

Title Moisture content and strength of corrugated cardboard exposed to a nano-sized mist
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Abstract

Low temperature and high humidity are recommended to maintain quality of fresh fruit and vegetables. Mist is used for increasing humidity in coolstores. Mist from conventional humidifiers, such as ultrasonic devices, can wet corrugated cardboard boxes and weaken their strength. In contrast, nano-sized mist made by nanomist humidifier (diameter <1000 nm) evaporates rapidly and does not wet the surface of the corrugated cardboard boxes. In this research the strength and moisture content of dry corrugated cardboard exposed to nano-sized mist were measured and compared with that exposed to a mist from conventional humidifiers. Cardboard exposed to the nano-sized mist for 4 days became about 20% moisture content d.b. (dry basis: g-water in material/g-dry weight). This was 7% lower than for cardboard exposed to conventionally humidified conditions even though temperature and humidity were almost the same during testing. Cardboard strength was measured using a tensile and compression testing machine and a column crush test (JIS Z0403-2). Strength of corrugated cardboard correlated with moisture content. Strength of cardboard exposed to the nano-sized mist for 4 days at ca. 6°C and 95% RH (relative humidity) decreased by 59% but under conventional conditions it decreased by 94%.