

POONGCHEON



CoolGreen 대향류형냉각탑(개방형)

INDUCED DRAFT COUNTER FLOW OPEN CIRCUIT COOLING TOWER



[주] 풍천엔지니어링
POONGCHEON ENGINEERING CO.,LTD

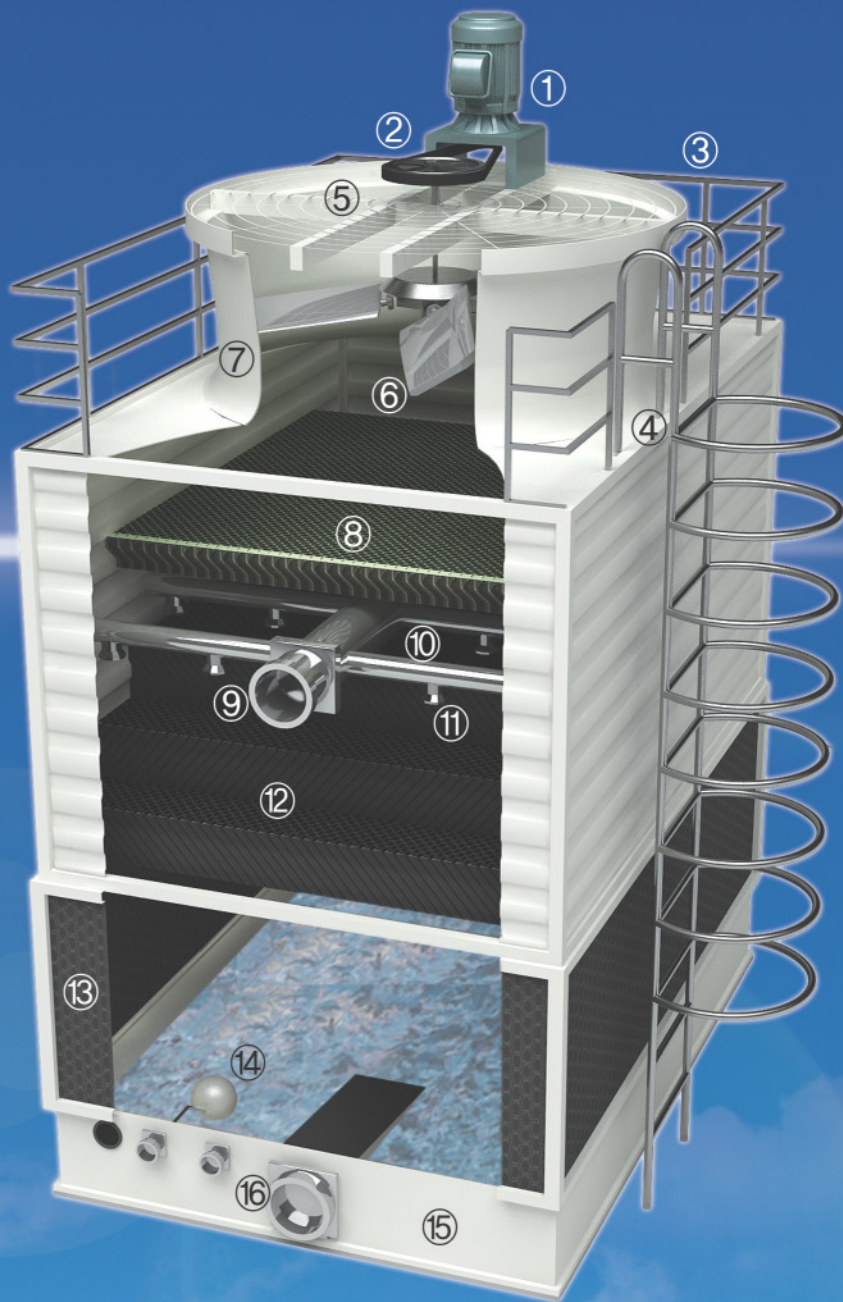
CoolGreen 대향류형냉각탑

INDUCED DRAFT COUNTER FLOW OPEN CIRCUIT COOLING TOWER

풍천엔지니어링의 쿨 그린냉각탑은
세계적으로 성능이 인정된 냉각탑 부품만을 엄선하여 제작,
최적의 시스템으로 고객만족을 실현하고 있습니다.

° CONTENTS

냉각탑의 구조(STRUCTURE OF COOL GREEN)	03
구조적 특징(COMPONENTS FEATURE)	04
COOL GREEN MODEL SELECTION TABLE	06
COOL GREEN LAYOUT DIMENSIONS	10
PERFORMANCE CHART	17
NOISE LEVEL DATA	21
MODEL SELECTION PROCEDURE	23
시공사례(PHOTOGRAPH)	24



냉각탑의 구조 (STRUCTURE OF COOL GREEN)

- | | | |
|---------------------------------|-----------------------------|----------------------------|
| 1. FAN MOTOR | 6. AXIAL FLOW FAN | 11. NOZZLE |
| 2. SPEED REDUCER(V-VELT&PULLEY) | 7. FAN STACK | 12. FILL PACK |
| 3. HAND RAIL | 8. DRIFT ELIMINATOR | 13. AIR INLET LOUVER |
| 4. LADDER&SAFE GUARD | 9. HOT WATER INLET PIPE | 14. MAKE UP VALVE |
| 5. FAN GUARD | 10. WATER DISTRIBUTION PIPE | 15. WATER BASIN |
| | | 16. COLD WATER OUTLET PIPE |

구조적 특징 (COMPONENTS FEATURE)

01 / 송풍기 모터 Fan Motor

냉각탑에 사용되는 모든 규격을 적용하였으며, 운전 방식에 따라 서비스계수를 1.0~1.15를 사용할 수 있으며, 참고로 팬의 설계 축동력은 최소 20%이상의 여유율을 갖는 것이 바람직하다.

We apply all sorts of standard to be used in cooling tower. According to operation mode, service factor is usable from 1.0 to 1.15. Hub power of fan designs is desirable to have a allowance ratio more than 20%.

02 / 감속장치 Speed Reducer

쿨그린이 사용하는 감속장치에는 1,740~1,750RPM으로 회전하는 고속 전동기를 V-Velt를 사용하여 팬이 요구하는 회전 속도로 감속해 주는 풀리가 장착되어 있으며, 팬에서 발생하는 축 추진력과 V-Velt 전동에 따른 인장력을 동시에 받으면서 팬에서 전달되는 진동을 흡수하는 두 개의 베어링이 장착되어 있다.

Speed Reducer is applied to the Cool Green which is equipped high speed motor(1,740~1,750RPM) and pulley using v-velt that reduce the speed as much as fan needs. It is equipped with two bearings that receive the propulsive force of hub occurring from fan and tensile force from electric motion of v-velt together, and also absorb the oscillation from fan.

03 / 축류형 팬 Axial Flow Fan

연속 운전에 적합하며, 가볍고 견고하면서 내식성이 탁월한 해수적용 알미늄 재질의 공진현상이 없는 축류형 팬을 사용하였다.

Axial Flow Fan is suited to the continuance operation. The fan is made of aluminium. It is light, strong and suitable to corrosion resistance from salt water.(No Resonance Phenomenon)

04 / 팬 스택 Fan Stack

공기압 손실을 최소화할 수 있도록 팬스택을 유선형으로 설계하였고, 에너지 절감을 위하여 벤추리부에 6도의 각도를 주었으며, 미려한 외관을 위해 FRP로 제작한다.

Fan Stack is designed by streamline to minimize the loss of air pressure and made of FRP for elegant appearance. In order to save energy, venturi part is slop-sided as much 6°

05 / 비산제거기 Drift Eliminator

냉각수 분배계통의 상부에 설치되는 비산제거기는 3단계로 공기의 유로를 변경시켜 물방울 입자가 유로 경사면에 부딪혀 아래로 흐르면서 물방울의 크기가 점점 확대된 후 중력에 의해 아래로 수직 낙하하게 함으로써 비산을 최대 0.02%까지 감축한 미국 Brentwood사의 D-15 MODEL을 사용한다. 동 제품은 Module 형태이므로 장.탈착이 용이하여 비산 제거기를 비롯하여 분사노즐과 충진재의 청소 작업이 매우 간편하다.

Drift Eliminator(made by Brentwood Co's D-15 Model and realized the drift loss ratio to 0.02%) equipped in the upper side of water distribution system makes to change the flow channel of air by the way of 3 stages and makes water-drop to vertically fall down passing through the corrugation of fill by gravity. Because drift eliminator is module type, it is easy to installation and desorption. So it is easy to sweep the drift eliminator, injection nozzle and fills.



06 / 케이싱 Casing

케이싱 재질은 FRP로 내부식성이 뛰어나며, 외관이 미려하여 주변건물과의 조화성이 탁월하다.

Casing is formed into FRP which is the superior solution for the corrosion resistance and elegant appearance.

07 / 물 분배 계통 Water Distribution System

폐쇄식 물 분배 계통을 적용하여 충전재 상부 전면에 냉각수가 고르게 분포할 수 있도록 하여 냉각탑의 열적 성능 향상을 도모하였다.

To improve cooling capacity, the Cool Green apply the closed type water distribution system that makes water to equally distribute on the surface of fills.

08 / 분사노즐 Spray Nozzle

냉각수가 충전재 전면에 고루 분사되도록 사각타입을 적용하였으며, P.P 재질로 강도가 강하고 부드러우며 장.탈착시 공구 없이 작업이 가능하다.

The rectangular nozzle equally sprays cooled water on the top of fill. It's made by P.P. which is strong and soft, you can work to easily install/uninstall without tool.

09 / 충전재 Fill

수온 58℃(최대 60℃까지 단기간)까지 사용이 가능한 PVC재질로 만들어졌으며, 단위체적당 전열면적이 높은 12mm의 골높이를 사용한다.

Fill is made with PVC resistable till 58℃ water temperature. It is used by 12mm Pitch of corrugation which electric heating area per unit volume is extraordinary high.

10 / 공기흡입루버 Air Inlet Louver

외부 공기 흡입시 전면에 고루 흡입이 되고, 이물질 유입을 막는 구조로 되어있으며, PVC 재질로 가볍고 강도가 강하며 탈착이 용이하여 내부 점검시 어느 곳에서든지 진입이 가능하다.

Air Inlet Louver executes to lead airflow as the most suitable condition and to prevent the foreign substance. It's made by PVC which is light, strong and easy to uninstall. So everywhere you could enter when you need to check the inside of towers.

