

**March, 2021 Textbooks for university students**

**ERGONOMICS MODIFY  
CONDITIONS OF WORK  
and THE SAFETY AT  
WORK**

**Assoc. Prof. Ing. Jan KRMELA, Ph.D.**

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Jan Krmela

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2021, March

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Videos from 3D printing and specific test of composite are included on the enclosed **DVD**.

This textbook has not been checked and corrected for spelling errors.

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### **Reviewers:**

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This publication can be used as study material for university students.

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**This textbook consists of two different but related parts.**

**The first part „Ergonomics modify conditions of work“ is based on various authors and publications and other sources have been used (see References at pages 12-14). This part was compiled so that the problem of ergonomics was described more comprehensively.**

**The second part „The safety at work ....“ with a larger text range is only the work and results of the author himself. The part presents work safety in relation to interesting problems from practice.**

**I believe that this textbook will help university students and students from Wyższa szkoła zarządzania ochroną pracy w Katowicach, Poland and all interest students from anywhere at World to better understand ergonomics and safety at work.**

## About the Author

Since 2013, assoc. professor Jan Krmela (1978) has been the Head of the Department of numerical methods and computational modeling at the Faculty of Industrial Technologies in Púchov at Alexander Dubček University in Trenčín, Slovakia. He received his Ing. degree with honors in the field of study Transport Means – Road Vehicles at Jan Perner Transport Faculty at the University of Pardubice, Czech Republic and a Ph.D. in Transport Means and Infrastructure at the same institution. He habilitated in Transport Means and Infrastructure (the habilitation work "The computational modeling of automobile tires") at the same university in 2010. He is a member of the Association of Mechanical Engineers (A.S.I.), the Czech Society for Mechanics and the Scientific Council at the Faculty of Industrial Technologies in Púchov. In 2006, he received a special award for science and research activities by the Rector of the University of Jan Evangelista Purkyně in Ústí nad Labem, Czech Republic. In 2016, he was awarded the Bronze Medal of Maximilián Hell for the development of the Faculty of Industrial Technologies in Púchov, science and education. At 2020, he received Award for the development and support of science, research and education, Alexander Dubček University of Trenčín.

He has been gaining experience in the FEM program ANSYS since 2000. He co-operated with the Fraunhofer Institut für Techno- und Wirtschaftsmathematik ITWM, Kaiserslautern, Germany and the Kompetenzzentrum - Das Virtuelle Fahrzeug Forschungsgesellschaft mbH, Graz, Austria (long-term stays by programs Erasmus+, DAAD and others stays). In 2016, he delivered lectures at the Belarusian State Technological University in Minsk, Belarus. He has been a supervisor of dissertation thesis; five Ph.D. students successfully finished under his guidance. He received financed projects GAČR, FRVS, KEGA and Erasmus+. He gives lectures, lessons and organizes seminars on technical subjects. The results of his work have been presented at conferences and in technical papers in CC journals, journals, monographs and chapters of books. Jan Krmela authored over 280 publications in the following research areas:

- Computational modeling and tests of composites with a rubber (an elastomer) matrix such as tire casings, especially with focus on strain-stress states and modal analysis and computational modeling of composites after the degradation processes, tire-road interaction and vehicle parts;
- Tests of tires on static and dynamic test machines with the pressure footprint analyses of contact footprints between tires and a plane road or a bump and also prediction of radial stiffness of tires;
- Specific low cyclic loading tests of composites with textiles on a test machine with a video extensometer and static tests of composites with planning of tests with a design of geometric parameters of test samples and test conditions for testing of tire casing parts;
- Determination of material parameters that can be used as input data into computational models;
- Microscopic observation of interface bonds between steel and textile cords and an elastomer;
- Safety at work in experiments of polymers and composites and ergonomic problems;
- 3D printing FFF of technical objects.

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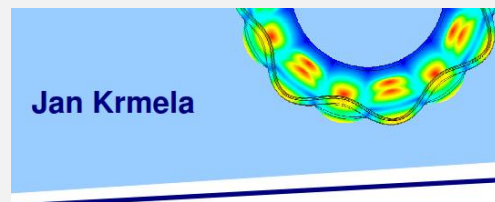
## REFERENCE

**KRMELA, J. Tire Casings and Their Material Characteristics for Computational Modeling. Scientific monograph. Printing House The Managers of Quality and Production Association, Czestochowa, Poland. 2017, ISBN 978-83-63978-62-4. With test videos at DVD. The book is available in Polish libraries.**

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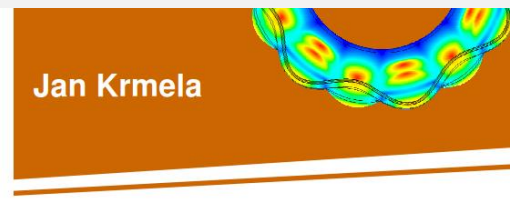
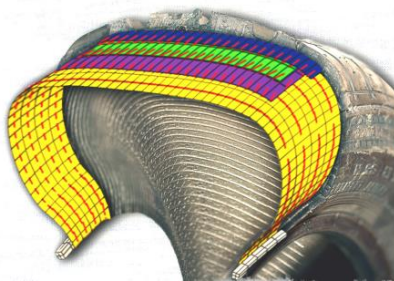


Jan Krmela

**Tire Casings  
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for Computational Modeling**

Scientific monograph

2017

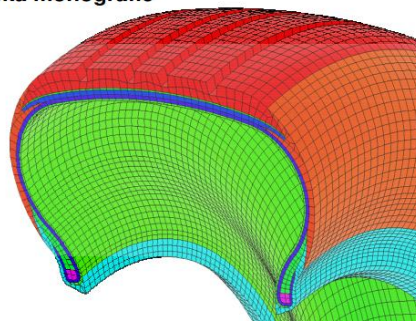


Jan Krmela

**Pláště pneumatik a jejich  
materiálové charakteristiky  
pro výpočtové modelování**

Vědecká monografie

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