Commercial Refrigeration Equipment

Industry Study with Forecasts for 2018 & 2023

Study #3159 | May 2014 | $5100 | 262 pages

www.freedoniagroup.com
Table of Contents

EXECUTIVE SUMMARY

MARKET ENVIRONMENT
General ............................................... 4
Macroeconomic Environment.............. 5
Demographic Outlook ......................... 9
Personal Income & Expenditure Trends .... 13
Nonresidential Building Construction ...... 16
Institutional Construction ................. 17
Office & Commercial Construction ...... 18
Industrial Construction ....................... 19
Transportation & Other............... 20
Nonresidential Construction ........... 21
Retail Sales ........................................ 22
Food & Beverage Industry Trends ....... 24
Pricing ................................................. 28
Historical Market Trends ................. 28
Regulatory & Environmental Issues ..... 31
Technology ......................................... 35
World Commercial Refrigeration ....... 37
Equipment Trends ............................ 37
US Foreign Trade .............................. 38
Exports ............................................ 40
Imports ............................................. 41

MARKETS
General ............................................. 43
New & Aftermarket ............................. 46
Foodservice ....................................... 48
Foodservice Industry Overview ............ 49
Commercial Refrigeration ........................
Equipment Demand ........................ 51
Food & Beverage Distribution ............ 54
Food & Beverage Distribution Industry Overview .... 55
Commercial Refrigeration ........................
Equipment Demand ........................ 56
Food & Beverage Retail ..................... 59
Food & Beverage Retail Overview .......... 59
Commercial Refrigeration ........................
Equipment Demand ........................ 61

Food & Beverage Production ............... 63
Food & Beverage Production Overview .... 64
Commercial Refrigeration Equipment Demand ............. 66
Other Markets ....................................... 68

PRODUCTS
General ............................................. 70
Transportation Refrigeration Systems ..... 73
Shipping Container Systems ............. 77
Trailer Refrigeration .......................... 80
Truck Refrigeration Systems ............. 82
Refrigerators & Freezers .................. 84
Walk-In Refrigerators & Freezers ....... 86
Reach-In Refrigerators & Freezers ...... 89
Beverage Refrigeration Equipment ....... 92
Drinking Fountains .......................... 93
Soda Fountain Equipment ................. 95
Beverage Cooling & Dispensing Equipment .......... 97
Beer Dispensing Equipment .............. 99
Display Cases .................................. 101
Normal Temperature Display Cases .... 105
Low Temperature Display Cases ....... 107
Ice Machines .................................... 109
Refrigerated Vending Machines ......... 112
Other Equipment ............................... 115
Cryogenic Equipment ........................ 117
Liquid Chillers .................................. 120
All Other Commercial Refrigeration Equipment .......... 122
Refrigeration Equipment Parts ......... 124

INDUSTRY STRUCTURE
General ............................................. 126
Market Share ..................................... 129
Product Development & Manufacturing .... 131
Marketing & Distribution .................... 133
Mergers & Acquisitions ..................... 135
Cooperative Agreements .................... 138

COMPANY PROFILES
AHT Cooling Systems ................. 142
Air Products and Chemicals ............. 144
Ali SpA ........................................ 146
Bally Refrigerated Boxes ................. 151
Berkshire Hathaway .......................... 154
Coin Acceptors ............................... 156
Crane Company .............................. 158
Daikin Industries ............................ 160
Dover Corporation ............................ 162
Dunham–Bush Holding Berhad ............ 166
Elkay Manufacturing ....................... 168
Emerson Electric ............................. 170
GEA Group .................................... 175
Grindmaster-Cecilware Corporation .... 178
Hoshizaki Electric ............................ 181
Hussmann Corporation ..................... 185
Illinois Tool Works ......................... 189
IMI plc ......................................... 192
Ingersoll-Rand plc ........................... 193
Johnson Controls ............................. 196
Leer Incorporated ............................. 198
Lennox International ....................... 201
Manitowoc Company ....................... 204
Metalfrío Solutions .......................... 210
Mueller (Paul) Company .................... 213
Oasis International ......................... 216
Paloma Company ............................. 218
Panasonic Corporation ..................... 220
Parker-Hannifin Corporation ............. 223
Perlick Corporation ......................... 224
Polar King International ................... 227
Praxair Incorporated ......................... 228
Rainey Road Holdings ..................... 230
Sanden Corporation ......................... 233
Source Refrigeration & HVAC ............ 235
SPX Corporation .............................. 236
Standex International ....................... 238
Tecumseh Products ......................... 243
Thermo Fisher Scientific ................... 246
True Manufacturing ......................... 249
United Technologies ....................... 251
Whirlpool Corporation ..................... 254
Zero Zone ..................................... 256
List of Tables