11 / 냉각수조 Cold Water Basin

냉각수 순환펌프의 원활한 운전에 필요한 적정수위와 수량을 고려한 설계를 채택하여 빈번히 발생하는 펌프 흡입배관 내에 공기 유입을 방지하는 것은 물론 수조 내 냉각수를 진동흡수 매개체로 활용하여 회전체에서 발생한 진동이 케이싱에서 완전히 흡수되지 않은 미세진동까지 추가흡수할 수 있도록 설계하였다.

The design of cold water basin is considered by the appropriate water level and quantity that is needed to smooth working of water circulation pump, so air does not flow into the inlet pipe of pump. To use the water in water basin as the absorption medium of oscillation, casing is designed to absorb the minute oscillation from rotator additionally.

COOL GREEN MODEL SELECTION TABLE

MODEL STANDARD SPECIFICATIONCG

			CG-30F	CG- 40F	CG- 50F	CG- 60F	CG- 80F	CG-100F	CG-125F	CG-150F
Capacity	Cooling Cap.	RT	30	40	50	60	80	100	125	150
	No. of Cell(s)	Cell(s)	30F-1	40F-1	50F-1	60F-1	80F-1	100F-1	125F-1	150F-1
	Heat Load	kcal/hr	117,000	156,000	195,000	234,000	312,000	390,000	487,500	585,000
	Water flow	LPM	390	520	650	780	1040	1300	1625	1950
		m³/hr	23.4	31.2	39.0	46.8	62.4	78.0	97.5	117.0
	Inlet Water Temp.	°C	37							
	Outlet Water Temp.	°C	32							
	Wet Bulb Temp.	°C	27							
Dimension	Length	mm	1300	1300	1500	1500	1800	2100	2100	2320
	Width	mm	1300	1300	1500	1500	1800	2100	2100	2320
	Height	mm	2130	2130	2200	2200	2220	2400	2400	3270
Driving Assembly	Fan	Type	Axial Flow							
		Diameter	mm	800	800	1,000	1,000	1,300	1,430	1,640
		Air Volume	m³/min	228	276	348	396	522	678	816
		Driver System	Direct Driver						V-Belt Driver	
		Quantity	ea	1	1	1	1	1	1	1
	Motor	Type	T.E.F.C, Class F, IP 54							
		Power Source	3Ph, 60 Hz, 220V (380V/440V)							
		Nominal Motor	Kw	0.75	1.5	1.5	2.25	2.25	3	3.7
		Quantity	ea	1	1	1	1	1	1	1
Material	Fan Stack		F.R.P							
	Fan Drive Support		SS41 + H.D.G							
	Fan Blade / Hub		Al-alloy or F.R.P / H.D.G Steel or Al-alloy							
	Frame Members		SS41 + H.D.G							
	Casing / Partition		F.R.P							
	Fill		P.V.C							
	Eliminator / Louver		P.V.C							
	Distribution Pipe		S.G.P							
	Lateral Pipe		S.G.P							
	Spray Nozzle		P.P							
	Cold Water Basin		F.R.P							
	C/T Support		SS41 + H.D.G							
Pipe Connections	Hot Water Inlet	A	80	80	80	80	100	125	125	150
	Cold Water Outlet	A	80	80	80	80	100	125	125	150
	Drain	A	25	25	25	25	32	32	32	65
	Overflow	A	25	32	32	32	32	32	32	65
	Make-up (Auto)	A	20	20	20	20	25	32	32	32
Water Distribution System			Low Pressure, Square Pattern Spray							
Evaporation Loss		%	0.78							
Drift Loss		%	Drift Loss less than 0.02 to Total Water Flow							
Weight	Net Weight	Kg	215	227	305	320	422	500	545	1306
	Operating Weight	Kg	355	367	532	547	680	815	851	2992
Water Head		m	2.5m @ Hot Water Inlet Pipe Flange							



MODEL STANDARD SPECIFICATION

			CG-175F	CG-200F	CG-225F	CG-250F	CG-300F	CG-350F	CG-375F	CG-400F
Capacity	Cooling Cap.	RT	175	200	225	250	300	350	375	400
	No. of Cell(s)	Cell(s)	175F-1	200F-1	225F-1	250F-1	300F-1	350F-1	375F-1	400F-1
	Heat Load	kcal/hr	682,500	780,000	877,500	975,000	1,170,000	1,365,000	1,462,500	1,560,000
	Water flow	LPM	2275	2600	2925	3250	3900	4550	4875	5200
		m³/hr	136.5	156	175.5	195	234	273	292.5	312
	Inlet Water Temp.	°C	37							
	Outlet Water Temp.	°C	32							
	Wet Bulb Temp.	°C	27							
Dimension	Length	mm	2320	2320	2320	2320	2320	2825	2825	2825
	Width	mm	2320	2820	2820	3420	3420	3830	3830	3830
	Height	mm	3570	3840	3840	4200	4200	4250	4250	4250
Driving Assembly	Fan	Type	Axial Flow							
		Diameter	mm	1,640	1,640	1,640	1,850	1,850	2,220	2,220
		Air Volume	m³/min	1,032	1,170	1,290	1,500	1,746	2,076	2,118
		Driver System	V-Belt Driver							
		Quantity	ea	1	1	1	1	1	1	1
	Motor	Type	T.E.F.C, Class F, IP 54							
		Power Source	3Ph, 60 Hz, 220V (380V/ 440V)							
		Nominal Motor	Kw	5.5	5.5	7.5	7.5	11	11	11
		Quantity	ea	1	1	1	1	1	1	1
Material	Fan Stack		F.R.P							
	Fan Drive Support		SS41 + H.D.G							
	Fan Blade / Hub		Al-alloy or F.R.P / H.D.G Steel or Al-alloy							
	Frame Members		SS41 + H.D.G							
	Casing / Partition		F.R.P							
	Fill		P.V.C							
	Eliminator / Louver		P.V.C							
	Distribution Pipe		S.G.P							
	Lateral Pipe		S.G.P							
	Spray Nozzle		P.P							
	Cold Water Basin		F.R.P							
	C/T Support		SS41 + H.D.G							
Pipe Connections	Hot Water Inlet	A	150	150	200	200	200	200	250	250
	Cold Water Outlet	A	150	150	200	200	200	200	250	250
	Drain	A	65	65	65	65	65	65	65	65
	Overflow	A	65	65	65	65	80	80	80	80
	Make-up (Auto)	A	32	32	32	32	40	40	40	40
Water Distribution System			Low Pressure, Square Pattern Spray							
Evaporation Loss		%	0.78							
Drift Loss		%	Drift Loss less than 0.02 to Total Water Flow							
Weight	Net Weight	Kg	1386	1577	1693	1998	2125	2520	2621	2646
	Operating Weight	Kg	3080	4055	4246	5185	5384	7221	7429	7501
Water Head		m	2.5m @ Hot Water Inlet Pipe Flange							

COOL GREEN MODEL SELECTION TABLE

MODEL STANDARD SPECIFICATION

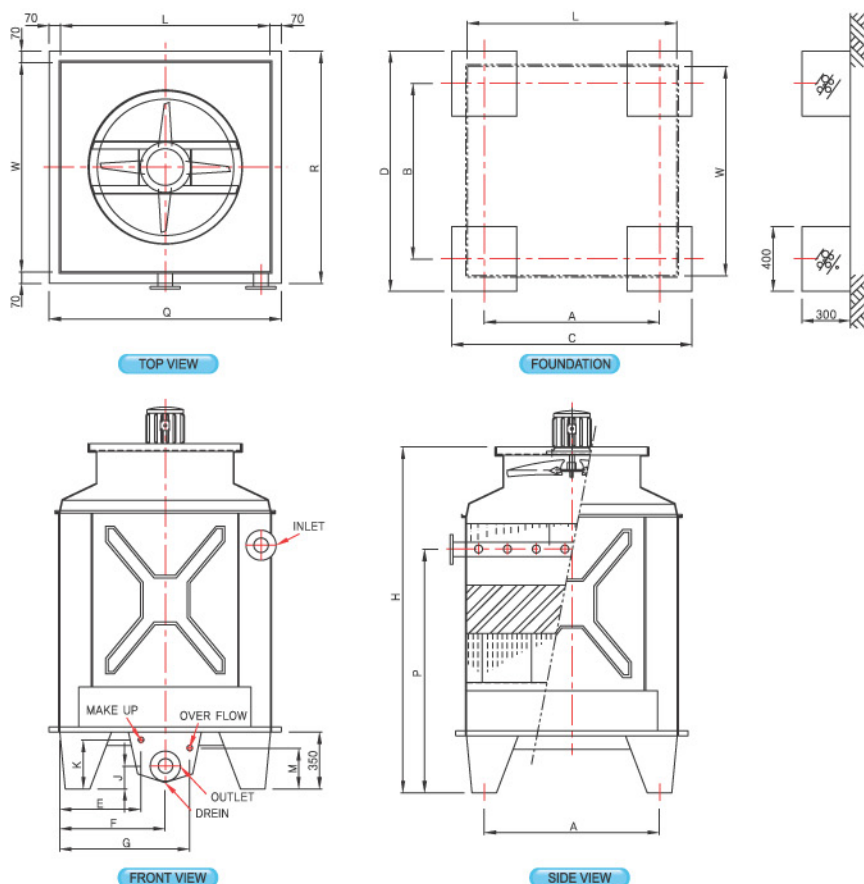
			CG-500F	CG-600F	CG-700F	CG-800F	CG-900F	CG-1000F	
Capacity	Cooling Cap.	RT	500	600	700	800	900	1000	
	No. of Cell(s)	Cell(s)	500F-1	600F-1	700F-1	800F-1	900F-1	1000F-1	
	Heat Load	kcal/hr	1,950,000	2,340,000	2,730,000	3,120,000	3,510,000	3,900,000	
	Water flow	LPM	6500	7800	9100	10400	11700	13000	
		m³/hr	390	468	546	624	702	780	
	Inlet Water Temp.	°C	37						
	Outlet Water Temp.	°C	32						
	Wet Bulb Temp.	°C	27						
Dimension	Length	mm	3400	3400	5200	5200	5800	5800	
	Width	mm	5000	5000	5200	5200	5800	5800	
	Height	mm	4900	5200	5200	5500	5300	5600	
Driving Assembly	Fan	Type	Axial Flow						
		Diameter	mm	2800	2800	4000	4000	4500	4500
		Air Volume	m³/min	3420	3,420	4800	4740	5460	6060
		Driver System	V-Belt Driver						
		Quantity	ea	1	1	2	2	2	2
	Motor	Type	T.E.F.C, Class F, IP 54						
		Power Source	3Ph, 60 Hz, 380V (220 V/ 440V)						
		Nominal Motor	Kw	18.5	22	18.5	22	22	30
		Quantity	ea	1	1	1	1	1	1
Material	Fan Stack		F.R.P						
	Fan Drive Support		SS41 + H.D.G						
	Fan Blade / Hub		Al-alloy or F.R.P / H.D.G Steel or Al-alloy						
	Frame Members		SS41 + H.D.G						
	Casing / Partition		F.R.P						
	Fill		P.V.C						
	Eliminator / Louver		P.V.C						
	Distribution Pipe		S.G.P						
	Lateral Pipe		S.G.P						
	Spray Nozzle		P.P						
	Cold Water Basin		F.R.P						
	C/T Support		SS41 + H.D.G						
Pipe Connections	Hot Water Inlet	A	250	250	300	300	300	300	
	Cold Water Outlet	A	250	250	300	300	300	300	
	Drain	A	65	65	65	65	65	65	
	Overflow	A	100	100	100	100	100	100	
	Make-up (Auto)	A	50	50	50	50	50	50	
Water Distribution System			Low Pressure, Square Pattern Spray						
Evaporation Loss		%	0.78						
Drift Loss		%	Drift Loss less than 0.02 to Total Water Flow						
Weight	Net Weight	Kg	4122	4354	6909	7279	8595	9056	
	Operating Weight	Kg	8168	8400	13253	13623	16241	16702	
Water Head		m	2.5m @ Hot Water Inlet Pipe Flange						

