

# The temperature difference inside the energy storage container produces water droplets

What determines the heat content of a hot water store?

The heat content of the hot water store in a specific temperature interval from  $T_{min}$  to  $T_{max}$  is determined by the product of the heat storage capacity and the temperature difference ( $T_{max} - T_{min}$ ).

How does temperature affect water droplets?

Research results lay a solid foundation for future research of IAJ. When water droplets are exposed to low temperatures, due to the effect of temperature difference, water droplets will continue to release heat until they condense into ice particles and cool down to the ambient temperature.

How do water drops form in a 2-bottle system?

The water particles in the air are spread far apart. When lots of those particles cluster together they become visible again, as water drops. This doesn't happen everywhere in the 2-bottle system. Water drops don't form in every part of the 2-bottle system.

How does water density affect a hot water store?

As water density is reduced with increased water temperature (see Figure 2.1), hot water will rise upwards and cold water move downwards in the hot water store. An appropriate hot water store design can therefore create large temperature differences in a hot water store.

Does ambient temperature affect the freezing time of water droplets?

When the ambient temperature drops from  $-10.67\text{ }^{\circ}\text{C}$  to  $-24.68\text{ }^{\circ}\text{C}$ , the freezing time of 5  $\mu\text{l}$  water droplets decreases by 45.5%, indicating that the ambient temperature has a great influence on the freezing time. The results of the study can significantly contribute to the development of ice air jet technology.

Is water a suitable heat storage material?

Consequently, water is a suitable heat storage material, and water is today used as a heat storage material in almost all heat stores for energy systems making use of a heat storage operating in the temperature interval from  $0\text{ }^{\circ}\text{C}$  to  $100\text{ }^{\circ}\text{C}$ . 2.2. Principles of sensible heat storage systems involving water



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