Defrosting: Basics & Beyond

Editor’s Note: This is the first of a two-part article on walk-in cooler and freezer defrost methods. We begin with descriptions of traditional methods this time and move to an in-depth discussion of Master-Bilt’s reverse cycle defrost method in the next issue. Thanks to Dave Entrekin, Master-Bilt’s national technical sales manager, who wrote the article.

A most basic definition of refrigeration is taking heat from someplace we don’t want it and moving it to someplace where it doesn’t matter. In the following discussion we’ll turn this concept around a bit and describe putting heat someplace cold where it accomplishes an important result: The removal of frost or ice from the evaporator coils of walk-in coolers and freezers.

In many cases the heat used to produce this effect in walk-in coolers comes from ambient air in the space in a process called off-cycle defrost. During this process, the evaporator fans run continuously. The refrigeration condensing unit or the flow of refrigerant is shut off, allowing the fins and tubing of the evaporator coil to warm by absorbing heat from the circulating air. As the air in the cooler is usually between 35°F and 40°F, it takes some time for the coil to warm sufficiently.

Generally, it takes 20-30 minutes to complete the removal of frost using the off-cycle method. Walk-in coils subject to high humidity conditions may build enough frost to require 40 minutes. As no refrigerating is taking place during this off-cycle, the air temperature in the space rises from heat introduced by opening doors or bringing in warm product. After the defrost ends, this

Master-Bilt Wins FE&S Best In Class Award

Master-Bilt is pleased to announce that Foodservice Equipment & Supplies magazine has awarded the company its Best In Class Award for walk-in refrigeration in the Operator category.

Over the course of several months, FE&S asked its foodservice operator, dealer and consultant subscribers to evaluate manufacturers based on seven characteristics: product quality, product value, product design and aesthetics, service and support, sales representation, product inventory and availability and product information availability. Survey participants prioritized these factors in order of importance and rated the manufacturers they work with on these attributes.

For more information on the survey and a complete list of winners, go to www.fesmag.com.

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heat gain must be removed by extended operation of the refrigeration system to return the space and stored products to the desired temperature.

The process for a walk-in freezer is different as the evaporator fan motors are shut off during defrost. Heat is provided by electric resistive rods that reach a temperature above 300°F. These rods are usually placed on the bottom of or rear (inlet) face of the finned coil. The heat generated and time of operation must be sufficient to warm the coil structure from bottom to top or back to front to 60-70°F to assure all surfaces are free of frost or ice. The coil in a typical walk-in freezer operates at -15°F to -20°F and defrost times are typically 20-30 minutes. There is significant heat generated within the space and product is necessarily exposed. This heat again must be removed by running the refrigeration system.

With today’s interest in reducing total electrical operating cost of walk-in coolers and freezers, a defrost process that’s been used in supermarkets and large warehouses for many years now becomes a useful option for food service applications. This process, generically called “hot gas defrost,” uses heat generated by the refrigeration cycle in its compressing mode to warm evaporator coils rather than using ambient or electric heat. The basic refrigeration cycle in part consists of compressing a low pressure medium temperature gas into a high pressure high temperature gas before it enters the condenser coil. It’s this “hot gas” that’s used to defrost the coils. There are historically three methods of hot gas defrost: Bypass, three pipe, and reverse cycle. For this article, discussion is limited to the third method.

Reverse cycle defrost (RCD) occurs when hot gas is supplied to the suction (return) line of the evaporator and flows backwards relative to the normal flow of refrigerant that cools the coil. The refrigerant liquid (supply) line becomes the return line and completes the circuit back to the condensing unit compressor inlet. This type of defrost can be accomplished with a parallel rack system or a single compressor condensing unit. The diagram at left illustrates a single compressor system.

In next issue’s conclusion, we’ll compare reverse cycle in parallel rack systems and single compressor units as well as discuss the advantages of RCD.
Megatops Make The Scene
The Fusion™ line is expanding again with the addition of megatop sandwich/salad prep units. These four new MBSMP models join the existing four standard size units. Construction and features are basically the same as the standard size MBSP models except the megatops offer additional pans. Stainless steel is standard on the interior and exterior as are vinyl-coated shelves (one per door). Megatop models will be available for shipment in mid-November.

Megatop prep units accommodate more pans for busy foodservice prep areas. The above picture shows an extra row of pans in the MBSMP72-30.

Two New Representative Firms Join Master-Bilt
Two new representative firms recently joined the Master-Bilt sales team.
Cimenet USA, with offices in Miramar, Florida and Mexico City, will represent Master-Bilt in Mexico.
Wyllie Marketing, based in Weymouth, Massachusetts, will cover the Northeastern US. Wyllie has offices in several states throughout the region.

“We’re very pleased to expand our presence in Mexico with Cimenet. They will not only supply product knowledge but excellent customer service as well,” said Bill Huffman, vice president of sales and marketing. “We’re equally excited about the addition of Wyllie Marketing and know their 15 years of experience will also further our goals of service and customer satisfaction.”