COOL GREEN LAYOUT DIMENSION

Cool Green
대향류형냉각탑(개방형)
INDUCED DRAFT COUNTER FLOW OPEN CIRCUIT COOLING TOWER



CG 30 - 125 FRAME

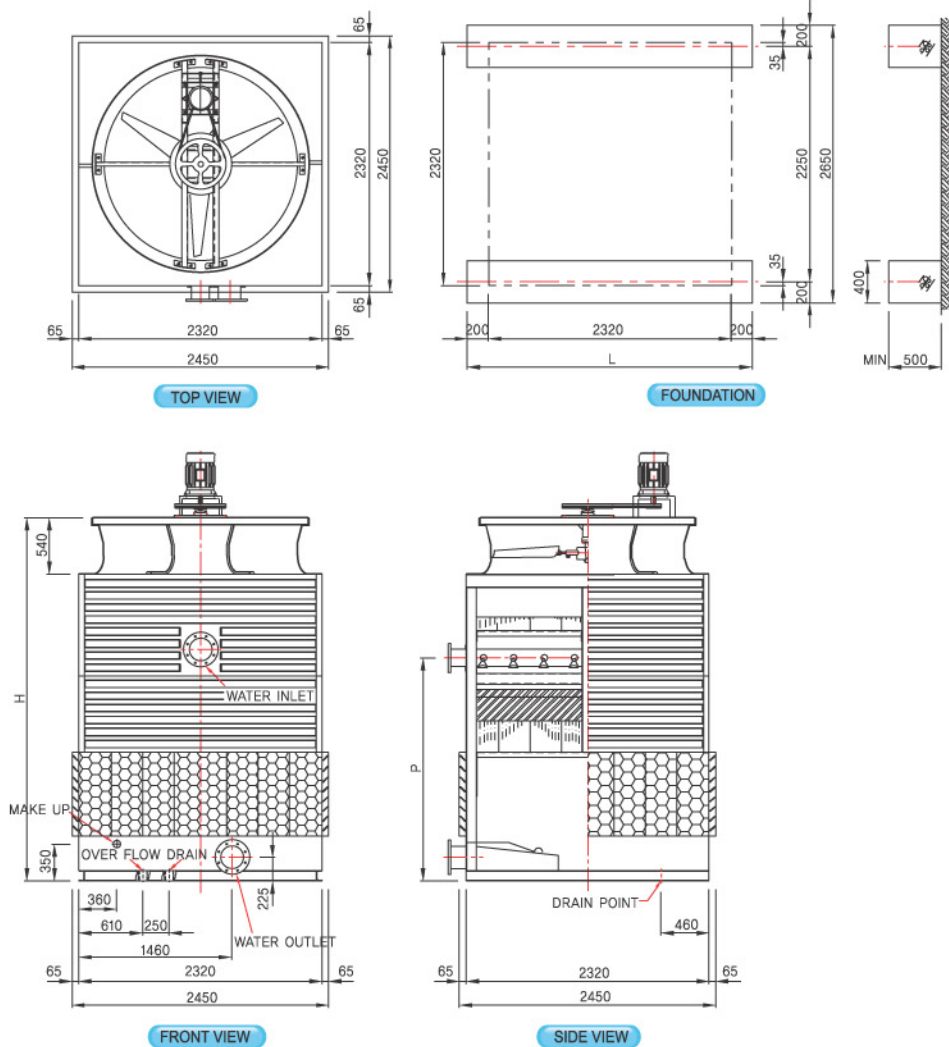


MODEL	Net Wt. (Kg)	Opr. Wt. (Kg)	L	W	P	H	A	B	C	D	E	F
CG 30F-1	215	355	1,300	1,300	1,500	2,130	1,080	1,080	1,480	1,480	500	650
CG 40F-1	227	367	1,300	1,300	1,500	2,130	1,080	1,080	1,480	1,480	500	650
CG 50F-1	305	532	1,500	1,500	1,550	2,200	1,290	1,290	1,690	1,690	600	750
CG 60F-1	320	547	1,500	1,500	1,550	2,200	1,290	1,290	1,690	1,690	600	750
CG 80F-1	422	680	1,800	1,800	1,550	2,220	1,480	1,480	1,880	1,880	750	900
CG 100F-1	500	815	2,100	2,100	1,650	2,400	1,780	1,780	2,180	2,180	830	1,050
CG 125F-1	545	851	2,100	2,100	1,650	2,400	1,780	1,780	2,180	2,180	830	1,050

MODEL	G	J	K	M	Q	R	Make-Up		Over flow	Drain	Inlet A	Outlet A
							Man.	Auto				
CG 30F-1	800	100	260	210	1,440	1,440	—	20A×1	25A×1	25A×1	80A×1	80A×1
CG 40F-1	800	100	260	210	1,440	1,440	—	20A×1	32A×1	25A×1	80A×1	80A×1
CG 50F-1	900	100	270	220	1,640	1,640	—	20A×1	32A×1	25A×1	80A×1	80A×1
CG 60F-1	900	100	270	220	1,640	1,640	—	20A×1	32A×1	25A×1	80A×1	80A×1
CG 80F-1	1,050	100	280	230	1,940	1,940	—	25A×1	32A×1	32A×1	100A×1	100A×1
CG 100F-1	1,270	120	280	230	2,240	2,240	—	32A×1	32A×1	32A×1	125A×1	125A×1
CG 125F-1	1,270	120	280	230	2,240	2,240	—	32A×1	32A×1	32A×1	125A×1	125A×1

COOL GREEN LAYOUT DIMENSION

CG 150. 175 FRAME



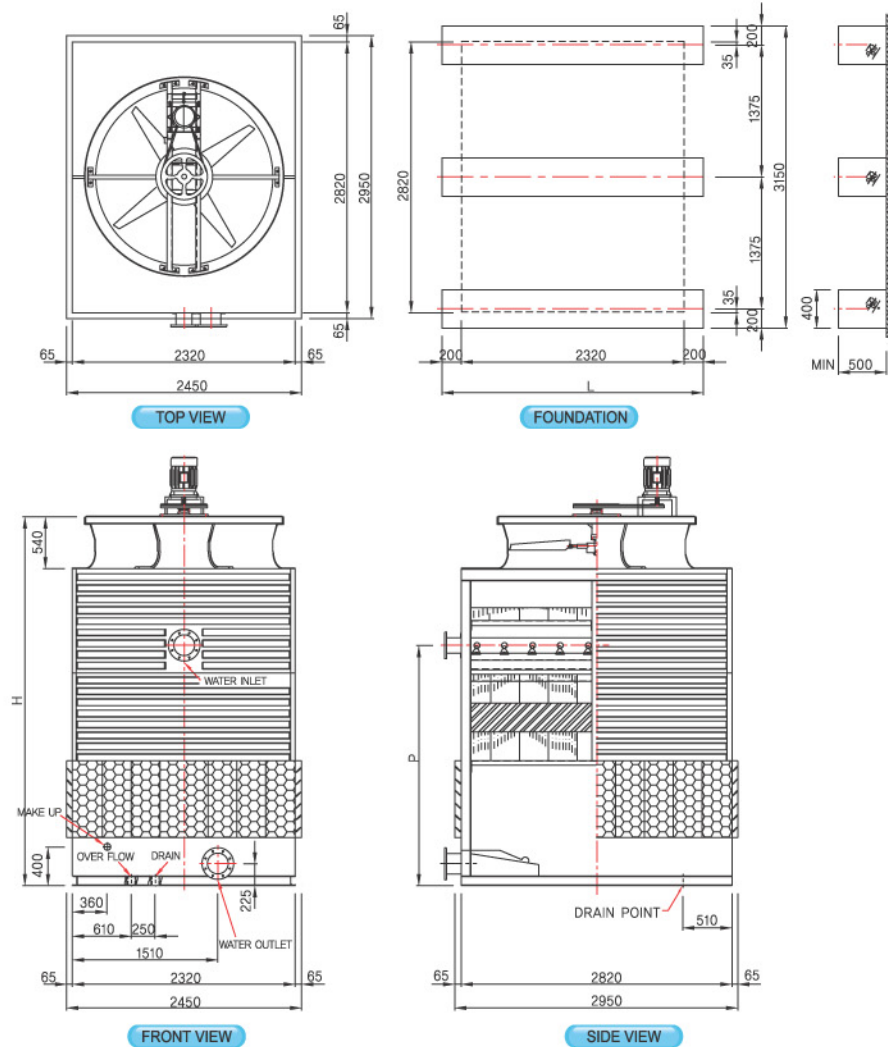
MODEL	NET WEIGHT	OPR. WEIGHT	H	P	L	Make-Up		Over flow	Drain	Inlet	Outlet
						Man.	Auto			A	A
CG 150F-1	1,306	2,992	3,270	1,930	2,720	32A×1	32A×1	65A×1	65A×1	150A×1	150A×1
CG 175F-1	1,386	3,080	3,570	2,230		32A×1	32A×1	65A×1	65A×1	150A×1	150A×1
CG 150F-2	2,456	5,830	3,270	1,930	5,050	32A×2	32A×2	65A×1	65A×2	150A×2	150A×2
CG 175F-2	2,624	6,212	3,570	2,230		32A×2	32A×2	65A×1	65A×2	150A×2	150A×2
CG 150F-3	3,609	8,670	3,470	2,130	7,380	32A×3	32A×3	65A×2	65A×3	150A×3	150A×3
CG 175F-3	3,858	9,240	3,770	2,430		32A×3	32A×3	65A×2	65A×3	150A×3	150A×3
CG 150F-4	4,764	11,516	3,470	2,130	9,710	32A×4	32A×4	65A×2	65A×4	150A×4	150A×4
CG 175F-4	5,092	12,268	3,770	2,430		32A×4	32A×4	65A×2	65A×4	150A×4	150A×4

