

## Posudek vedoucího diplomové práce

**Příjmení a jméno studenta:** Aleš Machů  
**Studijní program:** Chemie a technologie materiálů  
**Studijní obor:** Inženýrství polymerů  
**Zaměření**  
(pokud se obor dále dělí): (bez zaměření)  
**Ústav:** Ústav inženýrství polymerů  
**Vedoucí diplomové práce:** Dr.-Ing. Radek Stoček  
**Akademický rok:** 2017/2018

**Název diplomové práce:**  
Fracture behaviour of rubber used for sealing application at fatigue loading conditions.

### Hodnocení diplomové práce s využitím klasifikační stupnice ECTS:

Kritérium hodnocení	Hodnocení dle ECTS
1. Aktuálnost použité literatury	A - výborně
2. Využití poznatků z literatury	A - výborně
3. Zpracování teoretické části	A - výborně
4. Popis experimentů a metod řešení	A - výborně
5. Kvalita zpracování výsledků	A - výborně
6. Interpretace získaných výsledků a jejich diskuze	B - velmi dobře
7. Formulace závěrů práce	B - velmi dobře
8. Přístup studenta k diplomové práci	A - výborně

Předloženou práci **doporučuji** k obhajobě a navrhuji hodnocení

**A - výborně**

**Komentáře k diplomové práci:**

The diploma theses generally deals with a very new and interesting scientific aim which is focussed on complex determination of fracture behaviour for prediction of service life time of rubber products. The methodology is based on determination of an endurance limit and stable crack growth rate followed by ultimate strength, whereas the used methodologies and equipments have been introduced and described. The experimental investigation has been performed with a direct interest of an industrial partner focussing on sealing applications, whereas the material formulas have been defined in correspondence to real sealing products. The most interesting part of the thesis is focused on the implementation of upper written advanced experimental methods for the description of the complex fracture behavior of rubber in the simulation of the real loading of the sealing products. This thesis firstly implemented the estimation of minimum energy, which is required for crack initiation and propagation and is followed by determination of stable crack growth rate during cyclic fatigue loading. The results demonster an unique set of data describing the fracture mechanic in complex manner and clearly contribute to prediction of service lifetime of rubber products used for selaing applications. The thesis is a very good bases for future prediction of fracture behaviour of varied different industrial applications.

Due to industrially oriented field of interest the student have to understand the scientific theoretical background as well as industrial interets and applications. The student works very intesively with high engagement. The thesis contains only short extract from the coplex performed investigations based on standard as well as non-standard experiments, however the student was able to find out the most important phenomena and concentrasted the written thesis only on this predicative results, which shows the high scientific expertise of the student.

From the quality point of view of the written part of the thesis, there are few improper term present in the thesis, which technically do not clearly explane the merit of the statement.

I fully recommend the thesis for the defense.

**Otázky vedoucího diplomové práce:**

1. There is noted the critical tearing energy,  $T_c$  in the Figure 20, however this energy is not determined within the framework of the thesis. How the critical tearing energy,  $T_c$  experimentally can be determined?

2. The work is focussed on description of fracture behaviour under the cyclic dynamic loading, however the intrinsic cutting energy has been estimated under quasi-static loading condition. How the experimentaly determined data of intrinsic cutting energy under quasi-static loading conditions can contribute to the description of rubber behaviour under cyclic dynamic loading condition?

V e Zlíně dne **31. 5. 2018**



Podpis vedoucího diplomové práce