

RCCL Majesty Of The Seas				Date:	May-06	Rev:	1	Design by:		Page:	1/1																																								
Cooling/Heat Load & HVAC Air Flow Calculations								<div> <div>SUMMER</div> <div>WINTER</div> </div>																																											
Plant: 0 Size: <table> <tr> <td>A</td> <td>33 m</td> <td>1089 m²</td> </tr> <tr> <td>B</td> <td>33 m</td> <td>2395.8 m³</td> </tr> <tr> <td>H</td> <td>2.2 m</td> <td>2395.8 Rvs</td> </tr> </table>								A	33 m	1089 m ²	B	33 m	2395.8 m ³	H	2.2 m	2395.8 Rvs	System : CHT/ALT Room: DK MFZ 11 5				Conditions: <table> <tr> <td>d.b. °C</td> <td>w.b. °C</td> <td>u.r. %</td> <td>x gr/kg</td> <td>.b. °C</td> <td>x gr/kg</td> </tr> <tr> <td>35</td> <td></td> <td>80</td> <td>28.9</td> <td>-5</td> <td>2</td> </tr> <tr> <td>24</td> <td></td> <td>55</td> <td>9.4</td> <td>22</td> <td>2</td> </tr> <tr> <td>11</td> <td></td> <td></td> <td>19.5</td> <td>27</td> <td>0</td> </tr> </table>				d.b. °C	w.b. °C	u.r. %	x gr/kg	.b. °C	x gr/kg	35		80	28.9	-5	2	24		55	9.4	22	2	11			19.5	27	0			
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SUMMER LOAD								Peak Load																																											
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Item	Area or Quantity	Sun Gain Temp. Diff	Factor	W																																															
SOLAR GAIN - glass								People: 324 Minimum Air Changes/h: 6 Calculated Air Changes/h: 11																																											
<table> <tr> <td>window (w/shading)</td> <td>63 m²</td> <td>x 240</td> <td>x 1</td> <td>= 15120</td> </tr> <tr> <td>window glare</td> <td>63 m²</td> <td>x 100</td> <td>x 1</td> <td>= 6300</td> </tr> <tr> <td>window</td> <td>0 m²</td> <td>x 350</td> <td>x 1</td> <td>= 0</td> </tr> <tr> <td>window</td> <td>0 m²</td> <td>x 350</td> <td>x 1</td> <td>= 0</td> </tr> <tr> <td>skylight</td> <td>0 m²</td> <td>x</td> <td>x</td> <td>= 0</td> </tr> </table>								window (w/shading)	63 m ²	x 240	x 1	= 15120	window glare	63 m ²	x 100	x 1	= 6300	window	0 m ²	x 350	x 1	= 0	window	0 m ²	x 350	x 1	= 0	skylight	0 m ²	x	x	= 0	WINTER LOAD																		
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TRANSMISSION GAIN - glass								<table> <tr> <th>Factor K</th> <th>Temp Diff. (Δ)</th> <th>Heating Load (W)</th> <th>%</th> <th>W</th> </tr> </table>				Factor K	Temp Diff. (Δ)	Heating Load (W)	%	W																																			
Factor K	Temp Diff. (Δ)	Heating Load (W)	%	W																																															
<table> <tr> <td>window (twin glass)</td> <td>0 m²</td> <td>x 21</td> <td>x 2.8</td> <td>= 0</td> <td>2.8 x 27 = 0</td> <td>+</td> <td>= 0</td> </tr> <tr> <td>window</td> <td>0 m²</td> <td>x 21</td> <td>x 2.8</td> <td>= 0</td> <td>2.8 x 27 = 0</td> <td>+</td> <td>= 0</td> </tr> <tr> <td>window</td> <td>126 m²</td> <td>x 11</td> <td>x 5.7</td> <td>= 7900.2</td> <td>6.5 x 27 = 0</td> <td>+</td> <td>= 0</td> </tr> <tr> <td>window</td> <td>0 m²</td> <td>x 