

Software evolution to support advanced mechanical testing methods: an example about Thermo-Mechanical Fatigue Testing

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The major improvements in mechanical testing systems rely on development in software usability and flexibility. In the case of Thermo Mechanical Fatigue (TMF) testing, we must take into account a number of different parameters and algorithms for all aspects of investigation that are defined in a standard definition, called "validated code of practice for strain controlled thermo mechanical fatigue testing". New software implements this code of practice by following all the individual steps: thermal control stability, zero stress test, modulus calculation, thermal strain measurement, test execution and reporting.

Examples are given on how to perform thermal strain compensation calculations with basic formulas or advanced algorithms using an open source programming language called Python. Further, an adaptable display allows the user to choose what information to show at what point in time. The complete test procedure is defined in a fully open environment with the possibility to modify any of the individual steps or calculations. Results are given on thermal strain measurement, modulus calculation and temperature gradient control.