“The trouble with unemployment is that the minute you wake up in the morning you’re on the job.”
–Slappy White
‘I’m Not Home Right Now, So At The Beep . . . ’

Does your answering machine convey just the right message? If not, try one of these:
• “Hi, I’m not home right now. I do not need new aluminum siding, more insurance, or a new long-distance service, and I don’t want to switch cable TV providers. If you’re still with me, leave your name and number and I will get back to you.”
• “Hello. I’m probably home right now but I’m avoiding someone I don’t like. Leave me a message. If I don’t call back, it’s you.”
• “I can’t come to the phone now—well, actually, I can come to the phone now because I’m recording this message, but I’m doing that now, whereas you’re listening to it later, except for you it’s now because that’s when you’re listening to it. This is so confusing. Just leave me a message, OK?”
• “Hello, and welcome to Phone Tag! If you’d like to join the game, please leave your name and number at the beep and we’ll try to reach you when you’re not around. And thanks once again for playing Phone Tag!”
• “Question: If a telephone rings in an empty home and no one is there to answer it, was there really a phone call? Help me investigate this philosophical question by leaving your name and number after the tone.”

Not The Brightest Bulb?

Looking for a new way to describe your less-than-brilliant friends and relatives? Try these slams:
• He’s so uncoordinated, he once tripped over a cordless phone.
• She once spent a half-hour staring at an orange juice carton because it said “Concentrate.”
• He’d ask for a price check at the Dollar Store.
• She spent all night studying for a blood test—and still failed.
• When he missed the 44 bus, he decided to take the 22 bus twice.
• She sold her car—for gas money.

Call It Bumper Shtick

Some bumper stickers are inspiring and motivational. Others, not so much. Steer clear of these vehicular affirmations:
• My intuition nearly makes up for my lack of good judgment.
• Joan of Arc heard voices, too.
• I’m just grateful that I am not as judgmental as all those self-righteous people around me.
• Why suffer in silence while I can still moan, whimper, and complain?
• Forgiveness is cheaper than a lawsuit. But not nearly as gratifying.
• I am at one with my multiple personalities.
• I find humor in my everyday life by looking for people I can laugh at.
Upcoming

• NAFEM Show  
  February 10-12, 2011  
  Orange County Convention Center  
  Orlando, FL

• North America Pizza & Ice Cream Show  
  February 20-21, 2011  
  Columbus Convention Center  
  Columbus, OH

• International Pizza Expo  
  March 1-3, 2011  
  Las Vegas Convention Center

• Canadian Restaurant & Foodservices Association Show  
  March 6-8, 2011  
  Direct Energy Centre  
  Toronto, ON

• New England Food Show  
  March 20-22, 2011  
  Boston Convention and Expo Center

• ApEx Show  
  April 3-4, 2011  
  Moncton, NB

• Northwest Foodservice Show  
  April 3-4, 2011  
  Oregon Convention Center  
  Portland, OR

• NRA Restaurant Hotel/Motel Show  
  May 21-24, 2011  
  McCormick Place  
  Chicago, IL

Next February We’re Bringing The Cold To Orlando.  
And it’s all in booth 868.
Oakhill Correctional Institute in Oregon, Wisconsin recently built a new facility housing a centralized kitchen to feed over 700 inmates and 50 employees. The floorplan called for a huge combination walk-in system designed by the food administrator to meet exacting food safety requirements.

“We have a lot of frozen meats and need to make sure they stay at the correct temperature even during preparation,” says Stephen Bremer, food administrator at Oakhill Correctional Institute.

For that reason, Bremer contacted Kavanaugh Restaurant Supply, Inc. to provide an intricate system with internal access to a separate freezer in the meat thawing room and a cooler in the working walk-in where meats were prepped. “This system assures our frozen meats move directly from freezer to thawing room, and back and forth from refrigerator to working walk-in prep area, all the while staying below room temperature.”

The 60 foot long inline walk-in system features five sections with exterior doors: working walk-in, meat thawing room, dairy, produce and freezer with direct access to the loading dock.

The working walk-in, equipped with two large viewing windows, sinks, tables and electricity, is kept between 40-45°F so workers are comfortable. A separate rear access walk-in cooler stores all the meats at 38°F prior to and after prep.

Next is the meat thaw room with rear door access to the storage freezer. This freezer runs 40 feet down the rest of the length of the inline system, behind the dairy and product coolers, all the way to the loading dock.

“Since these cooler sections share the wall of the freezer, we’re able to use the cold conducted through the freezer panels to help cool the space and reduce refrigeration load,” says Bremer.

The new building went up faster than expected. A good thing because Oakhill Correctional Institute was under the gun (no pun intended) to get the walk-in up and running. “Master-Bilt went above and beyond their manufacturing schedule and was able to supply the system in three weeks,” says Scott Granath, project manager with Kavanaugh Restaurant Supply.

Oakhill’s custom walk-ins feature diamondtread exterior kickplates and windows on the doors. Plus the six different sections were built to wrap around support columns.

“Master-bilt designed and built a really nice system that runs flawlessly,” states Bremer.