COOL GREEN LAYOUT DIMENSION

Cool Green
대향류형냉각탑(개방형)
INDUCED DRAFT COUNTER FLOW OPEN CIRCUIT COOLING TOWER



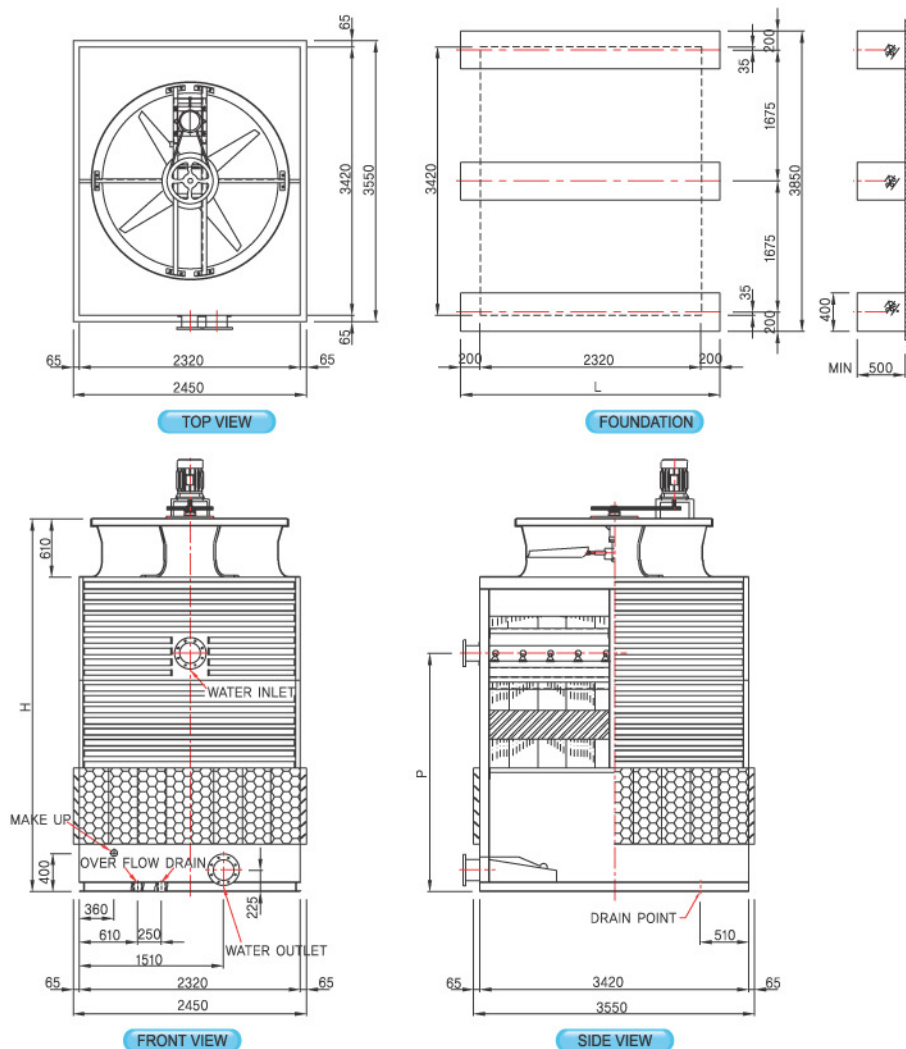
CG 200. 225 FRAME



MODEL	NET WEIGHT	OPR. WEIGHT	H	P	L	Make-Up		Over flow	Drain	Inlet	Outlet
						Man.	Auto			A	A
CG 200F-1	1,577	4,055	3,840	2,500	2,720	32A×1	32A×1	65A×1	65A×1	150A×1	150A×1
CG 225F-1	1,693	4,246	3,840	2,500						200A×1	200A×1
CG 200F-2	2,962	7,916	3,840	2,500	5,050	32A×2	32A×2	65A×2	65A×2	150A×2	150A×2
CG 225F-2	3,194	8,300	3,840	2,500						200A×2	200A×2
CG 200F-3	4,350	11,784	3,840	2,500	7,380	32A×3	32A×3	65A×3	65A×3	150A×3	150A×3
CG 225F-3	4,695	12,357	3,840	2,500						200A×3	200A×3
CG 200F-4	5,736	15,652	3,840	2,700	9,710	32A×4	32A×4	65A×4	65A×4	150A×4	150A×4
CG 225F-4	6,200	16,416	3,840	2,700						200A×4	200A×4

COOL GREEN LAYOUT DIMENSION

CG 250. 300 FRAME



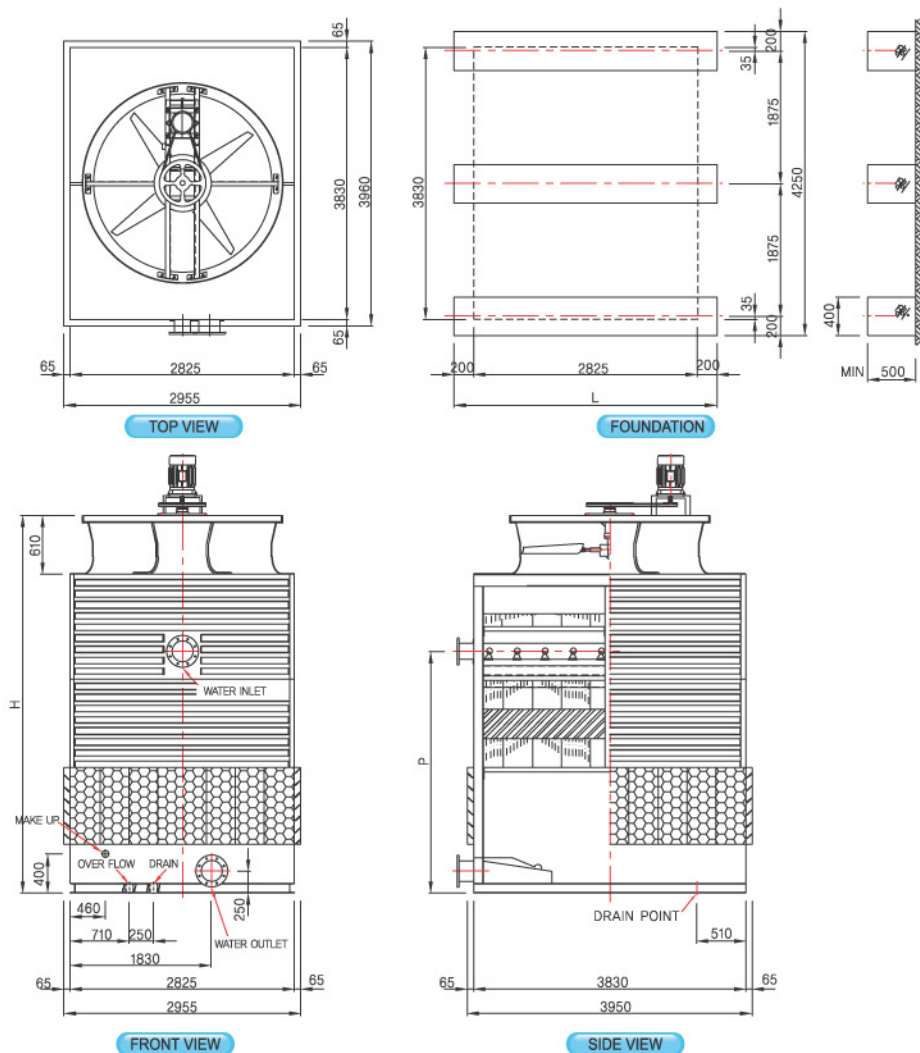
MODEL	NET WEIGHT	OPR. WEIGHT	H	P	L	Make-Up		Over flow	Drain	Inlet	Outlet
						Man.	Auto			A	A
CG 250F-1	1,998	5,185	4,200	2,700	2,720	32A×1	32A×1	65A×1	65A×1	200A×1	200A×1
CG 300F-1	2,125	5,384	4,200	2,700		40A×1	40A×1	80A×1			
CG 250F-2	3,764	10,136	4,200	2,700	5,050	32A×2	32A×2	65A×2	65A×2	200A×2	200A×2
CG 300F-2	4,018	10,536	4,200	2,700		40A×2	40A×2	80A×2			
CG 250F-3	5,538	15,096	4,200	2,700	7,380	32A×3	32A×3	65A×3	65A×3	200A×3	200A×3
CG 300F-3	5,919	15,696	4,200	2,700		40A×3	40A×3	80A×3			
CG 250F-4	7,312	20,056	4,200	2,700	9,710	32A×4	32A×4	65A×4	65A×4	200A×4	200A×4
CG 300F-4	7,980	20,856	4,200	2,700		40A×4	40A×4	80A×4			

