

Table of Contents

Abstract.....	ii
Dedication.....	iv
Acknowledgements.....	v
List of Figures.....	ix
Nomenclature.....	xiii
Chapter 1: INTRODUCTION.....	1
1-1 The Fire.....	1
1-2 Causes of Fire.....	3
1-3 The Nature of Fire.....	4
1-4 Fire life Cycle.....	7
1-5 Heat Gain - Heat Load.....	8
1-6 Fire Behavior.....	9
1-7 Importance of Studying the Effects of Fire.....	13
Chapter 2: LITERATURE REVIEW.....	16
2-1 Introduction.....	16
2-2 Weakness of the Current Design Approach.....	17
2-3 Dimensionless Groups for Compartment fire.....	30
2-4 Heat Transfer Through the Compartment.....	31
2-5 General Flow Pattern.....	34
2-6 Convection.....	35
Chapter 3: EXPERIMENTAL WORK.....	38
3-1 Introduction.....	38
3-2 Description of the Experimental Model.....	38
3-3 Burner Design.....	40
3-4 Thermocouple Description.....	41

3-5	Fuel Flow Measurements.....	41
3-6	Data Acquisition System and Output Temperature Recording....	42
3-7	Experimental Program.....	42
Chapter 4: RESULTS AND DISCUSSION		49
4-1	Results of Conduction Heat Load in Case of Center Fire.....	50
4-2	Results of Conduction Heat Load in Case of Corner Fire.....	57
4-3	Results of Conduction Heat Load in Case of Side Wall Fire.....	61
4-4	Comparison of Total Conduction Heat Load on The Compartment For The Three Different Burner Locations.....	65
4-5	Results of temperature variation inside the compartment at ($r/H = 0.29$) in case of center fire.....	66
4-6	Results of temperature variation inside the compartment at ($r/H = 0.29$) in case of corner fire.....	67
4-7	Results of temperature variation inside the compartment at ($r/H = 0.29$) in case of side wall fire.....	68
4-8	Results of Convection Heat Load Inside The Compartment at Different Fire Source Locations.....	70
4-9	Comparison of Convection Heat Load Inside The Compartment For Different Fire Source Locations.....	72
4.10	Discussion of Results.....	73
Chapter 5: CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE STUDY.....		84
5-1	Conclusions.....	84
5-2	Recommendations for Future Work.....	85
References.....		86