

CONTENTS

		<u>Page No.</u>
<i>Approval</i>		(i)
<i>Form 'A'</i>		(ii)
<i>Supervisor's Certificate</i>		(iii)
<i>List of Figures</i>		(vi)
<i>List of Tables</i>		(xi)
<i>Acknowledgement</i>		(xv)
<i>Nomenclature / Notations</i>		(xvi)
<i>Synopsis of the Thesis</i>		(xix)
Chapter 1	INTRODUCTION	1 - 4
	1.1 Flow Forming Process, 1	
	1.2 Reasons for Choosing the Present Work, 2	
	1.3 Scope of the Present Work, 3	
Chapter 2	FUNDAMENTALS OF FLOW FORMING	5 - 53
	2.1 History of Evolution, 5	
	2.2 Physical Concepts & Description of the Process, 7	
	2.3 Process Characteristics, 15	
	2.4 Process Parameters, 28	
	2.5 Advantages of Flow Forming, 29	
	2.6 Limitations of Flow Forming, 31	
	2.7 Applications of Flow Forming, 31	
	2.8 Flow Forming Machines, 32	
	2.9 Mechanics of Flow Forming of Cones, 38	
	2.10 Review of Theoretical Analysis & Mechanics of Flow Forming, 42	
	2.11 Localised Deformation : Main Asset of Flow Forming Process, 52	
Chapter 3	FLOW FORMABILITY OF MATERIALS	54 - 128
	3.1 Overview of Formability, 54	
	3.2 Flow Formability, 61	
	3.3 Experimental Assessment of Factors Affecting Flow Formability of Sheetmetals, 64	
	3.4 Experimental Evaluation of Flow Formability of Sheetmetals, 84	
	3.5 Correlating the Mechanical Properties of Work Materials, 124	
	3.6 Concluding Remarks, 127	

Chapter 4	ASSESSMENT OF OBTAINABLE DIMENSIONAL ACCURACY & SURFACE FINISH IN FLOW FORMING OF SHEETMETAL CONES	129 - 201
4.1	Characteristic Features of Accuracy & Finish of Flow Formed Cones, 130	
4.2	Details of Experiment, 137	
4.3	Design of Experiment, 144	
4.4	Analysis of Experiment, 150	
4.5	Evaluation of Factorial (Parametric) Effects & Exploration of Response (yield) surface, 166	
Chapter 5	PARAMETRIC OPTIMISATION IN FLOW FORMING OF SHEETMETAL CONES	202 - 242
5.1	Introduction to Optimisation, 202	
5.2	Optimisation of Flow Forming Parameters, 206	
5.3	Unconstrained Optimisation for Dimensional Accuracy & Surface Finish of Flow Formed Cones within Experimental Regime, 211	
5.4	Constrained Optimisation of Process Parameters in Flow Forming of Cones, 226	
5.5	Discussion, 237	
Chapter 6	CONCLUSIONS	243 - 250
6.1	Summary of Major Findings / Experimental Results, 244	
6.2	Important Inferences, 247	
6.3	Scope for future works, 250	
References		251 - 254
Appendix		255 - 262
Paper Published By The Author On The Present Subject		263