COOL GREEN LAYOUT DIMENSION

Cool Green
대향류형냉각탑(개방형)
INDUCED DRAFT COUNTER FLOW OPEN CIRCUIT COOLING TOWER



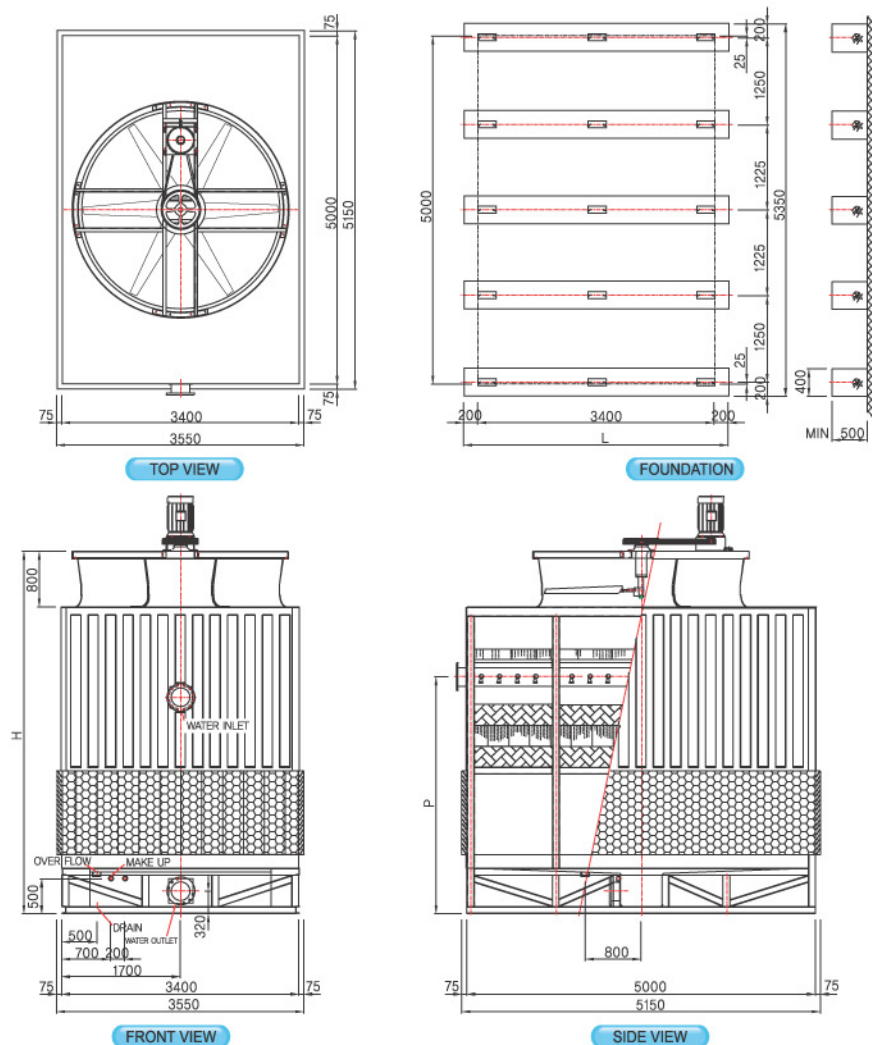
CG 350. 375. 400 FRAME



MODEL	NET WEIGHT	OPR. WEIGHT	H	P	L	Make-Up		Over flow	Drain	Inlet A	Outlet A
						Man.	Auto				
CG 350F-1	2,520	7,221	4,250	2,750	3,225	40A×1	40A×1	80A×1	65A×1	200A×1	200A×1
CG 375F-1	2,621	7,429	4,250	2,775						250A×1	250A×1
CG 400F-1	2,646	7,501	4,250	2,775							
CG 350F-2	4,750	14,154	4,250	2,750	6,060	40A×2	40A×2	80A×2	65A×2	200A×2	200A×2
CG 375F-2	4,954	14,570	4,250	2,775						250A×2	250A×2
CG 400F-2	5,004	14,714	4,250	2,775							
CG 350F-3	6,990	21,093	4,250	2,750	8,895	40A×3	40A×3	80A×3	65A×3	200A×3	200A×3
CG 375F-3	7,293	21,717	4,250	2,775						250A×3	250A×3
CG 400F-3	7,368	21,933	4,250	2,775							
CG 350F-4	9,228	28,036	4,250	2,750	11,730	40A×4	40A×4	80A×4	65A×4	200A×4	200A×4
CG 375F-4	9,632	28,860	4,250	2,775						250A×4	250A×4
CG 400F-4	9,732	29,148	4,250	2,775							

COOL GREEN LAYOUT DIMENSION

CG 500. 600 FRAME



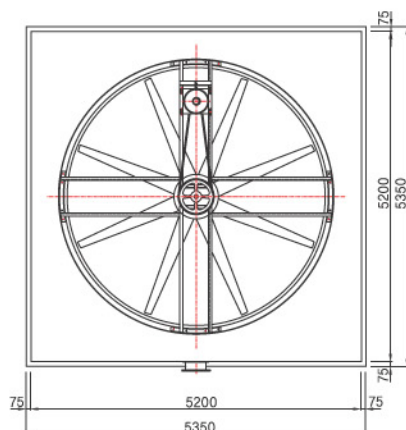
MODEL	NET WEIGHT	OPR. WEIGHT	H	P	L	Make-Up		Over flow	Drain	Inlet	Outlet
						Man.	Auto			A	A
CG 500F-1	4,122	8,168	4,900	3,100	3,800	50A×1	50A×1	100A×1	65A×1	250A×1	250A×1
CG 600F-1	4,354	8,400	5,200	3,400							
CG 500F-2	8,244	16,336	4,900	3,100	7,230	50A×2	50A×2	100A×2	65A×2	250A×2	250A×2
CG 600F-2	8,708	16,800	5,200	3,400							
CG 500F-3	12,366	24,504	4,900	3,100	10,660	50A×3	50A×3	100A×3	65A×3	250A×3	250A×3
CG 600F-3	13,062	25,200	5,200	3,400							
CG 500F-4	16,488	32,672	4,900	3,100	14,090	50A×4	50A×4	100A×4	65A×4	250A×4	250A×4
CG 600F-4	16,488	32,672	5,200	3,400							

COOL GREEN LAYOUT DIMENSION

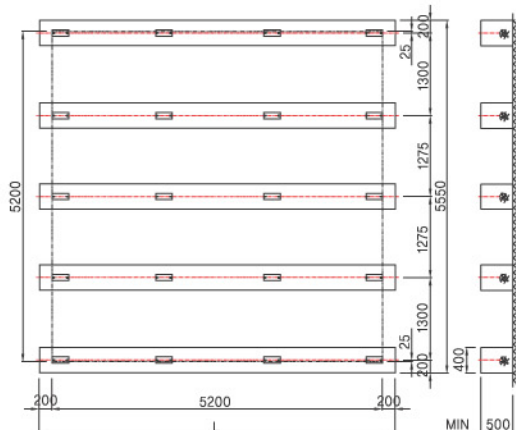
Cool Green
대향류형냉각탑(개방형)
INDUCED DRAFT COUNTER FLOW OPEN CIRCUIT COOLING TOWER