EXECUTIVE SUMMARY
1 Summary Table........................................3

MARKET ENVIRONMENT
1 Macroeconomic Indicators ..................9
2 Population & Households...............13
3 Personal Consumption Expenditures 16
4 Nonresidential Building
   Construction Expenditures ..........17
5 Retail Sales.......................................24
6 Food & Beverage Shipments ..........27
7 Commercial Refrigeration Equipment
   Market, 2003-2013 ..................30
8 US Foreign Trade in Commercial
   Refrigeration Equipment .......39

MARKETS
1 Commercial Refrigeration Equipment
   Demand by Market .....................45
2 New & Aftermarket Demand for
   Commercial Refrigeration
   Equipment...............................48
3 Foodservice Revenues ................51
4 Foodservice Market for Commercial
   Refrigeration Equipment
   by Sector & Type ....................54
5 Food & Beverage Distribution
   Market for Commercial
   Refrigeration Equipment ..........58
6 Food & Beverage Retail Indicators ....60
7 Food & Beverage Retail
   Market for Commercial
   Refrigeration Equipment ..........63
8 Food & Beverage Shipments ..........66
9 Food & Beverage Production
   Market for Commercial
   Refrigeration Equipment ..........67
10 Other Markets for Commercial
    Refrigeration Equipment ...........69

PRODUCTS
1 Commercial Refrigeration Equipment
   Supply & Demand ....................72
2 Transportation Refrigeration System
   Supply & Demand ...................77
3 Shipping Container System Demand 79
4 Trailer Refrigeration
   Equipment Demand ..................82
5 Truck Refrigeration System Demand 84
6 Refrigerator & Freezer
   Supply & Demand ...................86
7 Walk-In Refrigerator & Freezer
   Supply & Demand ...................89
8 Reach-In Refrigerator & Freezer
   Supply & Demand ...................91
9 Beverage Refrigeration Equipment
   Supply & Demand ...................93
10 Drinking Fountain
    Supply & Demand .....................95
11 Soda Fountain Equipment
   Supply & Demand ...................97
12 Beverage Cooling & Dispensing
   Equipment Supply & Demand ....99
13 Beer Dispensing Equipment
   Supply & Demand ....................100
14 Display Case Supply & Demand ....104
15 Normal Temperature Display Case
   Supply & Demand ....................106
16 Low Temperature Display Case
   Supply & Demand ....................109
17 Ice Machine Supply & Demand ....112
18 Refrigerated Vending Machine
   Supply & Demand ....................115
19 Other Commercial Refrigeration
   Equipment Supply & Demand ....116
20 Cryogenic Equipment
   Supply & Demand ....................119
21 Liquid Chiller Supply & Demand ....122
22 All Other Commercial Refrigeration
   Equipment Supply & Demand ....123
23 Commercial Refrigeration Equipment
   Parts Supply & Demand .............125

INDUSTRY STRUCTURE
1 US Commercial Refrigeration
   Equipment Sales
   by Company, 2013 ...................128
2 Selected Acquisitions/Divestitures 137
3 Selected Cooperative Agreements. 139

List of Charts

MARKET ENVIRONMENT
1 Commercial Refrigeration Equipment
   Market, 2004-2013 ...................31
2 US Commercial Refrigeration
   Equipment Exports by
   Destination, 2013 ...............41
3 US Commercial Refrigeration
   Equipment Imports
   by Source, 2013 ...................42

MARKETS
1 Commercial Refrigeration Equipment
   Demand by Market, 2013 ........46

PRODUCTS
1 Commercial Refrigeration Equipment
   Demand by Product, 2013 ....73

INDUSTRY STRUCTURE
1 Commercial Refrigeration Equipment
   Market Share, 2013 ...............129
Advances in commercial refrigeration equipment demand will be driven by an improving capital investment climate and growth in the foodservice and food retail sectors.

