}_j$. This was found through an energy balance on the lower layer which neglects heat transfer between the lower room surfaces and gas. Since these surfaces will be hotter than the gas, the energy balance yields the upper limit

$$(\dot{m}_j)_{max} = \dot{m}_a \, (T_\ell - T_\infty)/(T_u - T_\ell) \tag{2}$$

where T_u is the mean upper layer temperature, T_ℓ is the mean lower layer temperature, and T_∞ is the ambient temperature. Consequently,

$$\dot{m}_a \leq \dot{m}_e \leq \dot{m}_a + (\dot{m}_j)_{max} \tag{3}$$

In computing $(\dot{m}_j)_{max}$, T_u and T_ℓ were selected from the room temperature profile data and T_∞ was taken as the average of the gas temperature measured outside the room (T_a).

Complete listings of experimental data and results are presented in Appendices A and B.

Theoretical Aspects

The primary elements governing the flow induced by fire in a room are the phenomena of flow across an opening and the entrainment of air by the fire. An examination of the relationships describing these elements will show their dependence on the relevant variables. Also, these theoretical results will provide a basis for understanding and discussing the experimental results.

Flow Through a Vertical Opening

The temperature difference between the room (T_r) and its surroundings (T_a) creates a pressure difference which causes the flow at the opening. The application of Bernoulli's equation and hydrostatic principles along with the assumption of horizontal streamlines starting from rest leads to a formulation for the rate of mass flow from the room[7].

$$\dot{m}_g = W_o \rho_\infty T_\infty C \int_N^{H_o} [(2g/T_r) \int_N^Z (1/T_a - 1/T_r) dZ']^{1/2} dZ \tag{4}$$

A corresponding equation holds for the flow rate into the room. Since the case of steady-state small fires is being considered, the inflow rate equals the outflow rate and only Eq. (4) is necessary for this discussion. By approximating the temperature to be independent of position, Eq. (4) reduces to

$$\dot{m}_g = 2/3(2g)^{1/2} C \rho_a A_o H_o^{1/2} [(T_a/T_r)(1-T_a/T_r)]^{1/2} (1-N/H_o)^{3/2} \tag{5}$$

This form shows the functional dependence on the ventilation (geometric) parameter ($A_o H_o^{1/2}$), T_r, and N. A practical upper limit results for "large" fires or small openings when T_r is uniform over the entire opening and in the range of 500 - 1500 K[1,2].

$$\dot{m}_{max} = 2/3(2g)^{1/2} C\rho_a A_o H_o^{1/2} f(T_a/T_r) = 0.52\ A_o H_o^{1/2} \qquad (6)$$

where $f(T_a/T_r) = 0.21$ for $0.2 \leq T_a/T_r \leq 0.6$, $\rho_a = 1.2\ kg/m^3$, and the flow coefficient (C) is 0.7.

Fire Plume Entrainment

A complete theory for the entrainment of air into free symmetric fire plumes does not exist. An ideal model results from the theory of a weakly buoyant point source of heat as given by Zukoski et al[8].

$$\dot{m}_{pt} = 0.210\ \rho_\infty (g/c_p \rho_\infty T_\infty)^{1/3}\ Q^{1/3}\ Z^{5/3} \qquad (7)$$

This shows the dependence on the ambient density (ρ_∞), the heat source (Q), and height (Z). Data and empirical models on the entrainment into free plumes by Zukoski et al[8,9] and McCaffrey[10,11] show deviations from the point source ideal of up to $\pm$ 50 percent. Disturbances in the ambient air contribute to this deviation and a wind effect (i.e., $\theta < 90^o$ in Fig. 4) will increase the rate of entrainment[6,8]. All of these effects will be present in room fires due to the presence of walls and flows through openings. In any case, the ideal point source formula can serve as a useful reference to the in-situ fire entrainment rates measured.

Discussion of Results

During an experiment the ambient temperature in the test facility was very close to the outdoor temperature. Although T_∞ varied little during a given 2-hour experiment, it varied between 5°C and 35°C over the full course of experiments. Experiments were repeated on selected configurations on different days to determine the effect of T_∞ on results. Opening flow rates changed 3 percent or less

for T_∞ changes less than 2^oC, 5 percent or less for 10^oC changes, and 11.5 percent or less for 19^oC changes. Negligible changes in T_∞ produced negligible changes in the measured opening flow rates. When considering subsequent figures showing opening flow rate versus either $A_oH_o^{1/2}$ or Q, bear in mind that T_∞ was not controlled and, consequently, tolerances of 12 percent or less should be assumed when comparing results.

Opening mass flow rates for the three floor-level burner locations and Q = 62.9 kW are shown in Fig. 7 as a function of $A_oH_o^{1/2}$. Differences between inflow and outflow rates represent experimental error since the fuel rate was negligible compared to the opening flow rate. As expected, the smallest opening flows are in good agreement with the ventilation limit described by Eq. (6). The results for the larger openings follow curves characteristic of the explicit temperature and N/H_o dependence of Eq. (5). Average upper gas temperatures (T_u) ranged between 270 and 288^oC for the smallest windows and between 109 and 172^oC for the widest doorways. The ratio N/H_o increased with $A_oH_o^{1/2}$ (or decreasing T_u) from 0.45 to 0.59. The opening flow rates are highest for the room-center fire location, lower for the back-wall center position, and lowest for the corner position. This order reflects the decreasing effect of the door jet and the role of nearby walls in restricting flow to the fire plume.

Figure 8 shows flow rate through a fixed door opening increasing with fire strength (Q). As Q increased from 31.6 to 158 kW, the upper layer temperature increased from 85^oC to 289^oC, N/H_o decreased from 0.58 to 0.54, Z_e decreased 6 cm or 4 to 6 percent, and the opening flow increased by 54 to 68 percent. These results are reasonably consistent with Eqs. (5) and (6).

Opening flows for other fire locations are shown in Fig. 9. These experiments were conducted with a fixed door opening, fixed fire strength, nearly constant T_∞, and the face of the burner 30 cm above the floor. Opening flows are greatest with the fire just inside the doorway and decrease as the fire is moved back along the room centerline. This behavior is attributed to the door jet "wind effect" reported

by Quintiere et al[6]; namely, that fire plume entrainment is increased as the plume is blown over by the door jet.

Figure 10 presents the opening flow rates versus the static-pressure flow model given by Eq. (4) divided by the flow coefficient (C). The slope of the line represents the average outflow coefficient, C = 0.73, for all 55 experiments. This compares to 0.68 suggested by the water-kerosene analog experiments of Prahl and Emmons[12]. The correlation shown in Fig. 10 indicates that opening flow rates can be predicted within ~ 7 percent given N, T_r, T_o, T_a, and C = 0.73. Although N is based on the opening velocity profiles, Fig. 6 suggests that it can be estimated from T_o. Consequently, it appears that opening flow rates could be determined from temperature measurements alone.

Equation (7) shows that fire plume entrainment rate is a function of the density of the surrounding gas (ρ_∞). For an enclosure fire, this is the density of the lower gas layer (ρ_ℓ). In our experiments, changes in configuration and T_∞ resulted in T_ℓ ranging from 17°C to 157°C and consequently, ρ_ℓ ranging from 1.22 to 0.82 kg/m^3. To account for this variation, entrainment rates are presented in Figs. 11, 12, and 13 on a per unit density basis ($\dot{m}_e/\rho_\ell$). Likewise, the point source and empirical models are included as $\dot{m}_e/\rho_\infty$.

The entrainment results shown in Fig. 11 for fires located away from walls are affected by the wind associated with the air flow through the opening. Consistent with the results of others[6,8], the wind enhances the entrainment rate by as much as three times the free-standing plume model predictions. However, the room fire results are in agreement with the free-burn models when the wind effect is small and the fire plume in the room remains nearly vertical (e.g., the smallest window data point). In fact, Quintiere et al[6] found that the point source plume model gave good agreement with inclined wind-blown plume results if an effective entrainment length of $Z_e/\sin\theta$ were used in Eq. (7).

The entrainment rates for fire plumes adjacent to walls or in a corner might be expected to be diminished from their free-burn values due to interference from the

walls. For idealized point source plumes, the method of reflections would suggest (1/n)th the entrainment rate of an nQ source in which n=2 for a wall and 4 for a 90° corner. This is not the case of a circular burner tangent to vertical surfaces. In fact, Zukoski et al[8] found that the entrainment rate of a circular burner next to a vertical wall is nearly identical to the same fire without the wall. Within the scatter of the data, the results shown in Fig. 12 for room fires near walls are consistent with free-plume predictions. It appears that the wall orients the plume vertical but does not inhibit its perimeter for entrainment significantly. The case of the corner fire is a more severe geometry and some interference by the walls is obvious in Fig. 13.

Free-burn plume or wind-blown plume models seem sufficient for predicting the results within the uncertainty limits assigned to the derived entrainment rates. Any other effects, such as those due to less buoyant wall plumes in the lower region of the compartment, must lie within the uncertainty of these data at most.

Conclusions

A systematic experimental study of flows induced by a simulated pool fire in a compartment under conditions typical of the developing fire has been completed. The characteristics of the measured opening flow rates can be explained by a simple hydrostatic model based on temperature distribution. Indeed, a good correlation between the measured results and the idealized flows, taking into account the complete temperature distribution, has been demonstrated.

Fire plume entrainment results for fires located near a wall or corner are in reasonable agreement with results from free-standing plume models. Except for small openings, entrainment rates for fires in other locations are two to three times the rates predicted by these models. The higher rates are attributed to the "wind effect" brought about by the opening flow. Earlier work[6] indicates that the point source model can predict the wind-blown plume results if an effective entrainment length of $Z_e/\sin\theta$ is used.

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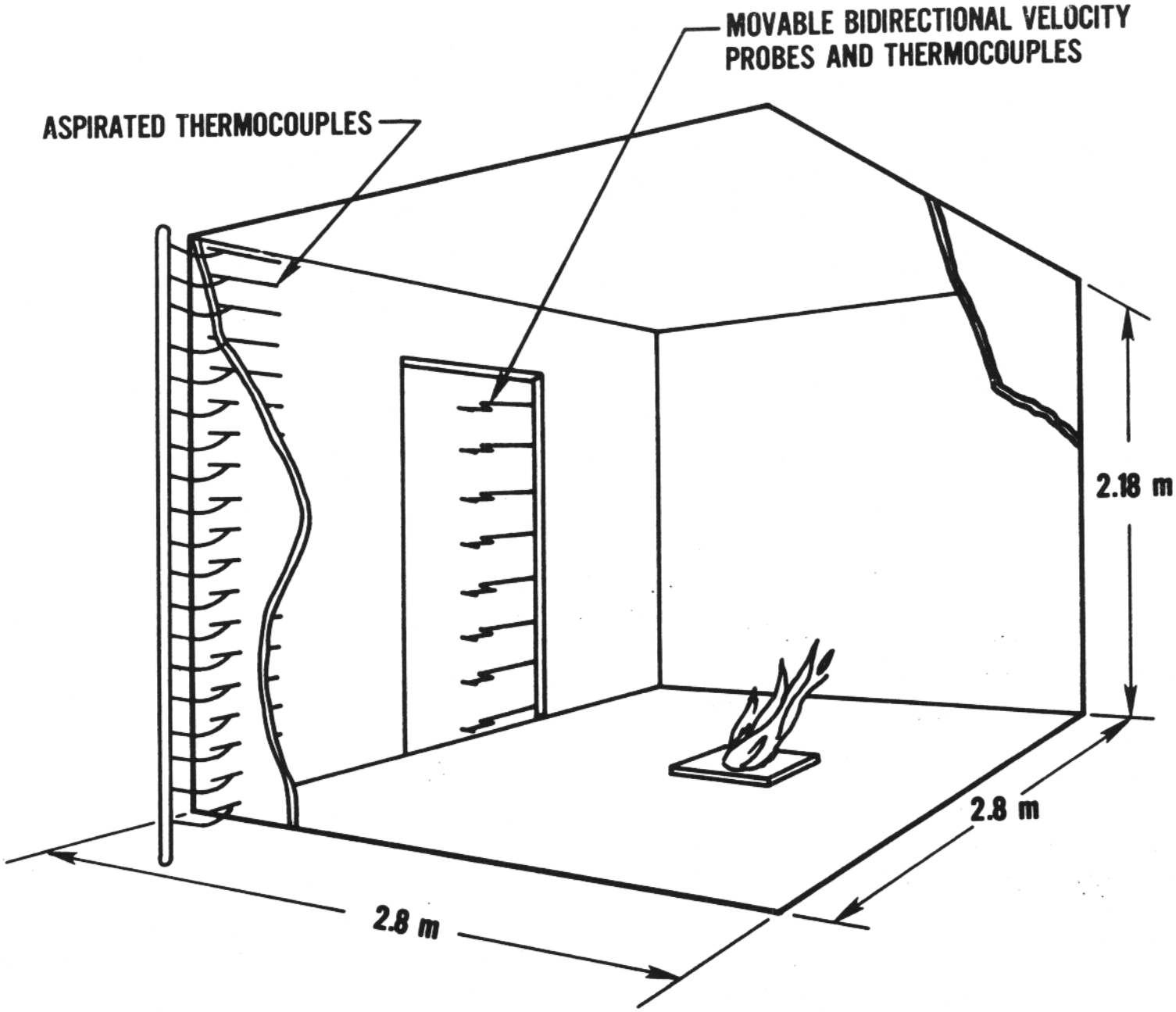

Fig. 1. Experimental arrangement.

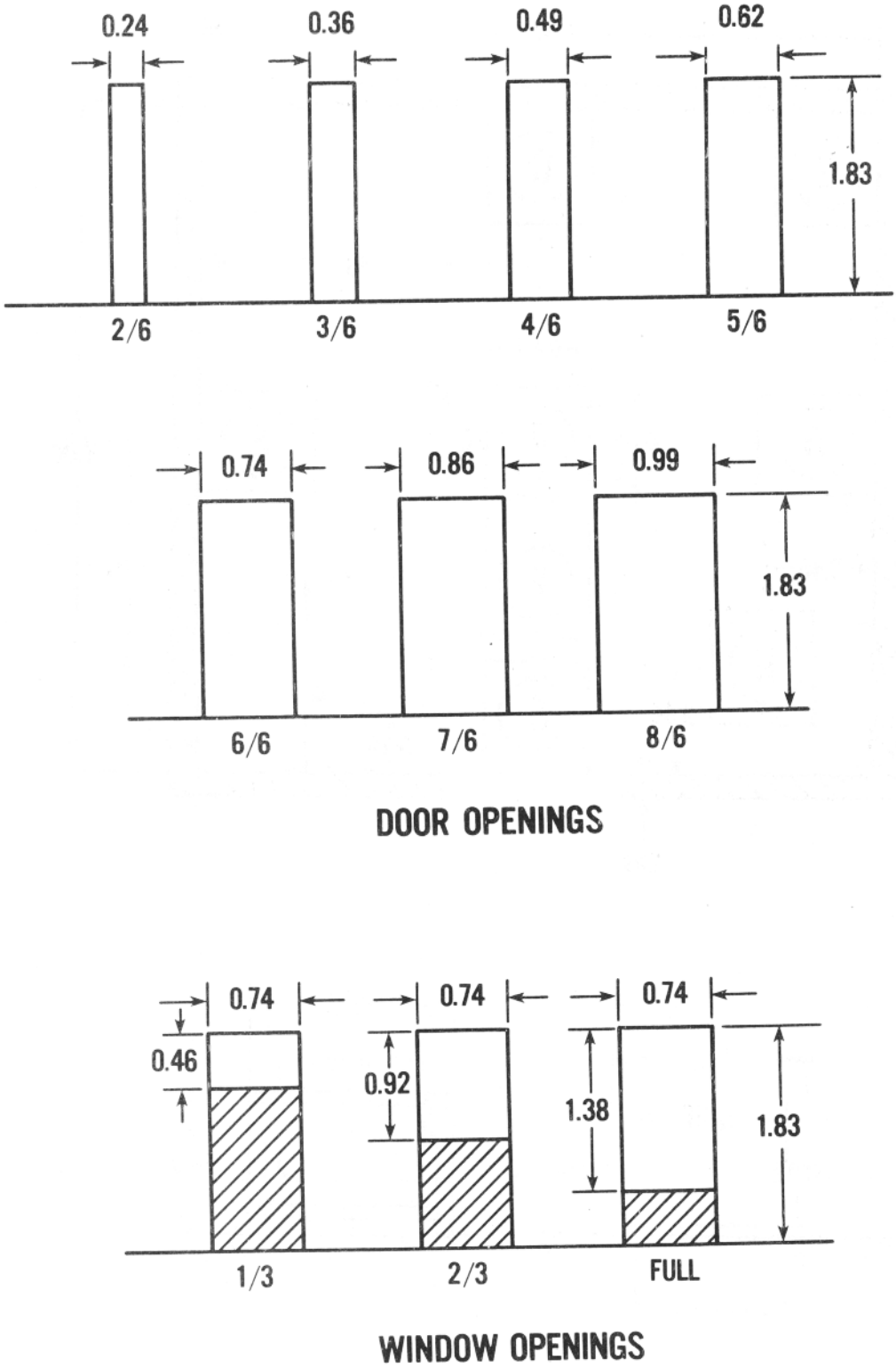

Fig 2. Room opening configurations with dimensions in m.

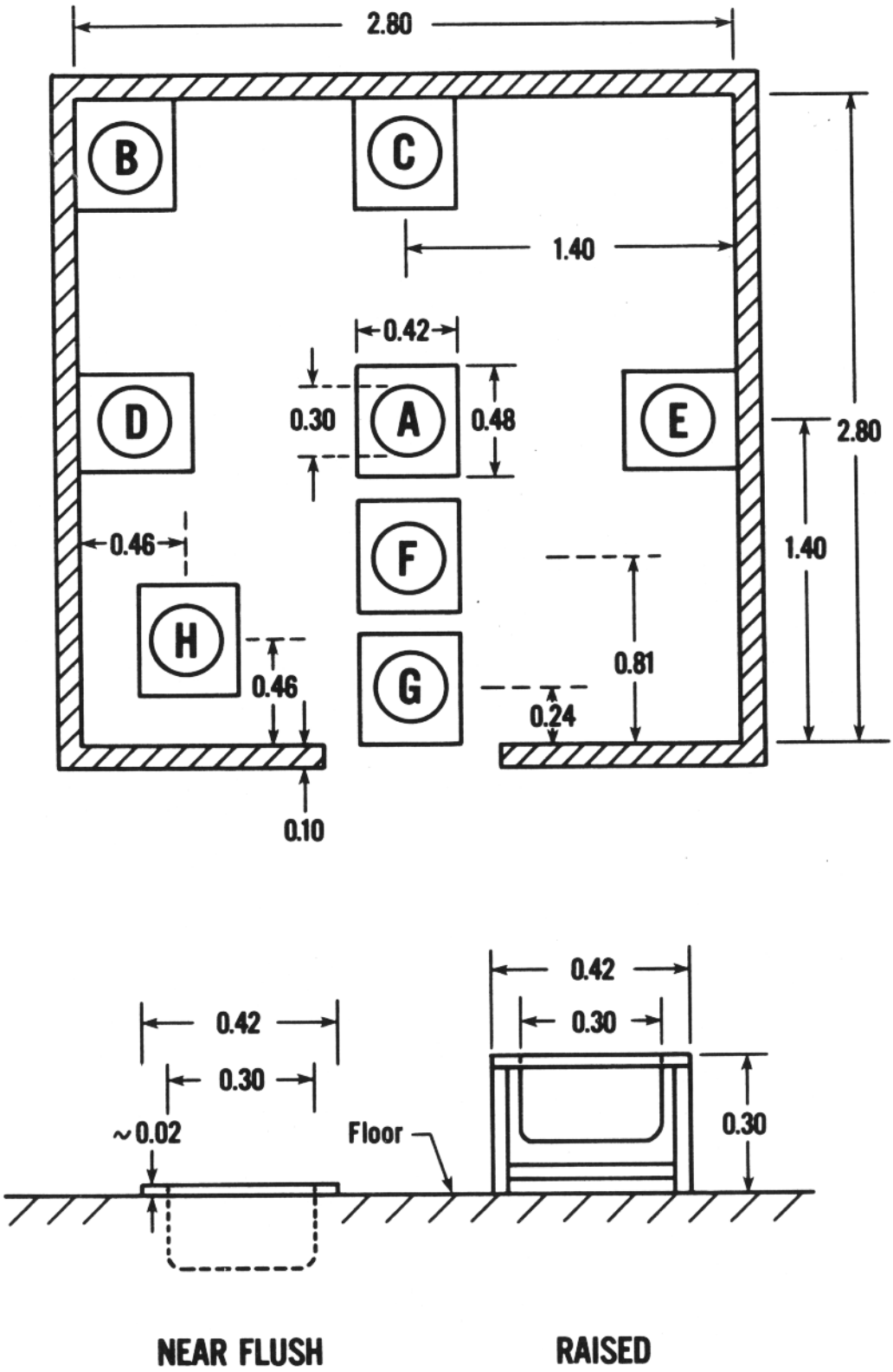

Fig. 3. Gas burner locations with dimensions in m.

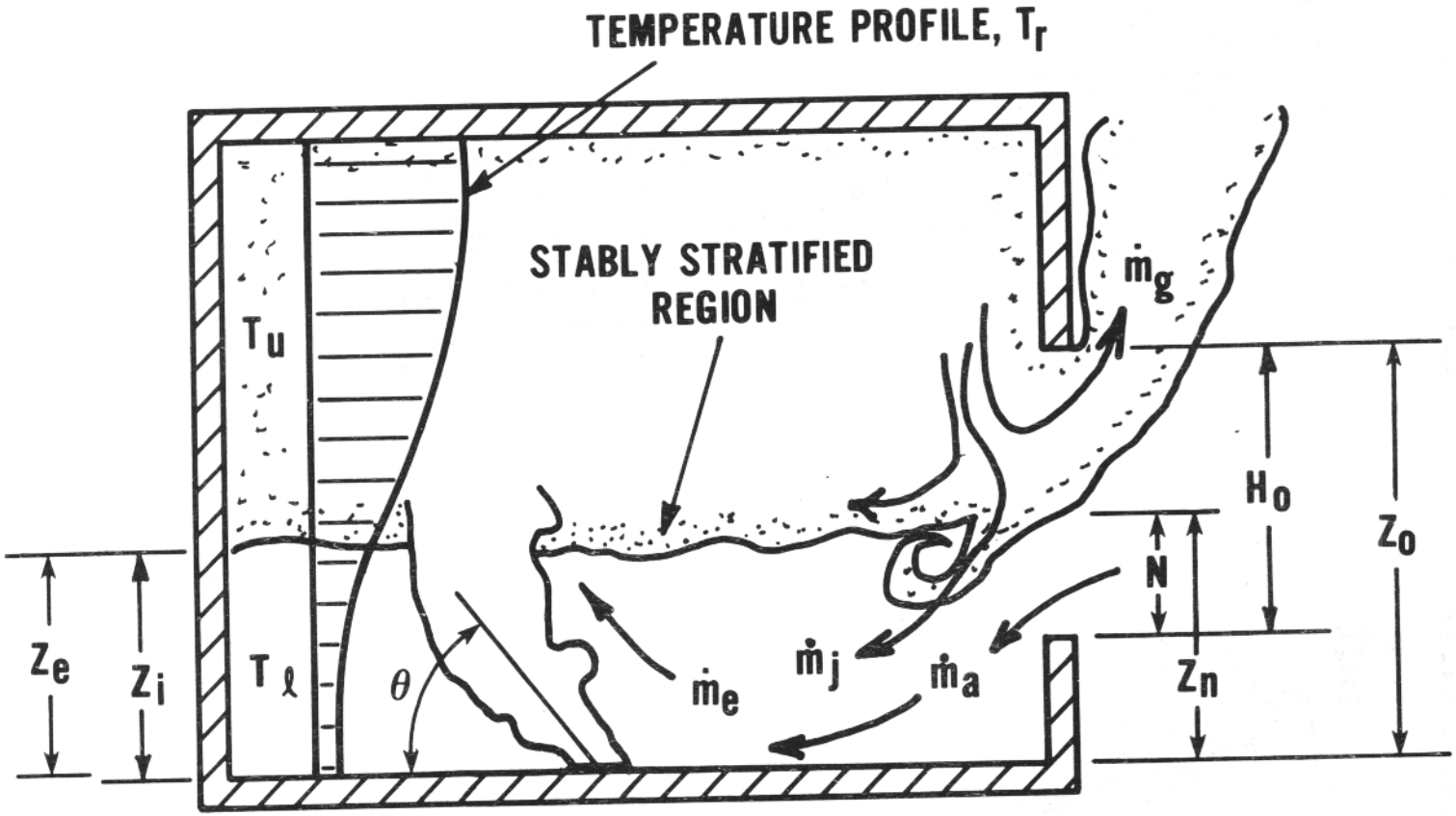

Fig. 4. Fire-induced flow dynamics.

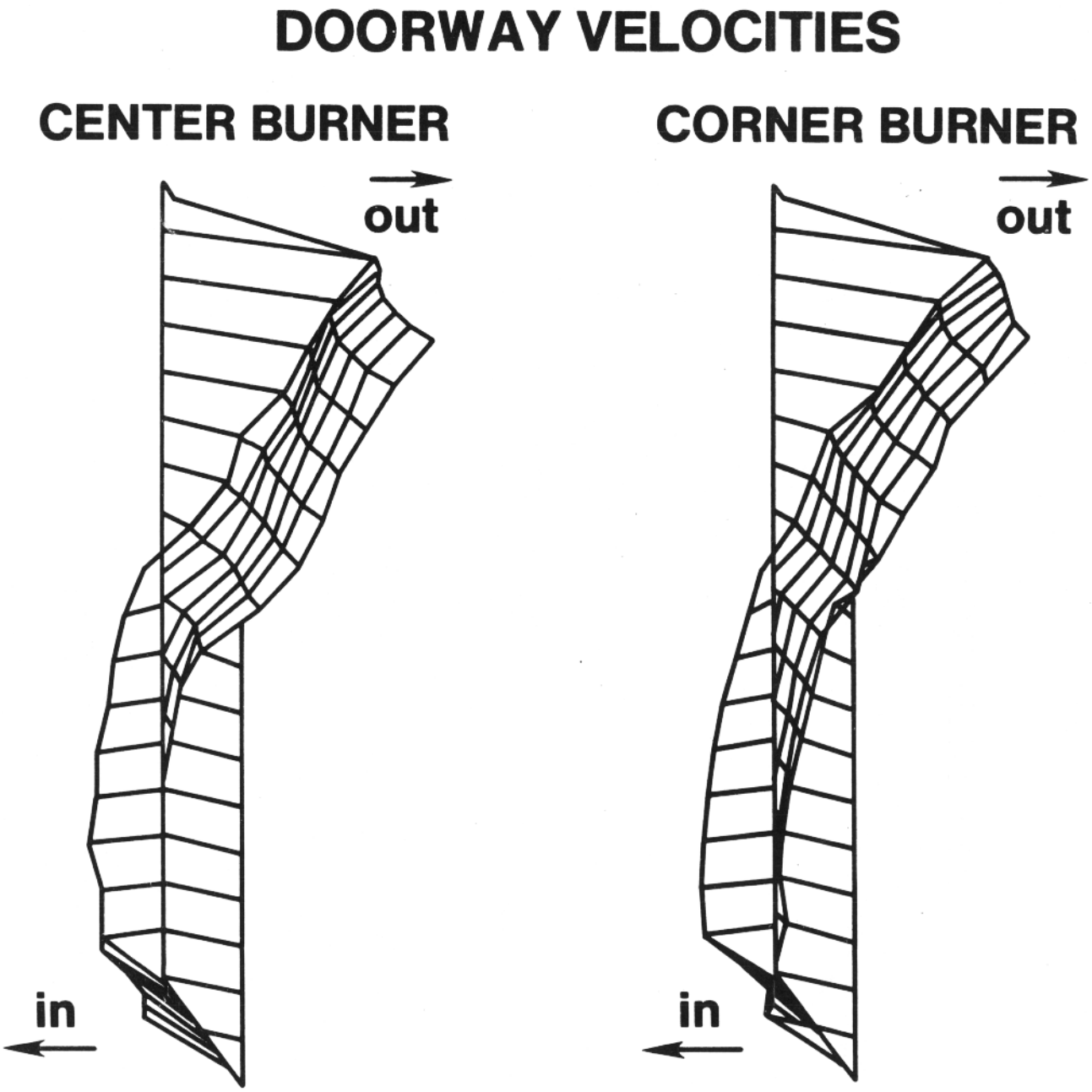

Fig. 5. Doorway velocity profiles for W_o = 0.74 m, H_o = 1.83 m, Q = 62.9 kW, and flush burner in positions A and B.

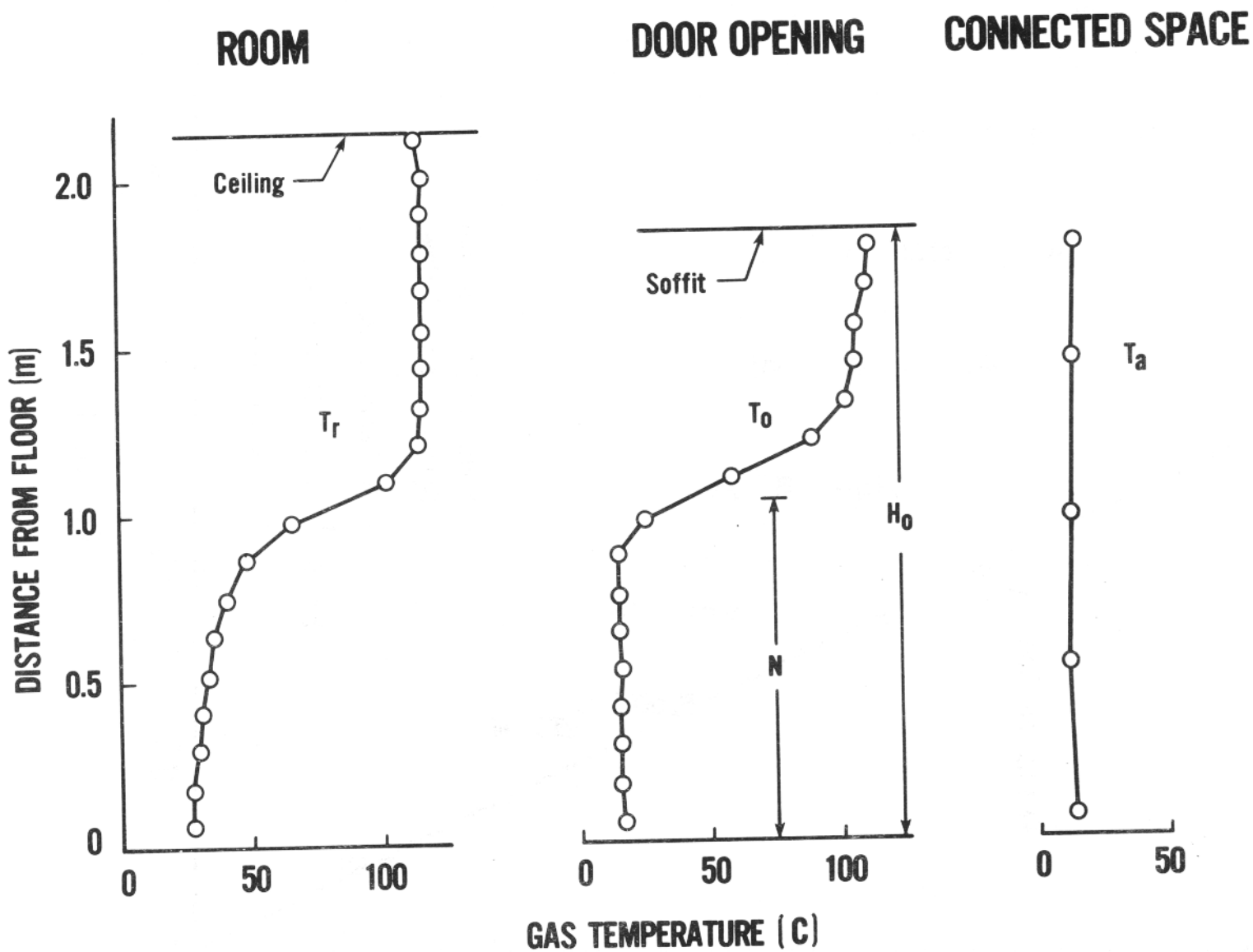

Fig. 6. Gas temperatures for W_o = 0.74 m, H_o = 1.83 m, Q = 62.9 kW, and flush burner in position A.

