



Research Paper

## **Stress and Wear of Conveyor Belts by Loading Point Impact**

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Loading point impact is one of the main reasons for belt wear. Impulse forces have been determined under realistic operating conditions. Stresses and deformations in the cross-section of a steelcord belt, with and without breaker plies, have been calculated by Finite-Element and Finite-Difference Methods. The non-linear elasticity of rubber has been taken into account. A clear relationship between distribution of stress and belt type is shown. Semi-stochastic impact is simulated in a test stand. First results indicate a strong coincidence of service-life and belt design and almost no relationship with quality standards of the covers. A technological grade of wear 1 is introduced to establish a rating of test stand results for different belt types.

### **1. Introduction.**

The present article is an extract from the Dissertation by the author. For reasons of space some parts of the Dissertation, dealing with the calculation of time-dependent deformations, the design criteria of a belt wear test stand and the results of a variety of quality tests are not reported here.

Discussed in the following are the main influences of dynamic forces at loading point, the distribution of stresses in the cross-section of different belt types,

calculated by two different numerical methods> Finite-Elements and Finite-Differences, the experimental deduction of a specific abrasivity of different materials, first results obtained from a newly designed conveyor belt wear test stand and the deduction of a technological grade of wear.