Elite Software — REFRIG

2700 Arrington Road College Station, Texas 77845 (800) 648-9523

REFRIG OVERVIEW

Refrig quickly calculates the maximum refrigeration load in btu's or watts per 24 hour period for all types of refrigeration applications. Refrig is able to work in both English and metric units and has provision for all types of loads including: roofs, walls, partitions, glass doors, floors, products, containers, infiltration, lights, equipment, people, defrost, compressor run-time, and more. There is even provision for a safety factor load. Design weather data is built-in and automatically looked up for hundreds of cities around the world. Product loads are easily accommodated as Refrig contains a built-in library of products (fruits, vegetables, meats, medical products, etc.). All the designer has to do is enter the product name and quantity to get automatic product cooling, freezing, sub-cooling, and respiration loads. Ripening of fruits and vegetables is accounted for. Effects of the containers that products are loaded in are accounted for as well. All types of boxes, cartons, tins, crates, and pallets are provided for along with the specific heat values of those containers. After all loads have been computed, the designer can specify the refrigerant type and temperature difference desired so that an appropriate evaporator coil and condensing unit can be quickly selected from the built-in library of coils and condensing units. Refrig allows for multiple evaporator coils to be applied to single condensing units if so desired. Refrig comes with over 400 coils and 400 condensing units from various manufacturers such as Bohn, Carrier, Krack, Witt, Russell, and others. Designers are able to add additional manufacturers' coils and condensers and all the appropriate data for each model. Up to 1,000 coils and condensing units can be stored per manufacturer. Numerous color presentation quality reports including a title page, box summary and detailed loads, pie charts, and equipment selections can be previewed and printed.

DEMONSTRATION VERSION

If you would like to evaluate Refrig in further detail, you can ***download free of charge*** a functional demo of Refrig from Elite's web site, **www.elitesoft.com** Alternately, a demo CD can be ordered directly from Elite Software. Functional demonstration versions can be "unlocked" into a full version.

REFRIG FEATURES

- Calculates 24 Hour Total Refrigeration Loads
- Appropriate for All Refrigeration Applications
- Uses Exact ASHRAE Procedures
- Built-in Design Weather Data for over 1,900 Cities
- Accounts For All Types of Loads Including Exterior, Internal, Product, Defrost, Compressor Run-time, etc.
- Built-in Library of Product Load Data
- Built-in Library of Container Data for Crates, Boxes, etc.
- Continuous Display of Load Totals On Input Screens
- Automatic Look-Up of Design Weather Data
- Includes Built-in Library of Coils & Condensing Units
- Allows Mixing & Matching of Coils & Condensing Units
- Comprehensive and Manually Verifiable Reports
- Works in both metric and English Units
- ***No Copy Protection Hassles!***

CALCULATION METHOD

The Refrig program performs calculations in accordance with the ASHRAE Handbook of Fundamentals and the ASHRAE Refrigeration Handbook. All necessary product and material data are automatically looked up. Computed output results can be easily verified by hand.

PROGRAM INPUT

The Refrig Program has all the standard Windows features including toolbars and hyper linked help. Refrig uses full screen editing features that provide a simple "fill in the blank" input procedure. All input data is checked at the time of entry so that no improper data can be entered. Three types of data are requested: general project data, box load data, and coil/ condensing unit data. The general project data includes the project name and location, the client name and address, and the outdoor design data. The box data includes all the envelope data, (roof, wall, and glass) refrigerated products, people, equipment, lighting, defrost, infiltration, and compressor run-time data. There are built-in typical insulated wall and roof materials to select from. In addition, the desired refrigerated space conditions must be given. The product data is automatically looked up from the ASHRAE Refrigeration Handbook and hundreds of products are provided for. As appropriate, each product has high and low specific heat values, freezing point temperature, latent heat of freezing, and respiration heat values at 32, 40, 50, and 60F. Most of the box load data also has timing considerations. For example, people can be specified as being in the space a certain number of hours while lights may be on for a different number of hours. Explicit control on the timing of loads allows the computation of a very precise 24 hour load total. Condensing unit and coil data include such items as model number, manufacturer, capacity, refrigerant type, cfm, air throw, fins per inch, and more. Data for over 400 coils and condensing units are included with REFRIG, and there is provision for defining up to 1,000 units per coil and condensing unit manufacturer.

SYSTEM REQUIREMENTS

Refrig is a Windows program and will run on any computer with Windows 2000 or higher including Windows 7 and 8.

PROGRAM OUTPUT

The Refrig program provides numerous color presentation quality reports including a title page, box summary and detailed loads, pie charts, and equipment selections. Any combination of detailed and summary reports can be selected for printing. All reports reflect the input data that caused the calculated results. Shown here are some of the many reports that can be printed.

