

Appendix B – Cooling Tower Selection

This appendix contains the cut sheets and other data for the Marley cooling towers studied and compared as a part of the design process.

Please see the all the cooling towers information on the following pages.

Job Information

Hilton Hotel at BWI Airport
 Nathan Patrick
 Linthicum Heights, MD

Selected By

SPX Cooling Technologies Contact

Marley Cooling Technologies, Inc.
 7401 W. 129 Street Tel 1-800-462-7539
 Overland Park, KS 66213
 info@marleyct.spx.com

Cooling Tower Definition

Manufacturer	Marley	Fan Motor Speed	1200 rpm
Product	NC Class	Fan Motor Capacity per cell	15.00 BHp
Model	NC8306EL2	Fan Motor Output per cell	15.00 BHp
Cells	2	Fan Motor Output total	30.00 BHp
CTI Certified	Yes	Air Flow per cell	122000 cfm
Fan	10.00 ft, 8 Blades	Air Flow total	244000 cfm
Fan Speed	191 rpm, 6000.4 fpm	ASHRAE 90.1 Performance	99.4 gpm/Hp
Fans per cell	1		

Conditions

Tower Water Flow	2100 gpm	Air Density In	0.07076 lb/ft ³
Hot Water Temperature	95.00 °F	Air Density Out	0.07117 lb/ft ³
Range	10.00 °F	Humidity Ratio In	0.01779
Cold Water Temperature	85.00 °F	Humidity Ratio Out	0.02931
Approach	6.00 °F	Wet-Bulb Temp. Out	88.12 °F
Wet-Bulb Temperature	79.00 °F	Estimated Evaporation	23 gpm
Relative Humidity	50 %	Total Heat Rejection	10463000 Btu/h

- This selection meets your design conditions.

Weights & Dimensions

	Per Cell	Total
Shipping Weight	10170 lb	20340 lb
Max Operating Weight	21980 lb	43960 lb
Width	19.83 ft	19.83 ft
Length	11.90 ft	24.08 ft
Height	12.98 ft	
Static Lift	12.23 ft	

Minimum Enclosure Clearance

Clearance required on air inlet sides of tower without altering performance. Assumes no air from below tower.

Solid Wall	8.70 ft
50 % Open Wall	6.00 ft

Weights and dimensions do not include options; refer to sales drawings. For CAD layouts refer to file NC8306.dxf

Cold Weather Operation

Heater Sizing (to prevent freezing in the collection basin during periods of shutdown)

Heater kW/Cell	24.0	18.0	15.0	12.0	9.0	7.5	6.0
Ambient Temperature °F	-25.81	-8.25	0.53	9.31	18.09	22.48	26.87

Job Information

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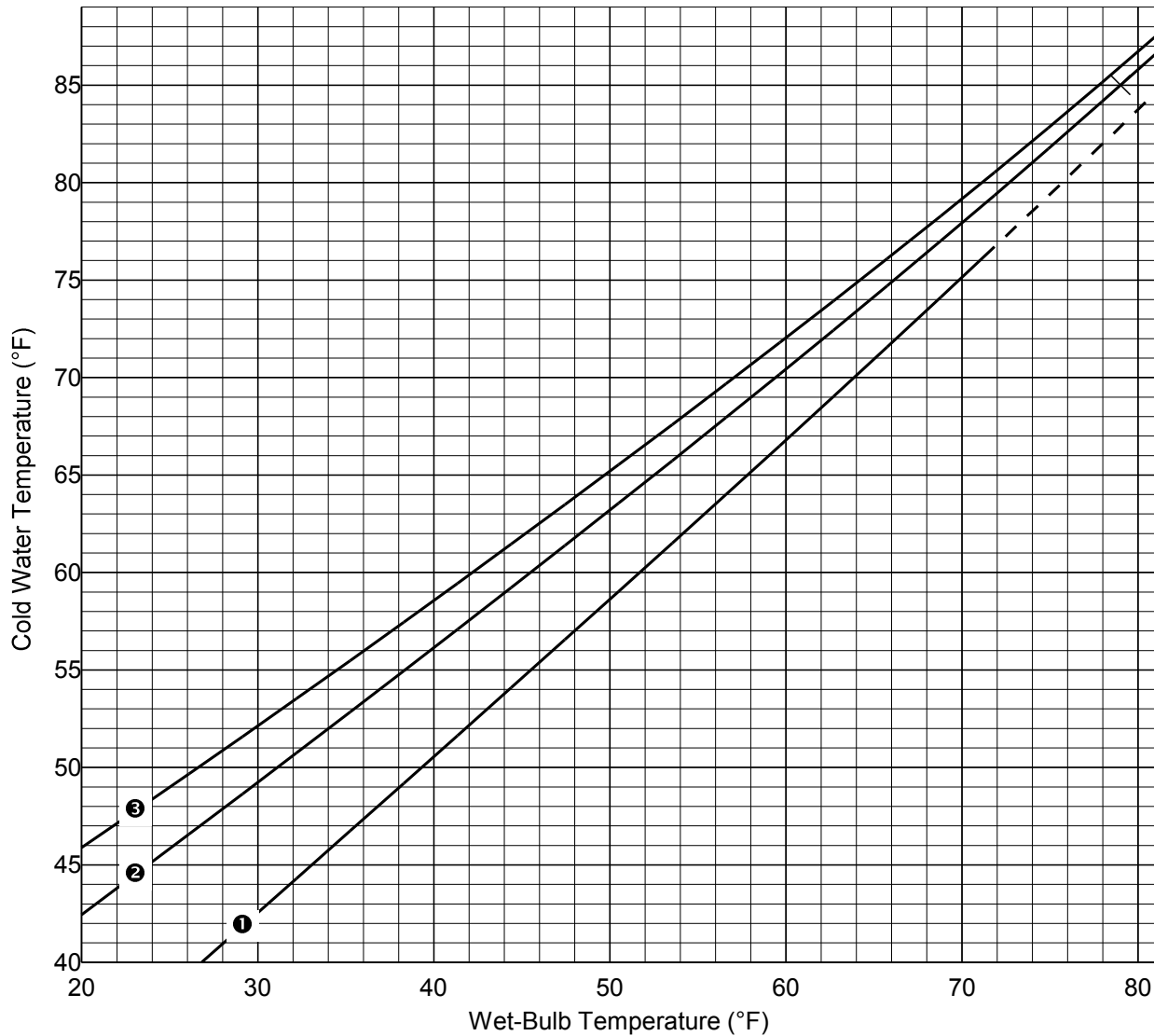
Selected by