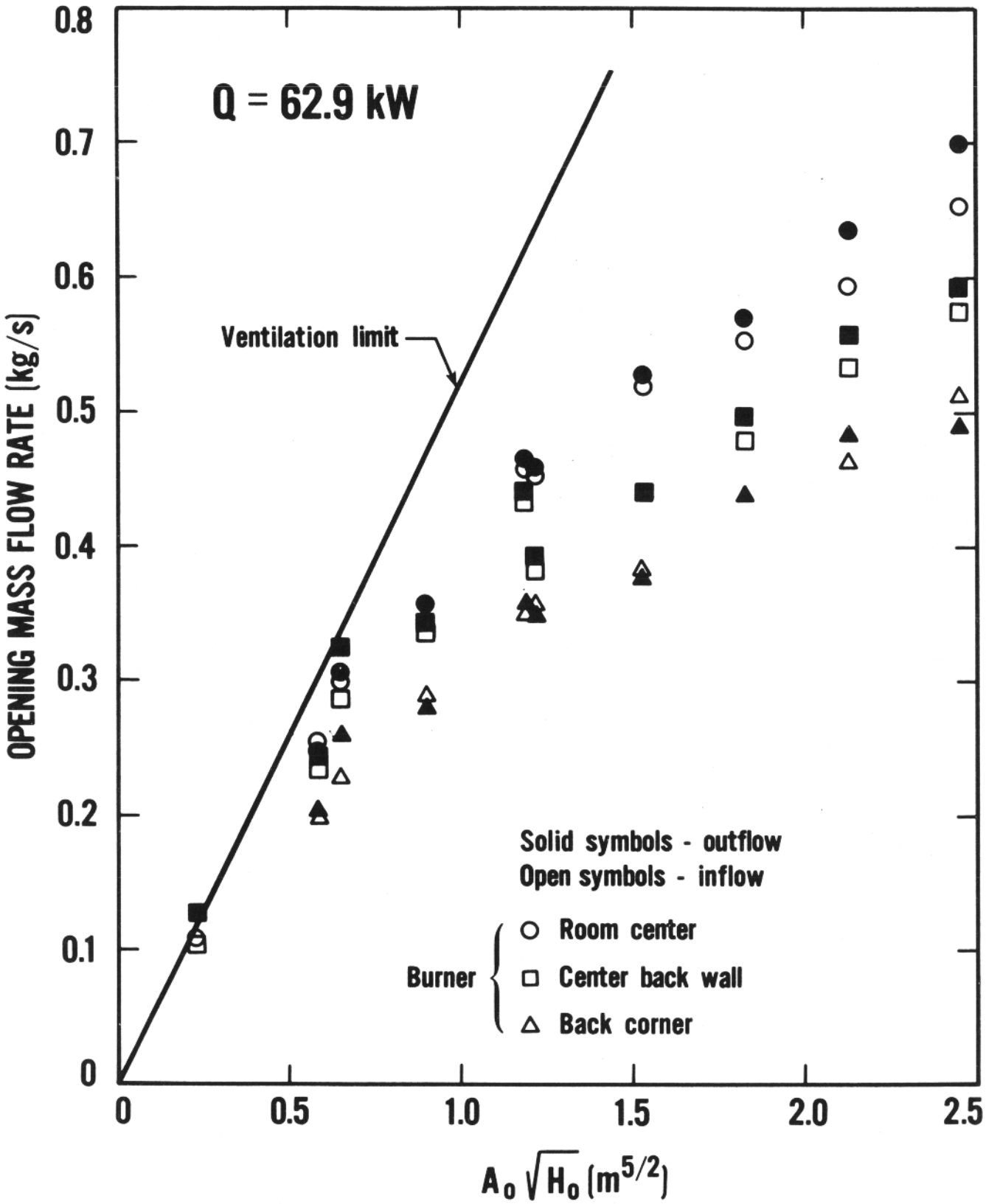

Fig. 7. Opening mass flow rate as a function of ventilation parameter for fixed fire strength and flush burner in positions A, B, and C.

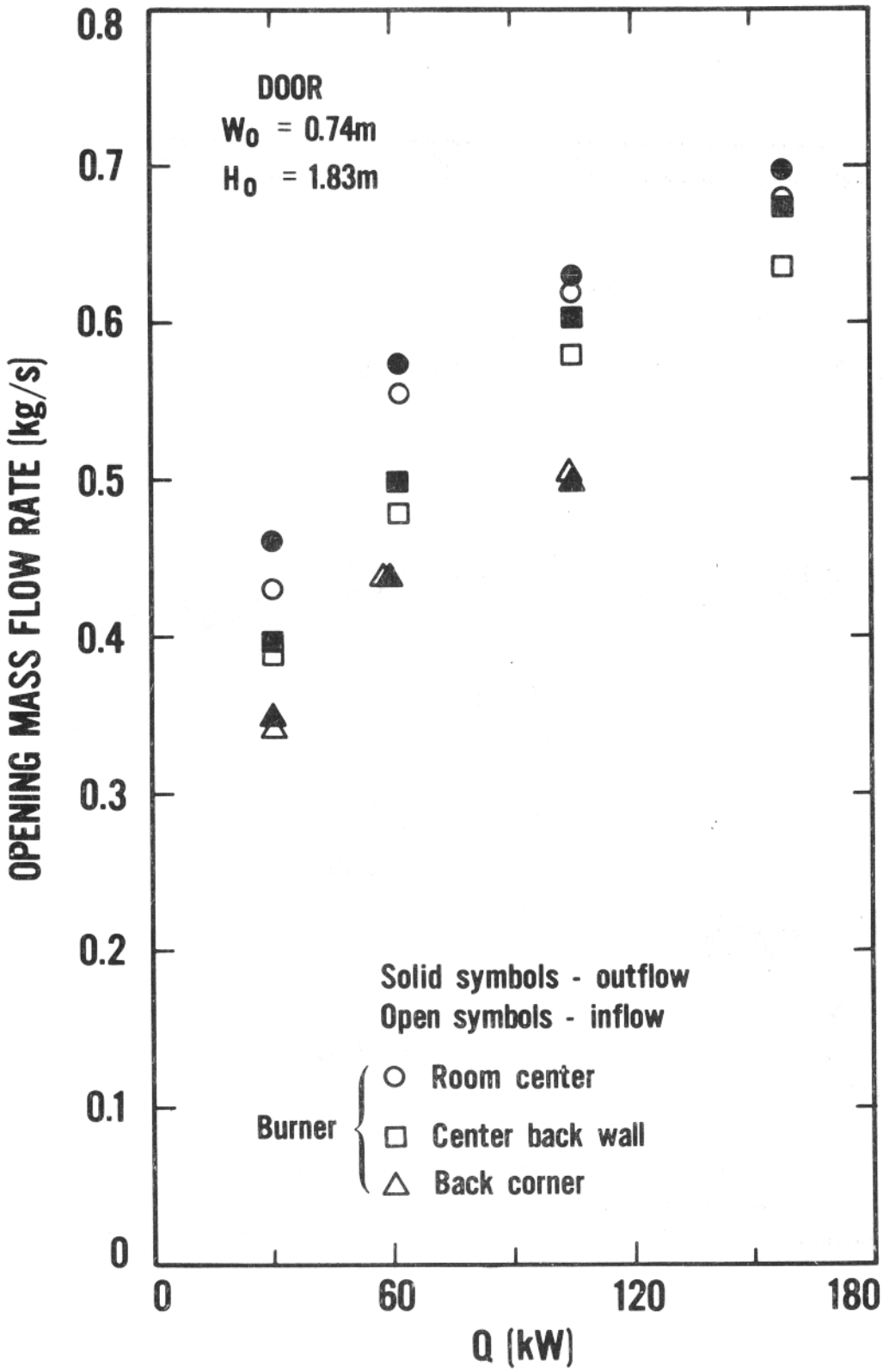

Fig. 8. Opening mass flow rate as a function of fire strength for fixed doorway opening and flush burner in positions A, B, and C.

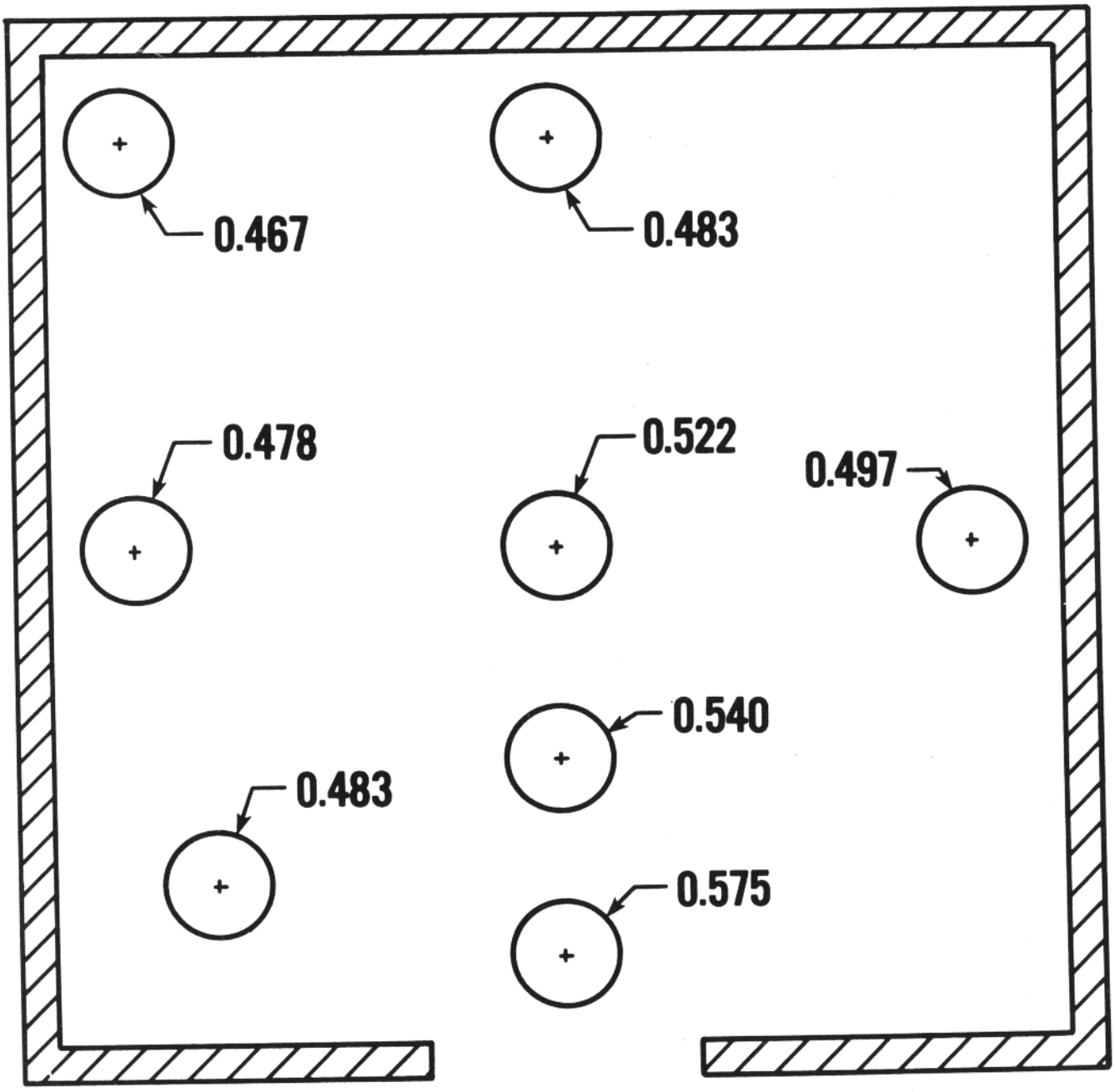

Fig. 9. Doorway mass flow rate in kg/s for raised burner in various locations, Q = 62.9 kW, W_o = 0.74 m, H_o = 1.83 m, and T_∞ = 6.5 ± 0.5°C.

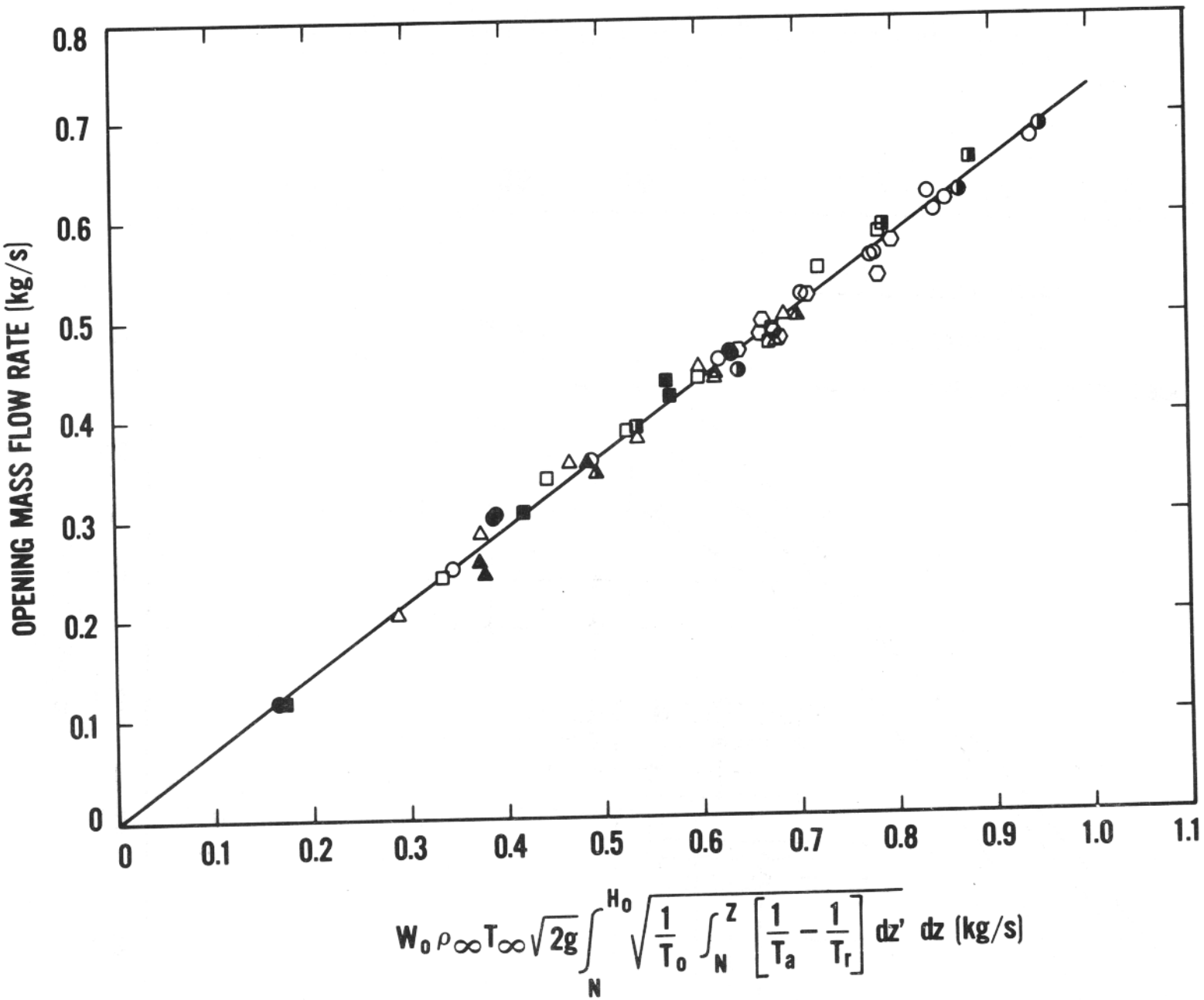

Fig. 10. Correlation of opening mass flow rate with idealized flow model.

Symbols: flush burner, 0 - position A, Δ - B, □ - C; raised burner, ⬡ - D, E, F, or G. Open symbols represent doorways and Q = 62.9 kW, solid symbols represent windows and Q = 62.9 kW, and half-filled symbols represent a fixed doorway and Q = 31.6, 105.3, or 158 kW.

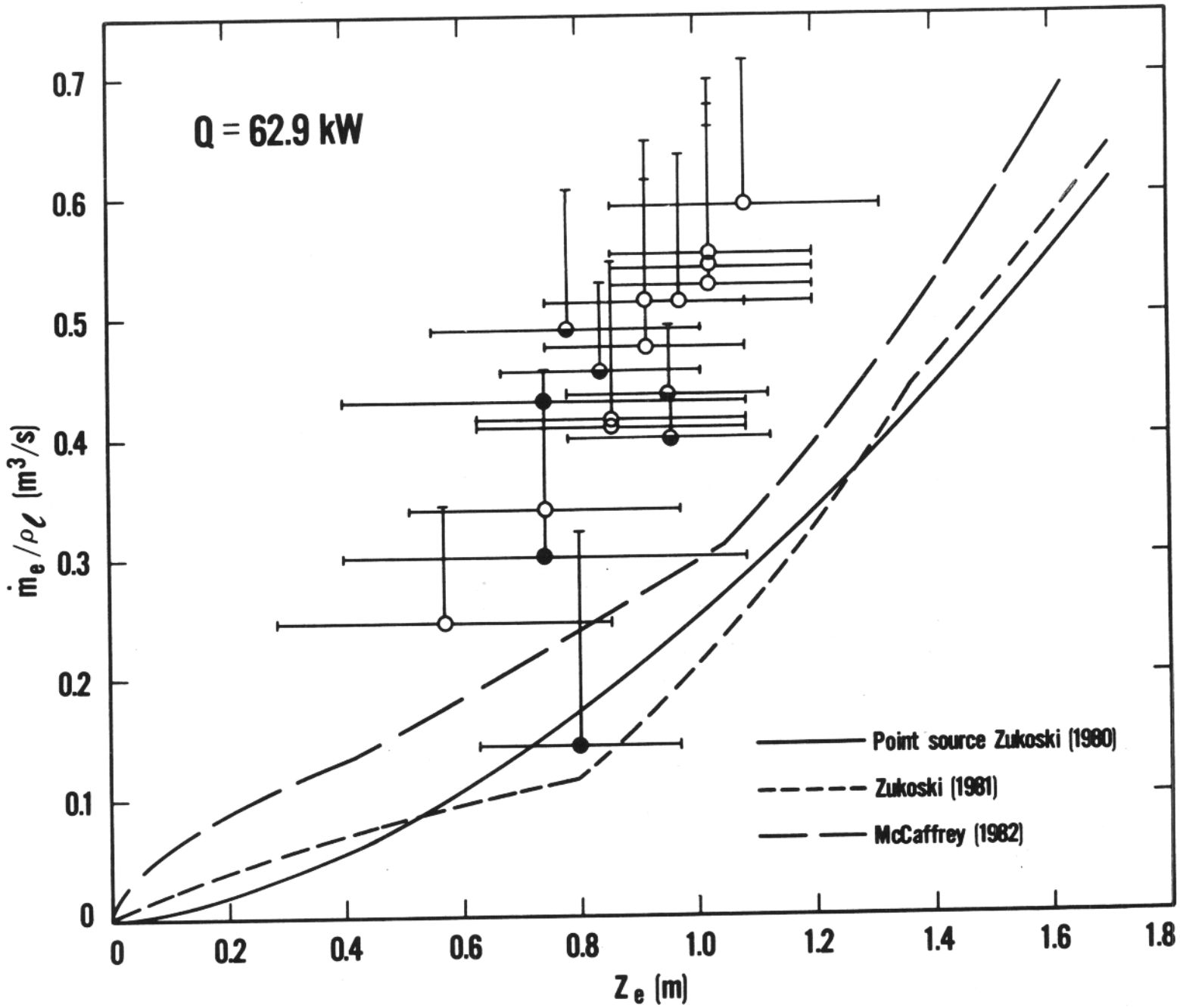

Fig. 11. Entrained mass flow rate per unit density as a function of entrainment height for fires located away from walls. Symbols: flush burner, 0 - doorways, ● - windows; raised burner, ◐ - doorway.

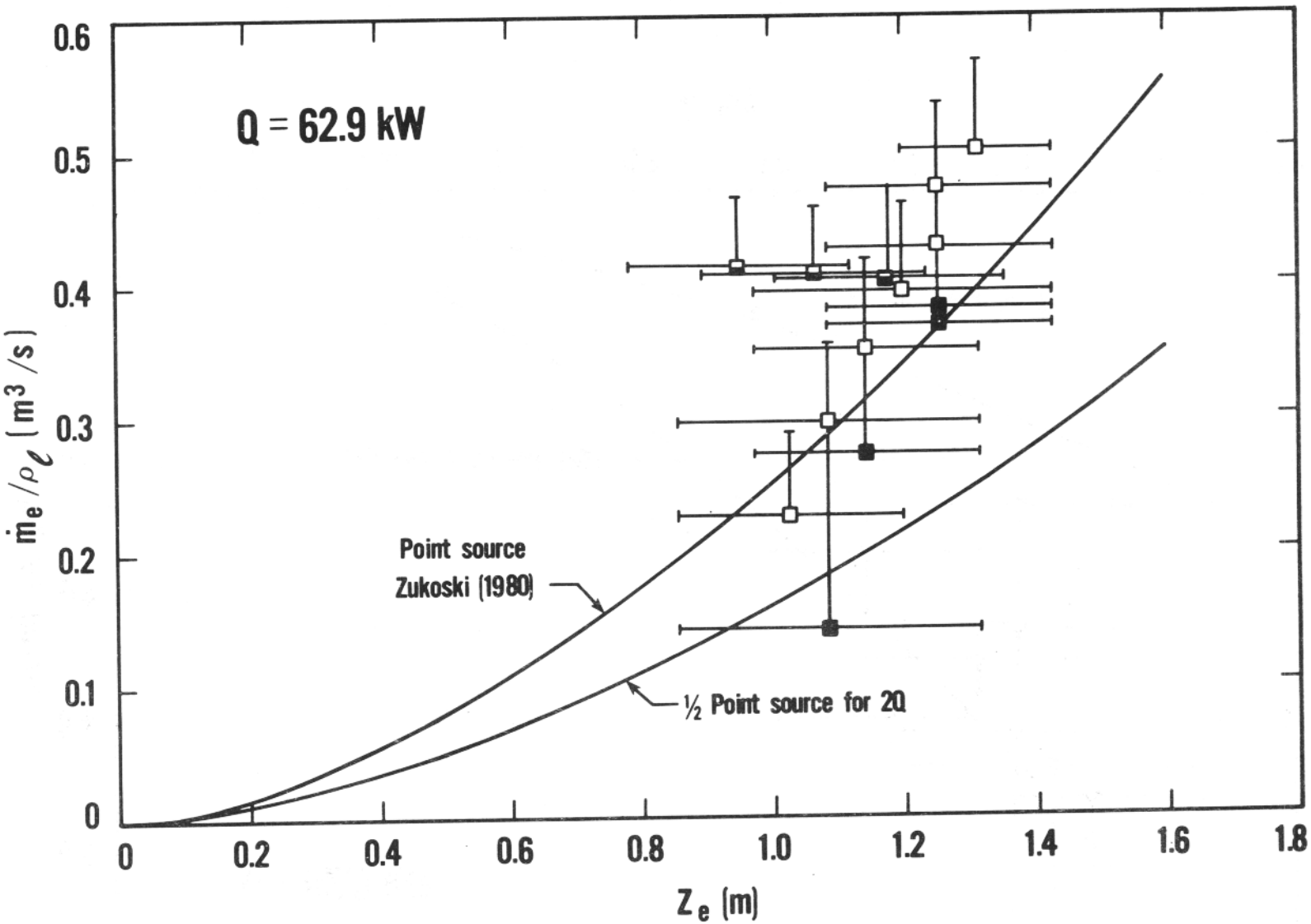

Fig. 12. Entrained mass flow rate per unit density as a function of entrainment height for fires located near centers of walls. Symbols: flush burner, □ - doorways, ■ - windows; raised burner, ▬ - doorway.

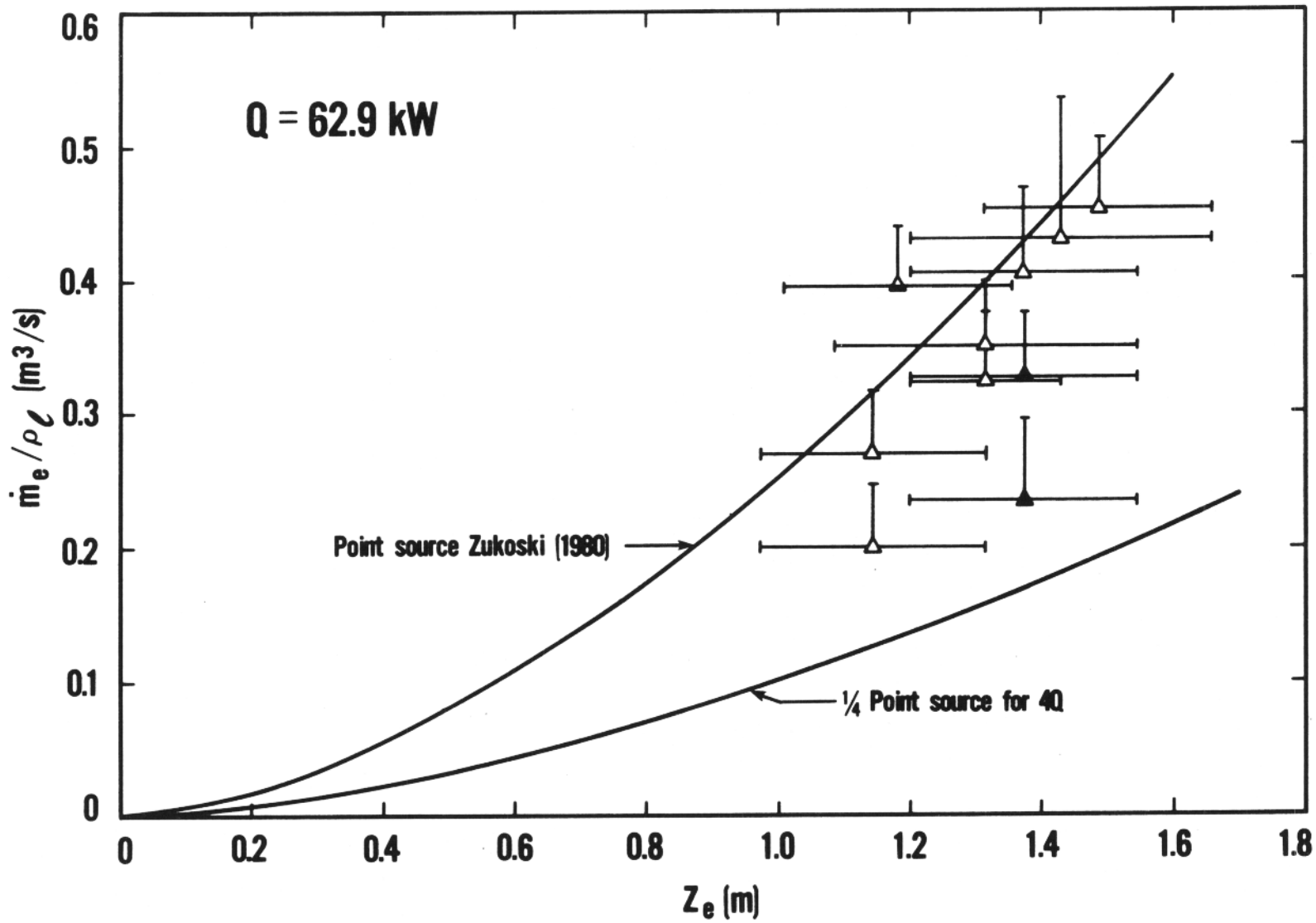

Fig. 13. Entrained mass flow rate per unit density as a function of entrainment height for fires located near corners. Symbols: flush burner, Δ - doorways, ▲ - windows; raised burner, ▲ - doorway.

Appendix A. Summary of Experimental Results

Table A-1. Summary of Experimental Results

Opening Configuration (Fig. 2)	Fire Strength Q (kW)	Fire Location (Fig. 3)	Air Mass Flow Rate $\dot{m}_a$ (kg/s)	Neutral Plane Location N/H_o	Thermal Interface Height Z_i (m)	Avg. Temp. of Upper Gas Layer T_u (°C)	Avg. Temp. of Lower Gas Layer T_ℓ (°C)	Ambient Temperature T_∞ (°C)	Maximum Mixing Rate $(\dot{m}_j)$ max (kg/s)
2/6 Door	62.9	A	0.251	0.499	0.57 ± 0.28	190	72	26	0.098
3/6 Door	62.9	A	0.358	0.514	0.74 ± 0.23	164	62	28	0.119
4/6 Door	62.9	A	0.457	0.531	0.86 ± 0.23	141	50	22	0.141
4/6 Door	62.9	A	0.465	0.536	0.86 ± 0.23	135	39	13	0.126
5/6 Door	62.9	A	0.523	0.552	0.91 ± 0.17	129	47	23	0.153
6/6 Door	62.9	A	0.563	0.562	0.97 ± 0.23	129	48	29	0.132
6/6 Door	62.9	A	0.560	0.561	0.91 ± 0.17	130	51	31	0.142
6/6 Door	62.9	A	0.624	0.556	1.03 ± 0.17	109	33	12	0.172
6/6 Door	62.9	A	0.605	0.557	1.03 ± 0.17	116	34	13	0.155
7/6 Door	62.9	A	0.616	0.573	1.03 ± 0.17	120	44	26	0.146
8/6 Door	62.9	A	0.677	0.582	1.09 ± 0.23	109	36	22	0.130
Full Window	62.9	A	0.464	0.501	0.74 ± 0.34	143	53	30	0.119
2/3 Window	62.9	A	0.302	0.485	0.74 ± 0.34	177	78	26	0.159
2/3 Window	62.9	A	0.304	0.484	0.74 ± 0.34	177	79	26	0.164
1/3 Window	62.9	A	0.117	0.453	0.80 ± 0.17	270	157	16	0.146
6/6 Door	31.6	A	0.446	0.569	0.97 ± 0.11	86	41	29	0.119
6/6 Door	105.3	A	0.624	0.547	0.97 ± 0.11	183	69	35	0.186
6/6 Door	158.0	A	0.688	0.535	0.91 ± 0.17	243	81	36	0.191
2/6 Door	62.9	B	0.203	0.523	1.14 ± 0.17	248	74	32	0.049
3/6 Door	62.9	B	0.286	0.556	1.14 ± 0.17	216	59	30	0.053
4/6 Door	62.9	B	0.354	0.568	1.31 ± 0.12	194	48	24	0.058

Table A-1. (continued)

Opening Configuration (Fig. 2)	Fire Strength Q (kW)	Fire Location (Fig. 3)	Air Mass Flow Rate $\dot{m}_a$ (kg/s)	Neutral Plane Location N/H_o	Thermal Interface Height Z_i (m)	Avg. Temp. of Upper Gas Layer T_u (°C)	Avg. Temp. of Lower Gas Layer T_ℓ (°C)	Ambient Temperature T_∞ (°C)	Maximum Mixing Rate $(\dot{m}_j)$ max (kg/s)
5/6 Door	62.9	B	0.380	0.566	1.31 ± 0.23	197	51	29	0.057
6/6 Door	62.9	B	0.442	0.566	1.37 ± 0.17	181	38	21	0.052
6/6 Door	62.9	B	0.439	0.568	1.37 ± 0.17	186	51	30	0.068
6/6 Door	62.9	B	0.449	0.571	1.37 ± 0.17	176	36	20	0.051
7/6 Door	62.9	B	0.474	0.564	1.43 ± 0.23	179	47	29	0.065
8/6 Door	62.9	B	0.502	0.586	1.49 ± 0.17	172	44	29	0.059
Full Window	62.9	B	0.355	0.552	1.37 ± 0.17	194	50	28	0.054
2/3 Window	62.9	B	0.245	0.499	1.37 ± 0.17	216	65	26	0.063
2/3 Window	62.9	B	0.257	0.511	1.37 ± 0.17	215	62	23	0.066
6/6 Door	31.6	B	0.345	0.580	1.37 ± 0.17	118	37	26	0.047
6/6 Door	105.3	B	0.502	0.546	1.31 ± 0.23	234	51	27	0.066
2/6 Door	62.9	C	0.243	0.528	1.03 ± 0.17	209	53	9	0.068
3/6 Door	62.9	C	0.340	0.560	1.09 ± 0.23	173	34	7	0.066
4/6 Door	62.9	C	0.388	0.566	1.14 ± 0.17	173	46	21	0.076
5/6 Door	62.9	C	0.441	0.577	1.20 ± 0.23	160	41	20	0.078
6/6 Door	62.9	C	0.488	0.579	1.26 ± 0.17	152	36	18	0.076
6/6 Door	62.9	C	0.475	0.572	1.26 ± 0.17	156	41	23	0.074
7/6 Door	62.9	C	0.549	0.591	1.26 ± 0.17	140	29	14	0.074
8/6 Door	62.9	C	0.584	0.593	1.31 ± 0.11	134	29	15	0.078

Table A-1. (continued)

Opening Configuration (Fig. 2)	Fire Strength Q (kW)	Fire Location (Fig. 3)	Air Mass Flow Rate $\dot{m}_a$ (kg/s)	Neutral Plane Location N/H_o	Thermal Interface Height Z_i (m)	Avg. Temp. of Upper Gas Layer T_u (°C)	Avg. Temp. of Lower Gas Layer T_ℓ (°C)	Ambient Temperature T_∞ (°C)	Maximum Mixing Rate $(\dot{m}_j)$ max (kg/s)
Full Window	62.9	C	0.438	0.562	1.26 ± 0.17	153	32	10	0.080
Full Window	62.9	C	0.421	0.552	1.26 ± 0.17	158	35	14	0.072
2/3 Window	62.9	C	0.306	0.488	1.14 ± 0.17	178	48	9	0.092
1/3 Window	62.9	C	0.117	0.450	1.09 ± 0.23	288	153	8	0.126
6/6 Door	31.6	C	0.391	0.613	1.26 ± 0.17	94	27	18	0.052
6/6 Door	105.3	C	0.590	0.558	1.20 ± 0.23	207	38	14	0.084
6/6 Door	158.0	C	0.657	0.539	1.20 ± 0.23	289	56	16	0.113
6/6 Door	62.9	AR[a]	0.522	0.593	1.26 ± 0.17	136	21	6	0.068
6/6 Door	62.9	BR	0.467	0.555	1.49 ± 0.17	190	25	6	0.054
6/6 Door	62.9	CR	0.483	0.566	1.37 ± 0.17	161	24	7	0.060
6/6 Door	62.9	DR	0.478	0.565	1.49 ± 0.17	153	27	6	0.080
6/6 Door	62.9	ER	0.497	0.581	1.26 ± 0.17	149	21	6	0.058
6/6 Door	62.9	FR	0.541	0.588	1.14 ± 0.17	129	24	7	0.088
6/6 Door	62.9	GR	0.575	0.580	1.09 ± 0.23	117	28	7	0.136
6/6 Door	62.9	HR	0.483	0.597	1.26 ± 0.17	150	19	7	0.044

[a] R denotes "raised" burner

APPENDIX B. LISTINGS OF INTERMEDIATE RESULTS

The steady-state temperature, velocity, mass inflow, and mass outflow results are presented in Tables B-3 to B-57. A key to these tables is presented in Table B-1 and Figure B-1. The opening velocity and temperature results represent averages of 60 readings or scans taken at 5 second intervals. Room temperatures were recorded following each scan of the opening sensors. Since the bidirectional probe array was shifted at least 6 and up to 18 times during a test, room temperatures represent averages of from 360 readings for the narrowest opening to 840 readings for the widest.

