TRANSFER OF KNOWLEDGE FOR FATIGUE STRENGTH EVALUATION OF STEERING WHEELS SKELETON

Goal of the project

- Interconnection of the expertise of the project team from University Politehnica Timisoara with the quality assurance requirements of TRW Company for the steering wheels.
- Transfer of knowledge regarding the static and dynamic characterization of Magnesium alloys.
- Intensification of the cooperation between University Politehnica Timisoara and TRW Company for understanding of mechanical behavior and for the implementation of a methodology to assess the durability of steering wheel skeletons.

Short description of the project

The project propose a transfer of knowledge from the experts from University Politehnica Timisoara in order to implement the methodology to determine the fatigue strength of steering wheel skeleton.

Project implemented by:

Universitatea Politehnica Timisoara and
TRW AUTOMOTIVE SAFETY SYSTEMS SRL (Economic partner)

Implementation period

30/09/2016-29/09/2018

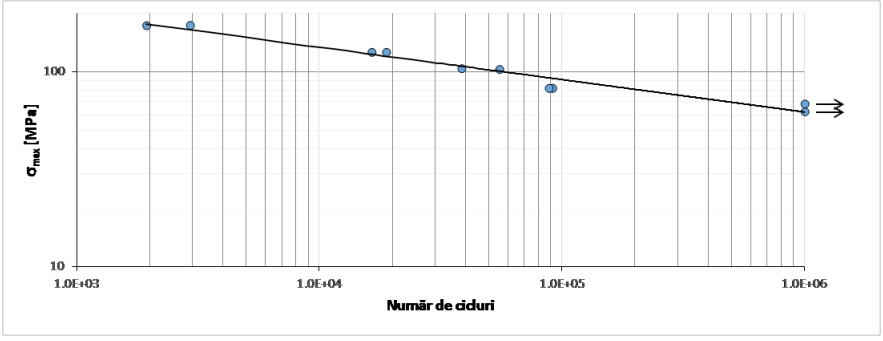
Main activities

- Interconnection of the expertise of the project team from University Politehnica Timisoara with the quality assurance requirements of TRW Company for the steering wheels.
- Mechanical characterization and determination of static and dynamic properties of Magnesium alloys used for steering wheels.
- Elaboration of material models for Magnesium alloy AM50. Numerical estimation of durability of steering wheel skeletons.
- Practical training of master students from University Politehnica Timisoara on modern equipment of TRW company.

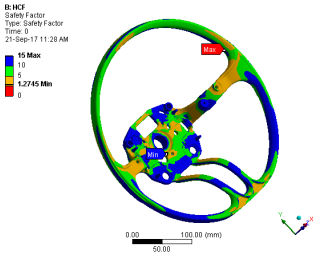
Results

The TRW company will implement a methodology to evaluate the fatigue strength for the steering wheels skeleton made of Magnesium alloys and will be able to perform in-house tests at the Timisoara branch.
After the project implementation the TRW company will receive a methodology to assess the static and dynamic characteristics of Magnesium alloys. Also, will be developed the methodology to assess the fatigue strength of steering wheels skeletons. Very important results are represented by fatigue curves for Magnesium alloy, which could be useful in the design stage to perform numerical durability studies.

Participation at two international conferences ARTENS - Sibiu 2016 and ICSID - Dubrovnik 2016. Publication of the paper FATIGUE ANALYSIS OF MAGNESIUM ALLOYS COMPONENTS FOR CAR INDUSTRY, Authors L. Marsavina, L. Rusu, D. Serban, R. Negru, A. Cernescu, ACTA UIVERSITATIS CIBINIENSIS – TECHNICAL SERIES Vol. LXIX 2017, p. 47-51



Fatigue curve on tensile loading for AM50 Magnesium alloy



Safety factor under fatigue loading

Applicability and transferability of the results:

The TRW company will implement a methodology to evaluate the fatigue strength for the steering wheels skeleton made of Magnesium alloys and will be able to perform in-house tests at the Timisoara branch. After the project implementation the TRW company will receive a methodology to assess the static and dynamic characteristics of Magnesium alloys. Also, will be developed the methodology to assess the fatigue strength of steering wheels skeletons. Very important results are represented by fatigue curves for Magnesium alloy, which could be useful in the design stage to perform numerical durability studies.

Financed through/by

Bridge Grant PN-III-P2-2.1-BG-2016-0060, Contract 89BG/2016 89 by Romanian Ministry of Research trough UEFISCDI

Research Center

ICER

Research team

Prof. Dr. Eng. Liviu Marsavina – Project Manager
Dr. Eng. Radu Negru – Researcher,
Dr. Eng. Emanoil Linul – Researcher,
Dr. Eng. Lucian Rusu – Researcher,
Dr. Eng. Dan A. Serban – Researcher,
Dr. Eng. Sergiu Gălățanu - Researcher,
Dr. Eng. Liviu Pîrvulescu – Researcher,
Eng. Alecsandru Falk - PhD student,
Mat. Raluca Pepelan - PhD student,
Eng. Tamasz Krausz - Master student

Contact information (Ex)

Prof. Liviu MARSAVINA, PhD
Faculty Mechanical Engineering
Department Mechanics and Strength of Materials
Address: Blvd. M. Viteazu, No. 1, 300222 Timisoara
Phone: (+40) 256 403 577, Mobile:(+40) 726 397 635
E-mail: liviu.marsavina@upt.ro
Web: http://dev.mioritix-media.ro/2423/