テキオン ラボ
TEKION LAB

2019-06

Ideal temperatures make life better

TEKION LAB offers constant-temperature transport solutions

Confidence

Reliable logistics thanks to ideal temperature control

Certain foods and pharmaceuticals need to be transported at controlled temperatures.

We want to protect important goods by preventing variations from the ideal temperature.

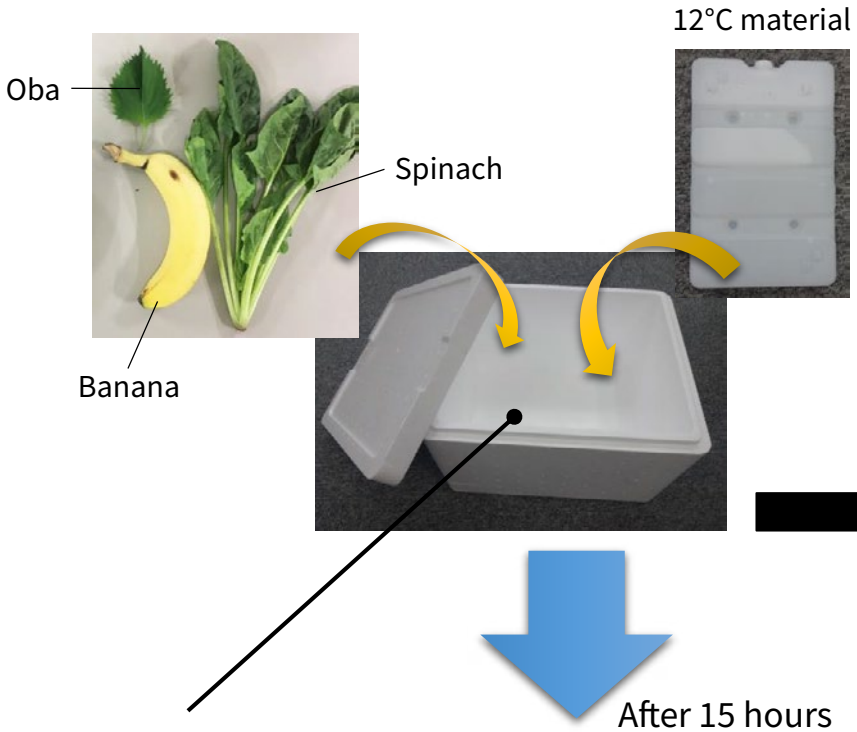
That's why we propose constant-temperature transport that not just cools goods but also minimizes variations in their temperature.

Examples of cold-retention material for constant-temperature transport

Cold-retention material melting point	Temperature characteristics	Blow-molded container	Soft pack
12°C	• Room-temperature cooling in mid-summer • Fresh produce cooling with no low-temperature damage ··· p2 • Can freeze in a refrigerator (3°C) (fast freezing in freezer) ··· p3	 Example: Content of approx. 500 g —Characteristics— • Robust • Returnable	 Example: 6 connected sections of 60 g each (upper) 16 connected sections of 20 g each (lower) —Characteristic— • Covering allows strict temperature control
0°C	• General cooling of daily foods • Starts freezing at –2°C or higher (Sharp's previous product freezes at less than –8°C) ··· p4		
-11°C	• Ice temperature range (Non-freezing temperature range neither refrigeration or freezing)		

Fresh produce cooling with no low-temperature damage

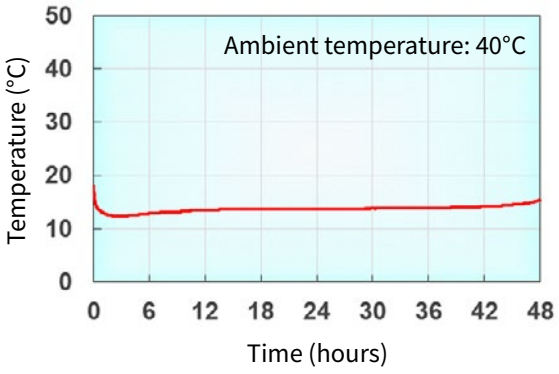
Some produce such as bananas and oba (shiso) experience discoloration and damage when exposed to near-zero temperatures. This is called low-temperature damage of produce.
With Sharp's 12°C cold-retention material, there is no low-temperature damage to the produce even if it touches the material.



Reference: When using ice (melting point of 0°C)

Discoloration
Damage

Air temperature inside insulated box cooled with 12°C material



Keeps for 2 days at approx. 13°C

After 15 hours

No change
Freshness maintained!

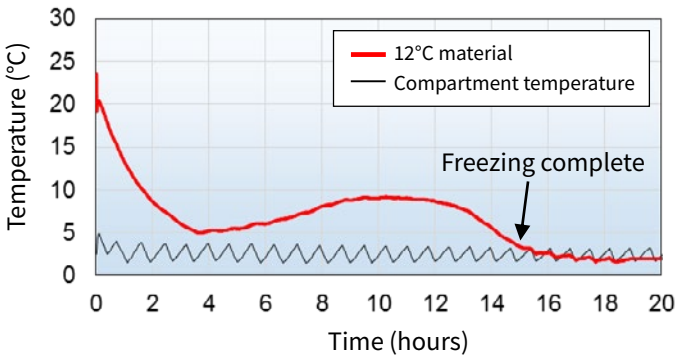
Weight of cold-retention material used: Approx. 5 kg
Insulated box material: EPS

Freezing performance of 12°C cold-retention material

Sharp's 12°C material is frozen in a refrigerator (3°C), so compared to using a freezer, its incorporation cost is lower, and so is electricity consumption.
And if you are using a freezer, the material can be frozen in a shorter time.