Accuracy of Temperature Results

Temperatures were measured with thermocouples formed by welding the overlapping ends of 0.254 mm chromel and 0.254 mm alumel wires. Junction diameters were approximately 0.51 mm. The limits of error associated with the thermocouple wires and data recording system were found to be $\pm$ 1°C. These limits do not include installation errors; e.g., radiation error.

The thermocouple junctions which were used to measure the gas temperatures within the heated room were located within stainless steel tubes to form aspirated thermocouples similar to the type described by Newman and Croce[B1*]. The limits of error associated with these units, including radiation error, are estimated at +1/-3°C.

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* Superscripts in text refer to references at the end of this appendix.

The bare thermocouple junctions located within the opening were also subject to radiation error. Error due to conduction along leads was minimized by placing the leads in a horizontal (near isothermal) plane. The radiation error or difference between the opening gas temperature (T), and the thermocouple temperature (T_t), is a function of T_t and the gas velocity (v). At locations in the inflow not near the neutral plane, the gas must be at ambient temperature (T_∞). For the 55 flow experiments, the difference ($T_\infty - T_t$) at these locations ranged between -1 and -9°C. Near or above the neutral plane, the difference or correction can be positive or negative depending on the net radiative and convective heat transfer between the junction and its environment. Table B-2 lists estimates of the range of the correction as a function of T_t and v. These corrections are based on the heat transfer analysis presented in Appendix C and selected experimental data representing the full range of fire strengths, locations, and opening geometries. The low limit is based on the assumption that the maximum total radiation incident upon a thermocouple near or above the neutral plane is equal to the maximum total radiation incident upon any thermocouple in the cold inflow plus radiation from the hot gas plume outside the opening. The high limit assumes that the thermocouple is completely shielded from the hot environment and views only an ambient environment. Consequently, the corrections in Table B-2 tend to be worst-case values. This is confirmed in part by a few independent corrections, also listed in Table B-2, which were obtained by extrapolating opening temperature data from nearby 0.51 mm and 0.051 mm diameter thermocouples to "zero diameter" following the procedure outlined by Lee[B2]. The $\pm$ 1°C error associated with the thermocouple wire and recording system has been included in the corrections displayed in Table B-2.

Since the local mass flux (ρv) varies at $T^{-1/2}$, the listed temperature uncertainties have a small effect on the opening mass flow rates. Table B-2 includes the uncertainty in mass flux associated with the listed temperature uncertainties. In general, the effect is less than 2 percent.

Accuracy of Velocity Results

Opening velocities were determined with bidirectional velocity probes previously described by McCaffrey and Heskestad[B3]. The low sensitivity of these devices to the angle of incidence of the flow required that care be taken to allign the probe head parallel with the flow. Smoke-trace experiments indicated that the streamlines through the opening tended to be horizontal at the mid-place of the jamb's depth. Consequently, probe heads were located in the mid-plane of the jamb with their axes horizontal.

The velocity of the gas past the probe is given by the expression

$$v = C(Re)(\rho_\infty T_\infty)^{-1/2}(2\Delta pT)^{1/2} \qquad \text{(B-1)}$$

where C(Re) is a calibration factor which varies with Reynolds number (Re), ρ_∞ is the density of air at T_∞, Δp is the pressure difference across the probe head, and T is the absolute temperature of the gas. C(Re) is known within 5 percent for Re between 40 and 3800[B3]; i.e., for cold flow velocities between 0.04 and 3.8 m/s. The differential pressures were measured with Datametrics* Model 570 transducers and Model 1014A electronic manometers.

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* Commercial products are neither endorsed nor necessarily recommended by the National Bureau of Standards.

Because of limited primary standards, the manufacturer reports known system accuracies as 0.1 percent at 1 torr, 5 percent at 10^{-3} torr, and 10 percent at 10^{-5} torr[B4]. The manufacturer also states that the system appears linear throughout this range. These accuracy figures are consistent with the 2 percent accuracy reported by McCaffrey[B5] for measurements made with these systems at 6.2×10^{-2} and 1.7×10^{-3} torr. Since opening gas temperatues were known within 5 percent for $v > 0.1$ m/s (see Table B-2), the maximum possible error associated with v due to uncertainties in C(Re), Δp, and T is 10 percent. For $v < 0.1$ m/s, the maximum possible error is at least 13 percent. Nevertheless, velocities in this regime constitute a small fraction of the results and account for less than 1.5 percent of the opening mass flow in any given experiment.

Accuracy of Mass Flow Results

Based on the accuracies of C(Re), Δp, and T, and provided the streamlines were normal to the opening at the measurement points, the maximum error associated with the mass flow results is expected to be approximately 10 percent. Differences between experimental inflow and outflow rates are consistent with this figure. For a given experiment involving a doorway or the largest window, mass inflow and outflow rates are within 5 percent of their average value. This deviation increases to 8 percent for the smaller window configurations.

References

B1. Newman, J.S. and Croce, P.A., A Simple Aspirated Thermocouple for Use in Fire, Journal of Fire and Flammability 10, 326 (1979).

B2. Lee, B.T., Thermocouple Size and Temperature Measurement in Room Fires, Memorandum, Center for Fire Research, National Bureau of Standards (U.S.), May 1977.

B3. McCaffrey, B.J. and Heskestad, G., A Robust Bidirectional Low Velocity Probe for Flame and Fire Applications, Combustion and Flame 10, 326 (1976).

B4. Datametrics Inc., Datametrics Barocel Vacuum/Pressure Measurement Systems and Accessories, Bulletin No. 2005, Datametrics, Inc., Wilmington, MA.

B5. McCaffrey, B.J., A Portable, Stable Low Differential Pressure Calibration Source, Memorandum, Center for Fire Research, National Bureau of Standards (U.S.), October 1976.

Table B-1

Key to intermediate results
(see Fig. B-1)

Temperature (°C)

	Connected space	Room		Opening (looking into room)							
21											
20		140.14	ceiling								
19		144.16									
18		144.12									
17	32.36	144.37		142.68	142.72	142.00	140.99	141.63	141.11	142.61	soffit
16	31.03	143.69		132.77	139.86	136.93	136.55	137.14	137.91	139.53	
15	30.32	142.87		110.32	138.98	135.85	134.20	134.63	135.70	137.24	
14		142.34		92.55	137.30	133.26	132.38	132.63	133.03	128.54	
13		140.84		88.98	132.96	131.71	129.03	129.85	130.40	115.47	
12		138.31		60.23	103.57	108.43	107.57	111.05	107.64	83.06	ΔZ
11		133.48		44.52	39.27	42.86	45.71	42.06	35.15	41.20	
10		121.29		38.43	33.51	33.58	33.14	32.38	31.37	33.23	
9		103.21		35.98	32.77	32.14	31.84	31.38	30.93	30.27	
8		88.56		34.47	32.30	32.18	31.75	31.58	30.70	30.22	
7		76.88		33.17	32.81	32.39	31.98	31.31	30.91	29.95	sill
6		65.06		32.43	32.44	32.02	31.31	31.55	30.89	30.15	
5		56.40	floor	33.01	32.45	31.81	31.38	31.04	30.70	30.18	
4		53.54		32.80	32.24	32.04	31.26	31.62	30.88	30.25	
3		52.00		32.83	32.23	31.72	31.35	31.02	30.57	30.05	
2		51.74		32.85	32.34	32.41	31.70	31.94	31.25	30.50	

VELOCITY (m/s) (looking into room)

18	soffit	0.	0.	0.	0.	0.	0.	0.	0.	0.
17		0.	2.22	2.15	2.11	2.07	2.11	2.13	2.26	0.
16		0.	1.79	1.63	1.51	1.48	1.49	1.58	1.84	0.
15		0.	1.44	1.41	1.28	1.23	1.27	1.37	1.62	0.
14		0.	1.15	1.12	1.04	1.02	1.05	1.14	1.29	0.
13		0.	0.76	0.84	0.78	0.77	0.79	0.84	0.92	0.
12	ΔZ	0.	0.27	0.45	0.47	0.48	0.51	0.49	0.33	0.
11		0.	-0.47	-0.47	-0.43	-0.39	-0.40	-0.51	-0.46	0.
10		0.	-0.87	-0.73	-0.68	-0.66	-0.66	-0.73	-0.85	0.
9		0.	-1.04	-0.84	-0.77	-0.75	-0.78	-0.87	-1.06	0.
8		0.	-1.16	-0.95	-0.88	-0.87	-0.86	-0.96	-1.19	0.
7		0.	-1.28	-1.10	-1.05	-1.03	-1.06	-1.14	-1.38	0.
6	sill	0.	-1.46	-1.43	-1.43	-1.44	-1.43	-1.46	-1.50	0.
5		0.	0.	0.	0.	0.	0.	0.	0.	0.
4		0.	0.	0.	0.	0.	0.	0.	0.	0.
3		0.	0.	0.	0.	0.	0.	0.	0.	0.
2		0.	0.	0.	0.	0.	0.	0.	0.	0.
1		0.	0.	0.	0.	0.	0.	0.	0.	0.

ΔX

left jamb

right jamb

Fig. B-1 Sensor locations with dimensions in m.

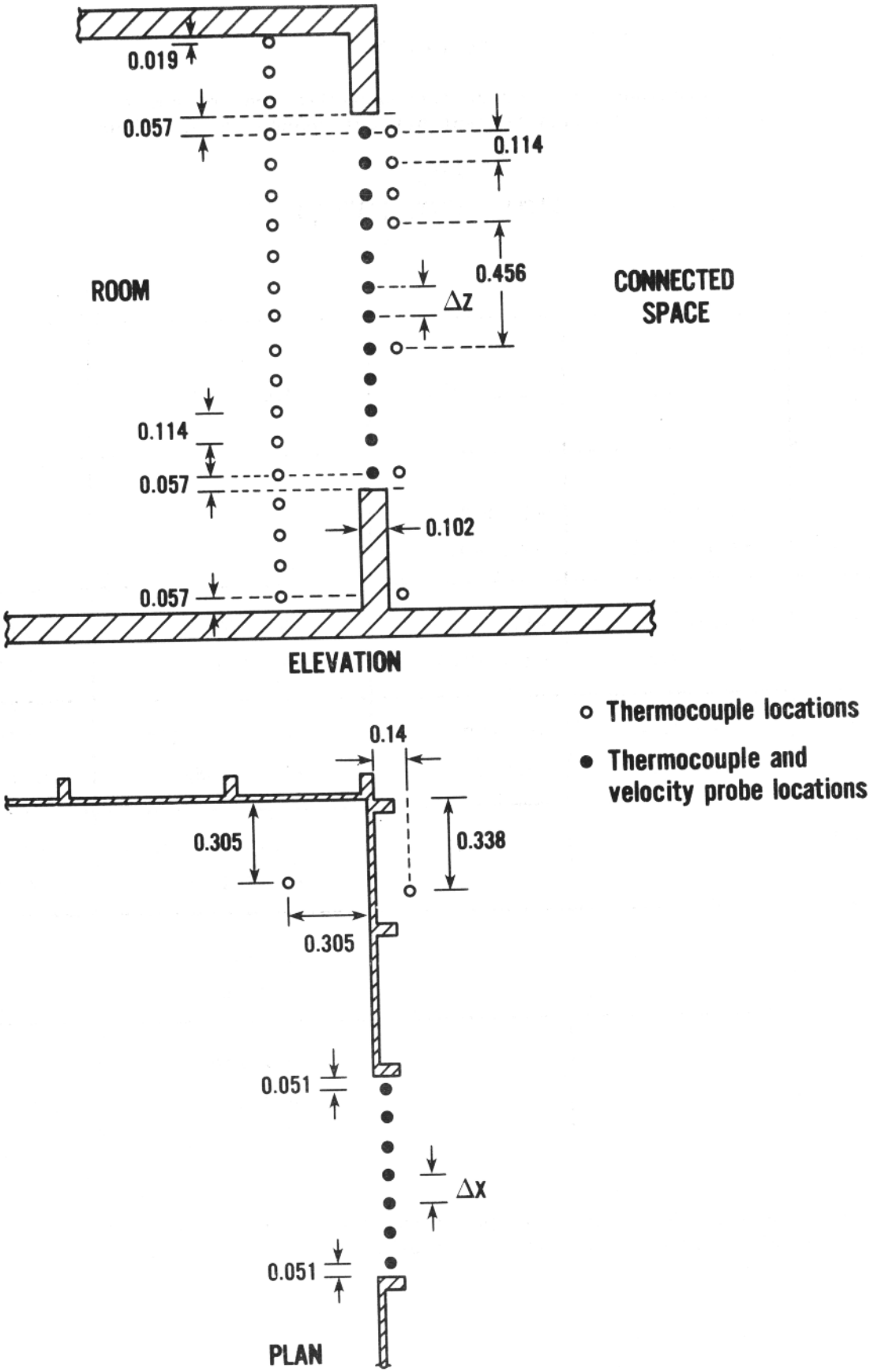

Table B-2

Corrections for opening thermocouples near or above neutral plane and attendant percent change in mass flux

$$T-T_t$$
$$[\dot{m}''(T) - \dot{m}''(T_t)]/\dot{m}''(T_t)$$

T_t (°C) \ v (m/s)	< 0.1	0.1 - 0.6	0.6 - 1.2	> 1.2
< 50	-20/+2°C +3.3/-0.4%	-14/+2°C +2.2/-0.4%		
50 - 100	-11/+4°C +1.5/-0.5%	-14/+4°C +2.2/-0.5%	-9/+4°C +1.1/-0.5%	-2/+4°C +0.4/-0.5%
100 - 150	-8/+7°C (-5°C)* +1.1/-0.9%	-5/+6°C +0.8/0.7%	-9/+7°C (+1°C)* +1.1/-0.8%	-2/+6°C (+2°C)* 0.2/-1.2%
150 - 200			-5/+11°C (+6°C)* +0.5/-1.1%	-2/+10°C +0.2/-1.0%
200 - 250			-1/+15°C 0.1/1.4%	-5/+13°C (+5,+3°C)* 0.5/-1.2%
> 250			-4/+16°C +0.4/1.5%	-3/+16°C +0.3/-1.4%

*Corrections obtained by linear extrapolation of 0.51 mm and 0.051 mm diameter thermocouple data to "zero diameter".

Table B-3

Test 10; 2/6 door, 62.9 kW, location A

TEMPERATURE (^{o}C)

21					
20		184.79			
19		192.98			
18		193.14			
17	26.96	193.06	194.06	192.72	190.92
16	25.89	191.98	189.87	187.63	188.93
15	25.32	190.51	183.95	182.60	183.96
14		190.75	182.86	182.03	181.62
13		190.24	186.03	180.88	179.99
12		189.25	171.64	179.12	178.27
11		188.24	154.79	172.49	173.26
10		187.13	115.69	129.20	146.42
9		184.70	31.14	32.71	44.93
8		177.23	28.67	26.68	26.68
7		135.48	27.46	27.60	26.47
6		96.70	27.53	26.68	26.60
5		82.38	26.81	26.41	25.73
4		71.90	27.28	25.95	26.14
3		67.72	27.98	28.08	26.79
2		65.52	28.54	27.54	27.98

VELOCITY (m/s)

18	0.	0.	0.	0.	0.
17	0.	3.30	3.12	3.17	0.
16	0.	2.80	2.62	2.77	0.
15	0.	2.55	2.38	2.57	0.
14	0.	2.33	2.17	2.31	0.
13	0.	2.03	1.85	1.93	0.
12	0.	1.63	1.54	1.58	0.
11	0.	1.27	1.18	1.24	0.
10	0.	0.62	0.59	0.70	0.
9	0.	-0.64	-0.58	-0.53	0.
8	0.	-1.01	-0.91	-1.02	0.
7	0.	-1.25	-1.18	-1.37	0.
6	0.	-1.47	-1.33	-1.43	0.
5	0.	-1.55	-1.45	-1.67	0.
4	0.	-1.62	-1.53	-1.71	0.
3	0.	-1.70	-1.64	-1.85	0.
2	0.	-1.77	-1.71	-1.87	0.
1	0.	0.	0.	0.	0.

$\Delta X = 0.067$ m
$\Delta Z = 0.114$ m
$Z_n = 0.912$ m

Outflow rate = 0.247 kg/s
Inflow rate = 0.255 kg/s
Outdoor temperature = 21.9-23.9^{o}C

Table B-4

Test 11; 3/6 door, 62.9 kW, location A

TEMPERATURE (°C)

21							
20		159.39					
19		165.81					
18		165.97					
17	28.79	166.19	164.49	164.13	163.61	163.13	163.12
16	28.12	165.44	161.46	160.01	159.84	160.33	160.83
15	27.54	164.34	154.71	158.32	156.00	156.45	160.40
14		164.51	151.84	156.96	156.42	156.50	157.81
13		163.99	150.87	156.67	153.83	154.77	158.05
12		163.07	136.59	153.11	152.66	152.59	154.34
11		162.02	114.66	136.90	140.63	141.49	140.77
10		160.11	55.21	77.13	95.96	102.89	102.02
9		150.69	33.29	31.40	30.86	31.48	31.48
8		113.62	29.98	30.08	29.83	28.78	28.81
7		83.38	29.41	30.38	30.14	29.75	27.94
6		71.28	29.67	30.35	30.25	29.01	28.66
5		64.89	29.33	29.76	28.99	28.60	27.48
4		61.07	29.21	30.10	29.51	28.39	28.24
3		58.52	30.51	30.88	30.76	30.41	28.18
2		56.44	30.66	31.35	31.15	30.57	29.69

VELOCITY (m/s)

18	0.	0.	0.	0.	0.	0.	0.
17	0.	2.90	2.76	2.69	2.74	2.82	0.
16	0.	2.47	2.20	2.17	2.20	2.41	0.
15	0.	2.18	2.00	1.93	1.98	2.23	0.
14	0.	1.96	1.76	1.72	1.78	2.05	0.
13	0.	1.65	1.49	1.42	1.49	1.71	0.
12	0.	1.30	1.20	1.15	1.20	1.37	0.
11	0.	0.93	0.88	0.87	0.92	1.02	0.
10	0.	-0.03	0.25	0.36	0.43	0.42	0.
9	0.	-0.70	-0.62	-0.61	-0.60	-0.68	0.
8	0.	-0.96	-0.83	-0.81	-0.84	-1.00	0.
7	0.	-1.10	-1.00	-0.98	-1.01	-1.20	0.
6	0.	-1.21	-1.11	-1.07	-1.13	-1.29	0.
5	0.	-1.28	-1.18	-1.16	-1.21	-1.40	0.
4	0.	-1.34	-1.25	-1.21	-1.28	-1.49	0.
3	0.	-1.40	-1.33	-1.30	-1.32	-1.55	0.
2	0.	-1.46	-1.37	-1.32	-1.37	-1.57	0.
1	0.	0.	0.	0.	0.	0.	0.

ΔX = 0.065 m
ΔZ = 0.114 m
Z_n = 0.940 m

Outflow rate = 0.357 kg/s
Inflow rate = 0.358 kg/s
Outdoor temperature = 24.6-25.8°C

Table B-5

Test 12; 4/6 door, 62.9 kW, location A

TEMPERATURE (^{o}C)

21							
20		136.57					
19		141.75					
18		141.71					
17	23.92	141.97	139.40	139.63	139.99	139.23	139.92
16	22.65	141.37	135.78	137.41	135.24	136.25	137.40
15	21.90	140.83	129.47	135.16	133.63	133.65	137.16
14		140.85	115.54	134.26	131.56	132.93	135.79
13		140.53	116.78	133.36	130.29	131.47	134.83
12		139.99	103.87	131.48	126.60	128.69	131.13
11		138.74	85.28	97.49	110.53	107.84	107.81
10		132.77	45.55	42.04	53.71	56.45	53.73
9		97.12	26.84	24.18	24.74	23.80	24.99
8		70.13	24.56	23.64	23.54	23.23	23.07
7		58.28	25.02	23.93	24.29	24.00	23.38
6		53.40	24.96	23.79	23.90	23.73	22.80
5		49.76	23.95	23.39	23.05	22.71	22.99
4		47.34	23.91	23.40	22.85	22.75	22.42
3		45.23	24.80	24.18	24.27	23.97	23.25
2		43.83	25.43	24.32	24.29	24.32	23.81

VELOCITY (m/s)

18	0.	0.	0.	0.	0.	0.	0.
17	0.	2.67	2.53	2.51	2.51	2.62	0.
16	0.	2.24	1.98	1.92	1.96	2.18	0.
15	0.	1.96	1.75	1.70	1.74	1.97	0.
14	0.	1.63	1.53	1.45	1.54	1.79	0.
13	0.	1.34	1.27	1.19	1.25	1.52	0.
12	0.	1.06	0.97	0.95	0.97	1.25	0.
11	0.	0.73	0.70	0.72	0.72	0.82	0.
10	0.	-0.22	-0.20	0.07	0.13	0.17	0.
9	0.	-0.73	-0.64	-0.58	-0.62	-0.71	0.
8	0.	-0.92	-0.77	-0.72	-0.75	-0.92	0.
7	0.	-0.96	-0.85	-0.81	-0.86	-1.03	0.
6	0.	-1.03	-0.95	-0.91	-0.96	-1.14	0.
5	0.	-1.08	-1.01	-0.96	-1.03	-1.23	0.
4	0.	-1.15	-1.06	-1.03	-1.07	-1.34	0.
3	0.	-1.17	-1.11	-1.07	-1.12	-1.40	0.
2	0.	-1.20	-1.14	-1.09	-1.15	-1.40	0.
1	0.	0.	0.	0.	0.	0.	0.

ΔX = 0.098 m
ΔX = 0.114 m
Z_n = 0.971 m

Outflow rate = 0.459 kg/s
Inflow rate = 0.454 kg/s
Outdoor temperature = 18.7-20.0^{o}C

Table B-6

Test 612; 4/6 door, 62.9 kW, location A

TEMPERATURE (°C)

*							
21							
20		130.80					
19		135.82					
18		136.09					
17	14.92	136.08	132.18	132.57	132.65	132.48	131.39
16		135.63	132.13	130.77	128.37	127.45	127.61
15		135.10	122.36	128.92	128.35	128.29	127.87
14	13.63	135.25	114.44	129.50	127.38	126.71	125.14
13		134.79	103.68	129.24	127.39	126.68	115.00
12		133.73	96.46	125.62	122.11	122.14	116.43
11		131.73	71.98	89.51	98.02	102.53	92.48
10	13.02	119.43	26.93	28.31	41.26	31.36	37.83
9		80.92	16.28	15.57	15.38	15.06	17.28
8		58.12	15.37	15.03	14.95	14.14	14.89
7		47.84	16.82	16.29	16.40	15.62	13.09
6	12.48	42.08	16.90	16.48	16.70	14.69	12.88
5		38.26	17.11	15.67	14.67	13.72	12.48
4		36.04	18.05	16.39	14.95	13.06	12.22
3		34.06	16.43	15.89	15.98	15.77	15.03
2	13.55	33.64	16.32	16.64	16.56	15.86	15.33
*							
*							

VELOCITY (m/s)

*							
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	2.62	2.12	2.49	2.50	2.66	0.00
16	0.00	2.31	2.02	1.96	2.01	2.25	0.00
15	0.00	1.99	1.56	1.75	1.81	2.05	0.00
14	0.00	1.74	1.59	1.53	1.62	1.78	0.00
13	0.00	1.41	1.17	1.23	1.28	1.39	0.00
12	0.00	1.11	0.98	0.96	0.99	1.22	0.00
11	0.00	0.68	0.59	0.73	0.75	0.80	0.00
10	0.00	-0.28	-0.23	0.11	-0.23	0.20	0.00
9	0.00	-0.65	-0.50	-0.58	-0.60	-0.68	0.00
8	0.00	-0.84	-0.72	-0.71	-0.76	-0.85	0.00
7	0.00	-1.03	-0.80	-0.86	-0.88	-1.02	0.00
6	0.00	-1.09	-0.94	-0.92	-0.98	-1.15	0.00
5	0.00	-1.15	-0.93	-0.97	-1.02	-1.21	0.00
4	0.00	-1.16	-1.04	-1.00	-1.08	-1.33	0.00
3	0.00	-1.19	-1.00	-1.05	-1.09	-1.40	0.00
2	0.00	-1.21	-1.08	-1.06	-1.15	-1.41	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00
*							
*							

ΔX = 0.098 m
ΔZ = 0.114 m
Z_n = 0.981 m

Outflow rate = 0.467 kg/s
Inflow rate = 0.463 kg/s

Table B-7

Test 13; 5/6 door, 62.9 kW, location A

TEMPERATURE (^{o}C)

21									
20		125.84							
19		130.24							
18		130.13							
17	24.07	130.41	125.07	125.69	124.65	124.86	128.14	127.54	129.41
16	23.30	129.95	123.01	123.23	122.70	121.38	121.67	124.91	127.16
15	22.81	129.58	114.68	124.26	121.70	121.28	122.88	123.05	127.28
14		129.58	102.94	123.84	121.59	119.41	120.30	122.24	124.35
13		129.26	94.15	123.26	119.64	117.87	119.80	122.03	122.56
12		128.61	79.73	114.61	113.97	112.06	112.98	114.92	114.36
11		126.28	47.10	61.58	77.36	83.08	92.04	87.50	79.47
10		106.81	35.94	32.73	36.68	42.82	45.79	43.88	41.44
9		72.78	26.51	24.65	25.00	25.16	24.74	24.11	25.55
8		58.30	26.30	24.27	24.19	24.33	24.10	24.05	25.62
7		51.69	26.09	24.45	24.77	24.92	25.18	24.26	24.89
6		48.51	27.16	24.34	24.47	24.76	24.69	24.36	24.60
5		45.68	24.39	24.30	24.20	23.99	23.95	23.66	24.56
4		43.65	24.35	24.20	24.05	23.83	23.85	23.93	24.13
3		41.52	25.60	24.81	25.26	25.48	25.50	25.07	25.25
2		40.31	26.96	25.10	25.28	25.36	25.65	25.99	25.52

VELOCITY (m/s)

18	0.	0.	0.	0.	0.	0.	0.	0.	0.
17	0.	2.50	2.38	2.41	2.35	2.31	2.35	2.55	0.
16	0.	2.07	1.84	1.77	1.72	1.75	1.87	2.03	0.
15	0.	1.77	1.61	1.53	1.50	1.55	1.61	1.84	0.
14	0.	1.46	1.42	1.32	1.27	1.33	1.44	1.60	0.
13	0.	1.11	1.12	1.04	1.03	1.03	1.12	1.39	0.
12	0.	0.77	0.79	0.79	0.83	0.85	0.89	1.07	0.
11	0.	0.29	0.43	0.50	0.55	0.58	0.58	0.61	0.
10	0.	-0.37	-0.36	-0.30	-0.21	-0.16	-0.18	-0.18	0.
9	0.	-0.66	-0.61	-0.56	-0.56	-0.56	-0.62	-0.66	0.
8	0.	-0.72	-0.73	-0.67	-0.65	-0.68	-0.74	-0.74	0.
7	0.	-0.84	-0.77	-0.73	-0.74	-0.75	-0.84	-0.92	0.
6	0.	-0.88	-0.86	-0.81	-0.80	-0.82	-0.90	-0.95	0.
5	0.	-0.98	-0.91	-0.86	-0.85	-0.87	-0.96	-1.10	0.
4	0.	-1.03	-0.97	-0.91	-0.90	-0.91	-0.97	-1.20	0.
3	0.	-1.04	-0.98	-0.93	-0.91	-0.93	-1.02	-1.22	0.
2	0.	-1.06	-1.02	-0.92	-0.93	-0.95	-1.04	-1.26	0.
1	0.	0.	0.	0.	0.	0.	0.	0.	0.

ΔX = 0.086 m
ΔZ = 0.114 m
Z_n = 1.010 m

Outflow rate = 0.527 kg/s
Inflow rate = 0.519 kg/s
Outdoor temperature = 18.2-21.7^{o}C

Table B-8

Test 14; 6/6 door, 62.9 kW, location A

TEMPERATURE (°C)

21									
20		125.15							
19		129.26							
18		129.32							
17	30.33	129.68	130.72	130.90	129.89	128.58	128.31	129.03	126.27
16	29.52	129.19	129.78	127.61	125.52	124.36	124.03	125.26	125.77
15	28.89	128.77	122.47	128.61	123.65	122.18	122.80	125.54	121.84
14		128.80	110.68	127.12	122.93	120.48	122.11	123.94	117.94
13		128.37	98.79	124.68	120.67	117.03	119.81	120.70	88.35
12		127.28	90.43	110.16	109.72	108.55	107.08	107.95	83.81
11		122.82	58.65	64.71	74.71	75.98	68.06	53.01	47.93
10		95.27	41.10	38.97	44.48	43.44	35.85	31.69	33.87
9		66.22	33.70	32.97	33.34	31.61	30.56	29.71	29.99
8		56.60	33.13	32.14	32.16	30.88	30.12	29.50	29.59
7		51.77	33.75	32.82	32.72	31.90	31.06	29.88	29.00
6		48.99	33.61	32.29	32.53	31.75	30.71	29.67	28.85
5		46.75	32.69	32.02	31.48	30.57	29.98	29.42	28.71
4		45.70	32.97	31.70	31.54	30.66	29.95	29.22	28.87
3		44.34	35.64	32.84	33.34	32.84	32.27	31.37	29.48
2		44.20	36.19	32.90	33.43	33.40	32.96	31.29	30.06

VELOCITY (m/s)

18	0.	0.	0.	0.	0.	0.	0.	0.	0.
17	0.	2.39	2.25	2.18	2.15	2.21	2.34	2.42	0.
16	0.	1.94	1.73	1.66	1.62	1.67	1.75	1.95	0.
15	0.	1.61	1.51	1.43	1.37	1.45	1.54	1.62	0.
14	0.	1.27	1.26	1.16	1.15	1.24	1.32	1.34	0.
13	0.	1.10	0.96	0.94	0.91	0.88	0.97	0.83	0.
12	0.	0.83	0.73	0.76	0.76	0.70	0.71	0.67	0.
11	0.	0.33	0.32	0.35	0.39	0.37	0.25	0.22	0.
10	0.	-0.37	-0.31	-0.20	-0.20	-0.33	-0.40	-0.34	0.
9	0.	-0.62	-0.49	-0.45	-0.47	-0.51	-0.59	-0.57	0.
8	0.	-0.73	-0.59	-0.55	-0.60	-0.64	-0.70	-0.69	0.
7	0.	-0.82	-0.69	-0.62	-0.64	-0.70	-0.78	-0.76	0.
6	0.	-0.89	-0.76	-0.72	-0.73	-0.76	-0.85	-0.89	0.
5	0.	-0.94	-0.79	-0.73	-0.74	-0.77	-0.88	-0.91	0.
4	0.	-0.99	-0.85	-0.79	-0.77	-0.80	-0.91	-1.00	0.
3	0.	-1.03	-0.89	-0.76	-0.79	-0.83	-0.95	-0.85	0.
2	0.	-1.07	-0.93	-0.84	-0.82	-0.86	-0.99	-0.86	0.
1	0.	0.	0.	0.	0.	0.	0.	0.	0.