US demand to grow over 3% annually through 2018

Demand for commercial refrigeration equipment in the US is expected to increase 3.1 percent per year through 2018 to $10.7 billion. Advances will be driven by an improving capital investment climate and expected growth in the foodservice and food retail sectors, both heavy users of commercial refrigeration equipment. Food industry participants will seek to reduce operating costs by improving the efficiency of their refrigeration equipment, helping to drive sales. Greater efficiency will stem from the incorporation of proximity sensors and light-emitting diode (LED) systems, and from further use of enclosed equipment.

Phaseout of R-22 to benefit new equipment sales

Environmental regulations regarding refrigerants play a key role in the commercial refrigeration industry. R-22, also known as HCFC-22, is currently set to be phased out by 2020 due to its ozone-depleting potential. Although commercial refrigeration equipment purchased after 2010 utilizes other refrigerants, many pre-2010 systems -- especially display cases and liquid chillers -- run on R-22. The phaseout is expected to significantly affect new refrigeration equipment sales well before it is completed. Many end users will replace their equipment as supplies of R-22 for recharging become scarce or too expensive.

HFCs are the most common alternative to HCFC refrigerants; however, HFCs have a high global warming potential. Since the typical grocery store has an average annual leak rate of about 25 percent of its refrigerant, there is concern within the industry that HFCs might see greater regulation as well. Natural refrigerants such as ammonia, carbon dioxide, and propane are among the most environmentally friendly alternatives.

Transportation refrigeration equipment to grow fastest, remain dominant

Transportation refrigeration equipment, which includes shipping containers, truck refrigeration systems, and trailer refrigeration systems, is the largest commercial refrigeration equipment segment and will account for the largest share of growth through 2018. Sales gains for shipping containers will be spurred by greater opportunities for US-based food producers in foreign markets. In addition, ongoing warehouse consolidation, which extends the distance from warehouses to many consumers, will boost demand for refrigerated trucks and trailers.

Shipments of commercial refrigeration equipment will approach $10 billion in 2018. Imports will continue to comprise a greater share of the US market, since imported products usually sell at a lower price, a key purchasing consideration. However, US-based firms will continue to benefit from rising domestic demand, especially in food retail applications where products are often custom-made.
Demand for trailer refrigeration equipment is forecast to expand at a 5.4 percent annual rate through 2018 to $950 million. Growth will slow compared to the double-digit advances recorded during the 2008-2013 period, as demand moderates following a significant increase in sales that occurred in 2011 and 2012. However, continuing food and beverage shipment gains will buoy demand for more trailers to carry that food. As a more centralized system of production and distribution arises, there will be greater demand for refrigerated delivery fleets to transport food products from production site to end users since the distance traveled may increase. Furthermore, innovations in higher value units will boost sales in value terms.

Trailer refrigeration systems are by far the most volatile transportation refrigeration product segment. In general, during times of economic prosperity, sales of trailer refrigeration units experience solid growth; however, when the economic outlook is bleak -- such as during the economic recessions of 2001-2002 and 2007-2009 -- sales of trailer refrigeration units are particularly affected. For instance, 2003 was a recovery year for sales following the 2001-2002 recession, while 2008 saw sales fall as the US was mired in its most recent recession. Retail sales of heavy-duty trucks, which are one of the leading users of trailer refrigeration equipment, experienced similar swings during this period. These sales are a good indicator of the health of the trailer refrigeration equipment market because trailer refrigeration systems are primarily installed on heavy trucks.

The volatility of trailer refrigeration system product demand stems from the large amount of capital required to purchase a refrigerated trailer and/or the refrigeration unit. In addition, trailers are frequently used in long-haul applications, and during economic downturns, the distance traveled may increase. Furthermore, innovations in higher value units will boost sales in value terms.

