

Sartoriusvågen

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11th Comparison Between the Swedish National Kilogram and SP Principal Standards for One Kilogram

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The 11th comparison at SP is the first to be performed with an electromagnetic force compensated mass comparator installed in an air tight chamber at atmospheric pressure. It was necessary to compensate the weighing results for the influence of air buoyancy, particularly since weights of different densities were measured.

The mass comparator is a commercial machine (Sartorius C1000S) based on the Ångström principle of electromagnetic force compensation [Ångström 1895]. The dynamic range of the comparator is between -100 mg and +500 mg about 1 kg and the resolution 1 μg .

The mass comparator generated significant amounts of heat. This necessitated a period of thermal stabilisation of the chamber during which the comparator was operated over a period of 24 hours prior to weighing. Air temperature in the chamber drifted by about 0,02 °C during a weighing comparison of about 10 hours.