$\Delta X = 0.106$ m
$\Delta Z = 0.114$ m
$Z_n = 1.027$ m
Outflow rate = 0.571 kg/s
Inflow rate = 0.554 kg/s
Outdoor temperature = 27.2-29.6°C

Table B-9

Test 18; 6/6 door, 62.9 kW, location A

TEMPERATURE (°C)

*									
21									
20		126.71							
19		130.73							
18		130.73							
17	31.92	131.15	131.55	129.99	129.20	131.22	129.93	130.03	129.85
16	31.09	130.76	127.87	127.95	124.85	125.45	126.88	127.44	128.35
15	30.56	130.47	121.69	127.16	123.94	123.77	124.43	126.60	126.17
14		130.56	105.43	127.46	122.09	121.97	124.97	126.25	119.93
13		130.18	95.32	124.04	120.17	119.30	120.65	121.25	96.77
12		129.17	86.24	109.63	109.18	109.20	108.42	108.89	89.67
11		124.79	57.06	63.61	76.73	77.37	65.69	56.12	58.39
10		97.62	42.95	39.89	43.93	43.32	35.60	33.39	40.24
9		68.20	34.60	33.92	34.16	33.25	32.33	31.70	34.59
8		59.05	34.32	33.21	33.08	32.94	32.37	31.39	34.77
7		54.36	34.64	33.69	33.96	34.05	33.11	32.02	32.49
6		51.62	35.09	33.50	33.53	33.94	33.21	31.73	32.11
5		49.33	33.35	32.86	32.93	32.77	32.23	31.52	32.05
4		48.11	33.65	32.83	32.52	32.70	32.41	31.36	31.58
3		46.77	35.52	33.79	34.59	35.22	34.72	33.96	32.52
2		46.91	37.32	34.24	34.66	35.23	35.08	33.97	33.46
*									
*									

VELOCITY (m/s)

*									
18	0.	0.	0.	0.	0.	0.	0.	0.	0.
17	0.	2.42	2.28	2.23	2.24	2.29	2.31	2.47	0.
16	0.	1.93	1.75	1.67	1.62	1.66	1.77	1.97	0.
15	0.	1.59	1.50	1.41	1.39	1.48	1.53	1.64	0.
14	0.	1.27	1.25	1.16	1.15	1.22	1.32	1.31	0.
13	0.	0.99	0.93	0.92	0.90	0.83	0.88	0.84	0.
12	0.	0.79	0.72	0.72	0.71	0.67	0.67	0.65	0.
11	0.	0.28	0.31	0.38	0.39	0.33	0.24	0.30	0.
10	0.	-0.36	-0.30	-0.22	-0.24	-0.36	-0.44	-0.17	0.
9	0.	-0.59	-0.47	-0.44	-0.47	-0.52	-0.57	-0.47	0.
8	0.	-0.71	-0.59	-0.53	-0.56	-0.60	-0.70	-0.45	0.
7	0.	-0.80	-0.67	-0.64	-0.64	-0.72	-0.80	-0.72	0.
6	0.	-0.86	-0.75	-0.70	-0.71	-0.74	-0.88	-0.78	0.
5	0.	-0.94	-0.80	-0.75	-0.73	-0.79	-0.87	-0.98	0.
4	0.	-0.97	-0.85	-0.78	-0.77	-0.79	-0.93	-1.08	0.
3	0.	-1.06	-0.89	-0.82	-0.80	-0.85	-0.93	-1.17	0.
2	0.	-1.08	-0.93	-0.84	-0.82	-0.86	-0.99	-1.20	0.
1	0.	0.	0.	0.	0.	0.	0.	0.	0.
*									
*									

ΔX = 0.106 m
ΔX = 0.114 m
Z_n = 1.026 m

Outflow rate = 0.567 kg/s
Inflow rate = 0.553 kg/s
Outdoor temperature = 28.9-29.4°C

Table B-10

Test 710; 6/6 door, 62.9 kW, location A

1 TEMPERATURE (°C)

*									
21									
20		107.75							
19		109.83							
18		109.76							
17	13.36	109.78	102.48	104.06	105.99	107.58	107.14	106.58	107.61
16		109.61	97.71	104.43	102.22	104.08	102.80	104.56	106.76
15		109.64	75.08	101.42	102.05	102.95	102.19	103.78	106.00
14	11.82	109.53	59.10	102.60	99.60	100.57	99.75	102.33	104.43
13		108.96	55.61	97.81	97.70	98.74	98.62	99.90	99.12
12		106.61	54.25	81.31	85.05	88.62	86.96	89.58	90.31
11		92.82	26.43	44.76	45.60	57.80	59.31	62.50	65.42
10	11.70	65.77	15.64	15.73	18.90	26.19	23.56	24.81	26.66
9		49.50	12.73	12.77	12.91	14.85	14.33	14.61	15.96
8		40.21	12.69	11.99	12.17	12.62	13.51	13.48	13.78
7		35.71	13.61	12.80	13.05	14.32	14.86	14.75	13.36
6	10.82	32.89	13.48	12.49	13.08	14.13	15.01	14.67	13.36
5		30.10	18.47	13.01	12.84	13.17	13.10	13.12	12.35
4		28.03	14.19	12.68	12.88	12.76	13.35	12.98	12.18
3		26.04	10.90	12.09	12.30	13.21	13.56	14.09	14.07
2	12.20	25.48	12.15	12.79	12.90	13.15	14.02	14.24	14.05
*									
*									

VELOCITY (m/s)

*									
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	2.38	2.30	2.30	2.24	2.27	2.28	2.36	0.00
16	0.00	1.93	1.81	1.68	1.67	1.70	1.78	2.01	0.00
15	0.00	1.56	1.55	1.47	1.42	1.47	1.57	1.73	0.00
14	0.00	1.19	1.30	1.20	1.22	1.25	1.33	1.66	0.00
13	0.00	0.92	1.04	0.95	1.01	1.03	1.05	1.30	0.00
12	0.00	0.72	0.81	0.86	0.86	0.81	0.85	0.98	0.00
11	0.00	0.29	0.44	0.40	0.48	0.51	0.51	0.58	0.00
10	0.00	-0.42	-0.38	-0.33	-0.22	-0.26	-0.26	-0.19	0.00
9	0.00	-0.60	-0.54	-0.51	-0.45	-0.50	-0.56	-0.52	0.00
8	0.00	-0.73	-0.62	-0.61	-0.60	-0.60	-0.64	-0.73	0.00
7	0.00	-0.80	-0.72	-0.70	-0.72	-0.73	-0.79	-0.89	0.00
6	0.00	-0.86	-0.75	-0.75	-0.75	-0.76	-0.83	-0.99	0.00
5	0.00	-0.88	-0.79	-0.76	-0.78	-0.78	-0.87	-1.07	0.00
4	0.00	-0.93	-0.83	-0.79	-0.80	-0.82	-0.91	-1.11	0.00
3	0.00	-1.01	-0.87	-0.84	-0.83	-0.87	-0.95	-1.18	0.00
2	0.00	-1.04	-0.93	-0.88	-0.86	-0.86	-0.96	-1.19	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
*									
*									

ΔX = 0.106 m
ΔZ = 0.114 m
Z_n = 1.016 m

Outflow rate = 0.643 kg/s
Inflow rate = 0.605 kg/s

Table B-11

Test 810; 6/6 door, 62.9 kW, location A

TEMPERATURE (^{o}C)

21									
20		113.01							
19		116.10							
18		116.16							
17	15.05	116.13	111.80	111.98	112.17	111.13	111.64	111.71	112.15
16		115.90	111.64	112.15	108.80	110.45	109.55	112.04	110.40
15		115.79	106.94	109.09	108.51	106.41	107.91	109.51	106.77
14	13.42	115.79	74.66	110.81	107.30	106.46	107.56	111.91	102.44
13		115.35	68.25	106.77	105.19	102.23	105.00	108.30	94.82
12		113.64	66.77	89.36	88.37	88.51	92.36	96.86	90.45
11		102.21	35.98	49.14	56.60	57.88	54.47	57.99	53.92
10	12.51	66.32	18.30	18.69	26.14	24.59	18.15	16.70	21.08
9		47.67	15.13	15.75	15.28	15.34	15.09	15.81	18.45
8		39.68	14.59	14.29	14.40	14.80	14.85	15.15	15.96
7		35.60	16.02	15.74	15.57	15.91	15.89	14.83	14.27
6	12.21	33.04	16.06	15.38	15.75	16.62	15.98	14.63	13.96
5		30.64	17.01	15.64	15.01	15.15	14.69	14.15	13.66
4		28.95	16.98	16.16	15.50	15.79	14.68	13.98	13.13
3		27.23	15.49	15.34	15.41	15.74	15.95	15.89	15.95
2	13.71	27.53	15.26	15.34	15.93	16.62	16.25	16.35	15.98

VELOCITY (m/s)

18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	2.35	2.28	2.21	2.20	2.23	2.25	2.42	0.00
16	0.00	2.01	1.81	1.69	1.64	1.71	1.81	2.01	0.00
15	0.00	1.70	1.57	1.43	1.41	1.47	1.55	1.63	0.00
14	0.00	1.12	1.27	1.23	1.19	1.25	1.37	1.38	0.00
13	0.00	0.98	0.93	0.96	0.94	0.95	1.02	1.24	0.00
12	0.00	0.81	0.78	0.70	0.69	0.77	0.80	0.95	0.00
11	0.00	0.33	0.37	0.43	0.41	0.42	0.45	0.49	0.00
10	0.00	-0.44	-0.32	-0.18	-0.25	-0.36	-0.43	-0.17	0.00
9	0.00	-0.62	-0.49	-0.48	-0.47	-0.53	-0.57	-0.38	0.00
8	0.00	-0.74	-0.63	-0.57	-0.58	-0.61	-0.68	-0.62	0.00
7	0.00	-0.85	-0.72	-0.68	-0.67	-0.71	-0.80	-0.71	0.00
6	0.00	-0.88	-0.80	-0.73	-0.73	-0.76	-0.85	-0.80	0.00
5	0.00	-0.94	-0.82	-0.78	-0.75	-0.79	-0.88	-0.93	0.00
4	0.00	-0.94	-0.85	-0.79	-0.79	-0.82	-0.92	-1.06	0.00
3	0.00	-0.97	-0.83	-0.81	-0.79	-0.85	-0.94	-1.21	0.00
2	0.00	-1.00	-0.89	-0.85	-0.82	-0.87	-0.97	-1.23	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

ΔX = 0.106 m
ΔZ = 0.114 m
Z_n = 0.019 m
Outflow rate = 0.616 kg/s
Inflow rate = 0.593 kg/s

Table B-12

Test 16; 7/6 door, 62.9 kW, location A

TEMPERATURE (^{o}C)

21											
20		116.35									
19		119.95									
18		119.93									
17	28.41	120.26	117.26	115.60	118.16	116.54	116.29	117.26	117.27	118.16	118.69
16	27.11	119.72	112.14	115.00	114.93	112.34	112.99	114.49	115.24	115.78	118.91
15	26.29	119.49	103.35	115.60	114.71	111.24	109.84	110.35	110.96	114.52	118.01
14		119.33	80.74	113.13	113.99	110.07	108.14	109.14	109.95	112.79	116.28
13		118.53	64.85	103.66	107.61	103.35	101.68	101.93	106.17	109.65	107.72
12		115.03	51.00	78.22	78.82	84.94	87.06	88.71	89.05	93.26	89.64
11		95.06	38.75	36.67	45.32	53.66	57.42	57.79	55.75	54.40	46.19
10		64.41	34.39	30.70	32.52	35.12	36.49	36.71	36.21	33.18	30.89
9		52.72	30.83	28.91	28.79	29.73	29.31	28.71	27.23	27.44	28.68
8		48.25	29.66	27.83	27.96	28.24	28.09	28.09	27.66	27.29	27.65
7		45.60	31.35	28.33	28.68	29.12	28.85	28.41	27.53	27.49	26.70
6		43.66	30.90	27.79	28.05	28.70	28.56	28.49	28.09	27.57	26.61
5		41.60	28.92	28.48	28.41	28.11	27.87	27.75	26.85	26.77	26.19
4		40.31	29.49	28.14	27.86	27.77	27.81	27.90	27.77	27.11	26.27
3		38.75	32.61	28.69	29.48	29.66	29.55	29.16	28.88	29.06	27.46
2		37.79	32.90	28.57	29.26	29.65	29.63	29.89	29.96	29.34	28.49

VELOCITY (m/s)

18	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
17	0.	2.31	2.25	2.22	2.16	2.12	2.10	2.09	2.13	2.31	0.
16	0.	1.85	1.71	1.62	1.57	1.53	1.48	1.57	1.63	1.79	0.
15	0.	1.45	1.49	1.47	1.29	1.24	1.23	1.32	1.42	1.57	0.
14	0.	1.03	1.14	1.11	1.04	1.02	1.05	1.12	1.21	1.42	0.
13	0.	0.65	0.80	0.74	0.84	0.88	0.89	0.91	0.94	1.21	0.
12	0.	0.38	0.58	0.56	0.65	0.66	0.68	0.71	0.74	0.81	0.
11	0.	-0.10	-0.13	0.13	0.25	0.29	0.32	0.32	0.29	0.28	0.
10	0.	-0.39	-0.39	-0.33	-0.28	-0.24	-0.25	-0.26	-0.30	-0.31	0.
9	0.	-0.52	-0.47	-0.45	-0.41	-0.42	-0.47	-0.49	-0.50	-0.43	0.
8	0.	-0.64	-0.59	-0.54	-0.51	-0.50	-0.53	-0.54	-0.56	-0.59	0.
7	0.	-0.70	-0.61	-0.60	-0.58	-0.58	-0.59	-0.64	-0.70	-0.73	0.
6	0.	-0.78	-0.69	-0.65	-0.64	-0.63	-0.63	-0.66	-0.71	-0.84	0.
5	0.	-0.84	-0.73	-0.66	-0.67	-0.65	-0.66	-0.70	-0.79	-0.93	0.
4	0.	-0.89	-0.76	-0.73	-0.70	-0.69	-0.68	-0.72	-0.77	-0.99	0.
3	0.	-0.89	-0.84	-0.73	-0.73	-0.71	-0.71	-0.75	-0.86	-1.07	0.
2	0.	-0.94	-0.82	-0.73	-0.73	-0.71	-0.72	-0.74	-0.84	-1.06	0.
1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

ΔX = 0.095 m
ΔZ = 0.114 m
Z_n = 1.048 m

Outflow rate = 0.637 kg/s
Inflow rate = 0.594 kg/s
Outdoor temperature = 21.5-25.6^{o}C

Table B-13

Test 17; 8/6 door, 62.9 kW, location A

TEMPERATURE (°C)

*											
21											
20		106.23									
19		109.22									
18		109.25									
17	22.93	109.66	108.03	107.83	107.05	107.63	107.27	108.69	107.66	108.18	107.63
16	22.11	109.25	100.91	105.09	106.12	103.14	103.21	103.18	103.39	104.04	107.11
15	21.68	109.08	84.89	106.12	104.08	101.26	99.33	101.45	101.70	105.21	104.87
14		108.92	56.83	101.59	104.76	98.98	97.18	98.63	100.26	101.55	96.65
13		107.86	51.86	90.50	92.89	88.21	88.40	91.23	93.21	95.61	80.72
12		101.20	35.74	56.56	61.54	67.82	66.79	68.92	70.28	58.27	56.22
11		74.70	28.77	31.50	37.90	42.58	43.93	41.53	35.35	31.69	31.93
10		50.20	27.23	26.22	27.71	31.04	29.30	27.00	24.77	24.18	28.33
9		42.60	24.39	23.87	24.07	24.52	24.24	24.01	23.17	23.20	25.23
8		39.66	24.72	23.44	23.47	23.31	23.70	23.70	23.44	22.62	25.31
7		37.84	25.21	23.95	24.16	24.05	24.23	24.43	23.74	23.35	22.63
6		36.55	25.73	23.80	23.84	23.58	24.14	24.30	24.07	22.80	22.88
5		35.01	23.84	23.56	23.39	22.96	23.15	23.41	22.80	22.74	21.87
4		33.98	24.03	23.47	23.33	22.79	23.33	23.41	23.18	22.16	22.22
3		32.63	24.83	23.91	24.38	24.46	24.79	25.03	24.72	24.73	22.83
2		32.74	24.56	24.65	24.51	24.74	25.00	25.43	25.14	24.51	24.14
*											
*											

VELOCITY (m/s)

*											
18	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
17	0.	2.31	2.33	2.16	2.12	2.19	2.13	2.09	2.22	2.39	0.
16	0.	1.71	1.74	1.69	1.50	1.48	1.47	1.51	1.70	1.73	0.
15	0.	1.23	1.42	1.35	1.22	1.21	1.21	1.28	1.35	1.41	0.
14	0.	0.82	1.00	0.95	0.99	0.96	0.98	1.03	1.07	1.16	0.
13	0.	0.61	0.72	0.72	0.76	0.77	0.79	0.76	0.79	0.84	0.
12	0.	0.22	0.42	0.45	0.54	0.51	0.52	0.51	0.44	0.50	0.
11	0.	-0.20	-0.09	0.14	0.24	0.24	0.23	0.14	-0.10	0.12	0.
10	0.	-0.37	-0.35	-0.29	-0.22	-0.23	-0.29	-0.36	-0.40	-0.18	0.
9	0.	-0.48	-0.45	-0.43	-0.40	-0.43	-0.41	-0.45	-0.48	-0.32	0.
8	0.	-0.57	-0.52	-0.50	-0.47	-0.47	-0.50	-0.52	-0.59	-0.38	0.
7	0.	-0.63	-0.59	-0.57	-0.55	-0.57	-0.56	-0.60	-0.66	-0.63	0.
6	0.	-0.68	-0.62	-0.62	-0.59	-0.58	-0.61	-0.65	-0.73	-0.73	0.
5	0.	-0.74	-0.63	-0.62	-0.61	-0.61	-0.61	-0.65	-0.73	-0.87	0.
4	0.	-0.78	-0.67	-0.65	-0.64	-0.62	-0.64	-0.68	-0.77	-0.95	0.
3	0.	-0.83	-0.71	-0.66	-0.63	-0.63	-0.67	-0.70	-0.80	-1.00	0.
2	0.	-0.86	-0.78	-0.70	-0.65	-0.65	-0.68	-0.73	-0.83	-1.03	0.
1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
*											
*											

ΔX = 0.111 m
ΔZ = 0.114 m
Z_n = 1.065 m

Outflow rate = 0.701 kg/s
Inflow rate = 0.653 kg/s
Outdoor temperature = 18.6-18.9°C

Table B-14

Test 22; full window, 62.9 kW, location A

TEMPERATURE (^{o}C)

21									
20		140.14							
19		144.16							
18		144.12							
17	32.36	144.37	142.68	142.72	142.00	140.99	141.63	141.11	142.61
16	31.03	143.69	132.77	139.86	136.93	136.55	137.14	137.91	139.53
15	30.32	142.87	110.32	138.98	135.85	134.20	134.63	135.70	137.24
14		142.34	92.55	137.30	133.26	132.38	132.63	133.03	128.54
13		140.84	88.98	132.96	131.71	129.03	129.85	130.40	115.47
12		138.31	60.23	103.57	108.43	107.57	111.05	107.64	83.06
11		133.48	44.52	39.27	42.86	45.71	42.06	35.15	41.20
10		121.29	38.43	33.51	33.58	33.14	32.38	31.37	33.23
9		103.21	35.98	32.77	32.14	31.84	31.38	30.93	30.27
8		88.56	34.47	32.30	32.18	31.75	31.58	30.70	30.22
7		76.88	33.17	32.81	32.39	31.98	31.31	30.91	29.95
6		65.06	32.43	32.44	32.02	31.31	31.55	30.89	30.15
5		56.40	33.01	32.45	31.81	31.38	31.04	30.70	30.18
4		53.54	32.80	32.24	32.04	31.26	31.62	30.88	30.25
3		52.00	32.83	32.23	31.72	31.35	31.02	30.57	30.05
2		51.74	32.85	32.34	32.41	31.70	31.94	31.25	30.50

VELOCITY (m/s)

18	0.	0.	0.	0.	0.	0.	0.	0.	0.
17	0.	2.22	2.15	2.11	2.07	2.11	2.13	2.26	0.
16	0.	1.79	1.63	1.51	1.48	1.49	1.58	1.84	0.
15	0.	1.44	1.41	1.28	1.23	1.27	1.37	1.62	0.
14	0.	1.15	1.12	1.04	1.02	1.05	1.14	1.29	0.
13	0.	0.76	0.84	0.78	0.77	0.79	0.84	0.92	0.
12	0.	0.27	0.45	0.47	0.48	0.51	0.49	0.33	0.
11	0.	-0.47	-0.47	-0.43	-0.39	-0.40	-0.51	-0.46	0.
10	0.	-0.87	-0.73	-0.68	-0.66	-0.66	-0.73	-0.85	0.
9	0.	-1.04	-0.84	-0.77	-0.75	-0.78	-0.87	-1.06	0.
8	0.	-1.16	-0.95	-0.88	-0.87	-0.86	-0.96	-1.19	0.
7	0.	-1.28	-1.10	-1.05	-1.03	-1.06	-1.14	-1.38	0.
6	0.	-1.46	-1.43	-1.43	-1.44	-1.43	-1.46	-1.50	0.
5	0.	0.	0.	0.	0.	0.	0.	0.	0.
4	0.	0.	0.	0.	0.	0.	0.	0.	0.
3	0.	0.	0.	0.	0.	0.	0.	0.	0.
2	0.	0.	0.	0.	0.	0.	0.	0.	0.
1	0.	0.	0.	0.	0.	0.	0.	0.	0.

ΔX = 0.106 m
ΔZ = 0.114 m
Z_n = 1.145 m

Outflow rate = 0.465 kg/s
Inflow rate = 0.462 kg/s
Outdoor temperature = 25.7-27.5^{o}C

Table B-15

Test 23; 2/3 window, 62.9 kW, location A

TEMPERATURE (°C)

*									
21									
20		172.59							
19		178.70							
18		178.89							
17	27.74	179.06	174.93	175.04	173.66	173.85	174.54	172.62	173.53
16	26.66	178.27	165.41	167.75	166.88	168.23	168.54	166.76	171.88
15	26.06	177.20	147.67	167.91	166.64	164.39	166.01	164.54	166.16
14		177.16	119.11	154.51	150.39	145.64	147.27	143.72	141.19
13		176.02	45.20	50.15	45.60	44.56	44.95	39.88	41.85
12		173.82	32.30	28.88	29.57	29.98	29.77	28.33	29.78
11		170.82	29.17	27.75	27.83	28.08	27.83	27.11	26.32
10		165.18	26.99	27.04	27.31	27.89	27.58	26.52	26.14
9		151.19	27.40	27.33	27.60	27.76	27.00	26.64	26.28
8		127.64	27.54	27.45	28.01	28.16	27.65	26.71	26.50
7		105.18	26.65	26.98	27.10	27.43	26.73	26.42	25.99
6		87.16	26.91	27.20	27.71	27.94	27.33	26.42	26.08
5		79.96	27.71	27.35	27.54	27.82	27.17	26.81	26.20
4		77.47	27.19	27.19	27.55	27.78	27.44	26.65	26.20
3		76.39	27.04	27.11	27.08	27.40	26.83	26.59	26.13
2		76.44	27.13	27.12	27.45	27.81	27.44	26.73	26.33
*									
*									

VELOCITY (m/s)

*									
18	0.	0.	0.	0.	0.	0.	0.	0.	0.
17	0.	2.15	2.09	2.02	2.01	2.06	2.10	2.22	0.
16	0.	1.68	1.49	1.39	1.38	1.40	1.47	1.75	0.
15	0.	1.29	1.16	1.09	1.07	1.12	1.20	1.42	0.
14	0.	0.81	0.76	0.73	0.70	0.76	0.78	0.86	0.
13	0.	-0.42	-0.43	-0.40	-0.39	-0.41	-0.48	-0.94	0.
12	0.	-0.88	-0.78	-0.73	-0.73	-0.74	-0.76	-0.91	0.
11	0.	-1.20	-1.02	-0.96	-0.96	-0.98	-1.00	-1.20	0.
10	0.	-1.51	-1.50	-1.46	-1.45	-1.49	-1.48	-1.53	0.
9	0.	0.	0.	0.	0.	0.	0.	0.	0.
8	0.	0.	0.	0.	0.	0.	0.	0.	0.
7	0.	0.	0.	0.	0.	0.	0.	0.	0.
6	0.	0.	0.	0.	0.	0.	0.	0.	0.
5	0.	0.	0.	0.	0.	0.	0.	0.	0.
4	0.	0.	0.	0.	0.	0.	0.	0.	0.
3	0.	0.	0.	0.	0.	0.	0.	0.	0.
2	0.	0.	0.	0.	0.	0.	0.	0.	0.
1	0.	0.	0.	0.	0.	0.	0.	0.	0.
*									
*									

ΔX = 0.106 m
ΔZ = 0.114 m
Z_n = 1.358 m

Outflow rate = 0.306 kg/s
Inflow rate = 0.299 kg/s
Outdoor temperature = 22.1-23.9°C

Table B-16

Test 30; 2/3 window, 62.9 kW, location A

TEMPERATURE (^{o}C)

*									
21									
20		171.90							
19		178.77							
18		179.02							
17	26.90	179.56	175.54	171.58	172.40	171.83	172.93	172.11	174.25
16	26.88	179.00	170.19	168.08	168.70	167.96	168.38	168.51	169.58
15	26.24	177.99	161.29	165.99	165.57	164.82	166.03	166.27	164.10
14		177.99	127.12	143.89	147.29	143.07	140.80	144.14	124.28
13		176.73	35.87	42.68	45.00	43.61	37.78	36.60	40.97
12		174.35	29.66	29.79	29.61	29.54	28.71	29.34	28.49
11		170.73	28.88	29.07	29.00	28.39	27.77	27.02	26.74
10		163.24	28.53	28.20	27.77	27.32	26.58	26.55	25.99
9		148.73	28.62	28.35	28.16	27.36	27.05	26.31	26.11
8		128.74	28.63	28.37	27.79	27.37	26.49	26.49	25.53
7		108.21	28.03	27.99	27.79	26.79	26.48	25.74	25.67
6		89.30	28.04	28.38	28.78	27.32	26.38	26.19	25.18
5		81.13	28.22	27.86	27.61	26.87	26.79	26.12	25.83
4		78.80	27.81	27.89	27.11	26.91	26.26	26.21	25.18
3		77.75	27.67	27.31	27.08	26.30	26.33	25.75	25.53
2		78.33	27.76	27.68	26.93	26.77	26.22	26.11	25.14
*									
*									

VELOCITY (m/s)

*									
18	0.	0.	0.	0.	0.	0.	0.	0.	0.
17	0.	2.22	2.10	2.10	2.11	2.16	2.11	2.31	0.
16	0.	1.74	1.52	1.44	1.43	1.47	1.54	1.78	0.
15	0.	1.27	1.08	1.04	1.04	1.09	1.13	1.23	0.
14	0.	0.80	0.69	0.68	0.70	0.72	0.76	1.13	0.
13	0.	-0.45	-0.36	-0.38	-0.42	-0.51	-0.52	-0.54	0.
12	0.	-0.84	-0.76	-0.75	-0.75	-0.77	-0.81	-0.98	0.
11	0.	-1.12	-0.96	-0.95	-0.96	-0.98	-1.01	-1.27	0.
10	0.	-1.52	-1.50	-1.41	-1.51	-1.48	-1.58	-1.54	0.
9	0.	0.	0.	0.	0.	0.	0.	0.	0.
8	0.	0.	0.	0.	0.	0.	0.	0.	0.
7	0.	0.	0.	0.	0.	0.	0.	0.	0.
6	0.	0.	0.	0.	0.	0.	0.	0.	0.
5	0.	0.	0.	0.	0.	0.	0.	0.	0.
4	0.	0.	0.	0.	0.	0.	0.	0.	0.
3	0.	0.	0.	0.	0.	0.	0.	0.	0.
2	0.	0.	0.	0.	0.	0.	0.	0.	0.
1	0.	0.	0.	0.	0.	0.	0.	0.	0.
*									
*									

ΔX = 0.106 m
ΔZ = 0.114 m
Z_n = 1.357 m

Outflow rate = 0.309 kg/s
Inflow rate = 0.298 kg/s
Outdoor temperature = 23.0^{o}C

Table B-17

Test 41; 1/3 Window, 62.9 kW, location A

TEMPERATURE (°C)

*									
21									
20		261.06							
19		274.01							
18		273.92							
17	16.35	273.76	264.01	260.49	259.49	260.15	263.54	256.85	256.06
16	16.46	272.21	260.95	256.77	255.46	256.53	258.39	252.33	252.99
15	16.35	268.75	252.64	249.77	246.48	245.24	252.02	246.21	249.36
14		270.07	231.79	194.71	182.65	193.13	193.43	188.89	203.22
13		269.20	131.64	71.03	57.81	47.79	49.95	58.45	118.00
12		266.35	36.35	23.29	21.91	21.38	22.07	19.99	24.13
11		265.13	24.41	24.20	25.32	25.51	25.80	24.08	22.19
10		262.98	21.43	22.17	21.80	21.75	21.39	20.58	19.53
9		252.93	15.79	15.77	16.21	16.10	15.50	14.97	14.35
8		215.07	16.06	15.94	15.83	15.69	15.53	14.63	14.90
7		171.64	16.34	16.39	17.33	17.33	17.02	17.32	16.70
6		163.76	16.59	16.64	17.62	17.98	17.70	18.23	18.75
5		159.62	15.37	15.52	15.94	15.88	15.02	14.30	13.47
4		153.96	15.68	15.67	15.67	15.41	15.18	14.02	13.58
3		149.33	15.92	16.26	16.56	16.30	15.51	14.92	14.05
2		144.53	16.83	17.15	16.87	16.10	15.86	14.79	14.31
*									
*									

VELOCITY (m/s)

*									
18	0.	0.	0.	0.	0.	0.	0.	0.	0.
17	0.	2.04	1.94	1.92	1.94	1.95	1.96	2.09	0.
16	0.	1.55	1.44	1.42	1.43	1.44	1.43	1.54	0.
15	0.	1.25	1.15	1.14	1.15	1.17	1.15	1.25	0.
14	0.	0.90	0.69	0.66	0.72	0.75	0.72	0.81	0.
13	0.	0.35	-0.24	-0.21	-0.21	-0.23	-0.23	0.24	0.
12	0.	-0.62	-0.65	-0.65	-0.64	-0.63	-0.65	-0.66	0.
11	0.	-0.86	-0.80	-0.78	-0.78	-0.78	-0.79	-0.84	0.
10	0.	-1.11	-1.04	-1.05	-1.08	-1.09	-1.08	-1.12	0.
9	0.	0.	0.	0.	0.	0.	0.	0.	0.
8	0.	0.	0.	0.	0.	0.	0.	0.	0.
7	0.	0.	0.	0.	0.	0.	0.	0.	0.
6	0.	0.	0.	0.	0.	0.	0.	0.	0.
5	0.	0.	0.	0.	0.	0.	0.	0.	0.
4	0.	0.	0.	0.	0.	0.	0.	0.	0.
3	0.	0.	0.	0.	0.	0.	0.	0.	0.
2	0.	0.	0.	0.	0.	0.	0.	0.	0.
1	0.	0.	0.	0.	0.	0.	0.	0.	0.
*									
*									

ΔX = 0.106 m
ΔZ = 0.051 m
Z_n = 1.579 m

Outflow rate = 0.126 kg/s
Inflow rate = 0.108 kg/s
Outdoor temperature = 13.0 - 15.0°C

Table B-18

Test 19; 6/6 door, 31.6 kW, location A

TEMPERATURE (°C)

21									
20		83.48							
19		86.12							
18		86.10							
17	30.26	86.51	88.21	87.03	88.13	86.01	85.61	86.37	84.21
16	29.74	86.18	87.28	85.85	86.03	83.66	83.63	83.57	83.90
15	29.31	85.93	83.87	84.94	84.01	82.38	82.27	84.08	82.21
14		85.98	80.54	84.45	84.38	81.03	82.58	82.91	80.55
13		85.75	67.29	82.92	81.42	77.88	80.65	81.67	62.92
12		85.15	69.72	75.48	73.74	72.77	71.24	72.16	59.57
11		82.92	43.60	51.36	55.95	50.76	45.69	39.77	36.09
10		68.57	36.17	34.92	36.19	35.27	31.94	30.21	31.92
9		49.71	32.68	31.91	31.85	31.23	29.79	29.35	29.43
8		44.26	32.64	31.31	31.23	30.76	29.89	29.19	29.36
7		41.64	33.01	31.92	31.77	31.45	30.13	29.47	29.04
6		40.13	33.17	31.50	31.52	31.06	30.13	29.19	29.02
5		39.04	32.22	31.50	30.91	30.50	29.45	29.08	28.86
4		38.57	32.21	30.98	30.98	30.14	29.56	28.91	29.09
3		38.00	33.27	31.89	31.99	31.35	30.45	30.14	29.31
2		37.70	33.26	31.73	31.88	31.50	30.86	29.97	29.79

VELOCITY (m/s)

18	0.	0.	0.	0.	0.	0.	0.	0.	0.
17	0.	1.78	1.66	1.65	1.65	1.68	1.71	1.80	0.
16	0.	1.45	1.27	1.24	1.19	1.24	1.28	1.45	0.
15	0.	1.21	1.09	1.03	1.04	1.11	1.15	1.23	0.
14	0.	1.05	0.95	0.87	0.85	0.94	0.98	1.00	0.
13	0.	0.72	0.70	0.69	0.62	0.59	0.66	0.53	0.
12	0.	0.62	0.55	0.50	0.51	0.45	0.47	0.44	0.
11	0.	0.19	0.25	0.27	0.26	0.18	0.10	0.06	0.
10	0.	-0.30	-0.24	-0.23	-0.23	-0.28	-0.32	-0.25	0.
9	0.	-0.47	-0.38	-0.35	-0.37	-0.39	-0.44	-0.46	0.
8	0.	-0.55	-0.45	-0.43	-0.42	-0.46	-0.51	-0.51	0.
7	0.	-0.60	-0.53	-0.50	-0.50	-0.53	-0.61	-0.62	0.
6	0.	-0.65	-0.58	-0.53	-0.55	-0.57	-0.65	-0.69	0.
5	0.	-0.69	-0.60	-0.57	-0.56	-0.60	-0.68	-0.72	0.
4	0.	-0.75	-0.64	-0.57	-0.60	-0.62	-0.71	-0.76	0.
3	0.	-0.80	-0.68	-0.62	-0.63	-0.67	-0.75	-0.72	0.
2	0.	-0.83	-0.72	-0.64	-0.65	-0.68	-0.77	-0.53	0.
1	0.	0.	0.	0.	0.	0.	0.	0.	0.

