## CONTENTS

	INTRODUCTION	4
1.	THE PROCESS OF CONVEYOR BELT DAMAGE	5
1.1	The description of the conveyor belt damage at transfer point	5
2.	MATHEMATICAL MODELLING OF STRESS-STRAIN STATES IN THE CONVEYOR BELT	8
2.1	Mathematical modelling of hyperelastic materials	8
2.1.1	Definition of deformation and stress for the hyperelastic material	9
2.1.2	Determination of hyperelastic materials' characteristics	10
2.2	Mathematical modelling of stress-strain states in conveyor belts	
	in Ansys	13
2.3	Mathematical modelling of stress-strain states in conveyor belts	
	In Abagus	15
3	DECISION-MAKING METHOD OF ANALYSIS FOR THE ASSESSMENT OF THE BELT	
	CONVEYOR	18
3.1	Multicriterial assessment of the construction elements of belt conveyors	18
3.1.1	Analytic Hierarchy Process (AHP)	18
3.1.2	Solution procedure	19
3.1.3	Use of the Saaty method to determine importance of changes	20
3.2	Application of multi-criterion decision methods by the selection of optimal	
	type belt	27
3.2.1	Material and methods	27
3.2.2	Results and discussion	28
4	IMPLEMENTATION OF THE STATISTICAL METHODS FOR CONVEYOR BELTS	32
4.1	Monitored conveyor belts and parameters	32
4.1.1	Material and methods	33
4.1.2	Results and discussion	33
5	IMPLEMENTATION OF THE REGRESSION MODELS FOR CONVEYOR BELTS	39
5.1	Using the classical linear regression model in analysis of the dependences	
	of conveyor belt life	39
5.1.1	Identification of the influential and outlying values	42
5.1.2	Analysis of the random component of the regression model	43
5.2	The mathematical regression model of the dynamic stress of the conveyor belts	46
5.2.1	Methods used within the experimental research	46
5.2.2	Methods for testing conveyor belts rip	47
5.2.3	Results of the experimental research and modeling	48
5.2.4	Evaluation of the experimental research results	50
5.3	Verification of multiple regression model of the functional dependencies	
	of impact force textil conveyor belt	52
5 3.1	Estimate of model's parameters	53
5.3.2	Analysis of random component in the regression model	55
5.3.3	Identification of outlying and influential data	56
5.4	Experimental research and mathematical modelling of damage	
3.4	steel cord conveyor belts	58
5.4.1		59
5.4.2	Material and realization of the experiment	59
5.4.3	Analysis and design of experiment regression model	61
5.4.4	Evaluation of the experiment	63
5.4.5	Identify factors with the most significant effects to the damage conveyor belt	64
5.5.1	Material and methods	64
5.5.3	The methodology of the conveyor belts testing by impact	65
5.5.4	Results and discussion	66
2.2.4	REFERENCES	72