Refrig - Refrigeration Box Loads Program
Miller Refrigeration Company
Gray, ME 04039
Elite Software Development, Inc.
EXAMPLE PROJECT
Page 2

Refrig Box Summary Loads

Box Load Description	Area Quan	Open Hours	Required Btuh Cap	24 Hour BTU Load	% Total Load
North Wall - 8 x 12 - Light	96	24	229	5,495	1.4
East Wall - 8 x 8 - Light	64	24	164	3,940	1.0
Partition - 8 x 12	96	24	173	4,147	1.1
Partition - 8 x 8	64	24	115	2,765	0.7
Roof - 8 x 12- Light	96	24	268	6,428	1.7
Floor - 8 x 12	96	24	151	3,629	0.9
People	2	2	150	3,600	0.9
Light	96	15	205	4,915	1.3
Produce, Example	216	5.00	1,720	41,280	10.6
Meat, Example	1	5.00	3	72	0.0
Soups/Stocks, Example	50	2.00	1,463	35,100	9.0
Bread Products, Example	100	5.00	630	15,120	3.9
Miscellaneous, Example	100	5.00	500	12,000	3.1
Infiltration	1,063	1.00	4,060	97,450	25.0
Compressor Runtime		16	4,915	117,971	30.3
Safety Load	10	24	1,475	35,391	9.1
Total Refrig Box Loads			16,221	389,303	100.0

Refrig - Refrigeration Box Loads Program
Miller Refrigeration Company
Gray, ME 04039
Elite Software Development, Inc.
EXAMPLE PROJECT
Page 3

Refrig Box Summary Loads (cont'd)

Box Load Description	Area Quan	Required Btuh Cap	24 Hour BTU Load	% Total Load
Transmission	512	1,100	26,404	6.8
Internal		355	8,515	2.2
Product And Container	467	4,316	103,572	26.6
Infiltration	1,063	4,060	97,450	25.0
Compressor Runtime	16	4,915	117,971	30.3
Safety Load	10	1,475	35,391	9.1
Total Refrig Box Loads		16,221	389,303	100.0

Check Figures

Total Refrigerated Area:	96	Square Feet
Total Refrigerated Volume:	768	Cubic Feet
Total Envelope Area:	512	Square Feet
Total Weight of Products:	451	Pounds
Total Weight of Containers:	16	Pounds
Weight of Products per Square Feet:	4.9	Pounds per Square Feet
Refrigerated Area per Ton:	71.0	Square Feet per Ton
Required 24 Hour Load:	389,303	BTU
Required Tonnage (16 Hour Runtime):	1.35	Tons
Required Capacity (16 Hour Runtime):	16,221	Btuh

Refrig - Refrigeration Box Loads Program
Miller Refrigeration Company
Gray, ME 04039
Elite Software Development, Inc.
EXAMPLE PROJECT
Page 4

Refrig Box Detailed Loads

Transmission Loads Description	Area (SF)	--U-- Factor	Temp Diff.	Hourly BTU Load	24 Hour BTU Load
North Wall - 8 x 12 - Light	96	0.045	53	229	5,495
East Wall - 8 x 8 - Light	64	0.045	53	164	3,940
Partition - 8 x 12	96	0.045	40	173	4,147
Partition - 8 x 8	64	0.045	40	115	2,765
Roof - 8 x 12 - Light	96	0.045		268	6,428
Floor - 8 x 12	96	0.045	35	151	3,629
Total Transmission Loads				1,100	26,404

Internal Loads Description	Unit Quan.	Load Factor	Operating Hours	24 Hour BTU Load
People	2	900	2	3,600
Motor	0	0	0	0
Defrost	135	0	0	0
Light	96	1	15	4,915
Equipment	96	1	0	0
Other Loads	0		0	0
Total Internal Loads				8,515

Refrig - Refrigeration Box Loads Program
Miller Refrigeration Company
Gray, ME 04039
Elite Software Development, Inc.
EXAMPLE PROJECT
Page 1

General Project Data Input

General Project Information

Project title:	EXAMPLE PROJECT
Designed by:	YOUR NAME
Project date:	12-28-2008
Project location:	BUFFALO, NEW YORK, USA
Project file name:	C:\Users\Bill Smith\Documents\Elite Software\Refrig 3 Projects\Sample.ref
Box name:	WALK-IN COOLER
Box dimensions (LxWxH):	8 X 12 X 8 Feet
Client name:	POPULAR RESTAURANT
Client address:	1234 FIFTH AVENUE
Client city:	NEW YORK, NEW YORK
Client phone:	979-690-9420
Client fax:	979-690-9425
Company name:	Joe's Heating And Air
Company representative:	My Rep
Company address:	Comp Address
Company city:	Comp City State
Company phone:	Comp Phone
Company fax:	Comp Fax

Design Conditions

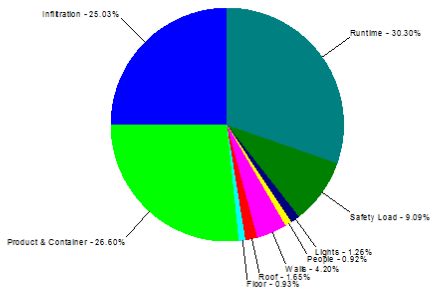
Weather data reference city:	BUFFALO, NEW YORK, USA	
Location latitude:	43	Degrees North
Location elevation:	704.99	Feet
Outdoor design dry bulb temperature:	88	Degrees
Outdoor design wet bulb temperature:	71	Degrees
Refrigerated box dry bulb temp:	35	Degrees
Refrigerated box relative humidity:	85	Percent
Box surround and infil. air dry bulb temp:	80	Degrees
Box surround and infil. air wet bulb temp:	69	Degrees
Compressor runtime per 24 hours:	16	Hours
Safety factor:	10	Percent

Refrig - Refrigeration Box Loads Program
Miller Refrigeration Company
Gray, ME 04039
Elite Software Development, Inc.
EXAMPLE PROJECT
Page 6

Refrig Box Loads Pie Charts

Total Box Load = 389,303 BTU

Detailed Loads Pie Chart



Summary Loads Pie Chart