ΔX = 0.106 m
ΔZ = 0.114 m
Z_n = 1.040 m

Outflow rate = 0.461 kg/s
Inflow rate = 0.430 kg/s
Outdoor temperature = 27.8-30.2°C

Table B-19

Test 20; 6/6 door, 105.3 kW, location A

TEMPERATURE (°C)

*									
21									
20		177.83							
19		183.96							
18		183.96							
17	37.22	184.21	181.53	180.18	181.84	181.47	183.58	183.04	177.56
16	35.38	183.48	176.26	177.07	172.32	176.06	174.77	178.80	178.85
15	34.35	182.79	161.69	175.41	175.17	171.46	172.70	176.14	171.85
14		182.89	135.86	176.68	169.53	170.96	169.97	176.71	165.87
13		182.21	115.05	172.14	171.85	164.62	166.94	172.81	130.09
12		180.28	99.14	154.99	149.66	155.00	155.17	158.17	128.03
11		172.11	73.59	87.13	104.52	108.62	115.35	103.40	83.08
10		130.31	50.06	51.00	56.67	64.04	60.48	46.77	54.25
9		93.55	41.09	38.28	39.09	39.80	37.69	36.16	38.71
8		79.27	38.77	37.31	37.13	37.81	36.62	35.35	41.09
7		72.15	41.47	37.73	38.27	38.68	38.36	36.48	36.21
6		67.72	39.85	37.62	37.77	38.63	37.89	36.05	36.40
5		63.81	38.11	36.46	37.93	37.06	36.38	35.39	35.91
4		61.44	37.95	37.13	36.41	37.17	36.68	35.18	35.56
3		58.89	45.19	38.17	38.71	39.98	40.25	39.64	37.28
2		57.54	43.91	38.43	39.15	39.92	40.41	39.57	38.30
*									
*									

VELOCITY (m/s)

*									
18	0.	0.	0.	0.	0.	0.	0.	0.	0.
17	0.	2.91	2.77	2.72	2.67	2.64	2.71	2.95	0.
16	0.	2.36	2.11	1.98	1.96	1.98	2.10	2.39	0.
15	0.	1.93	1.88	1.78	1.69	1.70	1.81	2.00	0.
14	0.	1.47	1.59	1.46	1.42	1.46	1.60	1.59	0.
13	0.	1.07	1.15	1.11	1.12	1.13	1.18	1.05	0.
12	0.	0.83	0.92	0.89	0.94	0.93	0.91	0.94	0.
11	0.	0.43	0.50	0.60	0.57	0.58	0.56	0.47	0.
10	0.	-0.38	-0.31	-0.23	-0.11	-0.20	-0.35	0.08	0.
9	0.	-0.65	-0.56	-0.57	-0.52	-0.54	-0.62	-0.59	0.
8	0.	-0.82	-0.71	-0.65	-0.64	-0.67	-0.76	-0.50	0.
7	0.	-0.89	-0.81	-0.78	-0.75	-0.78	-0.89	-0.91	0.
6	0.	-1.00	-0.89	-0.83	-0.83	-0.85	-0.97	-0.90	0.
5	0.	-1.06	-0.95	-0.89	-0.84	-0.89	-1.00	-1.14	0.
4	0.	-1.14	-1.01	-0.93	-0.90	-0.93	-1.05	-1.26	0.
3	0.	-1.14	-1.07	-0.95	-0.92	-0.97	-1.08	-1.32	0.
2	0.	-1.24	-1.08	-0.97	-0.93	-0.96	-1.12	-1.41	0.
1	0.	0.	0.	0.	0.	0.	0.	0.	0.
*									
*									

ΔX = 0.106 m
ΔZ = 0.114 m
Z_n = 1.001 m

Outflow rate = 0.630 kg/s
Inflow rate = 0.618 kg/s
Outdoor temperature = 27.2-32.2°C

Table B-20

Test 21; 6/6 door, 158 kW, location A

TEMPERATURE (^{o}C)

*									
21									
20		235.73							
19		244.88							
18		245.00							
17	39.04	244.88	250.84	243.97	238.46	240.36	235.17	237.17	241.92
16	36.44	243.96	240.58	230.59	227.08	227.13	227.22	231.02	236.99
15	35.14	242.58	217.55	237.27	224.83	224.03	219.94	225.04	234.95
14		243.09	177.87	231.70	222.62	219.51	221.55	229.64	218.65
13		242.47	150.35	231.52	219.68	214.11	211.64	220.08	206.17
12		240.25	134.89	201.05	198.71	196.15	197.48	205.00	181.20
11		232.32	99.39	126.06	139.07	137.86	139.14	138.42	129.66
10		171.86	67.22	61.01	73.47	83.29	83.58	66.18	73.29
9		117.47	45.02	43.06	44.70	44.35	38.99	39.63	40.70
8		99.58	45.46	40.43	40.76	40.84	38.93	36.56	43.85
7		90.55	45.72	42.09	42.30	41.77	39.98	38.90	37.43
6		85.08	47.05	40.85	41.51	41.42	40.86	37.91	36.20
5		79.31	41.16	41.08	39.11	38.59	36.76	36.71	36.34
4		75.20	43.19	39.61	39.04	38.25	37.74	35.97	35.31
3		70.64	49.27	41.29	41.38	42.51	41.58	42.28	39.52
2		68.83	54.92	41.62	42.14	41.94	43.08	42.54	40.28
*									
*									

VELOCITY (m/s)

*									
18	0.	0.	0.	0.	0.	0.	0.	0.	0.
17	0.	3.56	3.34	3.20	3.17	3.18	3.24	3.51	0.
16	0.	2.86	2.55	2.41	2.33	2.39	2.53	2.85	0.
15	0.	2.37	2.27	2.10	2.00	2.07	2.19	2.42	0.
14	0.	1.83	1.91	1.72	1.70	1.77	1.93	1.88	0.
13	0.	1.30	1.49	1.37	1.37	1.33	1.49	1.73	0.
12	0.	1.08	1.14	1.13	1.13	1.13	1.17	1.37	0.
11	0.	0.59	0.73	0.72	0.68	0.71	0.78	0.80	0.
10	0.	-0.24	-0.26	-0.17	0.04	0.16	-0.20	0.24	0.
9	0.	-0.75	-0.63	-0.56	-0.53	-0.57	-0.63	-0.67	0.
8	0.	-0.90	-0.78	-0.69	-0.67	-0.70	-0.81	-0.56	0.
7	0.	-1.05	-0.91	-0.82	-0.80	-0.87	-0.96	-1.03	0.
6	0.	-1.15	-0.99	-0.92	-0.90	-0.95	-1.06	-1.08	0.
5	0.	-1.25	-1.08	-0.97	-0.95	-1.00	-1.10	-1.32	0.
4	0.	-1.31	-1.13	-1.03	-1.02	-1.05	-1.17	-1.48	0.
3	0.	-1.43	-1.22	-1.10	-1.06	-1.09	-1.21	-1.59	0.
2	0.	-1.47	-1.25	-1.12	-1.11	-1.14	-1.27	-1.66	0.
1	0.	0.	0.	0.	0.	0.	0.	0.	0.
*									
*									

ΔX = 0.106 m
ΔZ = 0.114 m
Z_n = 0.978 m
Outflow rate = 0.606 kg/s
Inflow rate = 0.679 kg/s
Outdoor temperature = 27.7-29.8^{o}C

Table B-21

Test 114: 2/6 door, 62.9 kW, location B

TEMPERATURE ^{o}C

21					
20		234.03			
19		250.70			
18		250.80			
17	33.93	250.27	227.42	242.43	240.96
16		248.93	222.28	235.36	237.01
15		246.27	224.75	241.87	232.10
14	31.91	246.20	226.08	235.05	229.84
13		241.58	209.48	199.72	203.60
12		200.48	141.59	139.43	147.79
11		127.29	98.82	111.83	107.00
10	31.39	107.13	58.57	74.10	80.95
9		97.57	35.17	35.58	38.35
8		90.70	34.36	33.81	35.39
7		84.59	35.45	35.95	35.64
6	31.30	77.70	35.38	35.31	36.01
5		72.81	36.99	36.40	35.18
4		71.05	35.92	36.03	35.79
3		68.76	36.25	36.69	39.15
2	31.39	67.67	36.45	36.21	41.50

VELOCITY (m/s)

18	0.	0.	0.	0.	0.
17	0.	3.03	3.02	3.10	0.
16	0.	2.80	2.65	2.72	0.
15	0.	2.48	2.40	2.42	0.
14	0.	2.44	2.09	2.12	0.
13	0.	1.88	1.61	1.63	0.
12	0.	1.38	1.11	1.17	0.
11	0.	0.72	0.67	0.61	0.
10	0.	-0.11	0.21	0.24	0.
9	0.	-0.54	-0.59	-0.58	0.
8	0.	-0.78	-0.79	-0.83	0.
7	0.	-0.98	-1.01	-1.01	0.
6	0.	-1.14	-1.14	-1.10	0.
5	0.	-1.25	-1.25	-1.21	0.
4	0.	-1.37	-1.34	-1.25	0.
3	0.	-1.45	-1.44	-1.15	0.
2	0.	-1.51	-1.49	-0.90	0.
1	0.	0.	0.	0.	0.

$\Delta X = 0.067$ m
$\Delta Z = 0.114$ m
$Z_n = 0.956$ m
Outflow rate = 0.205 kg/s
Inflow rate = 0.201 kg/s

Table B-22

Test 144; 3/6 door, 62.9 kW, location B

TEMPERATURE (°C)

21							
20		204.80					
19		217.57					
18		217.73					
17	31.54	217.43	190.92	216.05	211.42	212.98	210.57
16		216.16	180.15	210.23	205.46	203.08	214.95
15		214.05	184.81	214.58	204.59	197.66	202.67
14	30.19	212.61	157.11	208.40	195.78	185.94	203.86
13		199.57	124.54	128.88	125.61	133.39	136.19
12		110.55	88.81	92.81	88.66	90.67	86.45
11		84.11	51.90	65.38	71.90	72.66	65.76
10	29.83	75.23	43.43	42.78	46.74	44.21	43.62
9		69.77	33.56	33.00	32.75	32.70	35.83
8		65.20	33.15	32.46	32.18	31.82	32.44
7		60.78	33.91	33.85	33.48	32.90	34.82
6	29.73	57.54	33.82	33.56	33.46	32.84	32.81
5		55.26	35.13	34.84	34.09	32.67	34.08
4		54.55	35.13	34.55	33.66	32.70	33.88
3		53.35	34.48	34.74	34.22	33.31	37.31
2	29.75	52.13	34.74	34.48	34.07	33.75	34.74

VELOCITY (m/s)

18	0.	0.	0.	0.	0.	0.	0.
17	0.	2.72	2.70	2.74	2.77	2.85	0.
16	0.	2.36	2.36	2.26	2.21	2.34	0.
15	0.	2.06	1.97	1.88	1.85	1.99	0.
14	0.	1.83	1.68	1.52	1.54	1.72	0.
13	0.	1.35	1.16	1.06	1.05	1.18	0.
12	0.	0.93	0.80	0.58	0.58	0.73	0.
11	0.	0.33	0.44	0.40	0.33	0.27	0.
10	0.	-0.22	-0.28	-0.19	-0.26	-0.22	0.
9	0.	-0.48	-0.49	-0.53	-0.56	-0.51	0.
8	0.	-0.65	-0.67	-0.64	-0.72	-0.68	0.
7	0.	-0.83	-0.79	-0.81	-0.88	-0.76	0.
6	0.	-0.95	-0.93	-0.89	-0.97	-0.94	0.
5	0.	-1.06	-1.00	-0.99	-1.03	-0.89	0.
4	0.	-1.15	-1.10	-1.05	-1.11	-0.98	0.
3	0.	-1.22	-1.12	-1.13	-1.19	-0.57	0.
2	0.	-1.24	-1.17	-1.14	-1.22	-0.86	0.
1	0.	0.	0.	0.	0.	0.	0.

ΔX = 0.065 m
ΔZ = 0.114 m
Z_n = 1.017 m
Outflow rate = 0.283 kg/s
Inflow rate = 0.289 kg/s

Table B-23

Test 212; 4/6 door, 62.9 kW, location B

TEMPERATURE (°C)

*							
21							
20		185.90					
19		195.44					
18		195.60					
17	25.91	195.63	165.66	194.28	191.53	190.39	190.36
16		194.66	157.66	191.85	185.44	186.11	187.20
15		192.25	129.62	188.85	175.41	168.99	183.02
14	24.44	188.26	130.14	152.88	144.23	145.16	157.37
13		130.28	76.61	79.23	75.63	79.22	79.46
12		73.14	53.13	64.69	64.16	63.97	55.07
11		62.65	40.81	49.91	51.78	44.07	42.56
10	24.12	56.62	30.82	32.20	30.23	29.69	29.98
9		52.31	27.56	27.46	26.79	26.08	26.60
8		48.88	27.55	26.54	26.34	26.58	26.56
7		46.48	28.24	28.42	27.98	27.40	28.07
6	24.10	45.13	28.80	28.13	27.54	28.04	27.97
5		43.95	30.43	29.29	27.78	26.12	25.72
4		43.48	30.89	28.16	27.44	27.08	25.82
3		42.39	29.31	29.72	28.57	27.42	26.87
2	24.37	41.89	29.25	29.23	28.94	28.43	27.03
*							
*							

VELOCITY (m/s)

*							
18	0.	0.	0.	0.	0.	0.	0.
17	0.	2.51	2.48	2.54	2.58	2.65	0.
16	0.	2.14	2.10	1.98	1.92	2.05	0.
15	0.	1.75	1.68	1.53	1.54	1.80	0.
14	0.	1.65	1.29	1.20	1.17	1.37	0.
13	0.	0.99	0.78	0.69	0.71	0.83	0.
12	0.	0.61	0.57	0.47	0.46	0.45	0.
11	0.	0.13	0.30	0.28	0.17	0.17	0.
10	0.	-0.27	-0.23	-0.29	-0.31	-0.29	0.
9	0.	-0.42	-0.40	-0.42	-0.45	-0.47	0.
8	0.	-0.56	-0.53	-0.53	-0.56	-0.58	0.
7	0.	-0.73	-0.64	-0.64	-0.70	-0.76	0.
6	0.	-0.84	-0.75	-0.73	-0.77	-0.83	0.
5	0.	-0.88	-0.77	-0.76	-0.83	-0.91	0.
4	0.	-0.97	-0.86	-0.84	-0.88	-0.94	0.
3	0.	-1.00	-0.86	-0.84	-0.92	-1.05	0.
2	0.	-1.07	-0.92	-0.89	-0.95	-1.05	0.
1	0.	0.	0.	0.	0.	0.	0.
*							
*							

ΔX = 0.098 m
ΔZ = 0.114 m
Z_n = 1.038 m
Outflow rate = 0.351 kg/s
Inflow rate = 0.357 kg/s

Table B-24

Test 242; 5/6 door, 62.9 kW, location B

TEMPERATURE (°C)

*									
21									
20		187.91							
19		198.16							
18		198.22							
17	30.90	198.26	167.49	194.45	190.49	190.74	192.94	192.61	193.99
16		196.77	157.68	192.44	184.00	181.72	178.94	185.14	192.64
15		192.81	104.65	189.72	175.66	165.68	154.77	172.03	174.46
14	29.42	174.35	83.22	137.46	114.78	109.15	106.04	121.07	130.55
13		89.76	66.03	73.56	72.19	70.45	69.33	68.60	62.51
12		67.76	55.89	59.95	64.91	66.60	62.39	60.43	54.50
11		60.19	42.12	44.77	51.95	53.45	50.37	43.27	46.48
10	28.87	56.75	38.11	37.59	39.90	39.60	34.88	32.88	33.29
9		54.56	35.00	34.13	33.90	32.74	31.75	30.56	31.04
8		52.64	35.44	33.76	32.89	32.60	31.52	30.95	29.71
7		50.64	35.19	34.14	33.76	32.77	32.37	31.37	30.35
6	28.81	48.98	35.98	34.44	33.70	33.47	32.54	31.79	29.77
5		47.18	35.17	34.54	33.64	32.22	31.33	30.24	30.41
4		46.23	36.83	34.65	32.96	32.42	31.11	30.52	29.99
3		44.71	36.05	36.44	35.76	34.36	33.41	31.68	30.50
2	29.12	44.13	36.43	36.47	35.50	34.76	33.41	32.33	30.75
*									
*									

VELOCITY (m/s)

*									
18	0.	0.	0.	0.	0.	0.	0.	0.	0.
17	0.	2.31	2.32	2.32	2.35	2.38	2.43	2.49	0.
16	0.	1.88	1.90	1.80	1.74	1.73	1.82	1.93	0.
15	0.	1.32	1.45	1.34	1.33	1.32	1.42	1.56	0.
14	0.	1.12	1.08	0.97	0.92	0.93	1.04	1.30	0.
13	0.	0.57	0.48	0.42	0.42	0.43	0.47	0.52	0.
12	0.	0.31	0.34	0.35	0.33	0.33	0.32	0.33	0.
11	0.	-0.09	0.14	0.31	0.29	0.26	0.17	0.23	0.
10	0.	-0.25	-0.22	-0.10	-0.10	-0.19	-0.25	-0.18	0.
9	0.	-0.37	-0.35	-0.34	-0.33	-0.36	-0.39	-0.40	0.
8	0.	-0.50	-0.43	-0.42	-0.42	-0.44	-0.50	-0.54	0.
7	0.	-0.65	-0.57	-0.52	-0.53	-0.56	-0.63	-0.72	0.
6	0.	-0.71	-0.62	-0.58	-0.58	-0.62	-0.71	-0.80	0.
5	0.	-0.79	-0.67	-0.62	-0.62	-0.66	-0.75	-0.90	0.
4	0.	-0.83	-0.72	-0.67	-0.67	-0.71	-0.80	-0.97	0.
3	0.	-0.89	-0.77	-0.72	-0.73	-0.77	-0.87	-1.03	0.
2	0.	-0.96	-0.81	-0.76	-0.75	-0.80	-0.91	-0.98	0.
1	0.	0.	0.	0.	0.	0.	0.	0.	0.
*									
*									

ΔX = 0.086 m
ΔZ = 0.114 m
Z_n = 1.034 m
Outflow rate = 0.378 kg/s
Inflow rate = 0.383 kg/s

Table B-23

Test 212; 4/6 door, 62.9 kW, location B

TEMPERATURE (°C)

21							
20		185.90					
19		195.44					
18		195.60					
17	25.91	195.63	165.66	194.28	191.53	190.39	190.36
16		194.66	157.66	191.85	185.44	186.11	187.20
15		192.25	129.62	188.85	175.41	168.99	183.02
14	24.44	188.26	130.14	152.88	144.23	145.16	157.37
13		130.28	76.61	79.23	75.63	79.22	79.46
12		73.14	53.13	64.69	64.16	63.97	55.07
11		62.65	40.81	49.91	51.78	44.07	42.56
10	24.12	56.62	30.82	32.20	30.23	29.69	29.98
9		52.31	27.56	27.46	26.79	26.08	26.60
8		48.88	27.55	26.54	26.34	26.58	26.56
7		46.48	28.24	28.42	27.98	27.40	28.07
6	24.10	45.13	28.80	28.13	27.54	28.04	27.97
5		43.95	30.43	29.29	27.78	26.12	25.72
4		43.48	30.89	28.16	27.44	27.08	25.82
3		42.39	29.31	29.72	28.57	27.42	26.87
2	24.37	41.89	29.25	29.23	28.94	28.43	27.03

VELOCITY (m/s)

18	0.	0.	0.	0.	0.	0.	0.
17	0.	2.51	2.48	2.54	2.58	2.65	0.
16	0.	2.14	2.10	1.98	1.92	2.05	0.
15	0.	1.75	1.68	1.53	1.54	1.80	0.
14	0.	1.65	1.29	1.20	1.17	1.37	0.
13	0.	0.99	0.78	0.69	0.71	0.83	0.
12	0.	0.61	0.57	0.47	0.46	0.45	0.
11	0.	0.13	0.30	0.28	0.17	0.17	0.
10	0.	-0.27	-0.23	-0.29	-0.31	-0.29	0.
9	0.	-0.42	-0.40	-0.42	-0.45	-0.47	0.
8	0.	-0.56	-0.53	-0.53	-0.56	-0.58	0.
7	0.	-0.73	-0.64	-0.64	-0.70	-0.76	0.
6	0.	-0.84	-0.75	-0.73	-0.77	-0.83	0.
5	0.	-0.88	-0.77	-0.76	-0.83	-0.91	0.
4	0.	-0.97	-0.86	-0.84	-0.88	-0.94	0.
3	0.	-1.00	-0.86	-0.84	-0.92	-1.05	0.
2	0.	-1.07	-0.92	-0.89	-0.95	-1.05	0.
1	0.	0.	0.	0.	0.	0.	0.

ΔX = 0.098 m
ΔZ = 0.114 m
Z_n = 1.038 m
Outflow rate = 0.351 kg/s
Inflow rate = 0.357 kg/s

Table B-24

Test 242; 5/6 door, 62.9 kW, location B

TEMPERATURE (°C)

21									
20		187.91							
19		198.16							
18		198.22							
17	30.90	198.26	167.49	194.45	190.49	190.74	192.94	192.61	193.99
16		196.77	157.68	192.44	184.00	181.72	178.94	185.14	192.64
15		192.81	104.65	189.72	175.66	165.68	154.77	172.03	174.46
14	29.42	174.35	83.22	137.46	114.78	109.15	106.04	121.07	130.55
13		89.76	66.03	73.56	72.19	70.45	69.33	68.60	62.51
12		67.76	55.89	59.95	64.91	66.60	62.39	60.43	54.50
11		60.19	42.12	44.77	51.95	53.45	50.37	43.27	46.48
10	28.87	56.75	38.11	37.59	39.90	39.60	34.88	32.88	33.29
9		54.56	35.00	34.13	33.90	32.74	31.75	30.56	31.04
8		52.64	35.44	33.76	32.89	32.60	31.52	30.95	29.71
7		50.64	35.19	34.14	33.76	32.77	32.37	31.37	30.35
6	28.81	48.98	35.98	34.44	33.70	33.47	32.54	31.79	29.77
5		47.18	35.17	34.54	33.64	32.22	31.33	30.24	30.41
4		46.23	36.83	34.65	32.96	32.42	31.11	30.52	29.99
3		44.71	36.05	36.44	35.76	34.36	33.41	31.68	30.50
2	29.12	44.13	36.43	36.47	35.50	34.76	33.41	32.33	30.75

VELOCITY (m/s)

18	0.	0.	0.	0.	0.	0.	0.	0.	0.
17	0.	2.31	2.32	2.32	2.35	2.38	2.43	2.49	0.
16	0.	1.88	1.90	1.80	1.74	1.73	1.82	1.93	0.
15	0.	1.32	1.45	1.34	1.33	1.32	1.42	1.56	0.
14	0.	1.12	1.08	0.97	0.92	0.93	1.04	1.30	0.
13	0.	0.57	0.48	0.42	0.42	0.43	0.47	0.52	0.
12	0.	0.31	0.34	0.35	0.33	0.33	0.32	0.33	0.
11	0.	-0.09	0.14	0.31	0.29	0.26	0.17	0.23	0.
10	0.	-0.25	-0.22	-0.10	-0.10	-0.19	-0.25	-0.18	0.
9	0.	-0.37	-0.35	-0.34	-0.33	-0.36	-0.39	-0.40	0.
8	0.	-0.50	-0.43	-0.42	-0.42	-0.44	-0.50	-0.54	0.
7	0.	-0.65	-0.57	-0.52	-0.53	-0.56	-0.63	-0.72	0.
6	0.	-0.71	-0.62	-0.58	-0.58	-0.62	-0.71	-0.80	0.
5	0.	-0.79	-0.67	-0.62	-0.62	-0.66	-0.75	-0.90	0.
4	0.	-0.83	-0.72	-0.67	-0.67	-0.71	-0.80	-0.97	0.
3	0.	-0.89	-0.77	-0.72	-0.73	-0.77	-0.87	-1.03	0.
2	0.	-0.96	-0.81	-0.76	-0.75	-0.80	-0.91	-0.98	0.
1	0.	0.	0.	0.	0.	0.	0.	0.	0.

ΔX = 0.086 m
ΔZ = 0.114 m
Z_n = 1.034 m
Outflow rate = 0.378 kg/s
Inflow rate = 0.383 kg/s

Table B-25

Test 410; 6/6 door, 62.9 kW, location B

1 TEMPERATURE (°C)

21									
20		173.18							
19		181.54							
18		181.74							
17	22.82	181.12	175.62	181.39	174.91	176.06	178.11	177.07	178.71
16		179.74	157.13	179.55	169.80	165.94	164.26	169.59	172.29
15		175.33	74.62	170.15	149.35	145.90	133.75	144.98	151.47
14	21.16	139.35	54.31	87.92	74.98	73.39	69.86	89.81	71.49
13		64.68	48.41	56.23	56.33	56.39	53.20	49.57	43.54
12		51.07	37.95	42.94	49.82	52.39	48.57	45.39	40.70
11		44.95	31.93	32.53	37.62	42.33	37.66	33.69	34.73
10	20.92	41.59	28.09	28.80	30.24	29.60	26.58	24.67	27.28
9		39.60	24.96	24.75	25.02	23.67	22.97	22.95	24.37
8		38.02	24.92	24.10	23.25	23.26	22.23	22.85	23.91
7		36.68	24.97	23.85	24.02	23.85	23.38	22.44	20.95
6	20.62	35.55	25.54	24.57	24.06	24.03	23.15	21.85	20.80
5		34.06	26.44	23.61	23.33	22.93	22.41	21.18	20.54
4		33.25	27.64	24.52	23.82	23.21	22.21	21.54	20.10
3		32.33	28.27	25.33	25.70	25.72	25.37	24.47	24.30
2	21.27	33.09	26.41	26.17	26.23	26.19	25.86	25.69	23.92

VELOCITY (m/s)

18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	2.31	2.17	2.23	2.23	2.31	2.35	2.40	0.00
16	0.00	1.80	1.73	1.64	1.56	1.55	1.63	1.77	0.00
15	0.00	1.21	1.26	1.21	1.22	1.18	1.24	1.43	0.00
14	0.00	0.93	0.90	0.80	0.76	0.75	0.86	0.94	0.00
13	0.00	0.73	0.62	0.57	0.52	0.53	0.51	0.57	0.00
12	0.00	0.34	0.40	0.42	0.41	0.40	0.37	0.36	0.00
11	0.00	-0.09	0.06	0.28	0.24	0.22	0.18	0.20	0.00
10	0.00	-0.24	-0.22	-0.13	-0.14	-0.16	-0.27	-0.04	0.00
9	0.00	-0.36	-0.33	-0.31	-0.35	-0.37	-0.40	-0.35	0.00
8	0.00	-0.47	-0.42	-0.40	-0.44	-0.45	-0.52	-0.40	0.00
7	0.00	-0.59	-0.52	-0.50	-0.54	-0.55	-0.59	-0.30	0.00
6	0.00	-0.68	-0.58	-0.55	-0.58	-0.59	-0.70	-0.60	0.00
5	0.00	-0.73	-0.62	-0.59	-0.61	-0.60	-0.66	-0.79	0.00
4	0.00	-0.76	-0.65	-0.60	-0.61	-0.61	-0.73	-0.86	0.00
3	0.00	-0.78	-0.65	-0.62	-0.61	-0.65	-0.72	-0.94	0.00
2	0.00	-0.81	-0.63	-0.59	-0.61	-0.65	-0.77	-0.98	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

ΔX = 0.106 m
ΔZ = 0.114 m
Zn = 1.035 m
Outflow rate = 0.454 kg/s
Inflow rate = 0.431 kg/s

Table B-26

Test 210; 6/6 door, 62.9 kW, location B

TEMPERATURE (°C)

21									
20		178.40							
19		187.20							
18		187.47							
17	32.69	187.59	155.46	186.49	181.48	182.47	187.16	188.08	187.28
16		186.22	112.84	184.38	176.10	171.02	171.90	176.92	184.26
15		182.47	81.40	181.34	162.80	157.94	146.46	159.98	166.77
14	30.50	156.45	67.61	120.23	98.51	94.49	92.04	107.89	115.53
13		81.12	60.29	68.15	67.89	69.90	67.39	66.75	63.74
12		65.47	50.98	58.17	61.28	62.13	62.38	61.16	57.83
11		59.56	40.60	45.62	49.63	51.21	48.70	46.58	48.06
10	29.92	55.60	36.69	38.92	38.19	35.21	36.61	34.63	37.07
9		52.75	33.56	33.82	32.87	34.03	33.68	34.87	35.29
8		50.78	33.73	32.74	31.93	32.33	33.84	33.85	33.97
7		49.26	33.86	33.41	32.89	34.61	34.94	35.54	34.68
6	29.97	48.23	34.58	33.46	32.82	33.36	35.14	34.83	34.08
5		46.89	36.12	33.42	32.67	33.88	33.90	34.36	34.42
4		46.13	40.20	33.29	32.71	32.66	33.83	33.69	33.70
3		45.13	35.23	35.45	35.06	35.89	35.72	35.56	34.58
2	30.45	45.60	34.75	35.70	35.70	35.76	36.52	35.36	35.11

VELOCITY (m/s)

18	0.	0.	0.	0.	0.	0.	0.	0.	0.
17	0.	2.11	2.09	2.15	2.21	2.28	2.33	2.36	0.
16	0.	1.65	1.73	1.66	1.59	1.59	1.67	1.81	0.
15	0.	1.22	1.24	1.17	1.20	1.18	1.26	1.45	0.
14	0.	1.05	0.95	0.84	0.80	0.82	0.89	1.12	0.
13	0.	0.69	0.54	0.50	0.48	0.46	0.48	0.54	0.
12	0.	0.38	0.41	0.40	0.39	0.35	0.33	0.34	0.
11	0.	-0.08	0.26	0.28	0.22	0.21	0.16	0.13	0.
10	0.	-0.25	-0.14	-0.15	-0.22	-0.23	-0.31	-0.23	0.
9	0.	-0.36	-0.31	-0.32	-0.34	-0.36	-0.39	-0.40	0.
8	0.	-0.48	-0.43	-0.41	-0.45	-0.43	-0.49	-0.54	0.
7	0.	-0.62	-0.52	-0.52	-0.52	-0.54	-0.61	-0.70	0.
6	0.	-0.70	-0.60	-0.57	-0.59	-0.60	-0.68	-0.81	0.
5	0.	-0.73	-0.62	-0.60	-0.60	-0.62	-0.72	-0.87	0.
4	0.	-0.66	-0.68	-0.63	-0.63	-0.65	-0.76	-0.92	0.
3	0.	-0.82	-0.70	-0.64	-0.64	-0.68	-0.82	-0.97	0.
2	0.	-0.91	-0.73	-0.65	-0.66	-0.72	-0.86	-0.93	0.
1	0.	0.	0.	0.	0.	0.	0.	0.	0.

