

Contents

Preface.....	5
1 Application FEM on impact loading of the rubber top covering layer of a conveyor belt	7
1.1 The dynamic force impacting the FEM model's covering layer.....	9
1.1.1 <i>Material constant verification</i>	<i>12</i>
1.1.2 <i>Monitoring of the stress-strain conditions in the CB covering layer.....</i>	<i>14</i>
1.1.3 <i>Creation of regression models</i>	<i>17</i>
2 Conveyor belt damage in term of impact loading.....	20
2.1 Testing of the belt impact loading.....	20
3 Evaluation the factors significance of the impact force of rubber composites by impact loading	26
3.1 DOE method application on the impact loading of rubber composites	27
4 Evaluation the factors significance of the tension force of rubber composites by impact loading	36
4.1 DOE method application on the tension load by impact loading of rubber composites	37
4.1.1 <i>Design and evaluation of experiment.....</i>	<i>38</i>
4.1.2 <i>Analysis of the impact to the tension load.....</i>	<i>43</i>
4.1.2.1 <i>Creation of regression models</i>	<i>45</i>
5 Research of impact bars from belt conveyor support system.....	47
6 Evaluation the factors significance of the tensile strength of rubber composites	60
6.1 Testing conveyor belts in tension.....	61
6.2 DOE method application on the tensile strength of rubber composites	66
6.2.1 <i>Designs of experiments for maximum response values.....</i>	<i>68</i>
6.2.2 <i>Designs of experiment for minimum response values</i>	<i>70</i>
7 Belt conveyor simulation.....	74
7.1 Pipe conveyor characteristics	74
7.2 Simulation of material conveyance.....	79

7.3	EXTEND simulation software	82
7.4	Simulation model in EXTEND software.....	84
7.5	Basic calculation for a conventional conveyor and a pipe conveyor.....	88
7.5.1	<i>Capacity calculation for a conventional conveyor</i>	88
7.5.2	<i>Capacity calculation for a pipe conveyor</i>	91
7.5.3	<i>Strength calculation</i>	93
	Summary	104
	Bibliography	105
	Subject Index	113