



The Cold Reality of Sustaining Life in Antarctica

Sometimes Carrier Transicold container refrigeration systems are found where you least expect them.

One such location is among the most remote outposts on the planet, a small scientific research base called Palmer Station located on Anvers Island just west of the Antarctic Peninsula, the part of the polar continent that stretches up toward the Drake Passage and southernmost tip of South America.

Palmer Station is home to two 20-foot containers with new ThinLINE® units that serve as full-time stationary freezers for food storage. Installed in 2011 to replace aging units, they provide a vital service for a small, transient population that ebbs and flows each year like the ice in the frigid waters that surround the tip of the rocky jut where the base is located.

Palmer Station has been in operation for about 45 years and since 1990 has been part of the National Science Foundation's Long Term Ecological Research Program, a multi-disciplinary program that studies the effects of changing sea ice cover on the region's ecosystem, including marine bacteria, plankton and seabirds.

On-site instruments measure seismic activity, atmospheric characteristics and radio waves. Less than a mile away, on Torgersen Island, Palmer Station's solar-powered "penguin cam" keeps watch on a colony of 2,500 Adélie penguins.

Back at the base, the human population ranges from a

low of 16 in winter to as many as 44 in the austral summer when researchers flock to Palmer. They stay in dormitory-style bedrooms and eat in a cafeteria-style dining hall that is supported by a small kitchen. That's where the ThinLINE units play a role.

"The two milvans sit side-by-side near our main building and are used strictly for food storage," said Robert Farrell, Palmer area manager for Antarctic Support Contract, the prime logistical contractor to the U.S. Antarctic Program. "Milvan" or just "van," short for military van, is the nickname the staff has given to the refrigerated storage units at the station.

"We also have a walk-in freezer in our building, but the bulk of our frozen food storage is in those two vans. We keep about a six- to eight-month supply of food storage on station," Farrell said.

If you think freezers at the bottom of the Earth are unnecessary, you would be right. Palmer Station (64° 46'S, 64° 03'W) is not quite at the bottom. It's situated north of the Antarctic Circle, on a part of Antarctica that is relatively mild compared to the international research operations that ring the continent at latitudes further south.

"The United States has three permanent research stations in the Antarctic and two research vessels," Farrell explained. "Palmer is the farthest north and also the smallest of the three.



We have a station at the South Pole (Amundsen-Scott Station) and McMurdo Station on Ross Island, which is south of New Zealand.”

At the South Pole’s elevation of 9,301 feet (2,835 meters), where the annual mean temperature is -56°F (-49°C), Farrell said that mechanical refrigeration is not needed for the bulk of the frozen food. Further to the north at McMurdo, the largest U.S. Antarctic research station and a small city with its population just under 1,000, food is shipped-in via freezer containers once a year and stored in a large freezer building.

Thanks to the warmer ocean water, winter temperatures at Palmer Station average 14°F (-10°C), seldom go below 0°F (-17°C), and don’t stay there long. During the research season, temperatures average 36°F (2°C).

“In the summer, temperatures get into the 40s fairly often,” Farrell says. “A 45-degree day is pretty warm and a 50-degree day feels balmy.”

Concrete blocks and a steel and wooden deck support the Palmer Station milvans, which have wooden storage shelves inside. The ThinLINE units are set to maintain internal temperatures at -5°F (-20°C). The freezers store “beef, poultry, vegetables, fruit and ice cream – everything you would keep in a normal freezer,” Farrell said. Water is one commodity the station does not need to import. Fresh drinking water is “harvested” locally from seawater, which is pumped in and run through a reverse osmosis system to create fresh water.

In the summer, when the station population peaks, two chefs manage the food service operation. In the winter, only one chef is needed. Except for Sundays, they serve three meals a day.

Now, as the research program transitions into winter mode, this dedicated pair of ThinLINE units will revert to lighter, yet still vital, duty.

Said Kartik Kumar, director of marketing and strategic planning, Global Container Refrigeration, “While the vast majority of containers refrigerated by Carrier Transicold equipment travel the world transporting food across the oceans, we are delighted to know that these units are helping to support the ecological research initiatives of the scientists at Palmer Station, who in turn, are helping us to better understand our world and environment.”



Looking across the tops of the Palmer Station milvans, investigators can be seen sampling water from a Zodiac boat.



The Palmer Station dining hall and kitchen.



Two 20-foot containers hold enough frozen food to support station operations for six to eight months.