ΔX = 0.106 m
ΔZ = 0.114 m
Z_n = 1.040 m
Outflow rate = 0.439 kg/s
Inflow rate = 0.440 kg/s

Table B-27

Test 310, 6/6 door, 62.9 kW, location B

1 TEMPERATURE (°C)

*

21									
20		170.24							
19		177.74							
18		177.90							
17	21.46	177.28	164.75	174.68	171.13	176.42	170.58	174.06	173.44
16		175.73	135.21	172.96	165.21	163.36	158.05	163.64	168.90
15		170.89	67.97	164.31	142.93	142.17	125.32	142.95	144.07
14	20.24	126.07	47.50	78.72	69.89	68.04	65.51	72.41	65.44
13		60.06	39.86	48.74	52.25	53.16	50.01	47.62	43.11
12		48.42	31.77	37.08	45.27	49.19	44.70	41.89	38.65
11		42.82	27.76	30.80	34.79	37.61	35.83	30.49	31.64
10	20.00	39.50	25.08	24.82	28.36	27.68	25.98	24.16	25.44
9		37.53	21.06	22.00	22.81	22.93	22.35	23.10	24.84
8		36.09	21.40	21.05	21.95	21.97	21.99	22.21	23.82
7		34.86	21.46	21.42	21.71	22.16	22.10	22.86	22.59
6	19.70	33.95	22.25	21.11	22.22	22.47	22.51	22.37	22.22
5		32.65	22.34	20.88	20.92	21.50	21.33	22.09	23.05
4		31.87	23.21	21.09	21.78	21.64	21.64	21.62	22.03
3		30.82	23.69	22.83	23.14	23.87	23.69	24.69	24.58
2	20.14	31.09	23.31	23.42	24.84	24.97	25.07	24.94	24.66

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*

VELOCITY (m/s)

*

18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	2.33	2.25	2.30	2.34	2.34	2.39	2.42	0.00
16	0.00	1.76	1.76	1.69	1.62	1.60	1.69	1.78	0.00
15	0.00	1.17	1.31	1.24	1.22	1.17	1.24	1.39	0.00
14	0.00	0.98	0.90	0.82	0.77	0.77	0.83	0.92	0.00
13	0.00	0.72	0.63	0.58	0.53	0.52	0.50	0.50	0.00
12	0.00	0.31	0.41	0.44	0.42	0.37	0.32	0.30	0.00
11	0.00	-0.16	0.20	0.28	0.22	0.23	0.08	0.09	0.00
10	0.00	-0.26	-0.18	-0.13	-0.15	-0.23	-0.28	-0.20	0.00
9	0.00	-0.36	-0.33	-0.31	-0.31	-0.35	-0.38	-0.35	0.00
8	0.00	-0.43	-0.40	-0.41	-0.40	-0.43	-0.47	-0.46	0.00
7	0.00	-0.56	-0.51	-0.49	-0.50	-0.53	-0.57	-0.58	0.00
6	0.00	-0.64	-0.55	-0.56	-0.55	-0.58	-0.64	-0.66	0.00
5	0.00	-0.69	-0.63	-0.60	-0.59	-0.61	-0.67	-0.71	0.00
4	0.00	-0.75	-0.64	-0.61	-0.61	-0.64	-0.72	-0.81	0.00
3	0.00	-0.82	-0.71	-0.65	-0.63	-0.68	-0.74	-0.89	0.00
2	0.00	-0.85	-0.73	-0.64	-0.64	-0.69	-0.77	-0.89	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

*

*

ΔX = 0.106 m
ΔZ = 0.114 m
Zn = 1.045 m
Outflow rate = 0.462 kg/s
Inflow rate = 0.435 kg/s

Table B-28

Test 240; 7/6 door, 62.9 kW, location B

TEMPERATURE (°C)

*											
21											
20		172.86									
19		180.82									
18		181.17									
17	30.96	181.31	132.39	181.50	178.42	178.54	177.29	177.56	179.96	177.73	177.19
16		179.53	104.88	179.76	177.63	167.74	166.47	159.04	160.01	171.92	144.69
15		173.63	64.94	169.95	149.44	140.06	138.16	125.88	126.15	154.45	121.43
14	29.06	119.06	59.25	85.20	79.93	77.62	68.34	71.48	73.32	72.37	58.81
13		66.18	55.38	58.04	59.66	62.24	62.86	60.17	58.30	54.96	53.66
12		57.40	46.77	48.93	52.40	56.07	54.36	54.82	52.94	50.99	50.63
11		52.86	40.61	40.36	42.24	44.84	45.49	43.92	42.35	41.65	47.30
10	28.61	49.90	37.40	37.42	38.72	38.89	36.80	34.51	34.12	34.35	42.22
9		47.91	34.59	33.71	33.32	32.88	32.13	31.34	31.46	31.18	37.54
8		46.53	34.14	32.74	32.39	32.48	31.66	31.21	30.93	30.66	34.65
7		45.20	34.72	33.51	34.04	33.14	33.58	32.95	32.94	31.95	34.97
6	28.64	44.26	35.90	33.94	33.74	34.02	33.23	32.85	32.31	31.88	33.28
5		42.95	34.15	32.64	32.55	32.30	32.44	31.75	31.60	30.66	31.68
4		42.19	35.25	32.47	32.83	32.73	31.86	31.34	31.13	30.84	30.91
3		41.38	34.82	34.92	34.17	34.08	34.25	33.60	33.09	32.00	33.18
2	28.81	42.01	34.39	35.01	35.23	35.58	34.60	33.94	32.95	32.29	33.39
*											
*											

VELOCITY (m/s)

*											
18	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
17	0.	1.92	2.00	2.08	2.07	2.07	2.08	2.17	2.24	2.31	0.
16	0.	1.48	1.59	1.53	1.46	1.47	1.46	1.47	1.60	1.45	0.
15	0.	0.58	1.13	1.06	1.07	1.09	1.07	1.08	1.18	1.05	0.
14	0.	0.78	0.83	0.75	0.71	0.69	0.70	0.73	0.77	0.84	0.
13	0.	0.31	0.58	0.58	0.54	0.53	0.52	0.51	0.51	0.55	0.
12	0.	0.31	0.40	0.42	0.41	0.39	0.38	0.36	0.32	0.35	0.
11	0.	-0.05	0.13	0.24	0.22	0.20	0.16	0.10	0.04	0.17	0.
10	0.	-0.23	-0.20	-0.08	-0.13	-0.17	-0.24	-0.29	-0.31	0.04	0.
9	0.	-0.34	-0.29	-0.28	-0.27	-0.32	-0.36	-0.37	-0.42	-0.10	0.
8	0.	-0.43	-0.39	-0.36	-0.37	-0.38	-0.42	-0.46	-0.53	-0.25	0.
7	0.	-0.55	-0.48	-0.46	-0.46	-0.47	-0.51	-0.56	-0.64	-0.42	0.
6	0.	-0.59	-0.55	-0.51	-0.50	-0.50	-0.54	-0.60	-0.70	-0.61	0.
5	0.	-0.65	-0.57	-0.52	-0.51	-0.51	-0.58	-0.64	-0.74	-0.65	0.
4	0.	-0.69	-0.62	-0.55	-0.53	-0.55	-0.60	-0.67	-0.78	-0.79	0.
3	0.	-0.72	-0.62	-0.58	-0.55	-0.60	-0.64	-0.75	-0.83	-0.67	0.
2	0.	-0.82	-0.68	-0.60	-0.59	-0.60	-0.65	-0.74	-0.86	-0.65	0.
1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
*											
*											

ΔX = 0.095 m
ΔZ = 0.114 m
Z_n = 1.032 m
Outflow rate = 0.483 kg/s
Inflow rate = 0.464 kg/s

Table B-29

Test 116; 8/6 door, 62.9 kW, location B

TEMPERATURE (°C)

*											
21											
20		164.41									
19		172.01									
18		172.13									
17	30.56	172.04	173.79	174.92	170.13	165.97	166.92	168.20	168.74	169.43	171.75
16		169.88	128.53	172.89	158.71	152.84	151.24	150.32	149.41	157.48	166.61
15		159.15	102.27	147.21	119.49	116.20	106.11	102.27	93.90	126.84	110.76
14	29.37	86.20	57.29	69.55	68.18	71.11	63.10	64.77	60.74	60.17	50.71
13		58.12	49.81	50.88	53.83	55.19	54.16	53.84	51.60	49.76	46.38
12		52.21	44.35	45.82	49.39	50.57	47.97	48.13	47.67	43.71	43.14
11		48.46	40.50	40.78	43.78	44.42	44.07	42.95	38.25	37.38	39.23
10	29.03	45.78	38.46	38.95	39.79	39.90	35.69	35.03	33.81	33.56	35.07
9		44.15	34.17	33.79	34.65	33.85	32.79	31.80	31.51	31.38	32.27
8		43.03	33.81	32.90	32.77	32.64	31.76	31.63	30.87	30.70	30.76
7		42.00	34.06	33.62	33.66	33.34	32.88	32.52	32.38	32.10	31.57
6	28.97	41.33	34.64	33.50	33.61	33.42	32.53	32.73	32.07	31.49	30.78
5		40.31	36.38	34.42	34.27	34.08	33.64	33.19	32.79	32.02	30.92
4		39.75	37.13	34.12	34.07	34.12	33.37	33.04	32.52	31.70	30.87
3		39.12	33.89	34.94	34.63	34.42	33.84	33.54	33.00	32.22	31.42
2	29.19	39.56	33.85	34.78	34.59	34.68	34.00	33.63	33.13	32.31	31.26
*											
*											

VELOCITY (m/s)

*											
18	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
17	0.	2.08	1.97	1.90	1.91	1.99	2.00	2.03	2.10	2.17	0.
16	0.	1.49	1.49	1.40	1.35	1.36	1.32	1.30	1.40	1.45	0.
15	0.	1.07	0.90	0.90	0.93	0.91	0.91	0.89	0.95	0.99	0.
14	0.	0.73	0.72	0.68	0.65	0.63	0.62	0.61	0.62	0.70	0.
13	0.	0.36	0.35	0.34	0.33	0.33	0.32	0.33	0.32	0.34	0.
12	0.	0.20	0.25	0.25	0.24	0.24	0.21	0.24	0.15	0.27	0.
11	0.	-0.07	0.04	0.18	0.20	0.18	0.13	-0.08	-0.14	-0.07	0.
10	0.	-0.21	-0.16	-0.10	-0.10	-0.20	-0.28	-0.26	-0.33	-0.22	0.
9	0.	-0.27	-0.29	-0.28	-0.28	-0.31	-0.35	-0.40	-0.41	-0.34	0.
8	0.	-0.36	-0.35	-0.34	-0.35	-0.40	-0.44	-0.42	-0.50	-0.47	0.
7	0.	-0.45	-0.41	-0.42	-0.40	-0.43	-0.47	-0.51	-0.55	-0.59	0.
6	0.	-0.51	-0.45	-0.43	-0.44	-0.48	-0.52	-0.54	-0.62	-0.67	0
5	0.	-0.56	-0.48	-0.45	-0.44	-0.47	-0.51	-0.57	-0.63	-0.74	0
4	0.	-0.65	-0.53	-0.49	-0.48	-0.53	-0.59	-0.59	-0.69	-0.74	0
3	0.	-0.70	-0.56	-0.53	-0.52	-0.57	-0.60	-0.66	-0.71	-0.79	0
2	0.	-0.77	-0.61	-0.60	-0.58	-0.62	-0.65	-0.65	-0.75	-0.74	0
1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0
*											
*											

ΔX = 0.111 m
ΔZ = 0.114 m
Z_n = 1.071 m
Outflow rate = 0.491 kg/s
Inflow rate = 0.513 kg/s

Table B-30

Test 122; full window, 62.9 kW, location B

TEMPERATURE (°C)

21									
20		185.09							
19		195.14							
18		195.02							
17	29.30	194.91	169.83	197.24	189.60	192.30	193.70	193.88	195.12
16		193.34	118.70	192.63	181.70	181.79	180.02	182.50	192.17
15		189.18	85.25	189.45	166.25	163.95	148.54	158.51	178.60
14	28.16	157.38	67.18	101.04	92.09	90.86	86.76	96.99	104.49
13		80.31	50.09	62.75	66.28	68.32	63.93	60.03	55.09
12		67.79	37.50	43.36	48.44	49.25	43.30	39.53	35.64
11		61.42	34.16	34.28	34.73	33.53	32.31	31.48	31.48
10	27.86	55.77	33.77	33.24	32.88	32.47	32.12	31.71	30.44
9		52.01	30.95	31.00	30.59	30.33	29.86	29.15	28.78
8		50.04	30.62	30.62	30.22	29.98	29.48	29.06	28.13
7		48.79	30.52	30.58	30.41	30.23	30.00	29.48	29.35
6	27.78	48.33	31.18	31.89	31.81	30.70	30.02	29.92	28.53
5		47.46	30.57	31.14	30.72	30.33	29.65	29.07	28.49
4		47.03	30.60	30.53	29.45	29.66	28.74	28.95	27.29
3		46.14	30.08	29.51	29.36	28.87	28.67	28.01	27.65
2	27.81	46.42	30.16	29.98	29.40	29.06	28.69	28.32	26.99

VELOCITY (m/s)

18	0.	0.	0.	0.	0.	0.	0.	0.	0.
17	0.	2.12	2.07	2.10	2.12	2.17	2.25	2.30	0.
16	0.	1.58	1.65	1.58	1.52	1.49	1.58	1.72	0.
15	0.	1.29	1.13	1.12	1.10	1.08	1.11	1.39	0.
14	0.	0.89	0.76	0.72	0.67	0.66	0.73	0.86	0.
13	0.	0.38	0.46	0.46	0.43	0.40	0.33	0.34	0.
12	0.	-0.16	-0.07	0.12	0.12	-0.09	-0.19	-0.20	0.
11	0.	-0.32	-0.34	-0.33	-0.36	-0.39	-0.43	-0.47	0.
10	0.	-0.48	-0.43	-0.43	-0.44	-0.47	-0.53	-0.61	0.
9	0.	-0.68	-0.56	-0.54	-0.54	-0.57	-0.65	-0.78	0.
8	0.	-0.80	-0.65	-0.63	-0.64	-0.66	-0.74	-0.86	0.
7	0.	-0.97	-0.84	-0.84	-0.81	-0.82	-0.87	-0.97	0.
6	0.	-1.07	-1.06	-1.03	-1.06	-1.05	-1.04	-1.01	0.
5	0.	0.	0.	0.	0.	0.	0.	0.	0.
4	0.	0.	0.	0.	0.	0.	0.	0.	0.
3	0.	0.	0.	0.	0.	0.	0.	0.	0.
2	0.	0.	0.	0.	0.	0.	0.	0.	0.
1	0.	0.	0.	0.	0.	0.	0.	0.	0.

ΔX = 0.106 m
ΔZ = 0.114 m
Z_n = 1.214 m
Outflow rate = 0.358 kg/s
Inflow rate = 0.352 kg/s

Table B-31

Test 224; 2/3 Window, 62.9kw, location B

TEMPERATURE (°C)

*									
21									
20		206.28							
19		217.46							
18		217.18							
17	28.92	216.80	215.69	211.38	209.53	209.40	208.86	207.15	205.13
16		215.29	190.07	208.49	199.97	199.06	191.79	197.40	205.21
15		210.91	123.16	194.92	183.52	176.49	156.64	171.79	186.49
14	27.23	196.71	57.41	96.29	109.21	106.68	103.13	107.46	85.95
13		111.57	33.44	32.63	34.71	33.99	33.31	32.06	31.24
12		86.14	32.66	31.71	31.60	31.90	30.70	29.71	28.84
11		78.49	31.45	30.87	31.07	30.93	30.60	29.45	28.82
10	26.37	73.65	31.29	31.13	31.02	30.89	30.47	29.62	28.17
9		69.05	28.57	28.60	28.34	28.08	28.02	26.49	26.39
8		64.45	28.52	28.49	28.08	27.83	26.76	26.21	25.67
7		60.83	29.03	28.63	28.10	27.82	27.84	26.36	26.25
6	26.19	58.88	29.96	29.62	28.28	28.06	27.11	26.74	25.82
5		57.22	31.27	34.44	30.82	29.79	29.95	29.08	27.42
4		56.79	28.91	28.30	28.13	28.12	27.36	27.68	26.08
3		56.05	28.38	28.33	28.07	27.81	27.64	26.49	26.44
2	26.36	56.79	28.69	28.43	27.98	27.92	27.03	26.67	25.85
*									
*									

VELOCITY (m/s)

*									
18	0.	0.	0.	0.	0.	0.	0.	0.	0.
17	0.	2.17	1.95	2.00	2.05	2.03	2.06	2.15	0.
16	0.	1.64	1.53	1.41	1.36	1.32	1.43	1.63	0.
15	0.	1.13	0.98	0.99	0.98	0.92	0.95	1.22	0.
14	0.	0.30	0.45	0.48	0.44	0.44	0.49	0.35	0.
13	0.	-0.48	-0.37	-0.35	-0.34	-0.32	-0.47	-0.53	0.
12	0.	-0.61	-0.53	-0.49	-0.47	-0.61	-0.67	-0.77	0.
11	0.	-0.88	-0.77	-0.73	-0.73	-0.73	-0.79	-0.95	0.
10	0.	-1.12	-1.10	-1.08	-1.10	-1.14	-1.13	-1.06	0.
9	0.	0.	0.	0.	0.	0.	0.	0.	0.
8	0.	0.	0.	0.	0.	0.	0.	0.	0.
7	0.	0.	0.	0.	0.	0.	0.	0.	0.
6	0.	0.	0.	0.	0.	0.	0.	0.	0.
5	0.	0.	0.	0.	0.	0.	0.	0.	0.
4	0.	0.	0.	0.	0.	0.	0.	0.	0.
3	0.	0.	0.	0.	0.	0.	0.	0.	0.
2	0.	0.	0.	0.	0.	0.	0.	0.	0.
1	0.	0.	0.	0.	0.	0.	0.	0.	0.
*									
*									

ΔX = 0.016m
ΔZ = 0.114m
Zm = 1.371m
Outflow rate = 0.261 kg/s
Inflow rate = 0.228 kg/s

Table B-32

Test 324; 2/3 window, 62.9 kW, location B

1 TEMPERATURE (°C)

21									
20		206.03							
19		217.23							
18		217.20							
17	24.42	216.25	212.29	209.47	206.02	207.29	207.02	210.53	209.20
16		214.64	188.35	207.09	199.08	197.76	188.81	196.39	208.23
15		210.28	117.42	183.37	175.91	175.55	157.12	171.63	183.63
14	22.93	192.53	43.04	73.95	86.73	96.74	91.67	88.64	67.96
13		106.59	29.33	28.08	28.54	30.30	29.49	27.65	28.54
12		83.74	27.61	27.16	27.45	27.89	27.51	27.08	26.32
11		75.95	27.43	26.64	26.70	26.88	26.62	26.41	25.78
10	22.69	70.51	27.40	27.14	27.00	26.99	26.42	26.24	25.66
9		65.84	24.07	24.04	23.77	23.89	23.55	23.42	23.24
8		61.41	24.58	23.73	23.52	23.66	23.04	23.02	22.86
7		57.99	25.49	23.85	23.38	23.46	23.02	22.82	22.83
6	22.51	56.05	26.36	25.23	23.82	23.74	23.81	23.37	22.72
5		54.54	26.97	27.85	24.08	23.60	23.74	23.55	22.68
4		53.99	23.29	23.44	23.26	23.33	23.23	23.08	22.92
3		53.18	23.89	23.58	23.45	23.52	23.15	23.19	23.33
2	22.64	54.25	23.71	23.58	23.55	23.62	23.37	23.28	23.52

VELOCITY (m/s)

18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	2.27	2.09	2.10	2.11	2.20	2.28	2.40	0.00
16	0.00	1.67	1.61	1.47	1.40	1.39	1.50	1.74	0.00
15	0.00	1.08	0.95	1.01	1.01	0.96	1.00	1.22	0.00
14	0.00	0.15	0.33	0.37	0.40	0.41	0.39	0.25	0.00
13	0.00	-0.47	-0.41	-0.43	-0.44	-0.45	-0.46	-0.54	0.00
12	0.00	-0.70	-0.61	-0.59	-0.60	-0.60	-0.65	-0.80	0.00
11	0.00	-0.92	-0.80	-0.76	-0.76	-0.77	-0.81	-1.00	0.00
10	0.00	-1.18	-1.16	-1.12	-1.13	-1.13	-1.15	-1.15	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

ΔX = 0.106 m
ΔZ = 0.114 m
Zn = 1.382 m
Outflow rate = 0.268 kg/s
Inflow rate = 0.247 kg/s

Table B-33

Test 220; 6/6 door, 31.6 kW, location B

TEMPERATURE (°C)

*									
21									
20		114.01							
19		119.28							
18		119.22							
17	27.10	118.92	116.16	118.01	117.82	115.88	117.10	116.95	118.50
16		118.08	112.90	119.54	113.82	112.13	110.31	113.74	116.62
15		116.08	50.60	114.76	100.12	98.80	91.79	99.30	104.13
14	25.80	94.28	45.11	68.08	59.65	55.74	54.83	59.79	54.84
13		48.84	42.64	44.81	44.68	44.26	42.88	40.52	38.98
12		42.71	38.09	40.86	41.74	41.74	39.18	38.36	36.52
11		39.70	33.04	34.30	35.18	33.03	30.48	27.97	31.94
10	25.38	37.75	30.59	29.86	29.28	27.83	26.45	26.52	27.40
9		36.38	28.65	28.10	27.72	26.79	26.65	25.75	27.03
8		35.49	29.06	27.64	27.25	26.77	26.24	26.04	26.24
7		34.79	29.22	28.32	28.31	27.35	27.14	26.31	27.50
6	25.38	34.36	29.77	28.20	27.87	27.49	26.80	26.72	26.72
5		33.76	28.93	27.94	27.72	26.97	26.56	25.61	26.76
4		33.43	29.41	27.83	27.54	26.98	26.36	26.07	25.78
3		33.03	29.15	28.77	28.93	28.24	27.61	26.62	26.23
2	25.68	33.40	28.97	28.97	29.07	28.57	27.56	27.27	26.26
*									
*									

VELOCITY (m/s)

*									
18	0.	0.	0.	0.	0.	0.	0.	0.	0.
17	0.	1.55	1.54	1.60	1.60	1.64	1.68	1.72	0.
16	0.	1.30	1.23	1.18	1.11	1.13	1.19	1.30	0.
15	0.	0.89	0.87	0.83	0.84	0.82	0.86	0.98	0.
14	0.	0.65	0.62	0.57	0.52	0.55	0.59	0.62	0.
13	0.	0.49	0.43	0.39	0.36	0.35	0.34	0.34	0.
12	0.	0.25	0.31	0.29	0.27	0.22	0.20	0.22	0.
11	0.	0.05	0.15	0.15	0.12	0.04	-0.13	0.03	0.
10	0.	-0.22	-0.13	-0.14	-0.19	-0.25	-0.26	-0.17	0.
9	0.	-0.27	-0.25	-0.27	-0.28	-0.29	-0.33	-0.27	0.
8	0.	-0.38	-0.32	-0.33	-0.34	-0.35	-0.39	-0.36	0.
7	0.	-0.46	-0.40	-0.40	-0.40	-0.43	-0.48	-0.47	0.
6	0.	-0.53	-0.45	-0.43	-0.43	-0.46	-0.52	-0.56	0.
5	0.	-0.56	-0.47	-0.44	-0.45	-0.49	-0.56	-0.60	0.
4	0.	-0.60	-0.50	-0.46	-0.46	-0.49	-0.57	-0.67	0.
3	0.	-0.62	-0.50	-0.45	-0.45	-0.54	-0.60	-0.71	0.
2	0.	-0.66	-0.52	-0.47	-0.48	-0.55	-0.62	-0.69	0.
1	0.	0.	0.	0.	0.	0.	0.	0.	0.
*									
*									

ΔX = 0.106 m
ΔZ = 0.114 m
Z_n = 1.061 m
Outflow rate = 0.346 kg/s
Inflow rate = 0.343 kg/s

Table B-34

Test 221; 6/6 door, 105.3 kW, location B

TEMPERATURE (°C)

*									
21									
20		222.69							
19		234.83							
18		235.51							
17	29.33	235.48	203.75	258.05	246.38	245.61	248.06	251.15	242.75
16		233.82	143.22	249.59	233.61	231.22	231.46	238.17	246.64
15		228.38	115.93	250.65	223.21	209.80	193.94	210.58	214.63
14	26.47	199.71	85.89	183.82	155.99	137.21	130.32	148.70	152.62
13		101.93	78.21	90.24	92.47	90.82	88.08	82.08	66.82
12		75.54	68.54	74.63	80.57	82.33	80.07	70.83	65.01
11		66.06	52.16	51.86	59.82	62.66	60.62	56.24	51.24
10	25.76	60.70	42.16	40.88	47.79	47.77	40.62	35.55	42.37
9		57.22	36.63	36.02	36.54	35.11	32.67	32.24	32.57
8		54.76	35.03	33.77	33.41	33.31	31.67	30.87	32.28
7		52.45	36.57	36.21	34.51	34.64	33.57	33.65	30.91
6	25.94	50.62	36.43	34.65	34.98	34.87	33.83	32.67	30.96
5		48.24	43.69	40.28	35.97	36.09	34.26	33.35	31.50
4		46.91	41.97	38.81	36.19	36.21	34.49	32.56	31.89
3		45.34	37.78	37.31	36.78	36.73	35.48	33.90	30.39
2	26.95	46.12	36.73	37.55	38.19	38.48	36.86	34.42	32.22
*									
*									

VELOCITY (m/s)

*									
18	0.	0.	0.	0.	0.	0.	0.	0.	0.
17	0.	2.58	2.61	2.70	2.75	2.80	2.88	2.86	0.
16	0.	2.04	2.14	2.06	1.97	1.99	2.10	2.24	0.
15	0.	1.50	1.60	1.54	1.54	1.50	1.61	1.75	0.
14	0.	1.29	1.18	1.12	1.07	1.07	1.16	1.37	0.
13	0.	0.64	0.58	0.56	0.52	0.52	0.52	0.75	0.
12	0.	0.48	0.42	0.42	0.41	0.42	0.38	0.53	0.
11	0.	0.26	0.30	0.41	0.38	0.34	0.31	0.26	0.
10	0.	-0.28	-0.22	0.10	0.02	-0.13	-0.29	-0.12	0.
9	0.	-0.41	-0.35	-0.32	-0.35	-0.41	-0.47	-0.42	0.
8	0.	-0.56	-0.49	-0.47	-0.49	-0.53	-0.58	-0.57	0.
7	0.	-0.73	-0.65	-0.61	-0.61	-0.65	-0.72	-0.74	0.
6	0.	-0.82	-0.73	-0.68	-0.67	-0.71	-0.80	-0.89	0.
5	0.	-0.86	-0.78	-0.72	-0.70	-0.74	-0.83	-0.94	0.
4	0.	-0.90	-0.83	-0.76	-0.74	-0.78	-0.87	-1.08	0.
3	0.	-0.98	-0.87	-0.79	-0.77	-0.80	-0.91	-1.12	0.
2	0.	-1.08	-0.90	-0.81	-0.80	-0.85	-0.95	-1.20	0.
1	0.	0.	0.	0.	0.	0.	0.	0.	0.
*									
*									

ΔX = 0.106 m
ΔZ = 0.114 m
Z_n = 1.000 m
Outflow rate = 0.498 kg/s
Inflow rate = 0.505 kg/s

Table B-35

Test 514; 2/6 door, 62.9 kW, location C

1 TEMPERATURE (°C)

21					
20		201.69			
19		210.11			
18		211.00			
17	10.57	210.85	206.56	200.84	202.91
16		210.35	198.39	199.82	199.58
15		208.63	169.73	191.37	195.19
14	8.93	208.16	185.63	191.71	192.64
13		205.65	191.57	191.15	194.28
12		200.40	168.82	185.27	187.44
11		188.07	118.76	146.98	151.64
10	8.75	127.89	32.72	51.77	38.02
9		78.72	11.37	10.36	11.06
8		65.45	9.88	9.58	9.36
7		56.06	12.49	11.46	10.87
6	7.79	49.57	11.72	11.64	10.31
5		46.20	10.21	8.77	8.50
4		45.00	10.16	9.46	8.60
3		43.03	11.76	11.44	11.55
2	8.87	41.42	11.79	11.56	11.70

VELOCITY (m/s)

18	0.00	0.00	0.00	0.00	0.00
17	0.00	3.36	3.22	3.43	0.00
16	0.00	2.99	2.86	3.04	0.00
15	0.00	2.60	2.57	2.71	0.00
14	0.00	2.51	2.35	2.49	0.00
13	0.00	2.19	1.98	2.13	0.00
12	0.00	1.72	1.59	1.67	0.00
11	0.00	1.09	1.06	1.12	0.00
10	0.00	-0.06	0.25	-0.05	0.00
9	0.00	-0.62	-0.64	-0.68	0.00
8	0.00	-0.82	-0.81	-0.89	0.00
7	0.00	-1.06	-1.04	-1.13	0.00
6	0.00	-1.21	-1.16	-1.25	0.00
5	0.00	-1.33	-1.26	-1.36	0.00
4	0.00	-1.43	-1.34	-1.45	0.00
3	0.00	-1.44	-1.44	-1.53	0.00
2	0.00	-1.54	-1.47	-1.57	0.00
1	0.00	0.00	0.00	0.00	0.00

$\Delta X = 0.067$ m
$\Delta Z = 0.114$ m
Zn = 0.966 m
Outflow rate = 0.248 kg/s
Inflow rate = 0.238 kg/s

Table B-36

Test 544; 3/6 door, 62.9 kW, location C

TEMPERATURE (°C)

21							
20		166.88					
19		173.52					
18		174.25					
17	8.84	174.18	168.56	168.70	167.52	167.74	167.47
16		173.56	161.13	168.41	164.25	163.67	165.14
15		172.24	128.91	161.84	159.66	160.62	162.02
14	7.30	171.16	139.22	158.27	154.93	157.06	160.34
13		167.20	136.01	154.60	150.71	151.32	154.20
12		155.60	97.29	114.48	121.33	117.85	132.01
11		103.97	37.72	52.27	55.08	56.03	48.27
10	7.21	56.67	13.32	16.43	14.60	12.32	11.68
9		44.29	9.67	9.32	8.57	8.77	8.87
8		38.77	9.33	9.11	8.23	8.07	8.94
7		36.04	10.88	10.64	9.93	9.12	7.86
6	6.31	34.07	10.89	10.59	9.77	8.22	6.99
5		32.07	10.08	9.37	7.70	7.05	6.20
4		30.83	10.66	9.88	8.22	6.71	6.06
3		29.20	10.31	10.20	9.48	9.36	8.89
2	7.43	27.30	10.54	10.46	9.53	9.38	9.03

VELOCITY (m/s)

18	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	2.94	2.85	2.82	2.81	2.98	0.00
16	0.00	2.55	2.39	2.34	2.37	2.54	0.00
15	0.00	2.19	2.07	2.00	2.07	2.33	0.00
14	0.00	2.12	1.84	1.74	1.79	2.03	0.00
13	0.00	1.75	1.50	1.41	1.43	1.68	0.00
12	0.00	1.14	1.03	1.01	1.00	1.17	0.00
11	0.00	0.40	0.45	0.45	0.43	0.38	0.00
10	0.00	-0.37	-0.29	-0.35	-0.40	-0.41	0.00
9	0.00	-0.61	-0.57	-0.58	-0.62	-0.64	0.00
8	0.00	-0.78	-0.69	-0.71	-0.78	-0.74	0.00
7	0.00	-0.92	-0.84	-0.84	-0.87	-0.90	0.00
6	0.00	-1.03	-0.94	-0.92	-1.00	-1.03	0.00
5	0.00	-1.10	-1.01	-0.98	-1.03	-1.12	0.00
4	0.00	-1.15	-1.05	-1.03	-1.10	-1.24	0.00
3	0.00	-1.13	-1.12	-1.08	-1.12	-1.28	0.00
2	0.00	-1.22	-1.16	-1.13	-0.67	-1.32	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00

ΔX = 0.065 m
ΔZ = 0.114 m
Zn = 1.025 m
Outflow rate = 0.343 kg/s
Inflow rate = 0.337 kg/s

Table B-37

Test 512; 4/6 door, 62.9 kW, location C

TEMPERATURE (°C)

21							
20		168.33					
19		174.07					
18		174.64					
17	22.38	174.44	163.32	168.27	167.04	168.14	169.57
16		173.95	151.40	166.79	164.68	165.29	167.94
15		172.55	118.36	162.18	160.04	161.80	164.94
14	20.91	170.63	122.23	155.13	153.01	155.96	160.62
13		163.41	113.47	134.30	144.36	140.37	144.22
12		128.79	67.41	78.32	83.16	86.51	82.36
11		76.18	53.34	57.70	50.05	41.46	35.21
10	20.99	58.03	37.70	30.46	28.64	25.70	25.02
9		51.49	24.29	22.23	22.52	22.39	23.11
8		48.44	24.10	21.94	21.70	21.74	22.46
7		46.35	23.85	22.78	23.37	23.41	22.27
6	19.66	44.40	23.39	23.06	23.48	23.19	22.22
5		42.56	23.79	22.77	21.67	21.19	20.64
4		41.56	25.91	23.41	21.82	21.16	20.78
3		40.11	22.57	22.96	23.45	23.66	23.74
2	20.85	38.21	23.30	23.54	23.60	23.86	23.96

VELOCITY (m/s)

18	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	2.59	2.51	2.46	2.44	2.60	0.00
16	0.00	2.14	2.05	1.99	1.98	2.21	0.00
15	0.00	1.78	1.73	1.64	1.72	2.02	0.00
14	0.00	1.69	1.46	1.38	1.46	1.77	0.00
13	0.00	1.34	1.12	1.00	1.09	1.36	0.00
12	0.00	0.73	0.65	0.58	0.61	0.66	0.00
11	0.00	0.36	0.34	0.27	0.17	0.11	0.00
10	0.00	-0.23	-0.24	-0.29	-0.35	-0.35	0.00
9	0.00	-0.50	-0.49	-0.46	-0.46	-0.52	0.00
8	0.00	-0.65	-0.60	-0.56	-0.58	-0.67	0.00
7	0.00	-0.82	-0.74	-0.68	-0.71	-0.85	0.00
6	0.00	-0.92	-0.81	-0.77	-0.80	-0.96	0.00
5	0.00	-0.97	-0.87	-0.82	-0.86	-1.05	0.00
4	0.00	-1.02	-0.91	-0.87	-0.91	-1.13	0.00
3	0.00	-1.03	-0.94	-0.92	-0.95	-0.68	0.00
2	0.00	-1.07	-0.97	-0.93	-0.97	-0.67	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00

ΔX = 0.098 m
ΔZ = 0.114 m
Zn = 1.034 m
Outflow rate = 0.393 kg/s
Inflow rate = 0.383 kg/s

Table B-38

Test 542; 5/6 door, 62.9 kW, location C

1 TEMPERATURE (°C)

21									
20		156.60							
19		161.67							
18		162.02							
17	22.15	161.96	147.72	157.15	156.33	155.80	154.03	154.88	155.25
16		161.15	128.26	155.68	153.96	152.85	150.14	155.50	153.54
15		158.97	98.11	151.19	148.51	146.27	145.60	147.41	141.30
14	20.55	155.19	87.59	135.89	132.14	134.78	137.19	143.22	131.08
13		140.68	72.82	89.32	94.06	99.23	107.45	117.25	112.64
12		92.89	54.60	57.68	62.90	62.36	61.23	57.82	45.91
11		59.34	47.04	48.09	45.46	40.51	31.12	28.39	34.33
10	20.66	48.36	34.73	28.26	29.11	26.47	23.81	23.05	24.76
9		44.23	25.02	22.55	22.75	22.49	21.69	21.68	24.05
8		42.61	25.31	22.51	21.81	21.58	21.19	21.40	22.20
7		41.59	25.26	23.06	23.06	23.04	22.47	22.25	20.93
6	19.57	40.74	24.74	23.10	22.97	23.05	22.45	22.59	21.54
5		39.49	26.99	23.75	22.63	21.87	20.87	20.33	19.90
4		38.32	29.11	24.01	22.76	21.98	21.12	20.69	20.43
3		36.38	24.76	23.63	23.58	23.30	22.57	22.33	22.89
2	20.57	35.56	23.93	23.95	23.13	23.12	22.95	23.54	23.39

VELOCITY (m/s)

18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	2.37	2.37	2.35	2.28	2.31	2.33	2.45	0.00
16	0.00	1.84	1.88	1.87	1.78	1.79	1.87	2.11	0.00
15	0.00	1.47	1.57	1.47	1.44	1.49	1.60	1.75	0.00
14	0.00	1.18	1.27	1.20	1.20	1.23	1.31	1.50	0.00
13	0.00	0.98	0.87	0.73	0.72	0.75	0.92	1.11	0.00
12	0.00	0.47	0.45	0.47	0.43	0.41	0.41	0.41	0.00
11	0.00	0.26	0.23	0.24	0.15	-0.09	-0.17	0.18	0.00
10	0.00	-0.24	-0.23	-0.25	-0.30	-0.32	-0.35	-0.25	0.00
9	0.00	-0.48	-0.46	-0.41	-0.43	-0.42	-0.45	-0.42	0.00
8	0.00	-0.56	-0.55	-0.52	-0.49	-0.49	-0.54	-0.57	0.00
7	0.00	-0.74	-0.68	-0.62	-0.60	-0.60	-0.66	-0.71	0.00
6	0.00	-0.80	-0.75	-0.69	-0.66	-0.67	-0.74	-0.83	0.00
5	0.00	-0.86	-0.78	-0.72	-0.70	-0.72	-0.79	-0.93	0.00
4	0.00	-0.89	-0.83	-0.76	-0.74	-0.76	-0.83	-0.99	0.00
3	0.00	-0.90	-0.86	-0.77	-0.76	-0.81	-0.88	-1.09	0.00
2	0.00	-0.97	-0.88	-0.82	-0.80	-0.82	-0.90	-1.09	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