Table IV-1

<table>
<thead>
<tr>
<th>Item</th>
<th>2003</th>
<th>2008</th>
<th>2013</th>
<th>2018</th>
<th>2023</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food &amp; Beverage Shipments (bil $)</td>
<td>532.7</td>
<td>703.1</td>
<td>820.0</td>
<td>943.0</td>
<td>1097.0</td>
</tr>
<tr>
<td>$ equipment/000$ food &amp; beverage</td>
<td>12.6</td>
<td>11.1</td>
<td>11.2</td>
<td>11.3</td>
<td>11.2</td>
</tr>
<tr>
<td>Commercial Refrig Equip Demand</td>
<td>6695</td>
<td>7790</td>
<td>9145</td>
<td>10650</td>
<td>12300</td>
</tr>
<tr>
<td>Transport Refrigeration Systems</td>
<td>1270</td>
<td>1450</td>
<td>2040</td>
<td>2515</td>
<td>3025</td>
</tr>
<tr>
<td>Refrigerators &amp; Freezers</td>
<td>1265</td>
<td>1495</td>
<td>1650</td>
<td>1825</td>
<td>2000</td>
</tr>
<tr>
<td>Beverage Refrigeration</td>
<td>870</td>
<td>1000</td>
<td>1100</td>
<td>1250</td>
<td>1350</td>
</tr>
<tr>
<td>Display Cases</td>
<td>720</td>
<td>780</td>
<td>875</td>
<td>1000</td>
<td>1160</td>
</tr>
<tr>
<td>Ice Machines</td>
<td>500</td>
<td>620</td>
<td>700</td>
<td>800</td>
<td>900</td>
</tr>
<tr>
<td>Vending Machines</td>
<td>450</td>
<td>425</td>
<td>410</td>
<td>440</td>
<td>475</td>
</tr>
<tr>
<td>Other Equipment</td>
<td>1090</td>
<td>1330</td>
<td>1560</td>
<td>1830</td>
<td>2190</td>
</tr>
<tr>
<td>Parts</td>
<td>530</td>
<td>690</td>
<td>810</td>
<td>990</td>
<td>1200</td>
</tr>
<tr>
<td>- net imports</td>
<td>108</td>
<td>867</td>
<td>740</td>
<td>990</td>
<td>1300</td>
</tr>
<tr>
<td>Commercial Refrigeration Equipment Shpts (mil 2009$)</td>
<td>7693</td>
<td>6968</td>
<td>7590</td>
<td>7970</td>
<td>7848</td>
</tr>
</tbody>
</table>
Zero Zone Incorporated
110 North Oakridge Drive
North Prairie, WI  53153
262-392-6400
http://www.zero-zone.com

Annual Sales:  $75 million (estimated)
Employment:  280 (estimated)
Key Products:  medium- and low-temperature reach-in merchandisers, and refrigeration systems

Zero Zone manufactures refrigerated display case equipment for use in supermarkets, convenience stores and drug stores. The privately held company also manufactures refrigeration and electrical distribution systems for use in ice arenas, cold storage industrial applications and supermarkets.

The Company participates in the US commercial refrigeration industry through the production of medium- and low-temperature reach-in merchandisers, and refrigeration systems. For example, Zero Zone’s medium-temperature reach-in refrigerators comprise models with 63-, 68-, and 72-inch-tall doors, as well as CRYSTAL MERCHANDISER types with 74-inch-tall doors. Its CRYSTAL MERCHANDISER units feature proprietary COOLVIEW doors for better product visibility, and are available in 4-, 6-, 8-, and 12-foot lengths. The 8- and 12-foot lengths were introduced in April 2013. In March 2014, Zero Zone expanded the CRYSTAL MERCHANDISER product line with the introduction of low-temperature freezer models. These units feature 30-inch-by-74-inch doors, and are suitable for storing ice cream and other frozen foods. The Company also produces HYBRID display case freezers, which integrate Zero Zone’s remote reach-in case design with

### Sample Profile

**Zero Zone Incorporated**

- **Address:** 110 North Oakridge Drive, North Prairie, WI 53153
- **Phone:** 262-392-6400
- **Website:** http://www.zero-zone.com

- **Annual Sales:** $75 million (estimated)
- **Employment:** 280 (estimated)
- **Key Products:** Medium- and low-temperature reach-in merchandisers, and refrigeration systems

Zero Zone manufactures refrigerated display case equipment for use in supermarkets, convenience stores and drug stores. The privately held company also manufactures refrigeration and electrical distribution systems for use in ice arenas, cold storage industrial applications and supermarkets.

