



## Minitube Quicklock Heater - transporting AI guns at a constant temperature

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During the cold period of the year it is important to protect loaded AI guns from cold temperature during transport to the animal. Also sexed semen must be handled very carefully and a constant temperature must be maintained.

When a thawed straw is placed into a prewarmed environment respectively AI gun, the semen is kept at +35°C which helps to keep it alive. Ideally, a battery-powered warming device is used, which allows to hold several AI guns at the same time. Minitube tested two different AI gun heaters to find out which device complies best with practical requirements: the Minitube Quicklock Heater and a similar device which is available on the market.

### Conditions for the test of two similar devices:

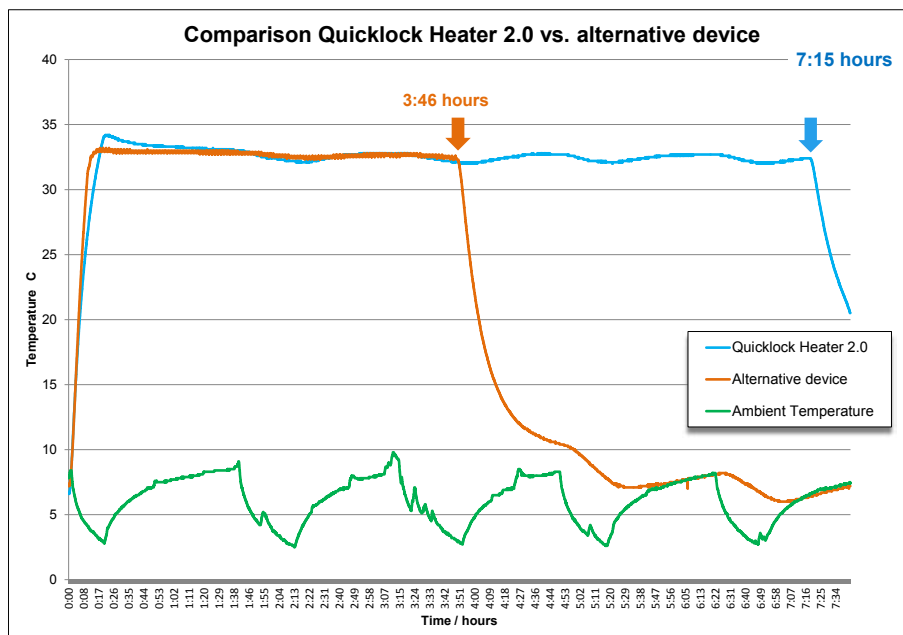
- Both devices were set to +33°C (setting for comparison only: preset temperature of Quicklock Heater is normally +35°C)
- Batteries of both devices were fully charged
- Battery type: Quicklock Heater: NiMH (Nickel-metal hydride), 1.2 V, 6000mAh; alternative device: NiCd (Nickel-cadmium)
- Ambient temperature was approx. +8°C
- Temperature sensors (PT100) monitored the temperature inside the heaters and of the ambient temperature during the test
- Every 3 seconds all sensors measured and recorded the temperature
- Temperature measuring device: Micromec Multisens 3587



The Quicklock Heater from Minitube in use.

### Measurements included the following parameters:

1. Time to reach +33°C from ambient temperature
2. Performance of batteries



**Graph 1:** At an ambient temperature of approx. +8°C both devices reach the set temperature of +33°C at nearly the same time. After 3.46 hours the temperature of the alternative device drops down, because the batteries are empty. The Quicklock Heater holds +33°C for 7.15 hours.

### Quicklock Heater 2.0:

All parts of the Quicklock Heater are placed inside a robust and washable bag. Heating elements are built into the bag and energized by a set of batteries. The battery set and controller are tightly attached to the bag, and easy access to battery and charger plug-in is given by a zip. The controller has a LED light which indicates the status of the device (device is heating, temperature has been reached, battery needs charging).



### Summary

Both devices need approx. the same time to reach operating temperature.  
Working duration of the Quicklock Heater 2.0 at +8°C is 7.15 hours.

The durability of an AI gun warmer is dependent on the quality of the batteries. The Quicklock Heater is equipped with high performance NiMH batteries while the alternative device uses Nickel-Cadmium (Ni-Cd) batteries.

NiMH (Nickel-metal hydride) batteries are very similar to the Nickel-Cadmium cells, however, NiMH batteries have a higher capacity, are less toxic, and are more cost effective.

Finally this test indicates, that the Quicklock Heater is a practical device to protect a loaded AI gun from cold temperatures during transport and therefor helps to provide optimal insemination conditions.



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