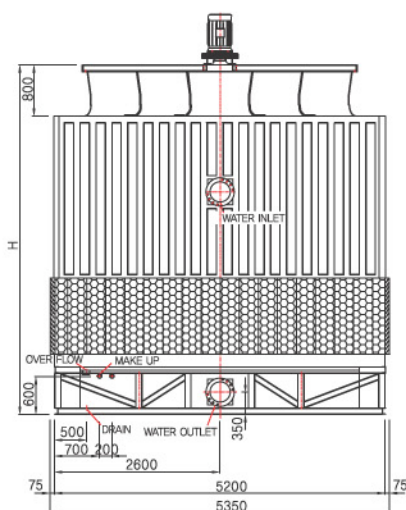
CG 700. 800 FRAME



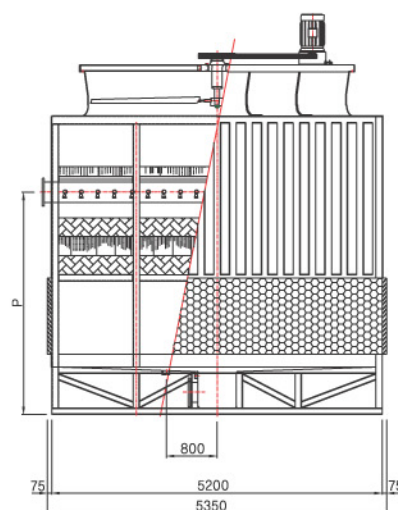
TOP VIEW



FOUNDATION



FRONT VIEW

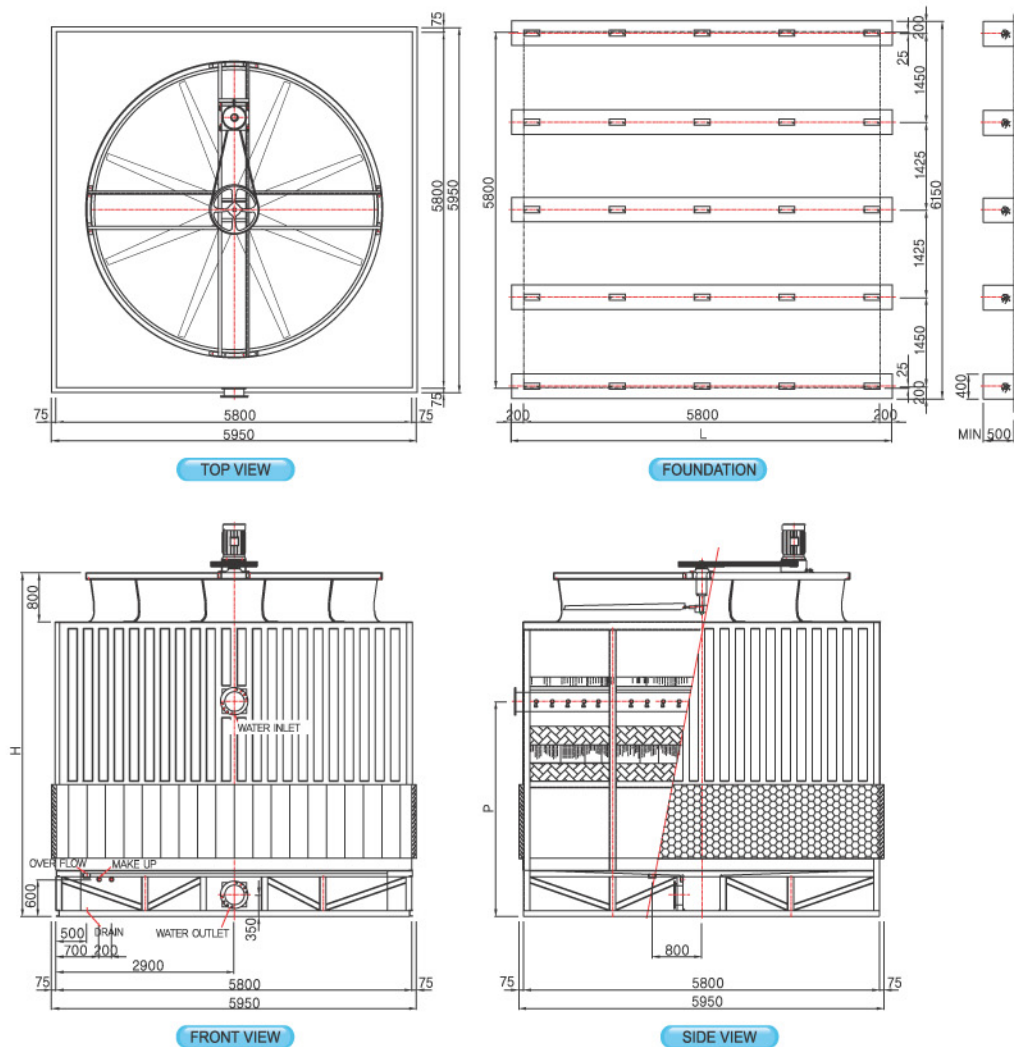


SIDE VIEW

MODEL	NET WEIGHT	OPR. WEIGHT	H	P	L	Make-Up		Over flow	Drain	Inlet A	Outlet A
						Man.	Auto				
CG 700F-1	6,909	13,253	5,200	3,300	5,400	50A×1	50A×1	100A×1	65A×1	300A×1	300A×1
CG 800F-1	7,279	13,623	5,500	3,500							
CG 700F-2	13,818	26,506	5,200	3,300	10,430	50A×2	50A×2	100A×2	65A×2	300A×2	300A×2
CG 800F-2	14,558	27,246	5,500	3,500							
CG 700F-3	20,727	39,759	5,200	3,300	15,460	50A×3	50A×3	100A×3	65A×3	300A×3	300A×3
CG 800F-3	21,837	40,869	5,500	3,500							
CG 700F-4	27,636	53,012	5,200	3,300	20,490	50A×4	50A×4	100A×4	65A×4	300A×4	300A×4
CG 800F-4	27,636	53,012	5,500	3,500							

COOL GREEN LAYOUT DIMENSION

CG 900. 1,000 FRAME



MODEL	NET WEIGHT	OPR. WEIGHT	H	P	L	Make-Up		Over flow	Drain	Inlet	Outlet
						Man.	Auto			A	A
CG 900F-1	8,595	16,241	5,300	3,300	6,200	50A×1	50A×1	100A×1	65A×1	300A×1	350A×1
CG 1000F-1	9,056	16,702	5,600	3,500							
CG 900F-2	17,190	32,482	5,300	3,300	12,030	50A×2	50A×2	100A×2	65A×2	300A×2	350A×2
CG 1000F-2	18,112	33,404	5,600	3,500							
CG 900F-3	25,785	48,723	5,300	3,300	17,860	50A×3	50A×3	100A×3	65A×3	300A×3	350A×3
CG 1000F-3	27,168	50,106	5,600	3,500							
CG 900F-4	34,380	64,964	5,300	3,300	23,690	50A×4	50A×4	100A×4	65A×4	300A×4	350A×4
CG 1000F-4	34,380	64,964	5,600	3,500							

PERFORMANCE CHART

Cool Green
대향류형냉각탑(개방형)
INDUCED DRAFT COUNTER FLOW OPEN CIRCUIT COOLING TOWER



APPROACH 3°C GROUP

Range (°C)	W.B.T (°C)	Cold Water Volume classified by Frame Size(M³/HR)																
		1000F	900F	800F	700F	600F	500F	400F	375F	350F	300F	250F	225F	200F	175F	150F	125F	100F
3.0	26.0	756	694	585	508	429	360	280	260	254	213	185	158	144	126	105	89	74
	27.0	785	722	607	528	446	375	291	270	265	222	192	164	150	131	109	93	77
	28.0	816	751	631	549	464	390	303	281	275	231	200	171	156	136	114	96	81
	29.0	849	781	656	570	482	405	315	292	286	240	208	178	162	142	118	100	84
4.0	26.0	650	593	504	434	366	308	239	222	217	182	158	135	123	108	89	75	63
	27.0	676	617	524	451	381	320	248	231	226	189	164	140	128	112	92	78	65
	28.0	703	642	545	470	396	333	258	240	235	197	170	146	133	116	96	81	68
	29.0	732	668	566	489	412	347	269	250	244	205	177	151	138	121	100	85	71
5.0	26.0	585	529	453	388	326	275	213	198	194	161	141	120	110	96	78	66	55
	27.0	608	551	471	403	340	286	220	206	202	168	146	125	114	100	81	69	58
	28.0	633	573	490	420	354	298	229	215	210	174	152	130	119	104	85	72	60
	29.0	659	597	510	437	368	310	238	223	218	183	158	135	123	108	88	75	62
5.5	26.0	560	505	434	370	311	262	201	189	185	154	134	114	105	91	74	63	53
	27.0	583	526	452	385	324	273	209	197	192	160	140	119	109	95	77	65	55
	28.0	607	548	452	406	337	284	219	205	200	167	145	124	113	99	81	68	57
	29.0	631	570	489	418	352	296	228	213	208	173	151	129	118	103	84	71	59
6.0	26.0	539	485	418	355	299	252	192	182	177	147	129	110	100	88	71	60	50
	27.0	561	505	435	385	324	273	200	189	185	154	134	114	104	91	74	63	52
	28.0	584	526	452	385	324	273	209	197	192	160	140	119	109	95	77	65	54
	29.0	608	548	471	401	338	284	218	205	200	166	145	124	113	99	80	68	57
7.0	26.0	505	452	392	332	279	235	179	169	165	137	120	102	93	82	66	55	46
	27.0	526	471	407	345	290	245	187	176	172	142	125	106	97	85	68	58	48
	28.0	547	491	424	360	302	255	194	184	179	148	130	111	101	88	71	60	50
	29.0	570	511	441	375	315	265	202	191	187	154	135	115	105	92	74	63	53
8.0	26.0	479	427	371	313	263	221	168	160	156	129	113	96	88	77	62	52	-
	27.0	499	445	386	326	274	231	175	167	162	134	118	100	92	80	64	54	-
	28.0	519	464	402	340	286	241	182	173	169	140	123	104	95	83	67	56	47
	29.0	540	483	419	354	298	251	191	180	176	145	128	108	99	87	70	59	49
9.0	26.0	457	407	355	298	251	211	160	152	149	122	108	91	84	73	58	49	-
	27.0	477	424	369	311	261	220	167	159	155	127	112	95	87	76	61	51	-
	28.0	496	442	385	324	272	229	173	165	161	133	117	99	91	79	63	53	-
	29.0	517	461	400	338	284	239	181	172	168	138	122	103	94	83	66	56	47
10.0	26.0	440	390	341	286	240	202	153	146	142	117	103	87	80	70	56	47	-
	27.0	459	407	355	298	250	210	160	152	148	122	108	91	83	73	58	49	-
	28.0	478	424	370	311	261	219	166	158	154	127	112	95	87	76	60	51	-
	29.0	497	442	385	324	272	229	173	165	161	132	117	99	90	79	63	53	-

PERFORMANCE CHART

APPROACH 4°C GROUP

Range (°C)	W.B.T (°C)	Cold Water Volume classified by Frame Size(M³/HR)																
		1000F	900F	800F	700F	600F	500F	400F	375F	350F	300F	250F	225F	200F	175F	150F	125F	100F
3.0	26.0	919	849	708	620	524	440	342	317	311	261	226	193	177	154	130	110	92
	27.0	951	882	—	643	545	458	356	330	323	271	235	201	183	160	135	115	96
	28.0	—	917	—	669	566	476	369	343	336	282	244	209	191	167	141	119	100
	29.0	—	953	—	695	589	495	370	356	349	290	253	217	198	173	146	124	104
4.0	26.0	781	718	604	525	443	372	289	268	263	220	191	163	149	130	109	92	77
	27.0	812	747	628	545	460	387	300	279	273	229	198	170	155	135	113	96	80
	28.0	843	776	652	567	479	403	312	290	284	238	206	176	161	141	117	110	83
	29.0	877	807	677	589	498	419	325	302	295	248	214	183	167	146	122	104	87
5.0	26.0	696	636	539	465	392	330	256	238	233	195	169	144	132	115	95	81	67
	27.0	724	662	560	484	408	343	266	247	242	203	176	150	137	120	99	84	70
	28.0	753	689	583	504	425	357	277	257	251	211	183	156	142	125	103	87	73
	29.0	783	717	606	524	442	372	288	267	262	219	190	162	148	130	107	91	76
5.5	26.0	665	605	515	443	373	314	243	226	221	185	161	137	125	110	90	76	64
	27.0	692	630	536	461	388	327	253	235	230	193	167	143	130	114	94	79	66
	28.0	720	656	557	480	404	340	263	245	239	201	174	148	136	119	98	83	69
	29.0	749	682	579	499	421	354	274	255	249	209	181	154	141	123	102	86	72
6.0	26.0	639	580	495	424	357	301	233	217	212	177	154	131	120	105	86	73	61
	27.0	664	603	514	442	372	313	242	225	220	185	160	136	125	109	89	76	63
	28.0	691	628	535	459	387	326	252	235	229	192	166	142	130	114	93	79	66
	29.0	719	653	556	478	403	339	262	244	239	200	173	148	135	118	97	82	69
7.0	26.0	596	538	462	394	332	279	215	201	197	164	143	122	111	97	79	67	56
	27.0	620	560	480	410	345	291	223	209	205	171	148	127	116	101	82	70	58
	28.0	645	584	500	427	360	303	232	218	213	178	155	132	120	105	86	73	61
	29.0	671	607	520	445	374	315	243	227	222	185	161	137	125	110	89	76	63
8.0	26.0	563	506	436	371	312	263	202	189	185	154	134	114	104	91	74	62	52
	27.0	586	527	454	386	325	274	210	197	192	160	140	119	109	95	77	65	54
	28.0	610	549	472	402	338	285	218	205	200	166	145	124	113	99	80	68	57
	29.0	635	572	491	419	352	297	227	213	208	173	151	129	118	103	84	71	59
9.0	26.0	537	481	416	352	296	250	190	180	176	146	127	108	99	87	70	59	49
	27.0	559	501	433	367	308	260	198	187	183	152	133	113	103	90	73	61	51
	28.0	581	522	450	382	321	271	206	195	190	158	138	117	107	94	76	64	54
	29.0	605	543	469	398	335	282	216	203	198	164	144	122	112	98	79	67	56
10.0	26.0	515	460	399	337	283	239	182	172	168	139	122	103	94	83	66	56	47
	27.0	536	479	415	351	295	249	189	179	175	144	127	108	98	86	69	58	49
	28.0	558	499	432	366	307	259	197	186	182	151	132	112	102	90	72	60	51
	29.0	581	520	450	381	320	270	205	194	189	157	137	117	107	93	75	63	53

