

Master thesis "**Development of an innovative power cycling test bench**" at Chemnitz Power Labs GmbH.

Power electronic components are indispensable building blocks in modern energy technology and have a central role in areas such as electromobility and renewable energies. The reliability in the required usage profile of these components is tested in power cycling tests. This master thesis aims at developing an innovative power cycling test bench to test the lifetime of power electronics under conditions close to the application. For this purpose, the following steps are implemented:

**1. Literature research:** current methods for application-oriented power cycling tests are identified within the scope of a comprehensive literature research in order to create the basis for the development of the innovative test bench.

**2. Concept development:** based on the results of the literature research, an innovative concept for the power cycling test bench will be developed, taking into account both the requirements for the test environment as well as the methodology for performing power cycling tests.


**3. Design and construction:** The innovative power cycling test bench will be designed and built, considering both hardware and software components.

**4. Validation:** a comprehensive validation of the innovative test bench is carried out to ensure that reliable results are obtained. For this purpose, comparative measurements with other test methods are carried out.

Chemnitz Power Labs GmbH is a young and dynamic company founded in November 2021 as a spin-off of the Chair of Power Electronics at Chemnitz University of Technology. We offer specialized test services for power semiconductors and also develop our own products. With our experienced team and extensive knowledge in this field, we have a lot of potential to grow further, to advance modern technologies such as electromobility and renewable energies, and to contribute to CO2 reduction.

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