

UNIVERSITI TEKNOLOGI MARA

**EXPOSURE TO CARBON BLACK AND LUNG
FUNCTION PERFORMANCE AMONG WORKERS
AT TYRE MANUFACTURING**

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**Thesis submitted in fulfillment of the requirements
for the degree of
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Declaration by Student

Project entitled "Exposure to Carbon Black and Lung Function Performance among Workers at Tyre Manufacturing" is a presentation of my original research work. Wherever contribution of others are involved, every effort is made to indicate this clearly, with due reference to the literature, and acknowledgement of collaborative research and discussions. The project was done under the guidance of En. Abd. Rahim Bin Dal as Project Supervisor and Tn. Hj Pozi Bin Mohd Tahir as Co-Supervisor. It has been submitted to the Faculty of Health Sciences in partial fulfillment of the requirement for the Degree of Bachelor in Environmental Health and Safety (Hons).

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TABLE OF CONTENTS

TITLE PAGE		
ACKNOWLEDGEMENT	ii	
TABLE OF CONTENTS	iii	
LIST OF TABLES	vii	
LIST OF FIGURE	x	
LIST OF APPENDICES	xi	
LIST OF ABBREVIATION	xii	
ABSTRACT	xiii	
CHAPTER 1: INTRODUCTION		
1.1	Background Information	1-2
1.2	problem statement	3-4
1.3	Study justification	5
1.4	Study Objectives	6
	1.4.1 General objective	
	1.4.2 Specific objective	6
1.5	Study Hypothesis	6
1.6	Conceptual Framework	7
1.7	Conceptual and Operational Definitions	9-10
	1.7.1 Conceptual Definitions	8-9
	1.7.2 Operational definitions	9-10
CHAPTER 2: LITERATURE REVIEW		
2.1	Introduction	11-12
2.2	Legal Requirements	12-13
2.3	Exposure of Carbon Black	14-17
2.4	Lung Function Performances	17-23
2.5	Body Mass Index (BMI)	23-25
2.6	Respiratory Symptoms	26-27

Abstract

A Study of Exposure to Carbon Black and Lung Function Performance among Workers at Tyre Manufacturing

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Introduction: Carbon black is raw chemical that combined with natural and synthetic rubber. Objective of this study are identify the carbon black concentration, measure the lung function performance, identify respiratory symptoms and correlate the carbon black concentration and lung function performance for both exposed and non-exposed group.

Methodology: The study was conducted in a tyre manufacturing located at Alor Setar. In the study location, respondents for exposed group (n=30) are come from mixing line and for non-exposed group (n=30) from administration department. Comparative cross-sectional study was conducted by using GILLIAN® air sampling pump, Spirometer-Vitolograph® 2120, questionnaire and SPSS version 17.0 to analyze the data.

Results: The study found that mean carbon black concentration for exposed group is 0.781mg/m³ and non exposed group is 0.440mg/m³. Result of lung function performance shown that non-exposed group has higher percentage than exposed group with significant level at p<0.01. Identified respiratory symptoms shown highest percentage occurs at exposed group compared to non-exposed group with significant level at p<0.05 for eye irritation, nose irritation and coughing and p<0.01 for sore throat and mucous dryness. Then, carbon black concentration of exposed group is higher than non-expose group and has lower lung function performance. Result shown that there is correlation between exposure to carbon black and lung function performance at significant level (p<0.05) for all variables.

Conclusion: In conclusion, concentration of carbon black for both groups does not exceed the standard limit. The concentration of the carbon black of exposed group is higher than non-exposed group. Lung function performance for non-exposed group is higher for all variables compared to exposed group. The respiratory symptoms for exposed group mostly present compared to the non-exposed group. There is significant association between lung function performance and carbon black dust concentration. Methods to reduce the carbon black concentration are recommended together with medical surveillance

Keywords: *Carbon black, lung function performance, respiratory symptoms*