Master Thesis

Energy Efficiency Mapping of Machine Tools

Challenge
The topic energy efficiency is widely spread in society as well as industries. Its importance rises incessantly, especially for industries that cause main shares of the worldwide energy consumption. Efficiency mapping is typically used for components as electric drives or pumps to indicate the components’ efficiency in dependence on its usage. Efficiency maps are beneficial for comparison of different components and to select the best operating range. Research and industries lack in a methodology to create an efficiency map for machine tools.

Task
Key objective of the thesis is to develop a methodology for energy efficiency mapping of machine tools based on a state-of-the-art review and evaluation of existing approaches. The developed methodology shall be applied into practice for the machine turning machine Schaublin 42L located at CLA/IWF. Devices for power metering are made available for data acquisition. The results shall finally be evaluated and discussed.

Work packages
- State-of-the-Art review and evaluation of approaches for energy efficiency mapping of machine tools
- Development of a methodology for energy efficiency mapping of machine tools
- Application of the methodology in practice (metering)
- Evaluation and discussion of the results

Details of work packages will be discussed in the beginning. The work load will be adapted to the type of student work. Exceptional thesis results will be suggested for the highly remunerated Zuger Science Award doped with 25’000 CHF.

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