ΔX = 0.086 m
ΔZ = 0.114 m
Zn = 1.056 m
Outflow rate = 0.440 kg/s
Inflow rate = 0.442 kg/s

Table B-39

Test 610; 6/6 door, 62.9 kW, location C

1 TEMPERATURE (°C)

21									
20		146.92							
19		151.81							
18		152.25							
17	19.66	152.34	146.49	147.50	146.84	144.69	145.48	145.32	145.25
16		151.63	116.08	146.99	145.84	142.82	141.52	141.24	140.10
15		149.63	80.95	140.29	137.65	134.90	136.00	137.26	121.87
14	18.39	144.85	75.22	120.57	117.05	123.38	127.40	127.06	115.50
13		119.41	56.39	65.66	63.95	69.64	76.34	79.88	65.80
12		66.16	43.21	47.71	47.16	46.54	43.06	37.67	35.56
11		46.07	34.19	37.17	38.84	33.51	27.55	24.50	27.86
10	18.28	39.52	26.20	23.75	25.96	23.14	21.43	20.22	21.80
9		37.16	23.36	20.31	20.64	19.74	19.80	19.14	20.24
8		36.15	22.01	20.36	19.76	19.37	19.10	18.83	18.85
7		35.31	24.29	20.67	20.96	20.39	20.61	19.67	18.10
6	17.35	34.56	23.76	20.98	20.49	20.71	20.31	19.92	17.38
5		33.42	25.45	21.06	20.38	19.29	19.14	17.95	17.35
4		32.46	25.59	21.76	20.69	19.74	19.04	18.34	16.66
3		31.03	24.23	21.08	21.23	20.62	20.89	20.04	19.99
2	18.33	30.79	21.71	21.87	21.36	21.25	21.33	20.74	19.25

VELOCITY (m/s)

18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	2.24	2.25	2.22	2.19	2.15	2.25	2.31	0.00
16	0.00	1.74	1.78	1.71	1.65	1.64	1.70	2.03	0.00
15	0.00	1.28	1.38	1.30	1.31	1.34	1.47	1.53	0.00
14	0.00	1.16	1.11	1.09	1.08	1.09	1.15	1.43	0.00
13	0.00	0.84	0.67	0.61	0.62	0.65	0.72	0.84	0.00
12	0.00	0.40	0.38	0.39	0.36	0.33	0.29	0.36	0.00
11	0.00	0.12	0.21	0.22	0.18	-0.09	-0.13	0.12	0.00
10	0.00	-0.28	-0.24	-0.17	-0.24	-0.26	-0.31	-0.17	0.00
9	0.00	-0.45	-0.41	-0.37	-0.37	-0.37	-0.41	-0.40	0.00
8	0.00	-0.54	-0.48	-0.44	-0.44	-0.45	-0.47	-0.51	0.00
7	0.00	-0.70	-0.60	-0.56	-0.53	-0.53	-0.60	-0.65	0.00
6	0.00	-0.73	-0.64	-0.60	-0.59	-0.61	-0.65	-0.73	0.00
5	0.00	-0.78	-0.69	-0.62	-0.61	-0.63	-0.70	-0.86	0.00
4	0.00	-0.76	-0.72	-0.64	-0.65	-0.67	-0.73	-0.95	0.00
3	0.00	-0.78	-0.74	-0.68	-0.67	-0.70	-0.78	-0.98	0.00
2	0.00	-0.88	-0.78	-0.71	-0.70	-0.70	-0.78	-1.04	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

ΔX = 0.106 m
ΔZ = 0.114 m
Zn = 1.059 m
Outflow rate = 0.498 kg/s
Inflow rate = 0.479 kg/s

Table B-40

Test 510; 6/6 door, 62.9 kW, location C

TEMPERATURE (^{o}C)

21									
20		151.02							
19		156.45							
18		156.98							
17	24.70	157.20	152.99	152.15	151.40	150.44	150.36	152.28	154.41
16		156.66	136.31	149.59	147.99	145.55	146.93	149.77	147.32
15		154.78	80.86	146.26	141.77	140.11	141.29	145.82	144.58
14	22.94	150.98	73.52	127.81	124.69	131.04	132.09	131.32	126.39
13		125.13	66.02	73.17	72.07	79.12	79.80	82.95	71.59
12		69.95	50.00	56.92	55.97	58.27	52.87	53.49	44.61
11		51.82	39.80	40.89	41.91	42.53	37.49	34.04	34.97
10	22.59	45.77	31.90	27.03	28.39	28.60	26.52	25.68	28.02
9		43.13	27.57	24.52	24.60	25.07	24.58	24.49	26.00
8		41.64	26.21	23.82	24.12	24.15	23.94	24.21	25.37
7		40.44	26.21	24.42	24.37	25.12	25.36	24.49	24.50
6	22.00	39.43	25.12	24.16	24.86	24.88	25.34	25.24	23.40
5		37.95	28.23	23.92	23.70	24.30	24.27	23.48	23.77
4		37.08	29.26	24.15	24.35	24.25	24.23	23.90	23.04
3		36.08	27.61	25.21	25.79	26.80	26.87	26.32	27.02
2	23.01	36.01	25.55	26.21	26.96	26.95	27.19	27.57	26.06

VELOCITY (m/s)

18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	2.24	2.15	2.20	2.09	2.11	2.16	2.26	0.00
16	0.00	1.77	1.73	1.65	1.52	1.57	1.68	1.87	0.00
15	0.00	1.27	1.36	1.28	1.27	1.29	1.42	1.71	0.00
14	0.00	1.05	1.09	1.05	1.01	1.05	1.12	1.44	0.00
13	0.00	0.85	0.68	0.58	0.57	0.60	0.64	0.79	0.00
12	0.00	0.39	0.38	0.35	0.33	0.33	0.33	0.32	0.00
11	0.00	0.12	0.15	0.15	0.18	0.18	0.06	0.13	0.00
10	0.00	-0.32	-0.27	-0.25	-0.22	-0.26	-0.29	-0.19	0.00
9	0.00	-0.42	-0.38	-0.36	-0.36	-0.40	-0.44	-0.42	0.00
8	0.00	-0.54	-0.49	-0.44	-0.43	-0.46	-0.51	-0.53	0.00
7	0.00	-0.71	-0.59	-0.54	-0.51	-0.56	-0.63	-0.68	0.00
6	0.00	-0.78	-0.65	-0.59	-0.58	-0.61	-0.67	-0.76	0.00
5	0.00	-0.83	-0.70	-0.65	-0.63	-0.64	-0.73	-0.84	0.00
4	0.00	-0.87	-0.75	-0.67	-0.65	-0.66	-0.74	-0.91	0.00
3	0.00	-0.85	-0.77	-0.70	-0.67	-0.69	-0.77	-0.99	0.00
2	0.00	-0.90	-0.73	-0.64	-0.63	-0.69	-0.79	-1.01	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

ΔX = 0.106 m
ΔZ = 0.114 m
Zm = 1.046 m
Outflow rate = 0.476 kg/s
Inflow rate = 0.474 kg/s

Table B-41

Test 540; 7/6 door, 62.9 kW, location C

1 TEMPERATURE (^{o}C)

21											
20		136.45									
19		141.04									
18		141.40									
17	15.63	141.43	121.38	134.39	136.75	133.87	135.30	136.71	134.71	137.17	137.14
16		140.33	89.70	133.90	133.03	131.33	130.72	130.46	131.13	132.42	134.80
15		137.24	49.72	125.05	122.05	119.62	120.27	125.19	123.46	126.56	125.75
14	14.45	126.89	53.92	86.22	76.64	86.44	84.51	91.83	97.92	94.93	102.90
13		83.68	36.76	45.64	47.05	47.06	44.85	47.39	43.60	41.68	37.58
12		46.14	25.39	31.67	34.96	36.66	36.29	34.71	30.61	27.53	32.42
11		35.99	20.96	24.26	26.46	27.82	24.92	23.04	20.61	19.87	24.99
10	14.40	32.38	17.84	19.29	19.80	20.19	18.98	17.92	17.01	16.98	20.59
9		31.07	16.37	16.49	16.50	16.43	15.74	16.45	16.06	16.44	19.60
8		30.27	15.17	15.66	15.40	15.45	15.37	15.58	15.60	15.91	17.62
7		29.52	18.32	16.51	16.41	16.27	16.36	17.13	16.16	15.90	15.91
6	13.72	28.79	17.86	16.21	16.06	16.36	16.24	16.44	16.31	15.47	15.20
5		27.72	21.26	16.92	16.48	15.78	15.35	15.98	14.89	14.70	14.48
4		26.83	18.78	16.46	16.40	16.19	15.96	15.40	15.15	14.68	14.36
3		25.53	21.09	16.76	16.61	16.41	16.45	17.46	16.90	17.18	17.27
2	14.61	25.45	17.55	16.91	16.87	17.03	17.18	17.34	17.47	17.89	17.05

VELOCITY (m/s)

18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	2.13	2.19	2.20	2.20	2.23	2.14	2.21	2.30	2.41	0.00
16	0.00	1.68	1.70	1.64	1.58	1.58	1.60	1.62	1.70	1.89	0.00
15	0.00	1.04	1.26	1.16	1.21	1.24	1.25	1.27	1.38	1.79	0.00
14	0.00	1.13	0.98	0.91	0.93	0.90	0.92	0.95	0.98	1.25	0.00
13	0.00	0.66	0.61	0.57	0.55	0.5[illegible]	0.53	0.50	0.50	0.53	0.00
12	0.00	0.34	0.37	0.37	0.38	0.34	0.33	0.25	0.18	0.36	0.00
11	0.00	-0.17	0.08	0.12	0.15	0.08	-0.06	-0.18	-0.19	0.13	0.00
10	0.00	-0.28	-0.26	-0.22	-0.20	-0.27	-0.31	-0.34	-0.37	-0.15	0.00
9	0.00	-0.40	-0.37	-0.35	-0.35	-0.37	-0.37	-0.42	-0.44	-0.28	0.00
8	0.00	-0.47	-0.44	-0.44	-0.42	-0.44	-0.46	-0.48	-0.54	-0.41	0.00
7	0.00	-0.55	-0.53	-0.52	-0.52	-0.52	-0.51	-0.57	-0.63	-0.54	0.00
6	0.00	-0.62	-0.56	-0.56	-0.54	-0.55	-0.59	-0.62	-0.71	-0.73	0.00
5	0.00	-0.57	-0.60	-0.58	-0.57	-0.57	-0.58	-0.64	-0.71	-0.80	0.00
4	0.00	-0.69	-0.64	-0.59	-0.56	-0.58	-0.64	-0.67	-0.76	-0.92	0.00
3	0.00	-0.56	-0.67	-0.60	-0.58	-0.60	-0.63	-0.69	-0.78	-0.99	0.00
2	0.00	-0.80	-0.74	-0.67	-0.60	-0.62	-0.65	-0.70	-0.82	-1.03	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

ΔX = 0.095 m
ΔZ = 0.114 m
Zn = 1.082 m
Outflow rate = 0.560 kg/s
Inflow rate = 0.539 kg/s

Table B-42

Test 517; 8/6 door, 62.9 kW, location C

1 TEMPERATURE (^{o}C)

21											
20		129.43									
19		133.96									
18		134.44									
17	16.00	134.68	105.51	131.11	129.91	131.66	128.97	128.89	128.88	130.25	129.31
16		134.07	71.65	130.64	124.77	127.75	126.17	124.00	126.42	125.69	121.05
15		131.88	51.42	117.65	113.82	116.17	116.82	117.21	113.13	118.18	105.86
14	15.01	119.56	41.36	77.37	71.95	74.20	76.72	77.73	73.14	66.07	61.43
13		68.02	33.22	39.72	40.94	41.10	40.24	40.02	37.73	34.01	32.05
12		41.23	25.09	29.08	31.95	33.91	32.85	31.38	27.89	25.52	26.46
11		34.09	22.47	23.59	26.04	28.03	24.20	23.64	20.64	19.39	22.45
10	14.93	30.67	19.86	18.29	19.93	19.97	19.59	18.30	17.57	17.68	19.43
9		29.06	17.34	16.76	17.26	17.75	16.74	16.61	16.76	16.66	19.07
8		28.09	17.23	16.40	15.77	16.26	16.26	16.17	16.10	16.51	17.92
7		27.32	18.07	16.25	16.69	17.19	16.98	16.90	16.61	16.49	16.72
6	14.33	26.64	18.66	16.72	16.09	16.96	16.97	16.71	16.68	15.71	15.79
5		25.65	19.08	15.99	16.20	16.47	16.13	15.82	15.46	15.37	15.38
4		24.98	19.86	17.32	15.84	16.75	16.47	15.70	15.82	15.06	14.73
3		24.05	18.26	16.92	17.10	17.52	17.48	17.43	17.04	17.61	17.31
2	14.98	24.41	18.79	18.11	17.71	18.30	18.04	17.96	18.18	17.56	17.14

VELOCITY (m/s)

18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	2.07	2.18	2.08	2.05	2.07	2.06	2.16	2.24	2.33	0.00
16	0.00	1.42	1.58	1.55	1.48	1.47	1.46	1.49	1.63	1.64	0.00
15	0.00	1.21	1.20	1.15	1.14	1.15	1.16	1.17	1.25	1.43	0.00
14	0.00	0.89	0.83	0.86	0.81	0.82	0.81	0.80	0.81	0.94	0.00
13	0.00	0.63	0.50	0.45	0.43	0.40	0.37	0.36	0.36	0.35	0.00
12	0.00	0.19	0.22	0.31	0.28	0.25	0.22	0.19	0.14	0.19	0.00
11	0.00	-0.14	0.12	0.15	0.19	0.09	-0.03	-0.16	-0.19	0.05	0.00
10	0.00	-0.27	-0.28	-0.20	-0.22	-0.23	-0.28	-0.30	-0.33	-0.22	0.00
9	0.00	-0.35	-0.34	-0.33	-0.29	-0.34	-0.38	-0.39	-0.42	-0.32	0.00
8	0.00	-0.42	-0.43	-0.42	-0.40	-0.41	-0.43	-0.44	-0.49	-0.40	0.00
7	0.00	-0.52	-0.48	-0.48	-0.45	-0.49	-0.51	-0.53	-0.58	-0.51	0.00
6	0.00	-0.57	-0.55	-0.53	-0.50	-0.52	-0.54	-0.55	-0.64	-0.63	0.00
5	0.00	-0.59	-0.53	-0.53	-0.49	-0.50	-0.54	-0.60	-0.65	-0.72	0.00
4	0.00	-0.64	-0.57	-0.55	-0.51	-0.53	-0.57	-0.60	-0.70	-0.82	0.00
3	0.00	-0.67	-0.60	-0.55	-0.53	-0.53	-0.58	-0.64	-0.72	-0.88	0.00
2	0.00	-0.73	-0.66	-0.63	-0.56	-0.53	-0.60	-0.63	-0.74	-0.91	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

ΔX = 0.111 m
ΔZ = 0.114 m
Zn = 1.085 m
Outflow rate = 0.593 kg/s
Inflow rate = 0.576 kg/s

Table B-43

Test 622; full window, 62.9 kW, location C

1 TEMPERATURE (°C)

21									
20		148.07							
19		153.37							
18		153.94							
17	11.10	154.09	138.77	148.01	146.44	148.04	148.64	152.83	150.72
16		153.65	119.42	146.35	146.97	143.57	142.43	145.65	146.11
15		152.10	83.40	138.55	135.82	137.97	138.19	145.72	119.22
14	9.47	148.12	75.17	115.58	118.77	125.31	122.42	113.97	114.05
13		123.74	53.73	71.72	70.45	68.80	65.89	66.01	67.29
12		70.34	18.77	17.99	25.39	30.33	25.53	20.33	20.24
11		49.66	13.66	12.12	12.16	13.02	12.26	11.32	12.42
10	9.45	40.23	13.16	11.31	11.83	11.84	11.54	10.92	10.95
9		34.34	11.83	11.27	10.45	10.82	10.55	9.98	10.03
8		31.11	11.52	10.64	10.89	10.86	10.42	9.96	10.05
7		29.76	12.33	12.93	12.09	11.35	11.35	10.15	9.05
6	8.65	29.09	11.42	11.67	11.55	11.49	10.80	10.15	9.77
5		28.28	11.29	11.10	9.92	10.07	10.08	9.22	8.53
4		27.78	10.94	10.63	10.33	10.48	9.84	9.15	9.01
3		26.62	10.80	10.47	9.72	10.10	10.29	9.33	8.75
2	9.59	26.90	11.05	10.18	10.48	10.81	10.70	10.01	9.92

VELOCITY (m/s)

18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	2.27	2.27	2.23	2.20	2.27	2.38	2.53	0.00
16	0.00	1.84	1.77	1.68	1.61	1.67	1.83	2.04	0.00
15	0.00	1.46	1.35	1.29	1.28	1.32	1.47	1.54	0.00
14	0.00	1.14	1.03	1.02	1.02	1.03	1.07	1.31	0.00
13	0.00	0.56	0.57	0.55	0.52	0.51	0.46	0.58	0.00
12	0.00	-0.23	-0.18	-0.11	-0.10	-0.14	-0.21	-0.26	0.00
11	0.00	-0.55	-0.49	-0.48	-0.49	-0.50	-0.54	-0.56	0.00
10	0.00	-0.70	-0.60	-0.58	-0.57	-0.59	-0.64	-0.79	0.00
9	0.00	-0.79	-0.67	-0.62	-0.62	-0.63	-0.72	-0.87	0.00
8	0.00	-0.87	-0.73	-0.69	-0.68	-0.71	-0.78	-0.98	0.00
7	0.00	-1.02	-0.88	-0.83	-0.84	-0.85	-0.95	-1.12	0.00
6	0.00	-1.17	-1.10	-1.09	-1.11	-1.15	-1.16	-1.22	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

ΔX = 0.106 m
ΔZ = 0.114 m
Zn = 1.228 m
Outflow rate = 0.441 kg/s
Inflor rate = 0.435 kg/s

Table B-44

Test 522; full window, 62.9 kW, location C

1 TEMPERATURE (°C)

21									
20		153.30							
19		158.98							
18		159.40							
17	15.24	159.57	155.82	154.86	154.32	152.47	152.10	151.75	151.98
16		158.97	145.61	153.53	149.44	150.10	149.08	149.70	150.07
15		156.95	91.05	146.07	144.37	143.46	143.20	144.95	141.96
14	13.25	152.53	87.68	122.95	127.60	133.22	130.62	123.40	127.01
13		127.79	65.30	74.79	72.68	73.98	70.80	69.32	68.71
12		72.93	28.54	26.24	35.35	35.30	30.54	22.82	22.37
11		52.93	19.32	14.94	15.03	17.08	15.73	15.12	15.29
10	13.28	44.28	18.30	15.55	14.95	15.06	14.58	14.68	14.04
9		37.99	15.16	13.80	13.73	13.99	13.71	13.41	13.95
8		34.13	14.44	13.74	13.58	13.62	13.34	13.46	13.38
7		32.42	15.88	15.82	15.57	15.21	15.26	14.06	13.20
6	12.77	31.74	14.42	14.92	14.09	14.09	13.96	13.79	13.28
5		30.71	13.76	13.22	13.27	13.48	13.51	13.34	12.97
4		30.27	14.09	14.03	13.68	13.76	13.49	13.47	13.10
3		29.19	14.95	13.51	13.81	14.02	14.16	13.88	13.52
2	13.95	29.34	14.70	13.89	14.14	14.29	14.18	14.29	14.06

VELOCITY (m/s)

18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	2.28	2.14	2.17	2.15	2.16	2.22	2.30	0.00
16	0.00	1.84	1.69	1.62	1.58	1.61	1.72	1.94	0.00
15	0.00	1.45	1.29	1.26	1.25	1.30	1.40	1.69	0.00
14	0.00	1.13	1.02	1.01	1.01	1.04	1.05	1.30	0.00
13	0.00	0.64	0.55	0.51	0.52	0.51	0.55	0.61	0.00
12	0.00	-0.16	-0.08	0.08	-0.03	-0.11	-0.19	-0.18	0.00
11	0.00	-0.56	-0.49	-0.47	-0.40	-0.45	-0.45	-0.51	0.00
10	0.00	-0.73	-0.61	-0.58	-0.54	-0.55	-0.59	-0.73	0.00
9	0.00	-0.83	-0.68	-0.63	-0.60	-0.61	-0.64	-0.83	0.00
8	0.00	-0.94	-0.76	-0.70	-0.68	-0.70	-0.75	-0.93	0.00
7	0.00	-1.05	-0.88	-0.84	-0.82	-0.86	-0.89	-1.05	0.00
6	0.00	-1.18	-1.12	-1.11	-1.11	-1.11	-1.13	-1.13	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

ΔX = 0.106 m
ΔZ = 0.114 m
Zn = 1.215 m
Outflow rate = 0.426 kg/s
Inflow rate = 0.416 kg/s

Table B-45

Test 524; 2/3 window, 62.9 kW, location C

1 TEMPERATURE (^{o}C)

21									
20		171.34							
19		178.25							
18		178.85							
17	10.36	178.84	163.53	173.01	172.01	170.57	169.13	168.83	169.88
16		178.32	144.47	170.11	167.50	165.67	164.39	166.06	167.47
15		176.69	89.61	165.58	163.23	160.04	158.68	165.11	141.92
14	8.76	174.73	49.87	115.87	135.40	142.31	135.65	121.07	94.21
13		166.74	16.49	13.25	20.63	18.83	18.98	14.20	12.51
12		132.39	12.23	11.52	12.14	12.42	12.36	12.01	11.43
11		85.82	11.76	11.43	11.34	12.02	11.80	11.03	10.64
10	8.92	66.31	11.06	11.43	11.67	11.60	11.68	11.32	10.70
9		56.01	9.01	9.66	9.45	9.56	9.51	8.92	8.98
8		49.57	9.36	9.46	9.37	9.14	9.06	8.87	8.88
7		45.85	9.24	10.05	9.61	9.40	9.49	8.72	8.93
6	8.34	43.69	9.60	10.24	10.30	9.84	9.81	9.29	8.98
5		42.27	10.69	13.84	11.41	10.70	10.69	10.10	9.22
4		41.66	9.97	10.30	9.47	9.24	9.29	9.18	8.97
3		40.76	9.03	9.60	9.41	9.24	9.53	9.06	9.21
2	8.93	41.67	9.17	8.89	9.14	9.21	9.74	9.64	9.36

VELOCITY (m/s)

18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	2.22	2.14	2.07	2.10	2.11	2.23	2.44	0.00
16	0.00	1.78	1.66	1.55	1.50	1.55	1.66	1.90	0.00
15	0.00	1.24	1.22	1.14	1.16	1.14	1.28	1.34	0.00
14	0.00	0.47	0.70	0.77	0.81	0.76	0.72	0.55	0.00
13	0.00	-0.54	-0.48	-0.40	-0.43	-0.43	-0.44	-0.49	0.00
12	0.00	-0.90	-0.65	-0.63	-0.62	-0.61	-0.64	-0.86	0.00
11	0.00	-1.11	-0.95	-0.91	-0.89	-0.90	-0.93	-1.10	0.00
10	0.00	-1.36	-1.31	-1.32	-1.31	-1.33	-1.32	-1.35	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

ΔX = 0.106 m
ΔZ = 0.114 m
Z_n = 1.361 m

Outflow rate = 0.325 kg/s
Inflow rate = 0.287 kg/s

Table B-46

Test 541; 1/3 window, 62.9 kW, lcoation C

TEMPERATURE (^{o}C)

*									
21									
20		275.05							
19		290.26							
18		291.45							
17	8.59	291.27	272.54	269.42	268.27	267.43	266.32	260.31	258.98
16		290.39	211.82	254.61	253.98	254.90	249.88	249.49	238.51
15		287.27	26.12	25.34	26.17	25.61	22.53	22.16	24.14
14	7.81	286.93	18.75	19.52	20.00	20.33	19.64	18.86	15.86
13		281.96	13.06	13.49	14.31	12.61	12.58	11.28	11.82
12		271.11	11.97	11.20	11.26	10.80	9.96	9.29	9.36
11		241.40	10.26	10.52	10.44	9.30	9.29	8.85	7.92
10	7.69	192.51	9.90	10.97	11.10	11.00	10.33	9.85	8.22
9		173.53	13.03	16.10	15.96	13.84	13.80	13.66	9.91
8		164.66	9.59	9.52	9.34	9.26	8.77	8.26	7.59
7		159.13	9.90	9.63	9.51	8.51	8.31	8.04	7.28
6	6.81	155.31	9.46	10.63	9.52	9.60	9.40	8.49	7.58
5		150.65	11.58	15.62	12.24	11.53	11.02	10.73	8.30
4		145.54	8.76	8.62	7.99	7.93	7.89	7.65	7.35
3		140.81	8.06	7.96	8.05	7.63	7.54	7.43	7.29
2	7.78	134.64	7.98	7.54	7.80	7.69	7.85	7.74	7.52
*									
*									

VELOCITY (m/s)

*									
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	2.08	1.89	1.85	1.84	1.84	1.88	2.07	0.00
16	0.00	1.23	1.15	1.13	1.11	1.10	1.13	1.28	0.00
15	0.00	-0.55	-0.54	-0.49	-0.46	-0.48	-0.47	-0.50	0.00
14	0.00	-1.17	-1.12	-1.09	-1.09	-1.06	-1.07	-1.12	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
*									
*									

ΔX = 0.106 m
ΔZ = 0.114 m
Zn = 1.577 m
Outflow rate = 0.126 kg/s
Inflow rate = 0.108 kg/s

Table B-47

Test 520; 6/6 door, 31.6 kW, location C

1 TEMPERATURE (°C)

*

21									
20		90.29							
19		93.91							
18		94.15							
17	18.49	94.40	93.07	91.68	91.15	90.84	90.99	91.42	91.27
16		94.11	85.49	90.88	88.74	88.94	89.70	90.07	86.79
15		93.31	53.77	87.64	86.04	84.98	84.20	88.98	79.38
14	17.45	91.19	51.71	77.45	77.84	80.18	77.38	80.40	69.16
13		76.45	37.21	46.34	45.27	47.60	44.01	47.20	37.12
12		43.88	27.65	33.64	33.23	33.98	29.42	29.39	24.78
11		33.20	21.84	23.61	23.77	21.74	19.99	20.03	21.85
10	17.33	29.69	19.56	19.67	19.51	18.78	18.72	18.37	19.24
9		27.83	18.66	17.96	18.07	17.97	17.89	18.24	19.31
8		26.70	18.41	17.97	17.86	17.76	17.95	18.01	18.92
7		25.99	19.07	18.13	18.33	18.51	18.36	18.20	18.13
6	17.01	25.41	18.72	18.30	18.44	18.40	18.42	18.07	17.99
5		24.70	20.37	18.08	17.97	17.84	17.78	17.84	17.84
4		24.29	20.32	18.68	18.40	18.15	18.10	17.92	18.21
3		23.87	20.43	18.67	18.73	18.82	19.09	19.21	19.23
2	17.53	24.06	19.22	19.04	19.02	19.36	19.71	19.70	19.20

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*

VELOCITY (m/s)

*

18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	1.77	1.68	1.67	1.66	1.69	1.71	1.77	0.00
16	0.00	1.37	1.34	1.28	1.23	1.25	1.34	1.41	0.00
15	0.00	1.03	1.06	0.99	0.99	0.99	1.07	1.13	0.00
14	0.00	0.88	0.83	0.81	0.80	0.80	0.84	0.91	0.00
13	0.00	0.52	0.47	0.41	0.41	0.38	0.42	0.41	0.00
12	0.00	0.18	0.26	0.22	0.20	0.16	0.13	0.07	0.00
11	0.00	-0.13	0.09	-0.06	-0.13	-0.16	-0.16	-0.05	0.00
10	0.00	-0.28	-0.20	-0.24	-0.26	-0.29	-0.33	-0.21	0.00
9	0.00	-0.34	-0.31	-0.30	-0.30	-0.32	-0.36	-0.32	0.00
8	0.00	-0.43	-0.37	-0.36	-0.35	-0.38	-0.42	-0.38	0.00
7	0.00	-0.52	-0.43	-0.43	-0.43	-0.45	-0.51	-0.49	0.00
6	0.00	-0.59	-0.48	-0.46	-0.46	-0.49	-0.56	-0.52	0.00
5	0.00	-0.57	-0.50	-0.48	-0.48	-0.51	-0.57	-0.63	0.00
4	0.00	-0.60	-0.51	-0.48	-0.50	-0.53	-0.60	-0.68	0.00
3	0.00	-0.56	-0.54	-0.51	-0.50	-0.52	-0.61	-0.76	0.00
2	0.00	-0.64	-0.55	-0.52	-0.49	-0.55	-0.63	-0.77	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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*

ΔX = 0.106 m
ΔZ = 0.114 m
Zn = 1.121 m
Outflow rate = 0.396 kg/s
Inflow rate = 0.387 kg/s

Table B-48

Test 521; 6/6 door, 105.3 kW, location C

1 TEMPERATURE (^{o}C)

21									
20		200.46							
19		207.62							
18		208.18							
17	16.09	208.33	201.35	199.33	200.69	197.96	199.30	196.71	194.34
16		207.29	175.24	195.21	197.48	193.60	189.27	192.17	193.12
15		203.84	99.42	190.34	187.35	184.82	186.13	186.10	182.44
14	13.39	196.56	90.68	158.15	156.16	167.57	168.99	169.26	169.66
13		161.74	80.41	94.82	88.70	99.67	104.71	115.24	88.65
12		88.40	56.00	65.69	65.32	68.42	58.75	57.52	47.12
11		56.87	41.86	46.63	48.48	48.30	36.25	32.33	40.80
10	13.14	46.33	28.93	20.42	26.61	26.77	22.10	17.69	22.33
9		42.58	19.48	15.50	16.72	16.83	15.32	15.57	20.27
8		40.92	18.45	15.25	14.64	14.70	14.44	14.06	15.96
7		39.70	18.86	14.88	15.70	15.93	15.60	15.57	14.00
6	12.29	38.70	17.48	15.64	15.47	15.89	16.06	15.81	13.45
5		36.84	21.46	15.94	15.09	14.80	14.18	13.81	13.22
4		35.49	24.85	16.15	16.03	15.64	14.53	14.00	12.80
3		33.12	20.93	17.13	17.81	18.27	18.41	18.52	18.03
2	13.99	32.61	19.58	18.92	18.34	19.47	19.15	18.90	17.77

VELOCITY (m/s)

18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	2.81	2.78	2.89	2.77	2.78	2.71	2.83	0.00
16	0.00	2.25	2.17	2.13	2.03	2.00	2.12	2.52	0.00
15	0.00	1.63	1.73	1.66	1.65	1.72	1.82	2.28	0.00
14	0.00	1.47	1.41	1.39	1.37	1.38	1.46	1.89	0.00
13	0.00	1.18	1.00	0.92	0.91	0.94	1.01	1.08	0.00
12	0.00	0.70	0.63	0.61	0.59	0.56	0.55	0.59	0.00
11	0.00	0.27	0.33	0.37	0.35	0.26	0.22	0.42	0.00
10	0.00	-0.27	-0.28	-0.17	-0.19	-0.26	-0.34	-0.18	0.00
9	0.00	-0.50	-0.48	-0.42	-0.41	-0.43	-0.48	-0.39	0.00
8	0.00	-0.66	-0.57	-0.55	-0.54	-0.54	-0.57	-0.63	0.00
7	0.00	-0.85	-0.73	-0.67	-0.63	-0.64	-0.74	-0.76	0.00
6	0.00	-0.93	-0.79	-0.74	-0.72	-0.72	-0.79	-0.93	0.00
5	0.00	-1.00	-0.88	-0.79	-0.75	-0.78	-0.86	-0.99	0.00
4	0.00	-0.99	-0.88	-0.81	-0.79	-0.81	-0.90	-1.12	0.00
3	0.00	-1.01	-0.93	-0.83	-0.81	-0.84	-0.94	-1.21	0.00
2	0.00	-1.02	-0.88	-0.84	-0.78	-0.82	-0.92	-1.21	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

ΔX = 0.106 m
ΔZ = 0.114 m
Zn = 1.021 m
Outflow rate = 0.602 kg/s
Inflow rate = 0.577 kg/s

Table B-49

Test 513; 6/6 door, 158 kW, location C

1 TEMPERATURE (^{o}C)

21									
20		280.09							
19		292.41							
18		293.67							
17	20.04	293.74	273.88	275.77	276.62	264.33	268.85	285.37	286.70
16		292.22	239.13	275.92	270.24	263.47	260.24	276.63	283.49
15		285.94	129.42	259.72	256.54	243.64	249.42	265.92	273.50
14	16.06	275.73	111.53	221.89	212.66	218.63	231.30	243.94	249.27
13		228.14	113.55	144.66	135.27	138.00	140.80	170.04	157.84
12		132.55	83.88	103.36	97.02	96.92	83.66	94.24	75.77
11		84.76	63.79	75.57	78.01	68.15	63.84	64.99	61.55
10	15.66	68.20	41.82	38.94	44.33	47.89	37.87	34.54	32.48
9		62.56	24.47	20.98	22.39	21.01	20.86	21.42	25.19
8		59.80	25.88	19.30	18.73	18.49	17.68	18.21	20.70
7		57.90	24.97	19.92	19.53	18.65	19.15	19.43	19.14
6	14.64	56.45	25.45	19.38	19.36	20.11	19.69	19.78	18.16
5		53.34	30.56	20.26	19.02	17.16	17.62	17.91	17.02
4		51.42	35.39	21.02	19.84	18.94	18.03	17.88	16.48
3		47.01	27.58	23.79	23.81	21.37	23.00	24.70	26.37
2	16.95	45.20	24.97	25.80	26.04	25.22	24.24	25.68	24.42

