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## The NMISA Watt balance

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The international definition of the kilogram in the International System of Units (SI) has not been changed since 1889. The kilogram (unit of mass) is defined as the mass of a Platinum-Iridium (Pt-Ir) alloy cylinder that is kept at the International Bureau of Weights and Measures (BIPM) in Paris, France since 1889. This is about to change in 2018. The new definition will be based on a constant of nature.

The National Metrology Institute of South Africa (NMISA) is responsible for maintaining the SI units and to maintain and develop primary scientific standards of physical quantities for South Africa and compare those standards with other national standards to ensure global measurement equivalence. NMISA has embarked on a project to develop a Watt balance in preparation of the re-definition of mass.

As a first step in the process, NMISA built a Model Watt balance mainly from Lego blocks, a replica of the NIST Lego Watt balance and designed a Watt balance that was printed on a 3D printer. This paper will discuss the calibration procedure of a typical Watt balance and compare the results from the Lego Watt balance to that of the 3D printed Watt balance and also discuss the major sources of errors in the system.

### Summary

The NMISA Watt balance will be discussed. The calibration results from a Lego system and a 3D printed Watt balance will be compared..

### Apply to be considered for a student &nbsp; award (Yes / No)?

No

### Level for award (Hons, MSc,   PhD, N/A)?

N/A

### Would you like to submit a short paper for the Conference Proceedings (Yes / No)?

No

**Primary author:** Dr KARSTEN, Aletta (NMISA)

**Co-authors:** Mr POTGIETER, Henk (NMISA); Mr MAMETJA, Thapelo (NMISA)

**Presenter:** Dr KARSTEN, Aletta (NMISA)

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