PERFORMANCE CHART

Cool Green
대향류형냉각탑(개방형)
INDUCED DRAFT COUNTER FLOW OPEN CIRCUIT COOLING TOWER



APPROACH 5°C GROUP

Range (°C)	W.B.T (°C)	Cold Water Volume classified by Frame Size(M³/HR)																
		1000F	900F	800F	700F	600F	500F	400F	375F	350F	300F	250F	225F	200F	175F	150F	125F	100F
3.0	26.0	—	—	—	—	—	520	370	370	367	—	267	229	209	182	155	132	110
	27.0	—	—	—	—	—	—	—	—	—	—	277	230	217	185	161	137	114
	28.0	—	—	—	—	—	—	—	—	—	—	288	230	225	185	168	142	119
	29.0	—	—	—	—	—	—	—	—	—	—	—	—	230	—	174	148	124
4.0	26.0	909	842	703	615	520	437	339	314	308	258	224	192	175	153	129	109	91
	27.0	945	875	—	639	540	454	352	327	320	268	232	199	182	159	134	113	95
	28.0	—	910	—	663	562	472	366	339	333	279	241	207	189	165	139	118	98
	29.0	—	945	—	689	584	491	370	353	346	290	251	215	196	171	145	123	102
5.0	26.0	807	742	624	542	457	385	298	277	271	227	197	168	154	135	112	95	79
	27.0	839	771	648	564	476	400	312	293	273	234	195	176	156	137	117	98	78
	28.0	872	802	674	586	495	416	322	299	293	246	213	182	166	145	121	103	86
	29.0	966	834	700	609	515	433	335	311	305	255	221	189	173	151	126	107	89
5.5	26.0	769	705	595	515	435	365	283	263	257	216	187	160	146	128	106	90	75
	27.0	799	733	618	536	452	380	294	274	268	224	190	166	152	133	110	93	78
	28.0	831	763	642	557	470	395	306	284	278	233	202	173	158	138	115	97	81
	29.0	864	793	668	579	489	411	318	296	289	242	210	180	164	143	119	101	84
6.0	26.0	736	673	570	492	415	349	270	251	246	206	178	152	139	122	101	85	71
	27.0	765	700	592	512	432	363	281	261	256	214	186	159	145	127	105	89	74
	28.0	796	729	615	532	449	378	292	272	266	223	193	165	151	132	109	92	77
	29.0	828	758	640	554	467	393	304	283	276	232	201	171	157	137	114	96	80
7.0	26.0	685	623	530	456	384	323	250	232	227	190	165	141	129	113	92	78	65
	27.0	712	648	551	474	399	336	260	242	236	198	172	146	134	117	96	81	68
	28.0	741	675	573	493	416	350	270	252	246	206	179	152	139	122	100	85	71
	29.0	771	702	596	513	433	364	281	262	256	214	186	158	145	127	104	88	74
8.0	26.0	645	584	500	428	360	303	234	218	213	178	155	132	120	105	86	73	61
	27.0	671	608	519	445	375	315	244	227	222	186	161	137	125	110	90	76	63
	28.0	698	633	540	463	390	328	253	236	231	193	167	143	130	114	93	79	66
	29.0	727	659	562	482	406	342	264	246	240	201	174	148	136	119	97	82	69
9.0	26.0	613	554	475	405	341	287	220	207	202	169	146	125	114	100	81	69	57
	27.0	638	576	494	422	355	299	231	215	210	176	152	130	119	104	84	71	60
	28.0	664	600	514	439	370	311	240	224	219	183	159	135	123	108	88	74	62
	29.0	691	625	535	457	385	324	250	233	227	190	165	140	128	112	92	77	65
10.0	26.0	588	529	455	387	325	274	210	197	193	160	140	119	109	95	77	65	54
	27.0	611	551	473	403	339	285	219	205	200	168	145	124	113	99	80	68	57
	28.0	636	573	493	420	353	297	228	214	209	174	151	129	118	103	83	71	59
	29.0	662	597	513	437	368	309	238	222	217	182	158	134	123	107	87	73	62

PERFORMANCE CHART

APPROACH 6°C GROUP

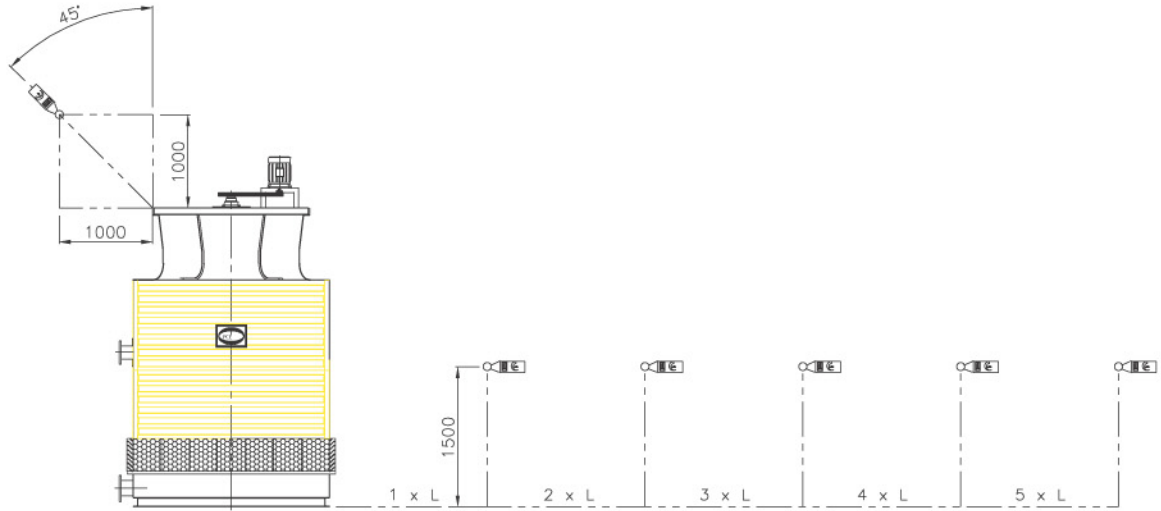
Range (°C)	W.B.T (°C)	Cold Water Volume classified by Frame Size(M³/HR)																
		1000F	900F	800F	700F	600F	500F	400F	375F	350F	300F	250F	225F	200F	175F	150F	125F	100F
3.0	26.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	180	153	128
	27.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	185	155	133
	28.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	155	138
	29.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	144
4.0	26.0	—	—	—	705	—	501	—	361	353	—	257	220	201	175	149	126	105
	27.0	—	—	—	—	—	521	—	370	367	—	267	228	208	182	155	131	110
	28.0	—	—	—	—	—	—	—	—	—	—	277	230	217	185	161	136	114
	29.0	—	—	—	—	—	—	—	—	—	—	288	—	225	—	167	142	119
5.0	26.0	919	848	709	619	523	440	341	316	310	260	225	193	176	154	129	109	91
	27.0	953	882	—	643	544	457	354	329	322	270	234	200	183	160	134	114	95
	28.0	—	916	—	668	565	475	368	342	335	281	243	208	190	166	140	118	99
	29.0	—	952	—	695	588	494	—	355	348	290	253	216	197	172	145	123	103
5.5	26.0	873	804	675	587	496	417	328	300	294	246	213	182	167	146	122	103	86
	27.0	907	836	700	610	516	434	336	312	305	256	222	190	173	151	127	107	90
	28.0	942	869	—	634	536	450	349	324	317	266	230	197	180	157	132	112	93
	29.0	—	904	—	659	558	469	363	337	330	276	239	205	187	163	137	116	97
6.0	26.0	835	767	645	560	473	397	308	286	280	235	203	174	159	139	116	98	82
	27.0	867	797	670	582	491	413	320	297	291	244	211	181	165	144	120	102	85
	28.0	901	829	696	605	511	430	333	309	303	254	220	188	172	150	125	106	89
	29.0	936	862	—	629	532	447	346	321	315	264	228	195	178	156	130	110	92
7.0	26.0	774	707	598	517	436	367	284	264	258	216	187	160	146	128	106	90	75
	27.0	805	736	622	538	454	381	295	274	268	225	195	166	152	133	110	93	78
	28.0	837	766	646	559	472	397	307	285	279	234	203	173	158	138	115	97	81
	29.0	870	797	672	582	491	413	319	297	290	243	211	180	164	144	119	101	84
8.0	26.0	727	662	563	484	408	343	265	247	241	202	175	149	137	119	98	83	70
	27.0	756	689	585	504	425	357	276	257	251	210	182	155	142	124	102	87	72
	28.0	787	717	608	524	442	371	287	267	261	219	189	162	148	129	106	90	75
	29.0	818	746	632	545	460	381	298	278	272	227	197	168	154	134	111	94	79
9.0	26.0	690	626	534	458	386	325	251	233	228	191	165	141	129	113	92	78	65
	27.0	718	652	555	477	401	338	261	243	237	199	172	147	134	117	96	81	68
	28.0	747	678	577	496	418	352	271	252	247	207	179	153	140	122	100	85	71
	29.0	777	706	600	516	435	366	282	263	257	215	186	159	145	127	104	88	74
10.0	26.0	660	597	511	437	368	309	239	222	217	182	158	134	123	107	88	74	62
	27.0	687	621	531	455	383	322	248	231	226	189	164	140	128	112	91	77	64
	28.0	714	647	552	473	398	335	258	241	235	197	171	145	133	116	95	80	67
	29.0	743	673	575	492	415	349	269	250	245	205	178	151	138	121	99	84	70

NOISE LEVEL DATA

Cool Green
대향류형냉각탑(개방형)
INDUCED DRAFT COUNTER FLOW OPEN CIRCUIT COOLING TOWER



표준모델(STANDARD FRAME)



