

Flash Chilling Apparatus from DRINKSTATION®

This is an innovative beverage chilling system designed to rapidly cool beverages on demand while maintaining a compact form suitable for home and business environments.

This invention represents a significant advancement in beverage cooling technology by achieving industrial-level cooling performance in a residential-scale appliance through enhanced heat exchange efficiency. The result is a super-compact flash chilling apparatus.

Traditional beverage coolers often pre-chill large quantities of liquid in reservoirs (20+ liters), making them impractical for residential use. This invention eliminates the need for storing pre-cooled beverages by implementing a highly efficient heat exchange system that can cool beverages to below 40°F in seconds as they flow through the device.

The key technical advancement involves an evaporator coil featuring specialized projections (fins, rods, or lattice structures) that extend from its surface. When coolant circulates through this coil, a “bank” of frozen heat exchange fluid forms not only around the coil but also along these projections, substantially increasing the surface area available for heat transfer.

The system consists of:

1. A compact reservoir (3-15 liters in volume) containing heat exchange fluid (this can be water or a specialized ionic liquid)
2. An evaporator coil with engineered projections that maximize surface area
3. One or more chiller coils through which your fresh drinking water flows during dispensing
4. Optional components including an agitator for fluid circulation and temperature sensors for operational control

During operation, coolant circulating through the evaporator coil causes the surrounding heat exchange fluid to freeze, creating an ice bank. When a beverage is dispensed, it flows through the chiller coil positioned near but not touching this ice bank, allowing rapid heat transfer without freezing the beverage itself.

The technology enables a countertop appliance that can:

- Dispense continuously chilled water at about 35°F (or even less) without pre-cooling
- Cool your drinking water from room temperature to below 40°F in under 10 seconds (max)
- Maintain sufficient carbonation levels in sparkling beverages

- Operate in residential kitchens or office settings due to its compact design