

**UNIVERSITI TEKNOLOGI MARA**

**OCCUPATIONAL PARTICULATE MATTER (PM<sub>2.5</sub>)  
EXPOSURE AND ITS RELATION WITH LUNG  
FUNCTION PERFORMANCE AMONG WORKERS IN  
AUTOMOTIVE COMPONENT MANUFACTURING  
INDUSTRY**

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**JULY 2012**

### Declaration by student

Project entitled "Occupational Particulate Matter (PM<sub>2.5</sub>) Exposure and Its Relation with Lung Function Performance among Workers in Automotive Component Manufacturing Industry" is a presentation of my original research work. Wherever contribution of others are involved, every effort is made to indicate clearly, with due reference to the literature, and acknowledgement of collaborative research and discussions. The project was done under the guidance of Mr. Nasaruddin bin Abd Rahman as Supervisor and Mr. Mohd Izwan bin Masngut as Co-supervisor. It has been submitted to Faculty of Health Sciences in partial fulfilment of the requirement for Degree of Bachelor in Environmental Health and Safety (Hons).

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Date: 25 / 07 / 2012  
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## ACKNOWLEDGEMENT

### **Bismillahirrahmanirrahim.**

Alhamdulillah. Thanks to Allah SWT, whom with His willing giving me the opportunity to complete this Final Year Project which entitle Occupational Particulate Matter (Pm<sub>2.5</sub>) Exposure and Its Relation with Lung Function Performance among Workers in Automotive Component Manufacturing Industry. This final year project report was prepared for Faculty of Health Sciences, Universiti Teknologi MARA (UiTM) Puncak Alam, basically for student in final year to complete the undergraduate program that leads to the degree of Bachelor of Environmental Health and Safety (Honours).

Firstly, I would like to express my deepest thanks to, Mr. Nasaruddin bin Abd Rahman, a lecturer of Department of Environmental Health and Safety and also assign, as my supervisor and Mr. Mohd Izwan bin Masngut as a co- supervisor who had guided be a lot of task. I also want to thanks the lecturers and staffs of Envrionmental Health and Safety for their cooperation during I complete the final year project that had given valuable information, suggestions and guidance in the compilation and preparation this final year project report.

Deepest thanks and appreciation to factory where I had done my project, my parents, family, friends, and others for their cooperation, encouragement, constructive suggestion and full of support for the report completion, from the beginning till the end. Also thanks to all of my classmate and everyone, that has been contributed by supporting my work and helps myself during the final year project progress till it is fully completed.

## TABLE OF CONTENT

<b>TITLE PAGE</b>	
<b>ACKNOWLEDGEMENT</b>	ii
<b>TABLES OF CONTENTS</b>	iii
<b>LIST OF TABLES</b>	vi
<b>LIST OF FIGURES</b>	vii
<b>LIST OF APPENDICES</b>	viii
<b>LIST OF ABBREVIATION</b>	ix
<b>ABSTRACT</b>	x
<b>CHAPTER ONE : INTRODUCTION</b>	
1.1 Background Information	1
1.2 Problem statement	3
1.3 Study justification	4
1.4 Study objectives	5
1.4.1 General objective	
1.4.2 Specific objectives	
1.5 Study hypothesis	5
1.6 Conceptual framework	6
1.7 Conceptual and operational definitions	
1.7.1 conceptual definition	7
1.7.2 operational definition	9
<b>CHAPTER TWO : LITERATURE REVIEW</b>	
2.1 Introduction to Respiratory System	10
2.2 Mechanism of Particulate Matter Impacts To Human Lungs	11
2.3 Toxicological Effects Of Particulate Matter On Animal Studies	14
2.4 Legal Requirements Related to the Dust Exposure Monitoring	15
2.5 Related study on (PM <sub>2.5</sub> exposure among workers in industries	17
2.6 Health effects and respiratory symptoms	18



## Abstract

### Occupational Particulate Matter (PM<sub>2.5</sub>) Exposure and Its Relation with Lung Function Performance among Workers in Automotive Component Manufacturing Industry

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**Background:** Workers are operating machine in the automotive component manufacturing industry could produces respirable particulate from the process of buffing, welding, damper assembly and band saw.

**Objective:** To determine the occupational PM<sub>2.5</sub> concentration exposure and its relation with lung function performance among workers in automotive component manufacturing industry.

**Methodology:** A cross- sectional study was carried out among sixty workers. The personal exposure of PM<sub>2.5</sub> was measured for both groups by using personal air sampling pump during working hours within 8-9 hours. The lung function performances were assessed to measure the Forced Vital Capacity (FVC), Forced Expiratory Volume in 1 second (FEV<sub>1</sub>) and FEV<sub>1</sub> / FVC ratio. The respiratory symptom was determined by using modified questionnaire based on American Thoracic Society.

**Results:** The mean of PM<sub>2.5</sub> concentration exposure to exposed group is (1.403 mg/ m<sup>3</sup>) which were higher compared to unexposed group of workers (0.668 mg/ m<sup>3</sup>). PM<sub>2.5</sub> exposure between exposed and unexposed group of workers shows a significant difference at (p< 0.001). Exposed group of workers had significantly lower percentage of predicted values of FVC, FEV<sub>1</sub> and FEV<sub>1</sub>/ FVC than unexposed group of workers. However, only variable FEV<sub>1</sub>/ FVC was significantly difference between these two groups (p=0.02). There is no correlation between (PM<sub>2.5</sub>) concentration exposure and lung function performance among workers in automotive components manufacturing industry. Only breathlessness has significant difference between exposed and unexposed group of workers at (p=0.01).

**Conclusion:** Findings showed that occupational PM<sub>2.5</sub> exposure was not related with the lung function performance among workers in automotive component manufacturing industry.

**Keywords:** *Particulate matter, lung function performance, symptom of respiratory problem.*