

# Nugget Ice Has a Cult-Like Following. Its Engineering Can Explain Why

People love chewing these soft pieces of ice, and they're found everywhere—in fast food drinks, healthcare facilities, and even your home.



BY MANASEE WAGH

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Scotsman Ice Systems

Chewing ice has long been considered an example of poor manners, perhaps second only to sucking futilely at those last few drops at the bottom of your cup. Biting down on hard ice cubes can be both a noisy and a potentially painful experience. Maybe some people still think chewing ice is rude, but the invention of airy little ice nuggets has made the practice both irresistible—and useful at times.

Scotsman Ice Systems invented the first nugget ice maker in 1981. Sonic popularized the shape by plopping this ice into its soft drinks, and people loved it so much that they would purchase bags of ice from the drive-through restaurant to take home. Today, nugget ice is common in many restaurants, not just in fast-food joints.

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The tiny, cylindrical nuggets have also long been the best ice for health care facilities due to their easily chewable texture, fast melting in the mouth, and moldability for use in therapeutic cold packs. Ice-machine companies caught onto the popularity of nugget ice quickly, and now you can even make your own at home with countertop nugget ice makers.

So what makes nugget ice so soft, chewy, and tempting?

## **How Nugget Ice Is Made**

Ice nuggets are not the same as crushed ice, which is simply a larger block of ice broken into smaller, unevenly shaped pieces. The main difference between a nugget ice maker and an ice-cube maker is that the latter first collects water before freezing it into cubes; these are separate processes. Meanwhile, a nugget ice maker employs a feed of water that it continually chills and forms into nuggets, Ben Miller, a technical expert in ice making for GE Appliances, tells *Popular Mechanics*.



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To start, water enters the bottom of a cylindrical reservoir. Similar to your freezer at home, the unit evaporates a liquid refrigerant inside copper tubing, a process that pulls heat out of the surrounding water. The rapidly cooling water forms ice crystals on the inside surface of the reservoir. An auger—essentially a large turning screw—scrapes the ice and pushes it to the top of the reservoir as it turns. As they travel, both ice crystals and liquid water form a frozen slurry, a kind of ice and water emulsion. When it reaches the top, the slurry passes through small holes in a metal lid, compressing it into a cylindrical shape; think of a play dough or pasta extruder, pushing out material into a particular shape. The mechanism breaks the frozen slush into small, chewable nuggets, barely 1 centimeter long, and they end up in a bin, where they're ready for scooping.

“The holes the slurry pushes through are a reverse cone shape, with the top diameter smaller than the bottom. That shape is what compresses the ice through the hole,”

Miller explains. The speed and the shape of the extruder help determine the hardness of the ice.



Scotsman Ice Systems

Generally, nugget ice can be made softer, containing about 25 percent water and 75 percent ice, or harder, with only about 15 percent water, Scotsman Ice Systems' Jeff Biel tells *Popular Mechanics*. The texture depends on the end use. For example, convenience stores like to use the harder form, because softer nugget ice tends to congeal into a ball that no longer dispenses well if the machine isn't used for a while. On the other hand, a hospital might want to use softer ice for easier chewing, says

Biel, who works as vice president of marketing and product development at Scotsman.

## **Who Loves Nugget Ice?**

At this point, the question may be: who doesn't love nugget ice? It has so many fans.

“If you were to pick up a handful of nugget ice and squeeze it, water would come out. Whereas if you did that with ice cubes that were in your freezer, there's really no water that's gonna get squeezed out. They're solid and pretty much 100 percent ice,” Biel says.



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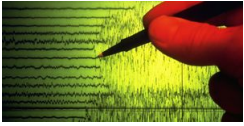
Its fast-melting quality makes nugget ice appealing for health care applications. Not only is it hydrating when you can't drink liquids before receiving anesthesia, but it's a safer alternative for people like seniors, who could have problems swallowing. "It really has a value in senior care. As soon as it hits your mouth, there's no chance of ever having it lodged in your throat and causing a problem breathing," John Ardente, senior director of facilities operations for Jefferson Health Northeast in the Philadelphia region, tells *Popular Mechanics*. It helps that this form of ice is easier to chew, too. Nugget ice has played an important role for patients in senior centers and hospitals over at least the past 25 years Ardente has worked in health care, he says.

Malleability is another convenient property of nugget ice, he adds. When compressed, a mass of ice nuggets has reduced surface area, so the inside is insulated from quick melting. This makes the ice ideal for molding into comfortable cold packs that can wrap around a knee or elbow, Ardente says.

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The way they are assembled means these ice nuggets also contain air pockets, making them a tasty bonus treat when you get to the end of your soft drink. “When you put it in Coke, the Coke rushes into the ice air pockets, and displaces the air. You end up with a flavored nugget,” says Biel. For this same reason, nugget ice blends easily into smoothies and slushies. Its softer qualities cause less wear-and-tear on blender blades, too.

Restaurants and health care facilities aren’t the only customers of nugget ice. Schools, factory floor break areas, and offices use them, too. Since they’re so satisfying to chew, some people buy nugget ice makers for home use.





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Still, there *are* some places where nugget ice is definitely not ideal. Since the nuggets melt faster than regular ice cubes, they water down alcoholic drinks, so you'd do better with solid chunks of ice in your gin and tonic. And, because they are still somewhat hard, ice nuggets may damage delicate seafood displays, which are better off with finer, flake ice.



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Before joining *Popular Mechanics*, Manasee Wagh worked as a newspaper reporter, a science journalist, a tech writer, and a computer engineer. She's always looking for ways to combine the three greatest joys in her life: science, travel, and food.