Thesis assessment

Author of thesis: Bc. Eren Balaban

Thesis: Theoretical and Experimental Analysis of Flexi-Coil Helical Springs Stress

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The present thesis contains 80 pages, 47 figures and three tables. This paper is divided into 12 chapters. Concerning its editing I have no serious comments. There is a shift about one in the reference numbering. There appears some mistakes in the numbering of figures. I miss an unambiguous assignment of the curves in the graphs to the conditions/variants of simulation.

It is not clear where originates some equations (e.g. equation 7 in paragraph 4.5 and equation 8 in paragraph 4.6). It is recommended to indicate the scope respectively and conditions under which the equations were obtained or are valid to prevent inaccurate results.

This thesis reflects the current state of the technology. Selected method (finite element method) is commonly used for stress analysis of constructions and its components. Stress concentration factor by Wahl used is also mentioned in the standard EN 13906-1. There is given relationship acc. Bergsträsser in this standard is. Perhaps it would be appropriate in this thesis to mention this relationship.

There is a description of an experiment in Chapter 7. More detail identification of the test specimen is missing (i.e. either drawing number or better serial number). The reason is that even manufacturing variations may affect the results, especially when there is a contact between the spring turns.

Chapter 8 is dedicated to the FE analysis spring. In results not shown which kind of stress is given in figures of stress distribution along the spring. I suppose this is Von Mises stress. The author bring some interesting conclusions. It confirms that the results are sensitive to the geometry of the spring. It determines when the end turns come to the contact. Satisfactory accurate modeling of this phenomenon is the key point for these cases.

Based on the above comments I classify the theses as excellent minus.

1st Jun 2015 in Prague

Roman Ježdík