Freezing performance in a refrigerator

Temperature change in Sharp's 12°C material (just under 1 kg)

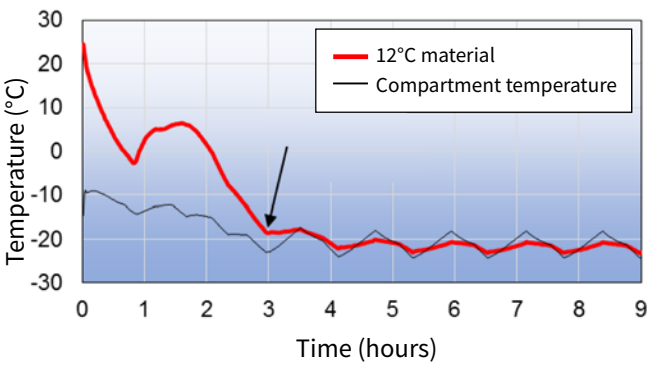


Sharp's 12°C material freezes in a refrigerator.

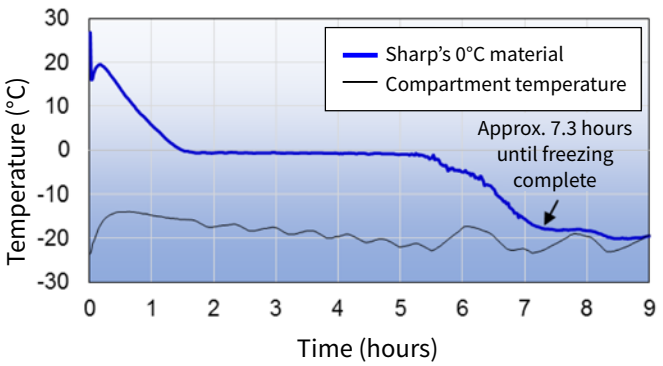
Takes approx. 15 hours until just under 1 kg is completely frozen.

Freezing performance in a freezer

Temperature change in Sharp's 12°C material (just under 1 kg)



Temperature change in Sharp's 0°C material (just under 1 kg of water)



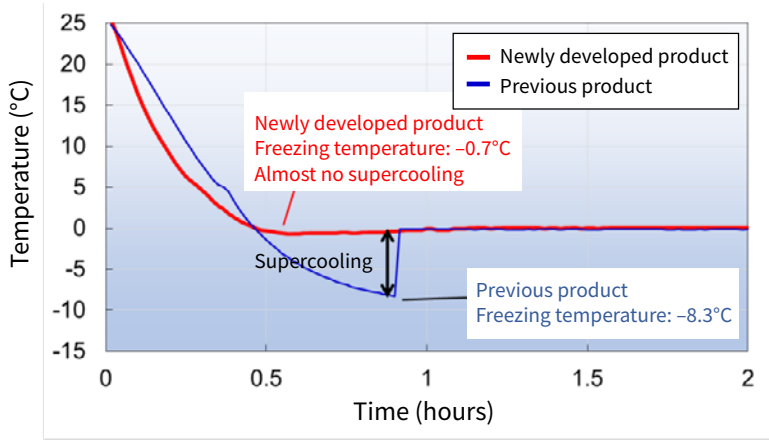
Compared to Sharp's 0°C material (water), our 12°C material takes about 40% less time* to freeze.
Therefore the freezing–usage cycle of the cold-retention material can be sped up, or the number of cold-retention units inside the freezer can be reduced.

*Based on results of Sharp testing

Freezing performance of 0°C cold-retention material

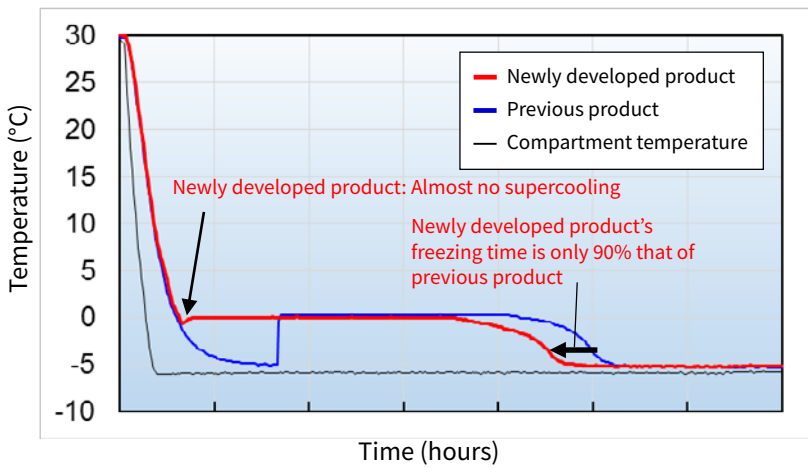
Generally, supercooling occurs when freezing water (used as 0°C material). Sharp developed a material that freezes at –2°C or higher using proprietary supercooling-reduction technology.

Degree of supercooling of newly developed product and previous product



Because freezing temperature is high, the freezer temperature can be set higher, which translates into lower energy consumption for the freezer.

Freezing time between newly developed product and previous product (freezing performance at –5°C)



There is almost no supercooling with Sharp's 0°C material, and freezing time is shorter, so the freezing–usage cycle of the cold-retention material can be sped up, or the number of cold-retention units inside the freezer can be reduced.

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This leaflet is current as of June 2019.