

## Coldroom Refrigeration Load Computation

**Date:** Monday, 1st April 2013

**File:** Fresh Meat Chiller - Johor Bahru.cwc

**Site location:** Malaysia, Johor Bahru.

**Latitude:** 1° 30' N

**Longitude:** 103° 42' E

**Altitude:** 5 metres above sea level.

**Calculation for:** 21st day of June. 2:45pm

**Reference:** Fresh Meat Chiller - Johor Bahru

**Ambient:** DB 33.9°C; WB 27.2°C; RH 60%

**Internal Floor Area:** 318.71m<sup>2</sup>

**Room:** DB -2.0°C; WB -2.2°C; RH 95%

**Internal Room Volume:** 836.61m<sup>3</sup>

**Dimensions:** *(see room ideogram on last page)*

Wall	Length	Height	Thickness	Facing	Shading	Ground	Colour <i>f</i>	Grnd. <i>f</i>	Solar exp.
1	6.250	2.750	0.100m	E	100%	0%	0.95	0.23	No
2	15.750	2.750	0.100m	N	100%	0%	0.95	0.23	No
3	16.000	2.750	0.100m	W	100%	0%	0.95	0.23	No
4	20.000	2.750	0.100m	S	100%	0%	0.95	0.23	No
5	5.000	2.750	0.100m	SSE	100%	0%	0.95	0.23	No
6	6.750	2.750	0.100m	E	100%	0%	0.95	0.23	No
7	8.250	2.750	0.100m	N	100%	0%	0.95	0.23	No

**Construction:**

Wall	Material	'U'	TD K	Gain
1	Polyurethane foam	0.240	35.9	0.148
2	Polyurethane foam	0.240	35.9	0.373
3	Polyurethane foam	0.240	35.9	0.379
4	Polyurethane foam	0.240	35.9	0.411
5	Polyurethane foam	0.240	35.9	0.118
6	Polyurethane foam	0.240	35.9	0.160
7	Polyurethane foam	0.240	35.9	0.195
<b>Total Wall Gain (not including windows or doors):</b>				<b>1.785 kW</b>

**Doors:**

Door	Wall	Type	Area	Colour <i>f</i>	Gain
1	4	Polyurethane (75 mm)	7.31	0.95	0.084
<b>Total Door Gain:</b>					<b>0.084 kW</b>

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### Floor:

Description	'U'	TD K	Location	Gain
Concrete block, heavyweight	19.000	19.0	Ground	12.743
<b>Total Floor Gain:</b>				<b>12.743 kW</b>

### Ceiling:

Description	'U'	TD K	Temp. Above	Gain
Polyurethane foam	0.192	35.9	Ambient	2.197
<b>Total Ceiling Gain:</b>				<b>2.197 kW</b>

### Infiltration:

<b>Usage:</b> Normal (acf=1.0).			
<b>Air change/day;</b>	<b>Litres per second;</b>	<b>Cubic metres per min;</b>	<b>Cubic metres per hour.</b>
2.318	22.442	1.346	80.8
<b>Sensible Gain: 2.879 kW</b>		<b>Latent Gain: 0.000 kW</b>	<b>Total Gain: 2.879 kW</b>

### Product:

<b>Product:</b>	All Meats.		
<b>Entry temperature:</b>	5.00 °C		
<b>Exit temperature:</b>	-2.00 °C		
<b>Freezing temperature:</b>	-2.10 °C		
<b>Reduction cycle:</b>	24 hours.		
<b>Turnover:</b>	50.00 kg/m <sup>3</sup> /cycle. Total of 41,830.4 kilograms/cycle.		
<b>Heat above freezing:</b>	3.00 kJ/kg K	<b>Gain:</b>	10.167 kW
		<b>Total Gain:</b>	10.167 kW
<b>Total Product Gain:</b>			<b>10.167 kW</b>

### Personnel:

No.	Activity	People	Hours	Sensible	Latent	Total
1	Moderate work	4	2.0	0.042	0.066	0.107
<b>Sensible Gain: 0.042 kW</b>		<b>Latent Gain: 0.066 kW</b>		<b>Total Gain: 0.107 kW</b>		

### Lighting:

No.	Description	Qty	Hours	Rated Watts	Total
1	Fluorescent	32	2.0	40	0.128
<b>Total Gain:</b>					<b>0.128 kW</b>

### Other loads:

No.	Description	Qty	Pwr.	Hours	Sensible	Latent	Total
1	Fork Truck (22 kW electric)	1	25%	2	0.458	0.000	0.458
<b>Sensible Gain: 0.458 kW</b>		<b>Latent Gain: 0.000 kW</b>		<b>Total Gain: 0.458 kW</b>			

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### Total Refrigeration Load:

	<b>Sensible</b>	<b>Latent</b>	<b>Total</b>
<b>Primary Load:</b>	<b>30.484 kW</b>	<b>0.066 kW</b>	<b>30.549 kW</b>
<b>Running Load:</b>			<b>10.183 kW</b>
<b>Cooler Fan Load:</b>			<b>3.055 kW</b>
<b>Total Ref. Load:</b>			<b>43.788 kW</b>

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**Objects:** *(see room ideogram on last page)*

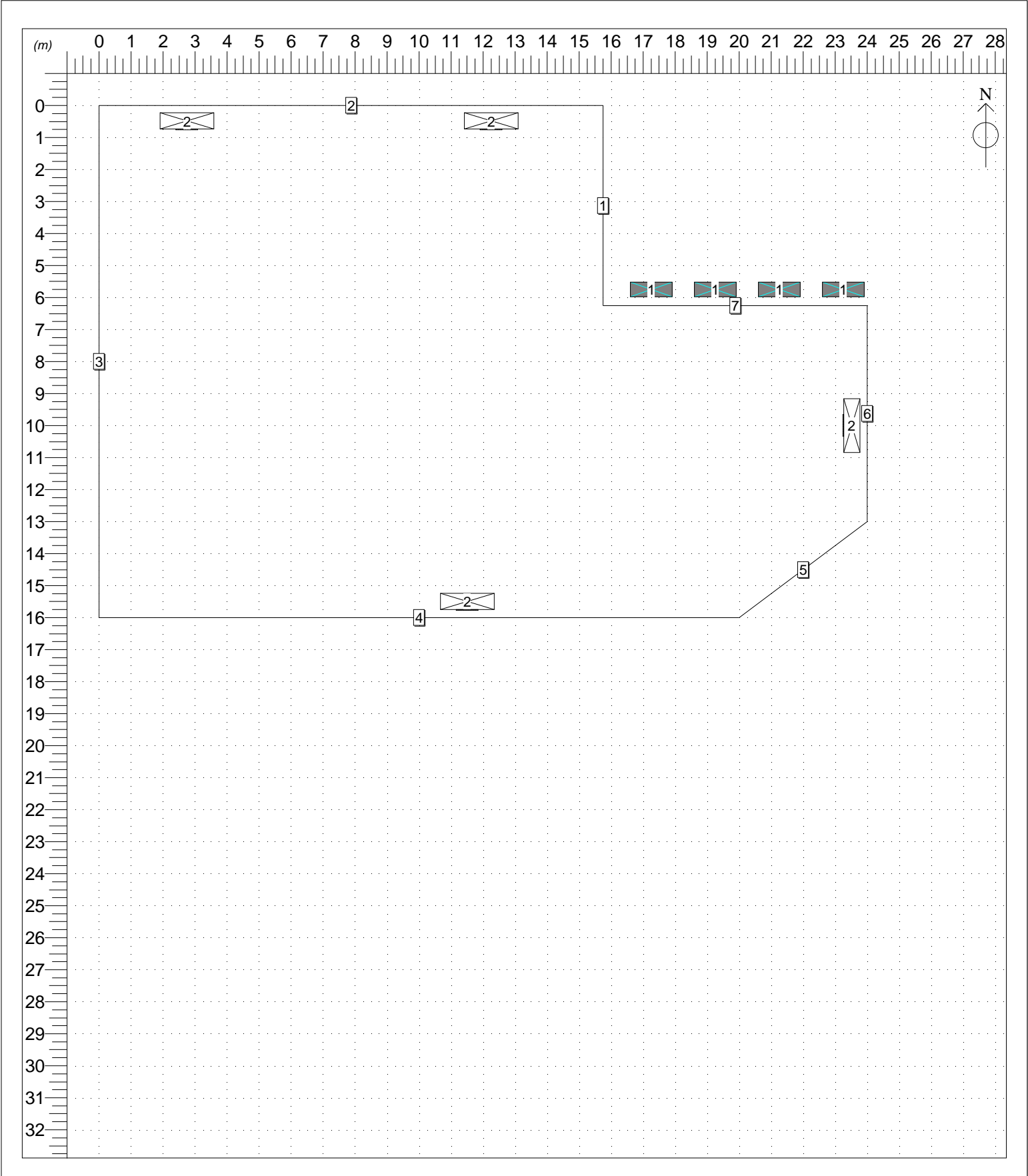
Code	Group	Description	Room	Qty	Price	Load
1	-	HUM245Z0312	-	4	-	-
2	-	KMe95-4L-1PH	1	4	-	-
<b>Totals:</b>				<b>8</b>	-	-

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## Room Ideogram:



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## Wall Ideograms:

Room 1, Wall 4:

20m



2.75m