

I. IDENTIFICATION DATA

Thesis title:	Influence of deformation on structure and properties of AlMgSi alloy
Author's name:	Bc. Radek Bednář
Type of thesis :	master
Faculty/Institute:	Faculty of Mechanical Engineering (FME)
Department:	Department of Materials Engineering
Thesis reviewer:	Ing. Jakub Horník, Ph.D.
Reviewer's department:	Department of Materials Engineering

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	challenging
<i>How demanding was the assigned project?</i>	
Thesis scope is focused on problematic of Al alloy Al-Mg-Si. This alloy is increasingly used in automotive industry for forged parts. Two types of semiproducts are evaluated in conditions of specific deformation levels. Materials characteristics were measured using tensile test, hardness measurement and metallographic analysis. Program for comparison of behavior of both semiproducts during deformation was designed for better understanding the processes of structural changes and their influence on final properties of forged material or product. Due to high number of states and samples were experiments divided between three students. This work is part of long term research of this problematic with the goal of optimizing the forging process to avoid fabrication of nonconforming products.	

Fulfilment of assignment	fulfilled
<i>How well does the thesis fulfil the assigned task? Have the primary goals been achieved? Which assigned tasks have been incompletely covered, and which parts of the thesis are overextended? Justify your answer.</i>	
The assignment was fulfilled. Theoretical part was focused in the area of processing Al-Mg-Si alloys. The proposed experimental program was also fulfilled.	

Activity and independence when creating final thesis	A - excellent.
<i>Assess whether the student had a positive approach, whether the time limits were met, whether the conception was regularly consulted and whether the student was well prepared for the consultations. Assess the student's ability to work independently.</i>	
The student actively participated in the solving of the assigned work. He was ready for the consultation. He independently conducted a number of experiments and their evaluation. The student is capable of independent creative activity.	

Technical level	B - very good.
<i>Is the thesis technically sound? How well did the student employ expertise in his/her field of study? Does the student explain clearly what he/she has done?</i>	
Thesis has character of technical text. Text is comprehensible on very good expert level. Figures and tables are clear. Results are well summarized but the more detail discussion is missing. Student use well their knowledges together with the literature information.	

Formal level and language level, scope of thesis	A - excellent.
<i>Are formalisms and notations used properly? Is the thesis organized in a logical way? Is the thesis sufficiently extensive? Is the thesis well-presented? Is the language clear and understandable? Is the English satisfactory?</i>	
The thesis has all the formal and content necessities, is well organized and understandable. Presented work meets the requirements for the master thesis.	

Selection of sources, citation correctness**A - excellent.**

Does the thesis make adequate reference to earlier work on the topic? Was the selection of sources adequate? Is the student's original work clearly distinguished from earlier work in the field? Do the bibliographic citations meet the standards?

Student uses number of relevant sources, including scientific one. The citation rules and standards are followed. Information cited in the text are properly labeled.

Additional commentary and evaluation (optional)

Comment on the overall quality of the thesis, its novelty and its impact on the field, its strengths and weaknesses, the utility of the solution that is presented, the theoretical/formal level, the student's skillfulness, etc.

The presented work is part of wider research in problematic of structure and properties control during hot forming operations of Al-Si-Mg alloys. Achieved novel results spread knowledge about structural changes of EN AW 6082 alloy and their influence on mechanical properties. Student demonstrated the ability to write an extensive technical document and gain skills in the experimental techniques needed to obtain and evaluate results.

III. OVERALL EVALUATION, QUESTIONS FOR THE PRESENTATION AND DEFENSE OF THE THESIS, SUGGESTED GRADE

The results of the work extend knowledge in the field of behavior of the EN AW 6082 alloy during hot forming. This issue is continually solved due to the tightening of quality requirements for forgings for the automotive industry. The contribution of this work is to obtain data on micro-structure and mechanical properties at certain degrees of deformation and consequent influence on properties achieved by final precipitation hardening. The results will be further used in the follow-up experimental work and will be utilized to optimize current forging processes.

The grade that I award for the thesis is **A - excellent**.

Date: **28.1.2020**

Signature: Jakub Horník