11</td> <td>x 6.5</td> <td>= 0</td> <td>6.5 x 27 = 0</td> <td>+</td> <td>= 0</td> </tr> <tr> <td>skylight</td> <td>0 m²</td> <td>x</td> <td>x</td> <td>= 0</td> <td>x = 0</td> <td>+</td> <td>= 0</td> </tr> </table>								window (twin glass)	0 m ²	x 21	x 2.8	= 0	2.8 x 27 = 0	+	= 0	window	0 m ²	x 21	x 2.8	= 0	2.8 x 27 = 0	+	= 0	window	126 m ²	x 11	x 5.7	= 7900.2	6.5 x 27 = 0	+	= 0	window	0 m ²	x 11	x 6.5	= 0	6.5 x 27 = 0	+	= 0	skylight	0 m ²	x	x	= 0	x = 0	+	= 0				
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skylight	0 m ²	x	x	= 0	x = 0	+	= 0																																												
SOLAR & TRANSMISSION GAIN - dk & blkd								Infiltrat ⁿ (1 Air Chng * δT * Air Vol Adj.) = 17762																																											
blkd light blkd (shg) 0 m ² x 16 x 0.85 = 0 dark blkd (shg) 0 m ² x 39 x 0.85 = 0								0.85 x 27 = 0 0.85 x 27 = 0 0.85 x 27 = 0																																											
dk light dk (shg) 115 m ² x 11 x 0.85 = 1075.25 dark dk (shg) 345 m ² x 16 x 0.85 = 4692								x 27 = 0 0.85 x 27 = 0 0.85 x 27 = 0																																											
TRANSMISSION GAIN - internal dk & blkd																																																			
technical rm blkd 0 m ² x 20 x 0.8 = 0 technical rm dk 0 m ² x 18 x 0.8 = 0 non air cond blkd 0 m ² x 22 x 0.8 = 0 spaces dk 0 m ² x 10 x 0.8 = 0 alleyway blkd 0 m ² x 2 x 0.8 = 0 dk 0 m ² x 2 x 0.8 = 0								0.8 x 12 = 0 0.8 x 12 = 0 0.8 x 12 = 0 0.8 x 12 = 0 2.5 x 5 = 0																																											
SUB-TOTAL HEAT								25680																																											
SENSIBLE INTERNAL HEAT								PRIMARY AIR LOAD																																											
resting people n° 324 x 75 = 24300 working people n° 0 x 140 = 0 light 18 w 1089 m ² x 0 x 0 = 19602 appliance 4000 0 x 0 = 4000								Winter Flow x Factor x (Room Temp - Delivery Temp) = FA Load 13570.77 x 0.337 x 22 - 14 = 36587																																											
ROOM SENSIBLE HEAT (RSH) 82989 + Inf. 8478 = 91467								TOTAL WINTER HEAT LOAD 25680																																											
LATENT HEAT								REQUIRED SUPPLY TEMPERATURE																																											
resting people n° 324 x 50 = 16200 working people n° 0 x 250 = 0 ROOM LATENT HEAT 16200 + Inf. 19388 = 35588								22 + 25680 / (0.337 x 13571) = T °C 27.6																																											
ROOM TOTAL HEAT (RTH) 127055.0								REQUIRED MINIMUM OUTDOOR AIR																																											
CALCULATED MINIMUM OUTDOOR AIR								324 people x 30 m ³ /p = 9720 Outdoor Air m ³ /h 13571																																											
SUMMER GRAND TOTAL HEAT (GTH)																																																			
AIR FLOW RATE																																																			
RSH = 91467 = 0.719901 indoor t.= 24 RTH 127055.0 supply t.= 14 91467 = 271415.40 m ³ /h 0.337 x δ.T 0.337 x 10 = 27141.54 m ³ /h								HEAT GAINS																																											