The Company participates in the US commercial refrigeration industry through the production of medium- and low-temperature reach-in merchandisers, and refrigeration systems. For example, Zero Zone’s medium-temperature reach-in refrigerators comprise models with 63-, 68-, and 72-inch-tall doors, as well as CRYSTAL MERCHANDISER types with 74-inch-tall doors. Its CRYSTAL MERCHANDISER units feature proprietary COOLVIEW doors for better product visibility, and are available in 4-, 6-, 8-, and 12-foot lengths. The 8- and 12-foot lengths were introduced in April 2013. In March 2014, Zero Zone expanded the CRYSTAL MERCHANDISER product line with the introduction of low-temperature freezer models. These units feature 30-inch-by-74-inch doors, and are suitable for storing ice cream and other frozen foods. The Company also produces HYBRID display case freezers, which integrate Zero Zone’s remote reach-in case design with

### Table III-4

<table>
<thead>
<tr>
<th>Item</th>
<th>2003</th>
<th>2008</th>
<th>2013</th>
<th>2018</th>
<th>2023</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eating &amp; Drinking Establishments (000)</td>
<td>514</td>
<td>574</td>
<td>610</td>
<td>646</td>
<td>668</td>
</tr>
<tr>
<td>$ equipment/establishment</td>
<td>3930</td>
<td>4120</td>
<td>4344</td>
<td>4652</td>
<td>4955</td>
</tr>
<tr>
<td>Foodservice Refrigeration Equipment</td>
<td>2365</td>
<td>2650</td>
<td>3005</td>
<td>3310</td>
<td></td>
</tr>
<tr>
<td>By Sector:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restaurants &amp; Bars</td>
<td>1614</td>
<td>1892</td>
<td>2123</td>
<td>2425</td>
<td>2690</td>
</tr>
<tr>
<td>Other</td>
<td>406</td>
<td>473</td>
<td>527</td>
<td>580</td>
<td>620</td>
</tr>
<tr>
<td>By Type:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refrigerators &amp; Freezers</td>
<td>835</td>
<td>960</td>
<td>1070</td>
<td>1180</td>
<td>1285</td>
</tr>
<tr>
<td>Beverage Refrigeration</td>
<td>670</td>
<td>775</td>
<td>870</td>
<td>1000</td>
<td>1085</td>
</tr>
<tr>
<td>Ice Machines</td>
<td>320</td>
<td>395</td>
<td>445</td>
<td>510</td>
<td>570</td>
</tr>
<tr>
<td>Other</td>
<td>195</td>
<td>235</td>
<td>265</td>
<td>315</td>
<td>370</td>
</tr>
<tr>
<td>% foodservice</td>
<td>30.2</td>
<td>30.4</td>
<td>29.0</td>
<td>28.2</td>
<td>26.9</td>
</tr>
<tr>
<td>Commercial Refrigeration Equipment</td>
<td>6695</td>
<td>7790</td>
<td>9145</td>
<td>10650</td>
<td>12300</td>
</tr>
</tbody>
</table>

Copyright 2014 The Freedonia Group, Inc.
ORDER INFORMATION
Five Convenient Ways to Order

ONLINE: www.freedoniagroup.com
MAIL: Print out and complete the order form and send to The Freedonia Group (see address at the bottom of this form)
PHONE: Call toll free, 800.927.5900 (US) or +1 440.684.9600
FAX: +1 440.646.0484 (US)
EMAIL: info@freedoniagroup.com

Free Handling & Shipping
There is NO charge for handling or UPS shipping in the US. Expect delivery in 3 to 5 business days. Outside the US, Freedonia provides free airmail service. Express delivery is available at cost.

Orders Outside of the US
Checks must be made payable in US funds, drawn against a US bank and mailed directly to The Freedonia Group. For wire transfers please contact our customer service department at info@freedoniagroup.com. Credit cards accepted.