Penn State
 104 Engineering Unit A
 University Park, PA
 wpb5@psu.edu

PSUAE
 Tel 814-863-2076
 Fax

Cooling Tower Definition

Manufacturer Marley
 Product NC Class
 Model NC8306EL2
 Cells 2
 Fan 10.00 ft, 8 Blades
 Fans per cell 1
 Fan Motor Capacity per cell 15.00 BHp



Design Conditions

Tower Water Flow 2100 gpm
 Hot Water Temperature 95.00 °F
 Cold Water Temperature 85.00 °F
 Wet-Bulb Temperature 79.00 °F

Curve Conditions

Tower Water Flow (100.0 %) 2100 gpm
 Fan Speed (100.0 %) 191 rpm
 Fan Motor Speed (100.0 %) 1200 rpm
 Fan Motor Output per cell 15.00 BHp
 Fan Motor Output total 30.00 BHp

Legend

- ① 6 °F Range
- ② 10 °F Range
- ③ 12 °F Range
- × Design Point

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Cooling Tower Definition

Manufacturer	Marley	Fan Motor Speed	1200 rpm
Product	NC Class	Fan Motor Capacity per cell	20.00 BHp
Model	NC8305FL2	Fan Motor Output per cell	20.00 BHp
Cells	2	Fan Motor Output total	40.00 BHp
CTI Certified	Yes	Air Flow per cell	114400 cfm
Fan	8.000 ft, 8 Blades	Air Flow total	228800 cfm
Fan Speed	313 rpm, 7866.5 fpm	ASHRAE 90.1 Performance	72.6 gpm/Hp
Fans per cell	1		

Conditions

Tower Water Flow	2100 gpm	Air Density In	0.07076 lb/ft ³
Hot Water Temperature	95.00 °F	Air Density Out	0.07108 lb/ft ³
Range	10.00 °F	Humidity Ratio In	0.01779
Cold Water Temperature	85.00 °F	Humidity Ratio Out	0.02985
Approach	6.00 °F	Wet-Bulb Temp. Out	88.68 °F
Wet-Bulb Temperature	79.00 °F	Estimated Evaporation	23 gpm
Relative Humidity	50 %	Total Heat Rejection	10463000 Btu/h

- This selection meets your design conditions.

Weights & Dimensions

	Per Cell	Total
Shipping Weight	8870 lb	17740 lb
Max Operating Weight	19170 lb	38330 lb
Width	18.750 ft	18.750 ft
Length	10.896 ft	22.083 ft
Height	12.979 ft	
Static Lift	12.234 ft	

Minimum Enclosure Clearance

Clearance required on air inlet sides of tower without altering performance. Assumes no air from below tower.

