Improve the Energy Efficiency of Your Company with NETZSCH Instruments!

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The new STA 449 *Jupiter® Eco* Series

* When using the instrument 3 times a day on 250 days a year

Technical Improvements with a View to the Introduction of an Energy Management System in Accordance with ISO 50001

Have you heard of "energy management"? Or are you at a company that successfully implements an energy management system? Then ISO 50001, designed to help organizations and companies with systematic energy management, should be well known to you.

In the future, the practice of an energy management system will be the basis for you, as an entity within the manufacturing industry, to be exempted from electricity and energy taxes in certain countries such as Germany.

Systematic energy management requires that you – as a company – evaluate:

- your energy consumption
- your energy sources
- and energy use.

To optimize your energy consumption, you need to measure it and systematically improve it through organizational and technical measures.

STA 449 Jupiter® Eco Series

How Is NETZSCH Involved with ISO 50001?

At the NETZSCH-Gerätebau GmbH headquarters in Selb, we introduced an energy management system in recent years. It made us aware that the energy consumption in our application laboratories and our final inspection department was high.

So in optimizing our processes, we thought: Why not allow our customers all over the world to benefit from the changes we make?

"STA *Jupiter® Eco* Series" – Energy-Efficient STA for Energy-Conscious Laboratory Use!

Simultaneous Thermal Analysis (STA) has been growing increasingly popular for years. It combines the two best-known methods of thermal analysis into a single device: A highly sensitive thermobalance (TGA) and a differential scanning calorimeter (DSC) are combined to show us when mass loss (TGA) or energy conversion (DSC) occur in a material. These events provide us with information about the temperature at which and duration of which, for example, a binder degrades in a ceramic material. Also, the analyses show us when a material melts and how much energy it absorbs until it is completely melted.

In general, STA will help you in the combined study of:

- Material compositions
- Thermal stability
- Phase transitions (phase diagrams)
- Binder removal and much more.

In order to ensure that an instrument of this type has the required temperature stability in application temperatures of up to 2400°C, manufacturers generally employ thermostating by means of a water cycle. The water at constant temperature flows from a thermostat through the balance chamber and sections of the furnace to keep the high-precision balance system at a constant temperature. Continuous cooling with the thermostat switched on requires a lot of energy and produces waste heat, which must be regulated by air conditioners. Thus, the energy consumption of an STA is composed of the primary energy demand for operating the system and the connected furnace(s) along with the primary demand required for operation of the thermostat. Secondary energy requirements include, for example, air conditioning for the space in which the instrument is installed as well as water consumption.

We took a closer look at these circumstances at NETZSCH and developed the STA 449 *Jupiter® Eco* Series based on our findings. It achieves very high performance without the need for a thermostatic water circulation system.

The fact that no thermostat is needed significantly reduces energy consumption. The heating foil, which replaces the thermostat, only requires 10% of the energy used by a thermostat – so in our case, with approximately 9 STA devices in the applications laboratory, this translates to a savings of € 80,000 (based on current energy costs in Germany) over a life cycle of 10 years.

Thermostating an STA system with a water cycle costs about € 1,000 of electricity per year in Germany. In the STA 449 *Eco*, the temperature-sensitive regions are stabilized with a resistance-heating foiling, which consumes only around € 100 per year (calculation basis: Germany). For a period of use of 10 years, you thus save about € 9,000 at the instrument alone – on top of that come all the savings in the areas of water cooling, maintenance and repair.

Since the cost of air conditioning a laboratory depends on how many heat sources are in the room, this cost component is much more difficult to estimate. A thermostat is responsible for about 20-30% of the total energy required, though, and produces a major amount of the waste heat for an STA system. So we can say that the waste heat for a single STA in a room is reduced by about one third thanks to the alternative thermostatization.

With the heating foil in the upper section of the weighing chamber, none of the maintenance and repair work usually required for thermostat operation (e.g., blocked filter systems) is necessary any longer.

Additionally, the heating-foil solution saves space due to the fact that no thermostat is needed in an often overcrowded laboratory. None of the STA's well-known properties are affected by the heating foil.

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