Credit Card Orders
For convenience, Freedonia accepts American Express, MasterCard or Visa. Credit card purchases must include account number, expiration date and authorized signature.

Save 15%
If you order three (3) different titles at the same time, you can receive a 15% discount. If your order is accompanied by a check or wire transfer, you may take a 5% cash discount (discounts do not apply to Corporate Use Licenses).

Corporate Use License
Now every decision maker in your organization can act on the key intelligence found in all Freedonia studies. For an additional $2600, companies receive unlimited use of an electronic version (PDF) of the study. Place it on your intranet, e-mail it to coworkers around the world, or print it as many times as you like.

Click here to learn more about the Corporate Use License

ORDER FORM

Commercial Refrigeration Equipment .............. $5100

☐ Corporate Use License (add to study price) * + $2600
___ Additional Print Copies @ $600 each *

Total (including selected option) $__________

☐ Enclosed is my check (5% discount) drawn on a US bank and payable to The Freedonia Group, Inc., in US funds (Ohio residents add 8% sales tax)

☐ Bill my company ☐ American Express ☐ MasterCard ☐ Visa

Credit Card #

MM  YY

Expiration Date

Name ____________________________
Title ______________________________
Company __________________________
Division __________________________
Street _____________________________
City/State/Zip _______________________
Country ____________________________
Phone _____________________________
Fax ________________________________
Email ______________________________

☐ Individual Use License Agreement
The undersigned hereby represents that the above captioned study will be used by only __ individual(s) who are employees of the company and that the study will not be loaded on a network for multiple users. In the event that usage of the study changes, the Company will promptly notify Freedonia of such change and will pay to Freedonia the appropriate fee based on Freedonia’s standard fee schedule then in effect. Note: Entire company corporate use license, add $2600; one additional user, add $600; two additional users, add $1200; three additional users, add $1800.

☐ Corporate Use License Agreement
The above captioned study may be stored on the company’s intranet or shared directory, available to company employees. Copies of the study may be made, but the undersigned represents that distribution of the study will be limited to employees of the company.

Signature ___________________________________________________________________

☐ Please check appropriate option and sign below to order an electronic version of the study.

Signature ___________________________________________________________________

* The Freedonia Group, Inc. 767 Beta Drive • Cleveland, OH • 44143-2326 • USA • Web site: www.freedoniagroup.com
Tel US: 800.927.5900 or +1 440.684.9600 • Fax: +1 440.646.0484 • e-mail: info@freedoniagroup.com
Page 7
About The Freedonia Group

The Freedonia Group, Inc., is a leading international industry market research company that provides its clients with information and analysis needed to make informed strategic decisions for their businesses. Studies help clients identify business opportunities, develop strategies, make investment decisions and evaluate opportunities and threats. Freedonia research is designed to deliver unbiased views and reliable outlooks to assist clients in making the right decisions. Freedonia capitalizes on the resources of its proprietary in-house research team of experienced economists, professional analysts, industry researchers and editorial groups. Freedonia covers a diverse group of industries throughout the United States, the emerging China market, and other world markets. Industries analyzed by Freedonia include:

- Chemicals
- Plastics
- Life Sciences
- Packaging
- Building Materials
- Security & Electronics
- Industrial Components & Equipment
- Automotive & Transportation Equipment
- Household Goods
- Energy/Power Equipment

Freedonia Custom Research

Freedonia Custom Research delivers the same high quality, thorough and unbiased assessment of an industry or market as an industry study. Since the research initiative is based upon a company’s specific needs, companies harness Freedonia’s research capabilities and resources to answer unique questions. When you leverage the results of a Freedonia Custom Research engagement, you are able to obtain important answers to specific questions and issues associated with: mergers and acquisitions, new product launches/development, geographic expansion, entry into new markets, strategic business planning, and investment and funding decisions.

Freedonia Custom Research is ideal for companies seeking to make a strategic difference in the status quo and focus on future business growth. Working side by side with clients, Freedonia’s team is able to define a research project that is custom-tailored to answer specific questions and provide the basis from which a company can make informed business decisions.