

HIGHER TECHNICAL INSTITUTE
MECHANICAL ENGINEERING DEPARTMENT
DIPLOMA PROJECT
IMPLEMENTATION OF QUALITY CONTROL
PROCEDURES IN A SHOE INDUSTRY

By

DEMOSTHENOUS THEODOROS (M/745)
JUNE 1996

**IMPLEMENTATION OF QUALITY CONTROL PROCEDURES
IN A SHOE INDUSTRY**

by

Theodoros Demosthenous

Project Report

submitted to

the Department of Mechanical Engineering

of the Higher Technical Institute

Nicosia, Cyprus

in partial fulfilment of the requirements

for diploma of

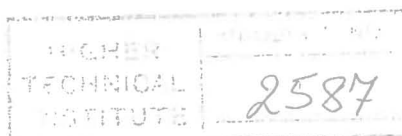
TECHNICIAN ENGINEER

IN

MECHANICAL ENGINEERING

M/745

June 1996



CONTENTS

Acknowledgements

Summary

Page

Chapter 1

1.	Basic Definitions and first principles on Quality Control	1
1.1	Historical Review	1
1.2	The meanings of quality	2
1.3	The meanings of control	3
1.4	Definition of quality control	4
1.5	What is a process	4
1.6	Process design	5
1.7	What is statistical process control	5
1.8	Why is quality important	6
1.9	Areas responsible for quality	7
1.10	Quality tools	8

Chapter 2

2.	Familiarization with “Bebe-Chic” shoe factory	11
2.1	General about the factory	11
2.2	The main parts of a shoe	12
2.3	The design and manufacturing procedure of a a shoe	12
2.3.1	Station A. Upper part design and manufacturing procedure	12
2.3.2	Station B. Insole design and manufacturing procedure	15
2.3.3	Station C. Sole design and manufacturing procedure	16
2.4	Making department	17
2.5	Finishing procedure	19
	PHOTOS	21-30

Chapter 3

3.	The existing status and quality policy of the factory	31
3.1	Purpose of the quality policy manual	31
3.2	Contents of the quality policy manual	32
3.3	Existing status in the factory	32
3.3.1	Investigation on the existing quality control procedures in “Bebe-Chic” shoe factory	32
3.3.2	Diagnostic stage	32
3.4	General characteristics and comments on the factory quality control policy	33
3.4.1	Organisational - structure, company culture	33
3.4.2	Departmental purpose	33
3.4.3	Suppliers, inputs	34
3.4.4	Quality associated activities	34
3.4.5	Design stage, optimization	35
3.4.6	Manufacturing stage, inspection	35
3.4.7	Customers	35

Chapter 4

4.	Suggestions for improving and implementing quality control procedures in the factory	36
4.1	Organisational-structure, company culture	36
4.2	Departmental purpose	38
4.3	Suppliers, inputs	38
4.4	Quality associated activities	39
4.5	Design stage, optimization	39
4.6	Manufacturing stage, inspection	39
4.7	Customers	40
4.8	Cause and effect diagram	41

Chapter 5

5.	Implementation of SPC techniques in the factory	43
5.1	The role of inspection	43
5.2	Forms of inspection	44
5.3	The three distinct types of inspection	44
5.3.1	Incoming inspection	44
5.3.2	Process inspection	45
5.3.3	Final inspection	45
5.4	Defects and defectives	46
5.5	Concept of variation	46
5.6	Quality control chart	47
5.7	Types of control charts	47
5.7.1	Types of control charts for variable data	48
5.7.2	Types of control charts for attribute data	49
5.7.3	Multiple characteristics chart	50
5.8	Control chart selection	51
5.9	Procedure how to construct a U chart	51
5.10	Procedure how to construct a p chart	53
5.11	Process capability	55
5.11.1	Control chart method: attributes data	55
5.12	Implementation of S.P.C. charts and techniques during manufacturing procedure	56
5.12.1	Chart reference 1	56
5.12.2	Chart reference 2	60
5.12.3	Chart reference 3	63
5.12.4	Chart reference 4	65

Chapter 6

6.	Costing related to quality	69
6.1	Economics of quality	69
6.2	Quality level and its cost	69
6.3	Costing calculations of the proposed quality improvement procedures and techniques	71
6.3.1	Labour costs	71

	Page
6.3.2 Material costs	72
6.4 Comments on the cost estimation	72

Chapter 7

7. Conclusions	73
7.1 Personal benefits	73
7.2 Companys' benefits	73

APPENDIX A

APPENDIX B

APPENDIX C

REFERENCES

ACKNOWLEDGEMENTS

It is my pleasure to express my appreciation to Mr Damianos Roushas, lecturer in the Mechanical Engineering Department in H.T.I. for his valuable contribution and guidance during the preparation of this project.

I wish also to thank Mr Ioannis Angeli, laboratory Assistant who supplied me with very useful information relevant to the subject of the project.

Finally my thanks to the Management of “Bebe-Chic” shoe factory who helped me during my study in the factory.

Demosthenous Theodoros

3rd year student in

Mechanical Engineering

H.T.I.

IMPLEMENTATION OF QUALITY CONTROL PROCEDURES IN A SHOE INDUSTRY

by: THEODOROS DEMOSTHENOUS

SUMMARY

The object of the current project was to Implement Quality control procedures in a shoe industry. The industry was decided to be "Bebe-Chic" childrens' shoe factory.

The main goal of the project is to prove to the management of the factory that using Quality Control (Q.C.) techniques results to better quality output products, therefore, to be encouraged to introduce them in a continuously basis to the factory.

The whole content of the project is divided into seven chapters which contain:

Chapter one: Basic definitions and first principles of Quality Control are included in this chapter.

Introduction to quality

Chapter two: A familiarization with the factory and the manufacturing process is carried out.

Managing quality and improvements

Chapter three: Includes an investigation on the Q.C. procedures and working methods used in the factory.

All about the ECCO shoe factory in Cyprus

Chapter four: Suggestions for improving the Q.C. policy of the factory.

Implementation of S.P.C techniques in the factory

Chapter five: An implementation of S.P.C. techniques is carried out at different stages of the manufacturing process.

Cost estimation of the suggested

Chapter six: Cost estimation of the suggested Q.C. improvement techniques.

Q-C improvements

Chapter seven: Final conclusions of the whole project.

Conclusions

Finally charts and tables are included in the appendices.