VELOCITY (m/s)

18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	3.42	3.33	3.46	3.35	3.35	3.46	3.63	0.00
16	0.00	2.73	2.64	2.58	2.48	2.48	2.71	3.25	0.00
15	0.00	1.90	2.15	2.03	1.99	2.08	2.33	2.97	0.00
14	0.00	1.62	1.75	1.67	1.66	1.70	1.90	2.38	0.00
13	0.00	1.55	1.34	1.19	1.15	1.17	1.35	1.56	0.00
12	0.00	0.98	0.89	0.83	0.80	0.64	0.84	0.94	0.00
11	0.00	0.50	0.55	0.55	0.50	0.51	0.54	0.57	0.00
10	0.00	-0.25	-0.08	0.05	0.13	-0.16	-0.20	-0.20	0.00
9	0.00	-0.57	-0.51	-0.46	-0.45	-0.45	-0.48	-0.51	0.00
8	0.00	-0.73	-0.65	-0.63	-0.60	-0.56	-0.62	-0.73	0.00
7	0.00	-0.96	-0.80	-0.77	-0.71	-0.71	-0.78	-0.96	0.00
6	0.00	-1.07	-0.91	-0.85	-0.81	-0.79	-0.90	-1.12	0.00
5	0.00	-1.15	-0.98	-0.92	-0.85	-0.87	-0.97	-1.22	0.00
4	0.00	-1.17	-1.02	-0.96	-0.91	-0.92	-1.04	-1.31	0.00
3	0.00	-1.18	-1.06	-0.97	-0.93	-0.96	-1.09	-1.39	0.00
2	0.00	-1.29	-1.09	-0.97	-0.94	-0.92	-1.08	-1.38	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

ΔX = 0.106 m
ΔZ = 0.114 m
Zn = 0.986 m
Outflow rate = 0.677 kg/s
Inflow rate = 0.636 kg/s

Table B-50

Test 160; 6/6 door, 62.9 kW, location AR

TEMPERATURE (^{o}C)

21									
20		131.88							
19		136.40							
18		136.38							
17	7.11	136.17	132.85	132.01	131.26	130.49	130.48	128.85	131.68
16		135.73	133.89	125.87	120.31	122.37	120.45	121.24	127.33
15		135.25	120.08	124.42	117.75	117.75	116.27	117.77	104.50
14	5.68	134.51	79.93	109.10	98.87	100.83	98.81	102.26	94.10
13		123.10	34.50	57.16	53.97	51.22	55.68	49.07	32.79
12		59.19	20.96	25.98	30.38	31.04	27.05	21.96	22.20
11		31.89	15.78	19.96	20.47	16.55	12.36	10.41	18.28
10	5.53	25.88	10.77	10.64	11.23	8.69	7.99	8.97	11.57
9		22.86	8.05	8.39	8.16	7.97	7.96	8.14	12.71
8		21.02	7.65	7.27	7.14	7.31	6.87	7.66	9.18
7		19.87	9.37	9.21	9.12	8.89	8.72	6.98	8.60
6	5.17	19.12	9.52	8.64	8.64	8.49	7.67	7.54	7.72
5		18.09	10.17	8.79	8.36	7.43	7.17	6.02	6.98
4		17.43	9.60	8.73	8.65	8.00	6.99	6.55	6.13
3		16.48	7.25	9.56	9.60	9.70	9.61	9.23	8.84
2	6.26	17.64	9.40	9.55	9.91	10.29	9.86	10.23	8.96

VELOCITY (m/s)

18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	2.61	2.48	2.50	2.53	2.51	2.53	2.67	0.00
16	0.00	1.98	1.87	1.78	1.73	1.75	1.83	1.96	0.00
15	0.00	1.45	1.44	1.42	1.39	1.40	1.45	1.34	0.00
14	0.00	1.07	1.07	1.09	1.10	1.10	1.07	1.14	0.00
13	0.00	0.71	0.74	0.67	0.61	0.65	0.61	0.57	0.00
12	0.00	0.33	0.40	0.39	0.36	0.31	0.23	0.28	0.00
11	0.00	-0.13	0.17	0.16	0.04	-0.18	-0.24	0.13	0.00
10	0.00	-0.31	-0.30	-0.24	-0.35	-0.35	-0.37	-0.26	0.00
9	0.00	-0.42	-0.40	-0.40	-0.43	-0.46	-0.52	-0.20	0.00
8	0.00	-0.52	-0.47	-0.46	-0.52	-0.53	-0.58	-0.52	0.00
7	0.00	-0.61	-0.57	-0.56	-0.58	-0.61	-0.69	-0.44	0.00
6	0.00	-0.70	-0.61	-0.61	-0.63	-0.66	-0.72	-0.67	0.00
5	0.00	-0.72	-0.64	-0.62	-0.64	-0.67	-0.76	-0.65	0.00
4	0.00	-0.78	-0.68	-0.64	-0.65	-0.69	-0.77	-0.93	0.00
3	0.00	-0.81	-0.71	-0.67	-0.66	-0.70	-0.80	-0.93	0.00
2	0.00	-0.89	-0.76	-0.71	-0.70	-0.72	-0.82	-1.03	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

ΔX = 0.106 m
ΔZ = 0.114 m
Z_n = 1.085 m
Outflow rate = 0.528 kg/s
Inflow rate = 0.516 kg/s

Table B-51

Test 163; 6/6 door, 62.9 kW, location BR

TEMPERATURE (^{o}C)

21									
20		183.56							
19		191.42							
18		191.35							
17	8.03	189.99	184.34	180.19	181.16	181.80	181.60	181.87	181.07
16		186.69	163.37	174.47	167.60	168.68	162.33	170.12	150.60
15		165.07	83.94	128.06	111.61	91.91	81.14	106.63	103.06
14	6.34	70.35	35.94	53.40	46.34	45.54	45.43	48.95	36.75
13		42.79	33.72	34.35	35.96	36.69	36.54	32.69	29.00
12		34.79	27.45	25.24	27.90	30.27	31.13	29.04	26.78
11		29.66	22.98	19.92	21.64	22.73	23.86	26.09	26.91
10	6.31	26.58	20.44	10.61	11.48	14.17	15.06	13.00	20.47
9		24.93	11.15	9.04	10.04	8.98	8.71	9.58	13.93
8		23.61	12.28	8.14	8.58	8.29	7.79	7.59	10.61
7		22.40	11.40	10.16	9.81	9.17	8.72	8.45	8.92
6	5.77	21.23	11.90	9.46	9.70	9.57	10.08	8.86	8.12
5		19.86	10.29	7.86	7.89	7.40	7.47	7.53	8.23
4		18.97	11.05	8.36	8.01	7.81	7.45	7.14	7.28
3		17.80	10.88	10.53	10.71	10.36	10.21	10.10	10.47
2	7.15	18.44	10.91	11.61	11.70	11.53	11.43	11.12	10.33

VELOCITY (m/s)

18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	2.33	2.18	2.18	2.24	2.32	2.36	2.47	0.00
16	0.00	1.86	1.66	1.58	1.59	1.59	1.70	1.61	0.00
15	0.00	1.18	1.17	1.11	1.07	1.07	1.16	1.34	0.00
14	0.00	0.81	0.82	0.75	0.73	0.75	0.83	0.96	0.00
13	0.00	0.65	0.61	0.56	0.56	0.59	0.58	0.60	0.00
12	0.00	0.42	0.40	0.41	0.42	0.44	0.43	0.41	0.00
11	0.00	0.15	0.16	0.17	0.17	0.21	0.27	0.31	0.00
10	0.00	-0.19	-0.26	-0.20	-0.19	-0.12	-0.20	0.13	0.00
9	0.00	-0.42	-0.35	-0.30	-0.29	-0.38	-0.40	-0.21	0.00
8	0.00	-0.46	-0.45	-0.38	-0.38	-0.42	-0.48	-0.40	0.00
7	0.00	-0.68	-0.55	-0.50	-0.48	-0.55	-0.62	-0.60	0.00
6	0.00	-0.69	-0.61	-0.56	-0.55	-0.57	-0.65	-0.68	0.00
5	0.00	-0.81	-0.65	-0.60	-0.58	-0.62	-0.68	-0.78	0.00
4	0.00	-0.78	-0.69	-0.62	-0.61	-0.63	-0.72	-0.89	0.00
3	0.00	-0.89	-0.72	-0.66	-0.64	-0.67	-0.75	-1.00	0.00
2	0.00	-0.94	-0.74	-0.65	-0.65	-0.65	-0.76	-1.00	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

ΔX = 0.106 m
ΔZ = 0.114 m
Z_n = 1.015 m
Outflow rate = 0.471 kg/s
Inflow rate = 0.463 kg/s

Table B-52

Test 164; 6/6 door, 62.9 kW, location CR

1 TEMPERATURE (^{o}C)

21									
20		155.93							
19		161.17							
18		161.51							
17	8.45	161.49	151.12	153.66	153.40	151.68	152.86	151.76	148.87
16		160.06	132.84	148.84	147.77	149.15	146.21	149.63	146.12
15		154.78	112.92	138.00	133.92	138.96	136.76	138.54	91.21
14	6.70	132.85	52.77	77.35	73.30	85.26	85.43	93.98	84.93
13		57.51	35.79	39.26	38.11	37.90	34.97	36.68	30.39
12		36.67	26.75	29.05	31.28	32.08	28.27	26.52	25.06
11		30.17	22.93	21.69	23.21	23.74	19.86	17.64	19.33
10	6.61	26.98	16.73	10.89	12.46	14.53	9.58	10.81	14.65
9		25.32	11.96	8.76	9.05	8.34	8.02	8.37	9.27
8		24.10	9.83	8.17	8.28	8.14	7.52	7.51	8.73
7		22.90	11.04	9.85	9.39	9.45	8.84	8.17	7.52
6	5.97	21.77	10.45	9.50	9.61	9.69	8.51	8.27	7.34
5		20.38	10.55	7.81	7.76	7.61	7.44	7.02	6.78
4		19.40	10.71	8.16	8.11	7.54	7.35	6.84	6.48
3		18.02	9.54	9.87	10.28	10.12	10.13	9.52	9.45
2	7.57	17.92	10.08	10.37	11.48	11.13	11.24	10.75	9.83

VELOCITY (m/s)

18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	2.28	2.26	2.19	2.18	2.19	2.22	2.34	0.00
16	0.00	1.82	1.72	1.63	1.63	1.61	1.73	2.03	0.00
15	0.00	1.42	1.26	1.27	1.27	1.28	1.38	1.19	0.00
14	0.00	1.08	0.95	0.88	0.92	0.90	1.02	1.19	0.00
13	0.00	0.65	0.57	0.53	0.53	0.52	0.55	0.65	0.00
12	0.00	0.37	0.37	0.38	0.39	0.36	0.38	0.40	0.00
11	0.00	0.12	0.15	0.15	0.20	0.18	0.13	0.20	0.00
10	0.00	-0.25	-0.25	-0.19	-0.16	-0.28	-0.22	-0.12	0.00
9	0.00	-0.38	-0.37	-0.32	-0.35	-0.38	-0.41	-0.37	0.00
8	0.00	-0.51	-0.45	-0.43	-0.43	-0.46	-0.47	-0.49	0.00
7	0.00	-0.65	-0.56	-0.50	-0.50	-0.54	-0.60	-0.67	0.00
6	0.00	-0.73	-0.62	-0.58	-0.57	-0.60	-0.63	-0.77	0.00
5	0.00	-0.76	-0.68	-0.61	-0.59	-0.62	-0.70	-0.84	0.00
4	0.00	-0.79	-0.70	-0.63	-0.62	-0.66	-0.72	-0.93	0.00
3	0.00	-0.82	-0.73	-0.66	-0.65	-0.69	-0.77	-0.98	0.00
2	0.00	-0.90	-0.75	-0.67	-0.65	-0.69	-0.78	-1.01	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

ΔX = 0.106 m
ΔZ = 0.114 m
Z_n = 1.035 m
Outflow rate = 0.485 kg/s
Inflow rate = 0.480 kg/s

Table B-53

Test 165; 6/6 door, 62 kW, location DR

TEMPERATURE (°C)

*									
21									
20		148.88							
19		154.36							
18		154.61							
17	8.48	154.14	152.40	153.26	151.32	150.06	153.73	153.66	155.04
16		152.88	144.97	144.57	140.70	139.94	138.65	147.27	147.77
15		150.38	127.19	147.79	141.07	125.62	121.98	128.49	120.12
14	6.38	142.60	40.28	90.20	86.63	83.10	73.53	91.57	104.23
13		64.17	27.51	30.11	40.29	40.41	39.13	40.68	33.39
12		38.51	21.99	21.14	24.64	33.67	32.41	29.45	28.37
11		31.22	18.52	15.54	20.36	24.05	23.14	22.45	27.08
10	6.12	27.45	13.48	10.78	12.95	15.93	13.49	12.89	22.57
9		25.17	10.29	9.56	9.34	9.14	7.88	10.07	16.41
8		23.16	9.41	8.52	8.34	7.50	7.70	8.36	13.11
7		21.46	10.69	10.04	9.37	9.31	8.70	7.64	10.93
6	5.66	20.24	10.58	10.34	9.91	9.51	9.08	7.58	9.28
5		19.17	9.48	8.09	7.66	7.60	7.12	7.24	9.24
4		18.37	9.70	8.41	8.11	7.42	7.38	6.92	7.15
3		17.30	9.09	10.22	10.33	10.39	9.98	10.05	10.80
2	7.19	18.32	9.80	10.96	11.51	11.18	11.33	11.35	10.56
*									
*									

VELOCITY m/s)

*									
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	2.40	2.26	2.17	2.21	2.28	2.40	2.47	0.00
16	0.00	1.91	1.83	1.75	1.65	1.62	1.75	1.85	0.00
15	0.00	1.42	1.41	1.30	1.26	1.30	1.32	1.42	0.00
14	0.00	0.75	0.75	0.82	0.92	0.88	0.96	1.25	0.00
13	0.00	0.49	0.56	0.61	0.58	0.54	0.56	0.61	0.00
12	0.00	0.21	0.24	0.35	0.42	0.40	0.37	0.37	0.00
11	0.00	-0.15	-0.08	0.24	0.23	0.20	0.20	0.25	0.00
10	0.00	-0.31	-0.28	-0.18	-0.10	-0.16	-0.23	0.16	0.00
9	0.00	-0.39	-0.34	-0.33	-0.32	-0.40	-0.45	-0.13	0.00
8	0.00	-0.48	-0.43	-0.41	-0.46	-0.48	-0.55	-0.26	0.00
7	0.00	-0.61	-0.52	-0.52	-0.51	-0.55	-0.67	-0.38	0.00
6	0.00	-0.68	-0.58	-0.55	-0.57	-0.61	-0.71	-0.54	0.00
5	0.00	-0.75	-0.63	-0.61	-0.60	-0.63	-0.75	-0.67	0.00
4	0.00	-0.79	-0.67	-0.60	-0.63	-0.65	-0.77	-0.91	0.00
3	0.00	-0.86	-0.71	-0.66	-0.63	-0.69	-0.80	-1.01	0.00
2	0.00	-0.90	-0.74	-0.65	-0.67	-0.70	-0.80	-1.04	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
*									
*									

ΔX = 0.106 m
ΔZ = 0.114 m
Zn = 1.034 m
Outflow rate = 0.485 kg/s
Inflow rate = 0.470 kg/s

Table B-54

Test 162; 6/6 door, 62.9 kW, location ER

1 TEMPERATURE (°C)

*

21									
20		160.94							
19		155.92							
18		150.13							
17	7.42	146.15	150.42	146.77	144.93	145.04	146.49	147.56	143.56
16		141.42	141.76	143.29	135.96	133.63	136.42	139.82	137.86
15		137.99	129.49	126.97	117.55	123.20	140.02	143.83	97.81
14	5.71	129.92	66.46	94.27	83.19	83.72	85.01	100.87	65.42
13		81.64	33.84	40.39	39.64	41.54	33.39	27.34	26.37
12		38.56	27.44	29.83	30.56	27.30	20.16	18.46	22.01
11		27.56	22.67	23.95	19.12	16.21	10.90	11.78	19.14
10	5.58	22.91	14.27	13.99	12.30	8.66	8.42	8.64	13.98
9		21.60	10.19	8.80	7.51	7.90	7.19	7.77	11.80
8		21.04	8.80	7.52	7.33	6.91	6.71	7.14	9.55
7		20.68	12.89	10.17	9.58	10.41	8.83	8.46	7.73
6	5.25	20.39	12.36	10.05	9.86	9.36	9.00	8.01	8.00
5		19.49	11.36	7.57	6.71	7.12	6.58	6.67	7.31
4		19.25	10.85	7.63	7.57	7.02	6.76	6.59	6.83
3		18.60	9.16	9.87	9.58	9.77	9.55	9.05	8.48
2	6.33	20.30	9.86	9.89	10.36	10.10	9.91	10.44	8.73

*

*

VELOCITY (m/s)

*

18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	2.48	2.44	2.35	2.27	2.37	2.48	2.82	0.00
16	0.00	1.93	1.77	1.68	1.72	1.83	1.85	2.01	0.00
15	0.00	1.48	1.31	1.31	1.30	1.44	1.50	1.32	0.00
14	0.00	1.15	1.02	0.98	0.96	0.93	1.02	1.02	0.00
13	0.00	0.68	0.62	0.59	0.61	0.55	0.51	0.50	0.00
12	0.00	0.44	0.44	0.43	0.38	0.25	0.21	0.27	0.00
11	0.00	0.21	0.25	0.17	0.06	-0.20	-0.20	0.21	0.00
10	0.00	-0.20	-0.16	-0.20	-0.32	-0.34	-0.35	-0.15	0.00
9	0.00	-0.36	-0.33	-0.37	-0.36	-0.42	-0.43	-0.29	0.00
8	0.00	-0.50	-0.43	-0.43	-0.47	-0.48	-0.52	-0.45	0.00
7	0.00	-0.59	-0.55	-0.54	-0.54	-0.59	-0.63	-0.54	0.00
6	0.00	-0.69	-0.59	-0.59	-0.62	-0.65	-0.70	-0.63	0.00
5	0.00	-0.68	-0.61	-0.62	-0.60	-0.66	-0.71	-0.77	0.00
4	0.00	-0.73	-0.65	-0.61	-0.62	-0.68	-0.75	-0.88	0.00
3	0.00	-0.76	-0.69	-0.65	-0.63	-0.70	-0.76	-0.96	0.00
2	0.00	-0.86	-0.72	-0.66	-0.67	-0.69	-0.77	-0.96	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

*

*

ΔX = 0.106 m
ΔZ = 0.114 m
Z_n = 1.063 m

Outflow rate = 0.507 kg/s
Inflow rate = 0.486 kg/s

Table B-55

Test 167; 6/6 door, 62.9 kW, location FR

TEMPERATURE (^{o}C)

21									
20		127.44							
19		129.65							
18		129.12							
17	8.99	128.94	130.13	126.91	127.35	128.53	126.41	126.59	127.83
16		129.00	127.09	121.73	118.18	119.16	117.28	120.00	123.89
15		129.27	120.77	117.29	113.46	115.08	108.53	111.99	119.24
14	6.78	129.79	74.97	111.88	104.94	105.51	99.54	104.67	108.53
13		129.41	54.25	85.47	83.20	80.96	72.18	71.78	69.32
12		115.14	28.19	38.03	47.55	47.39	43.63	38.61	33.60
11		51.55	20.05	18.91	24.77	25.92	19.53	13.66	21.99
10	6.53	35.39	15.33	11.72	13.83	11.89	10.15	9.07	14.79
9		29.96	11.34	9.99	9.62	9.38	8.82	9.15	12.48
8		26.63	10.80	9.21	8.68	8.48	8.04	8.58	10.48
7		24.08	12.04	10.48	10.06	9.69	9.40	8.35	8.56
6	6.05	22.28	11.83	10.47	10.02	9.85	8.97	7.73	8.63
5		20.51	13.59	9.21	8.58	8.13	8.21	7.61	7.97
4		19.20	12.56	9.85	8.95	8.46	7.79	7.18	6.98
3		18.36	9.53	11.32	10.82	10.81	10.71	10.55	10.41
2	7.59	19.90	10.67	11.86	11.47	11.54	11.44	11.43	10.53

VELOCITY (m/s)

18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	2.58	2.43	2.43	2.42	2.41	2.48	2.63	0.00
16	0.00	1.98	1.77	1.69	1.66	1.67	1.74	1.93	0.00
15	0.00	1.58	1.44	1.41	1.40	1.37	1.44	1.55	0.00
14	0.00	1.05	1.11	1.17	1.15	1.11	1.14	1.37	0.00
13	0.00	0.83	0.90	0.88	0.82	0.77	0.78	0.93	0.00
12	0.00	0.32	0.44	0.51	0.46	0.44	0.43	0.45	0.00
11	0.00	-0.16	-0.04	0.18	0.21	-0.01	-0.17	0.18	0.00
10	0.00	-0.35	-0.34	-0.26	-0.31	-0.34	-0.44	-0.16	0.00
9	0.00	-0.47	-0.40	-0.38	-0.41	-0.46	-0.50	-0.43	0.00
8	0.00	-0.55	-0.50	-0.49	-0.50	-0.52	-0.60	-0.54	0.00
7	0.00	-0.68	-0.59	-0.57	-0.59	-0.62	-0.68	-0.66	0.00
6	0.00	-0.74	-0.65	-0.63	-0.64	-0.66	-0.76	-0.69	0.00
5	0.00	-0.74	-0.69	-0.65	-0.65	-0.68	-0.76	-0.83	0.00
4	0.00	-0.78	-0.71	-0.65	-0.66	-0.70	-0.81	-0.97	0.00
3	0.00	-0.80	-0.75	-0.68	-0.69	-0.73	-0.82	-1.05	0.00
2	0.00	-0.94	-0.77	-0.71	-0.71	-0.75	-0.86	-1.07	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

ΔX = 0.106 m
ΔZ = 0.114 m
Z_n = 1.076 m
Outflow rate = 0.549 kg/s
Inflow rate = 0.532 kg/s

Table B-56

Test 161; 6/6 door, 62.9 kW, location GR

TEMPERATURE (°C)

21									
20		116.41							
19		117.33							
18		116.96							
17	7.97	116.98	117.55	114.19	113.54	116.86	116.56	115.54	114.07
16		117.10	114.14	111.40	109.83	108.16	109.53	111.39	108.17
15		117.29	111.20	109.28	102.97	105.60	105.64	111.34	88.66
14	6.47	117.07	70.41	106.11	99.72	95.79	97.96	107.18	73.27
13		115.33	72.76	86.32	82.24	83.73	79.85	85.80	67.83
12		104.35	35.27	46.25	64.56	63.46	51.97	42.19	34.32
11		70.01	25.71	34.39	39.20	37.39	23.94	14.74	24.77
10	6.31	44.73	17.36	16.36	18.77	19.59	14.45	11.38	16.52
9		35.81	10.78	10.97	10.91	11.77	11.55	11.12	14.68
8		31.20	11.17	10.13	10.69	11.48	11.56	10.82	13.02
7		28.23	17.36	18.12	17.22	18.84	16.98	10.70	9.63
6	5.90	26.72	17.92	17.10	18.57	19.25	17.46	10.11	8.98
5		25.42	10.51	9.06	9.68	11.88	12.38	9.92	9.91
4		24.83	9.24	8.13	8.86	9.77	9.57	7.61	7.37
3		23.96	8.15	8.71	7.88	8.61	9.11	8.68	9.95
2	7.07	25.27	9.64	8.92	8.48	8.83	9.06	9.50	8.73

VELOCITY (m/s)

18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	2.61	2.50	2.48	2.47	2.52	2.56	2.68	0.00
16	0.00	2.03	1.90	1.80	1.75	1.78	1.87	2.00	0.00
15	0.00	1.72	1.53	1.46	1.46	1.46	1.56	1.40	0.00
14	0.00	1.12	1.22	1.20	1.16	1.18	1.25	0.91	0.00
13	0.00	1.18	1.02	0.96	0.93	0.89	0.95	0.98	0.00
12	0.00	0.49	0.63	0.69	0.63	0.51	0.44	0.43	0.00
11	0.00	0.15	0.32	0.33	0.24	-0.14	-0.28	0.13	0.00
10	0.00	-0.36	-0.34	-0.30	-0.32	-0.38	-0.48	-0.24	0.00
9	0.00	-0.50	-0.48	-0.48	-0.48	-0.50	-0.58	-0.44	0.00
8	0.00	-0.60	-0.56	-0.54	-0.53	-0.55	-0.67	-0.60	0.00
7	0.00	-0.75	-0.67	-0.63	-0.63	-0.65	-0.78	-0.78	0.00
6	0.00	-0.85	-0.69	-0.66	-0.62	-0.65	-0.84	-0.85	0.00
5	0.00	-0.89	-0.73	-0.64	-0.62	-0.67	-0.84	-1.02	0.00
4	0.00	-0.95	-0.66	-0.46	-0.42	-0.48	-0.81	-1.08	0.00
3	0.00	-1.02	-0.75	-0.57	-0.54	-0.52	-0.83	-1.19	0.00
2	0.00	-1.09	-0.80	-0.75	-0.71	-0.67	-0.87	-1.21	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

ΔX = 0.106 m
ΔZ = 1.062 m
Z_n = 1.062 m
Outflow rate = 0.601 kg/s
Inflow rate = 0.550 kg/s

Table B-57

Test 166, 6/6 door, 62.9 kW, location HR

TEMPERATURE (°C)

21									
20		144.96							
19		151.19							
18		151.65							
17	9.07	151.52	136.82	142.13	146.15	147.23	145.11	144.41	146.95
16		150.87	133.85	137.89	137.99	137.02	137.80	140.47	127.30
15		149.42	125.32	129.50	128.42	122.60	115.36	117.73	109.94
14	7.19	148.08	86.21	113.43	99.36	91.36	85.70	86.85	92.85
13		115.72	43.31	61.09	55.14	47.49	48.62	46.78	45.24
12		46.36	27.15	30.91	29.30	28.30	26.45	23.23	23.70
11		29.03	19.77	20.78	17.53	17.31	13.00	13.09	18.79
10	7.01	23.69	13.89	13.58	13.20	11.29	10.60	10.57	14.52
9		20.62	10.50	10.32	9.70	9.53	9.39	9.70	12.66
8		19.14	10.25	9.39	9.55	8.86	9.08	9.29	10.90
7		18.19	10.70	11.08	10.29	10.84	9.92	8.91	9.54
6	6.51	17.52	11.31	11.32	11.31	10.61	10.15	9.10	9.41
5		16.82	10.27	9.25	8.74	8.79	8.20	8.17	8.47
4		16.41	11.32	9.38	9.22	8.79	8.65	8.05	7.59
3		15.79	9.65	11.23	11.42	11.92	11.18	11.24	10.60
2	7.92	16.66	10.44	11.59	12.89	12.94	12.65	12.69	11.27

VELOCITY (m/s)

18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	2.39	2.25	2.26	2.15	2.19	2.25	2.34	0.00
16	0.00	2.00	1.80	1.69	1.64	1.67	1.73	1.68	0.00
15	0.00	1.62	1.47	1.47	1.40	1.35	1.33	1.44	0.00
14	0.00	1.15	1.11	0.98	0.96	0.99	1.04	1.22	0.00
13	0.00	0.66	0.64	0.58	0.54	0.57	0.55	0.59	0.00
12	0.00	0.34	0.34	0.29	0.25	0.25	0.16	0.25	0.00
11	0.00	0.06	0.16	-0.09	-0.06	-0.21	-0.21	0.09	0.00
10	0.00	-0.28	-0.21	-0.22	-0.27	-0.33	-0.36	-0.10	0.00
9	0.00	-0.43	-0.34	-0.38	-0.36	-0.42	-0.46	-0.27	0.00
8	0.00	-0.53	-0.44	-0.41	-0.43	-0.47	-0.50	-0.43	0.00
7	0.00	-0.67	-0.54	-0.54	-0.51	-0.56	-0.62	-0.47	0.00
6	0.00	-0.72	-0.59	-0.56	-0.55	-0.61	-0.67	-0.55	0.00
5	0.00	-0.76	-0.62	-0.61	-0.58	-0.64	-0.70	-0.71	0.00
4	0.00	-0.78	-0.65	-0.61	-0.60	-0.64	-0.72	-0.85	0.00
3	0.00	-0.82	-0.69	-0.65	-0.64	-0.69	-0.75	-0.93	0.00
2	0.00	-0.90	-0.74	-0.67	-0.65	-0.67	-0.76	-0.96	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

ΔX = 0.106 m
ΔZ = 0.114 m
Zn = 1.092 m
Outflow rate = 0.485 kg/s
Inflow rate = 0.482 kg/s

APPENDIX C. RADIATION ERROR ASSOCIATED WITH OPENING GAS TEMPERATURE MEASUREMENTS

Since most of the air flowing into the room must be at ambient temperature (T_∞), differences between the temperatures of thermocouples in the inflow (T_{ti}) and T_∞ establish the radiation error for these thermocouples and also provide a means for estimating the error associated with the hot-gas temperatures measured by the thermocouples in the outflow region of the opening. Although each opening thermocouple was partially shielded from the fire and hot room by the velocity probe to which it was attached, the shielding probably varied slightly from probe to probe. In the following analysis, error bounds on the outflow thermocouple measurements will be estimated from the known error associated with the inflow thermocouples by assuming that the outflow thermocouples (a) were shielded from the fire and heated room to the same extent as the inflow thermocouples, and (b) were completely shielded from the fire and heated room.

The radiation incident upon the inflow-region thermocouples (q") is given by the expression

$$q'' = (h_i/\alpha)(T_{ti} - T_\infty) + (\varepsilon\sigma/\alpha)T_{ti}^4 \qquad \text{(C-1)}$$

where ε is the emissivity of the thermocouple bead, α is the absorbtivity, and h_i is the forced convection heat transfer coefficient for a sphere given by the expression[C1*]

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* Superscripts in text refer to references at the end of this appendix.

$$h = (k/d)(2 + 0.37\ Re^{0.6}\ Pr^{0.33}) \qquad \text{(C-2)}$$

where $Re = \rho v d/u$

$Pr = uc/k$

v is the gas velocity

ρ is the gas density

k is the gas thermal conductivity

c is the gas specific heat

u is the gas viscosity, and

d is the diameter of the thermocouple bead.

If it is assumed that the radiation incident upon the <u>outflow</u> thermocouples from the flame, gas, and surfaces within the heated room is equal to q'', then the energy balance for any of these thermocouples is

$$q'' + 0.5\ \alpha\sigma\varepsilon_o T_u^4 + h_o(T - T_{to}) = \varepsilon\sigma T_{to}^4 \qquad \text{(C-3)}$$

where the second term on the left accounts for radiation from the hot gas plume outside the opening,

T is the actual outflow gas temperature,

T_{to} is the temperature of the thermocouple in the outflow,

$\varepsilon_o = \varepsilon_{CO_2} + \varepsilon_{H_2O}$, the emmissivity of the opening plume,

$\varepsilon_{CO_2} = 0.7\ (X_{CO_2}\ell)^{0.5}/(T_u/100)^{0.5}$, the emmissivity of the carbon dioxide component[C2],

$\varepsilon_{H_2O} = 7.0\ (X_{H_2O}\ell)^{0.8}/(Tu/100)$, the emissivity of the water component[C2],

X is the mole fraction of the species,

ℓ is the mean beam length of the opening plume,

T_u is the average temperature of the upper gas layer, and

h_o is given by Eq. C-2 evaluated at T_{to}.

On the other hand, the outflow thermocouples might have been better shielded from the hot environment than their inflow counterparts. In the limit of complete shielding, radiant heat transfer from the junction is maximized and the energy balance becomes

$$h_o\ (T - T_{to}) + \alpha\sigma T_\infty^4 = \varepsilon\sigma T_{to}^4 \qquad \text{(C-4)}$$

Solving Eqs. C-3 and C-4 for the difference between the actual and measured gas temperatures $(T - T_{to})$ produces error bounds for the upper-region thermocouple results,

$$(\varepsilon\sigma T_{to}^4 - \alpha q'' - 0.5\ \alpha\sigma\varepsilon_o T_u^4)/h_o < (T - T_{to}) < (\sigma/h_o)(\varepsilon T_{to}^4 - \alpha T_\infty^4) \qquad \text{(C-5)}$$

The corrections listed in Table B-2 (Appendix B) are the maximum values calculated with Eq. C-5 using a wide range of experimental results for T_t, T_∞, T_u, and v, X values based on the complete combustion of pure methane, $\ell = 1$ m, $\alpha = \varepsilon = 0.5$, and $\alpha = \varepsilon = 1.0$.

References

C1. Eckert, E.R.G. and Drake, R.M., Heat and Mass Transfer, New York, McGraw Hill, 1959.

C2. Schack, A., Arch. Eisen Huttenwesen, 241 (1939).

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11. ABSTRACT *(A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here)*

Fifty-five full-scale steady-state experiments were conducted to study the flow induced by a simulated pool fire in a compartment under conditions characteristic of the developing fire. The mass flow rate through the door or window opening and bounds on the fire plume entrainment rate are presented as a function of opening geometry, fire strength, and fire location.

The characteristics of the measured opening flow rates are explained by a simple hydrostatic model based on temperature distribution. A good correlation between the measured results and the idealized flows, taking into account the complete temperature distribution, is demonstrated.

Entrainment results for fires near walls are in reasonable agreement with results from free-standing plume models. Except for the smallest openings, fires in other locations entrain at a rate two to three times the rate predicted by these models. This phenomenon is attributed to room disturbances caused by the opening flow and is similar to the behavior of a fire plume in a cross wind.

12. KEY WORDS *(Six to twelve entries; alphabetical order; capitalize only proper names; and separate key words by semicolons)*

air flows; compartment fires; entrainment; flow rates; fire plumes; opening flows

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