

## OPPONENT'S ASSESSMENT ON DIPLOMA THESIS

**Student's name and surname:** Emmanuel Nyarko Ayisi  
**Name of the diploma thesis:** Study of degradation of SilicaGel based Thermal Energy Storage system.  
**Supervisor of the thesis:** prof. Ing. Karel Fraňa, Ph.D.  
**Opponent:** prof. Dr.-Ing. Sylvio Simon

### 1. Diploma thesis evaluation

Evaluation	excellent	excellent minus	very good	very good minus	good	failed
Meeting the goal and fulfilling task of the thesis		x				
Quality of conducted survey		x				
Methodology of solutions			x			
Expert level of the thesis			x			
Merit of the thesis and its potential applicability of results		x				
Formal and graphic level of the thesis		x				
Student's personal approach		x				

Mark x in the corresponding box.

Supervisor's final evaluation is based on his/her overall subjective evaluation.

Grading is stated literally in the article no. 5, neither by a number, nor by a letter.

### 2. Comments and remarks on diploma thesis:

The topic deals with the important issue of storing energy in the form of heat. Material adsorption is used to store heat. Storing heat with Silica Gel is however no new idea. The property of storing and re-releasing heat by adsorption and desorption has long been used in Silica Gel and was studied in my works.

However, I consider as an exceptional solution the creation of a test device to verify the heat-absorbing ability of the material and to test the degradation of the material as a function of cycles and time.

In this work, the author deals with the issue of changing the density of stored energy depending on the number of cycles. The achieved efficiency is relatively small, but the work can continue towards the identification of the optimal flow of medium in the vessel with Silica Gel.

I evaluate the work as promising further research. I really appreciate a detailed search of the problem and finding your own device concept. The work is supplemented by technical documentation in the appendix.

### 3. Questions about diploma thesis:

What were the optimal operating conditions for the testing equipment?

Explain main advantageous of the well-known adsorption models? Why is the D-A isothermal model the best?

Why does the specific performance drop by more than 20% from the 1st to the 5th cycle?

### 4. Opponent's statement whether the diploma thesis meets the academic title requirements and whether it is recommended for defense:

The work meets all requirements needed for the academic title. I recommend the thesis for defense.

### 5. Opponent's grading: excellent minus

Date 18.06.2020, in Senftenberg

  
Opponent's signature



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