

Original Paper

A Novel Weight Loading Method in the 20 kN Deadweight Force Standard Machine

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Abstract

This paper introduces a novel deadweight force standard machine (DWM) with independent loading weights driving mechanism. So the weights can be individually loaded and unloaded. Because of their free movement, the weights can also be exchanged mutually, and the number of weights can be optimized. In addition, this novel machine requires only a few weights to achieve as much as possible force loading steps, which greatly expands the testing range. This structure and method have been widely used in the production and measurement detection of the DWMs. The loading speed of each step in this 20 kN force standard machine is about 5 s and hence the efficiency is greatly improved. The sensor testing experiments showed that the repeatability accuracies of this device is less than 0.005 %.

Keywords

The deadweight force standard machine – Independent loading – Load progression