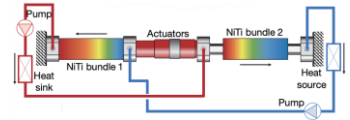




The Journal



Squeezeable Metal Offers Greener refrigeration



Florida's Gaylord Palms Completes \$200 Million Hotel Expansion

Sept 1, 2023 Gaylord Palms Resort and Convention Center in Kissimmee, FL, has revealed what is said to be the largest expansion in the hotel's history. Costing \$200 million, the project adds more than 100,000 square feet of meeting space and 306 guestrooms in the new Gulf Coast Tower. As a result of the expansion, which began in 2019 and opened in summer 2021, Gaylord Palms now has more than 500,000 square feet of meeting space and 1,718 guestrooms.

For conventions, weddings and other outdoor group events, guests should look to book the new Mangrove Lawn. Named for the high-rooted trees and plants that thrive in Florida's coastal intertidal areas, the multi-purpose tract has 10,000 square feet of artificial grass (a total of 13,000 square feet with the paved perimeter) that can be configured into multiple setups for events, networking opportunities and receptions.

Indoors, the new Coastal Ballroom has more than 30,000 square feet of space. It is complemented by an additional 30,000 square feet of breakout meeting rooms and 30,000 square feet of space for pre-function gatherings. The neighboring Citrus Ballroom offers a smaller venue with giant windows offering natural light and providing views of the central Florida landscape.



Oscartek Gala series an integral part of the remodel

The Coastal Ballroom also has color-changing LED lighting that can be programmed for any gathering or meeting theme. Lights in adjacent meeting rooms are designed to be equally flexible, and they can create a variety of looks.

Pre-functions also take centerstage in the expansion project, notably via the outdoor Escambia Terrace that overlooks the resort's event lawn and new Crystal River Rapids action river. A neighboring pre-function space provides a view of the surrounding area and fireworks on display at the nearby Walt Disney World Resort.

More than 300 new guestrooms have tiled entryways, marble counters and custom closets. The living areas are bright and spacious, while bathrooms have floor-to-ceiling mirrored barn doors, stone vanities and backlit mirrors. Nice touch: Each room is equipped with plenty of USB charging ports for mobile devices and electronics. A glass bridge provides direct access from the rooms to the ballrooms, so meeting-goers can quickly get back to their event action.

ICE at Gaylord Palms brings back 'A Charlie Brown Christmas'

It may be **checks calendar** the beginning of August, but some Central Florida attractions are already thinking about Christmas.

One of the most popular and unique amusements during the local holiday season is ICE at Gaylord Palms, and this year the resort is repeating their popular theming of A Charlie Brown Christmas.

ICE is an immersive, walk-through exhibit built of more than 2 million pounds of colored and sculpted ice. It's a chilly 9 degrees inside, so guests are given thick, insulated parkas to keep warm. However, as someone who's experienced ICE several times, I highly recommend bringing gloves, thick socks and layered clothing.

The "Charlie Brown Christmas" theme includes beloved Peanuts characters like Charlie Brown, Lucy, Sally, Linus, Snoopy and Peppermint Patty. There are also plenty of ice Christmas trees, including Charlie Brown's skinny stick one. The attraction includes some interactive and photo opportunities as it re-creates iconic scenes from the holiday special, including its songs and musical score. There are also ice tunnels, seating areas and thrilling two-story ice slides inside the 20,000-square-foot exhibit.

ICE has been brought to life in Florida for years thanks to the craftsmanship of master ice sculptors from Harbin, China. It takes them about five weeks to carve 6,700 blocks — 300 pounds each — into holiday characters and scenes. Beyond "A Charlie Brown Christmas" sculptures, ICE features classic Christmas scenes and a Carver's Showcase with live ice sculpting.

ICE is just part of Gaylord Palms' holiday event programming, which also includes Christmas entertainment, family-friendly guest activities, an escape room, carolers, gingerbread house decorating, the Bavarian Alpine Village shopping area and the popular "Cirque: Spirit of Christmas" show. Santa and Mrs. Claus will be inside the Alpine Village from Nov. 17 through Dec. 24 for meet and greets and storytime.