Solid Wall	8.829 ft
50 % Open Wall	6.234 ft

Weights and dimensions do not include options; refer to sales drawings. For CAD layouts refer to file NC8305.dxf

Cold Weather Operation

Heater Sizing (to prevent freezing in the collection basin during periods of shutdown)

Heater kW/Cell	18.0	15.0	12.0	9.0	7.5	6.0	4.5
Ambient Temperature °F	-16.14	-6.05	4.04	14.13	19.17	24.22	29.26

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 info@marleyct.spx.com

Cooling Tower Definition

Manufacturer	Marley	Fan Motor Speed	1800 rpm
Product	NC Class	Fan Motor Capacity per cell	20.00 BHp
Model	NC8305F2	Fan Motor Output per cell	20.00 BHp
Cells	2	Fan Motor Output total	40.00 BHp
CTI Certified	Yes	Air Flow per cell	116100 cfm
Fan	8.000 ft, 6 Blades	Air Flow total	232100 cfm
Fan Speed	370 rpm, 9299.1 fpm	ASHRAE 90.1 Performance	73.8 gpm/Hp
Fans per cell	1		

Conditions

Tower Water Flow	2100 gpm	Air Density In	0.07076 lb/ft ³
Hot Water Temperature	95.00 °F	Air Density Out	0.07110 lb/ft ³
Range	10.00 °F	Humidity Ratio In	0.01779
Cold Water Temperature	85.00 °F	Humidity Ratio Out	0.02973
Approach	6.00 °F	Wet-Bulb Temp. Out	88.55 °F
Wet-Bulb Temperature	79.00 °F	Estimated Evaporation	23 gpm
Relative Humidity	50 %	Total Heat Rejection	10463000 Btu/h

- This selection meets your design conditions.

Weights & Dimensions

	Per Cell	Total
Shipping Weight	8730 lb	17460 lb
Max Operating Weight	19030 lb	38050 lb
Width	18.750 ft	18.750 ft
Length	10.896 ft	22.083 ft
Height	12.979 ft	
Static Lift	12.234 ft	

Minimum Enclosure Clearance

Clearance required on air inlet sides of tower without altering performance. Assumes no air from below tower.

Solid Wall	8.795 ft
50 % Open Wall	6.201 ft

Weights and dimensions do not include options; refer to sales drawings. For CAD layouts refer to file NC8305.dxf

Cold Weather Operation

Heater Sizing (to prevent freezing in the collection basin during periods of shutdown)

Heater kW/Cell	18.0	15.0	12.0	9.0	7.5	6.0	4.5
Ambient Temperature °F	-16.14	-6.05	4.04	14.13	19.17	24.22	29.26

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Cooling Tower Definition

Manufacturer	Marley	Fan Motor Speed	1800 rpm
Product	NC Class	Fan Motor Capacity per cell	15.00 BHp
Model	NC8307E2	Fan Motor Output per cell	15.00 BHp
Cells	2	Fan Motor Output total	30.00 BHp
CTI Certified	Yes	Air Flow per cell	121100 cfm
Fan	10.00 ft, 6 Blades	Air Flow total	242300 cfm
Fan Speed	241 rpm, 7571.2 fpm	ASHRAE 90.1 Performance	103 gpm/Hp
Fans per cell	1		

Conditions

Tower Water Flow	2100 gpm	Air Density In	0.07076 lb/ft ³
Hot Water Temperature	95.00 °F	Air Density Out	0.07116 lb/ft ³
Range	10.00 °F	Humidity Ratio In	0.01779
Cold Water Temperature	85.00 °F	Humidity Ratio Out	0.02937
Approach	6.00 °F	Wet-Bulb Temp. Out	88.18 °F
Wet-Bulb Temperature	79.00 °F	Estimated Evaporation	23 gpm
Relative Humidity	50 %	Total Heat Rejection	10463000 Btu/h

- This selection meets your design conditions.

Weights & Dimensions

	Per Cell	Total
Shipping Weight	11040 lb	22070 lb
Max Operating Weight	26090 lb	52190 lb
Width	22.42 ft	22.42 ft
Length	11.90 ft	24.08 ft
Height	13.31 ft	
Static Lift	12.57 ft	

Minimum Enclosure Clearance

Clearance required on air inlet sides of tower without altering performance. Assumes no air from below tower.

Solid Wall	8.19 ft
50 % Open Wall	5.44 ft

Weights and dimensions do not include options; refer to sales drawings. For CAD layouts refer to file NC8307.dxf

Cold Weather Operation

Heater Sizing (to prevent freezing in the collection basin during periods of shutdown)

Heater kW/Cell	24.0	18.0	15.0	12.0	9.0	7.5	6.0
Ambient Temperature °F	-17.30	-1.86	5.85	13.57	21.28	25.14	29.00