Tickets and hotel packages are on sale now for Christmas at Gaylord Palms and the ICE attraction. For more information, visit

Squeezable Metal Offers a Greener Approach to Refrigeration

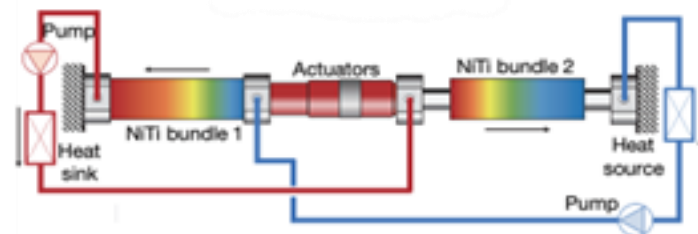
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Refrigeration systems that use materials that cool in response to an applied electric, magnetic, or mechanical force offer environmentally friendly alternatives to the greenhouse-gas-leaking ones found in most homes and factories (see Feature: In Hot Pursuit of 21st Century Cooling). Now researchers have demonstrated a cost-effective, scalable version of one of these so-called “caloric cooling” systems [1]. Their approach, which uses a material that responds to a mechanical force, exceeds performance records set by methods that rely on magnetic fields. The researchers say their technology is also much less expensive to make and to operate and could be ready for commercial use within a year.

Magnetic-based cooling systems had an early brush with fame in 1998 with the demonstration of a near-room-temperature system that kept its contents cold for 1500 hours [2]. In that system, a magnetic field was applied to a magnetocaloric material, resulting in a temperature increase, as atomic vibrations compensated for the entropy lost as unpaired spins in the material aligned. Turning the field off reversed that increase, allowing the material to act as refrigerant that could be used in the cooling coils of a household fridge. But inducing the magnetocaloric effect requires strong (> 1 tesla) magnetic fields, which can only be provided by expensive permanent magnets that contain rare-earth alloys.

An alternative approach is to use an elastocaloric material. Such a material undergoes an entropy-induced temperature change when subjected to a mechanical force that is large enough to partially change the phase of the material. In 2012 Ichiro Takeuchi of the University of Maryland discovered that when stretched, a commercially available wire made from nickel and titanium (NiTi) undergoes such a change, with the temperature increase being large enough to be felt by hand. He later found that a temperature decrease occurs when compressing NiTi tubes and then used the effect in 2016 to develop an early electrocaloric cooling system. “We started making [low-power cooling] systems using NiTi tubes in compression mode about ten years ago,” Takeuchi says.

In the system developed by Takeuchi and colleagues, a steel actuator compresses a bundle of NiTi tubes to 700 megapascals (bundle 1). Water is pumped from the cold end of that bundle toward the hot end. At the same time, the actuator unloads a second... Show more



Now a team led by Takeuchi and Reinhard Radermacher at the University of Maryland has brought elastocaloric cooling to the front of the greenhouse-gas-free refrigeration race. Several engineering challenges stood between their 2016 demo and the new one, which has improved fluid recovery, reduced heat loss due to friction, and provided denser bundles of tubes. In the new device, water—the heat exchange fluid—flows through two bundles of commercially available NiTi tubes. The two bundles connect via an actuator, which applies a load to one bundle as it unloads the other, thereby creating cycles of compression that drive refrigeration. The system can operate in two different modes, depending on how much water flows through the system during a cycle. One mode optimizes the cooling power, the other the temperature span. The team demonstrated that they could cool the system by 22.5 K, compared to 4.7 K in their 2016 scheme.

Still, the team’s calculations indicate that the system’s overall efficiency could be improved by a factor of 6 by using more efficient actuators. Additionally, the researchers think that they could improve efficiency by switching the NiTi with a known copper-based material that exhibits a similar elastocaloric temperature change under a smaller stress. Such materials are currently not commercially available, but Takeuchi says that he is excited about implementing them in low-stress cooling systems.

The data from Takeuchi and his team “is very impressive,” says Kilian Bartholomé, who researches thermal energy convertors at the Fraunhofer Institute for Physical Measurement Techniques in Germany. He points out that almost all demonstrated elastocaloric systems use NiTi that was neither manufactured nor optimized for use in refrigeration devices, meaning that there is still “great potential” to increase the performance of the systems. Takeuchi believes that he and his colleagues will be able to improve the performance of their system enough to make the technology commercially viable within a year. The first application that he envisions: a compact wine cooler.

–Rachel Berkowitz

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