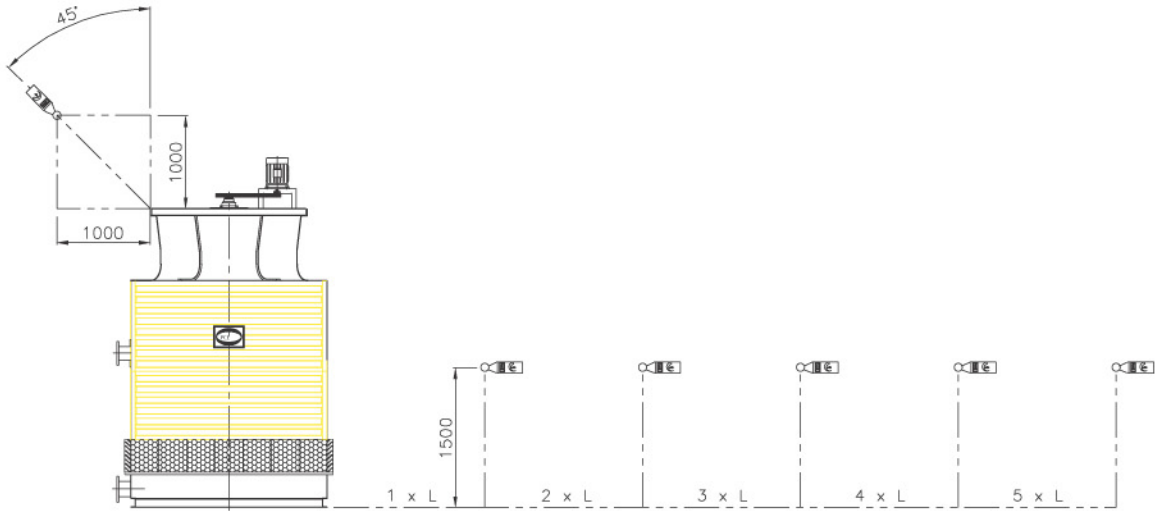
FRAME SIZE	CELLS	SOUND PRESSURE LEVEL, dB(A) - STANDARD FRAME					
		FAN STACK	LENGTH×1	LENGTH×2	LENGTH×3	LENGTH×4	LENGTH×5
100F - 1	1	67.4	74.8	70.3	67.3	65.0	63.2
125F - 1	1	72.9	75.9	71.5	68.5	66.2	64.4
150F - 1	1	73.5	77.4	72.9	69.9	67.6	65.8
175F - 1	1	75.3	78.1	73.6	70.6	68.3	66.5
200F - 1	1	75.3	78.9	74.5	71.6	69.4	67.6
225F - 1	1	76.5	79.4	75.1	72.1	69.9	68.1
250F - 1	1	76.5	79.8	75.5	72.6	70.4	68.6
300F - 1	1	78.4	80.6	76.4	73.5	71.3	69.5
350F - 1	1	78.5	80.5	76.2	73.3	71.1	69.3
375F - 1	1	78.7	80.8	76.5	73.6	71.4	69.6
400F - 1	1	79.7	81.1	76.8	73.9	71.7	69.9
500F - 1	1	79.3	81.5	77.3	74.4	72.2	70.5
600F - 1	1	82.0	81.9	77.7	74.8	72.6	70.9
700F - 1	1	77.1	82.0	77.9	75.1	72.9	71.2
800F - 1	1	80.1	82.6	78.5	75.7	73.6	71.8
900F - 1	1	82.4	81.9	77.8	75.0	72.8	71.1
1000F - 1	1	82.5	78.4	73.9	70.9	68.6	66.8

주석 1 : 상기 소음자료는 설계 표준조건 하에서의 냉각수 순환수량과 모터와 팬의 축 동력을 근거로 셀 수가 한 셀인 경우를 기준한 것이며, 설계 비표준조건 하에서의 소음 분석자료는 승인자료를 참고하시기 바랍니다. 상기 소음자료는 냉각탑 주변의 암소음을 보정하지 않은 것이므로 실제 현장 소음기준이 아닙니다.

NOTE-1 : The above sound data is on the authority of the circulation cold water volume and hub power of motor & fan in the standard design condition, in the case of 1 cell, You should refer to the approval data in case of the sound data from the non-standard design condition, And the above data without respect to the back ground noise is not actual spot noise standard.

NOISE LEVEL DATA

저소음형(APPLIED TO ENKA MAT)



FRAME SIZE	CELLS	SOUND PRESSURE LEVEL, dB(A) - APPLIED TO ENKA MAT					
		FAN STACK	LENGTH×1	LENGTH×2	LENGTH×3	LENGTH×4	LENGTH×5
100F - 1	1	67.4	67.1	62.7	59.7	57.4	55.6
125F - 1	1	72.9	68.9	64.5	61.6	59.3	57.5
150F - 1	1	73.5	70.1	65.8	62.8	60.5	58.7
175F - 1	1	75.3	70.9	66.6	63.7	61.4	59.6
200F - 1	1	75.3	71.5	67.3	64.4	62.2	60.4
225F - 1	1	76.5	72.2	68.0	65.1	62.9	61.1
250F - 1	1	76.5	72.4	68.3	65.5	63.3	61.5
300F - 1	1	78.4	73.5	69.4	66.6	64.4	62.6
350F - 1	1	78.5	73.3	69.2	66.4	64.2	62.4
375F - 1	1	78.7	73.6	69.5	66.7	64.5	62.7
400F - 1	1	79.7	74.0	70.0	67.1	64.9	63.2
500F - 1	1	79.3	74.2	70.1	67.3	65.1	63.3
600F - 1	1	82.0	75.1	71.0	68.2	66.0	64.3
700F - 1	1	77.1	74.3	70.2	67.5	65.3	63.6
800F - 1	1	80.1	75.1	71.1	68.4	66.2	64.5
900F - 1	1	82.4	74.9	70.9	68.1	65.9	64.2
1000F - 1	1	82.5	71.5	67.0	64.0	61.7	59.8

주석 1 : 상기 소음자료는 설계 표준조건 하에서의 냉각수 순환수량과 모터와 팬의 축 동력을 근거로 셀 수가 한 셀인 경우를 기준한 것이며, 설계 비표준조건 하에서의 소음 분석자료는 승인자료를 참고하시기 바랍니다. 상기 소음자료는 냉각탑 주변의 암소음을 보정하지 않은 것이므로 실제 현장 소음기준이 아닙니다.

NOTE-1 : The above sound data is on the authority of the circulation cold water volume and hub power of motor & fan in the standard design condition, in the case of 1 cell, You should refer to the approval data in case of the sound data from the non-standard design condition. And the above data without respect to the back ground noise is not actual spot noise standard.

MODEL SELECTION PROCEDURE

Cool Green
대향류형냉각탑(개방형)
INDUCED DRAFT COUNTER FLOW OPEN CIRCUIT COOLING TOWER



냉각탑에 유입되는 외기 습구온도가 27°C이고, 냉각수가 37°C에서 32°C로 냉각될 때의 일(1) 공칭톤이 0.78m³/hr인 경우의 조건을 설계 표준조건인 냉각탑이라고 하며, 이들 조건 중 어느 하나라도 설계 표준조건과 상이하면 다음의 절차에 따라 냉각탑의 용량을 선정하여야 한다.



1. 먼저 냉각범위를 계산한다. ▶ 냉각범위 = 냉각수 입구 수온 - 냉각수 출구 수온
2. 다음은 접근온도를 계산한다. ▶ 접근온도 = 냉각수 출구 수온 - 냉각탑 입구 공기의 습구온도
3. 냉각탑 성능차트에서 접근온도에 해당하는 그룹을 찾은 다음, 습구온도에 해당하는 테이블에서 냉각범위와 일치하는 열을 찾는다.
4. 그 다음 순환수량과 가장 근접한 프레임 사이즈를 찾으면 냉각탑 선정은 완료된다. 만약 해당 열에서 찾고자 하는 순환수량이 없으면 냉각탑 셀 수를 늘려야 하는 경우이므로 희망하는 순환수량을 각각의 프레임에 명시된 순환수량으로 나누면 셀 수를 얻을 수 있다. 이때 냉각탑의 효율적 운영이 가능하도록 셀 수를 결정하되, 지나치게 많은 수의 셀이 되지 않도록 유의한다.
5. 냉각탑 성능차트에 없는 냉각범위, 접근온도와 습구온도를 요구하는 설계조건인 경우에는 당사 기술부로 문의하시기 바랍니다.
다음 예(냉각탑 설계 습구온도 28°C, 980m³/hr의 냉각수를 39°C에서 33°C로 냉각을 요구하는 냉각탑 선정사례)를 통하여 알아본다.
위 설명절차에 따라 냉각범위와 접근온도를 먼저 구한다. ▶ 냉각범위 = 39 - 33 = 6°C ▶ 접근온도 = 33 - 28 = 5°C
냉각탑 성능차트에서 접근온도 5°C 그룹을 찾은 다음, 냉각범위 6.0°C인 테이블에서 외기 습구온도가 28°C인 열을 찾는다. 이 열에 순환수량이 980m³/hr와 동일한 프레임이 없으므로 순환수량 980m³/hr을 각 프레임에 명시된 순환수량으로 나누면 셀의 수를 구할 수 있다.



The Standard Design Conditions of cooling towers are the condition that 1 nominal ton is equal to 0.78m³/hr when water is cooled from 37°C to 32°C in 27°C wet bulb temperature. Even if one of these conditions differs from the standard design conditions, it is necessary to select the capacity of cooling towers according to the following procedure.



1. Determine Range ▶ Range = Entering water temperature - Leaving water temperature
2. Determine Approach ▶ Approach = Leaving water temperature - Wet bulb temperature
3. After searching for the appropriate Approach in the Performance Chart search for the column to fit with the Range in the Wet Bulb Temperature.
4. Selection is finished when you could search the most similar frame size from the circulating water flow. If there is not circulating water flow in the corresponding column, you should increase the number of cells. If you divide the circulating water flow needed by the circulating water flow specified from the each frame, you can get the number of cells. In consideration of economical efficiency, you should avoid too much cells as possible.
5. If you can't find the design conditions to be required Range, Approach and Wet Bulb Temperature in the Performance Chart, please contact with our technical division.
Example : To cool 980m³/hr of water from 39°C to 33°C at 28°C wet bulb temperature. According to the above procedure, determine the range and approach. ▶ Range = 39 - 33 = 6°C ▶ Approach = 33 - 28 = 5°C
Select the group of 5°C approach, and find out the column of 28°C wet bulb temperature in the below table. There is not the same frame as 980m³/hr circulating water flow in this column, if you divide 980m³/hr circulating water flow by the circulating water flow as mentioned in each frame, you can get the numbers of cells.

〈The table : 6°C range in the group of 5°C approach〉

Range (°C)	W.B.T. (°C)	Cold Water Volume classified by Frame Size(m³/hr)										
		400F	375F	350F	300F	250F	225F	200F	175F	150F	125F	100F
5.5	26.0	283	263	257	216	187	160	146	128	106	90	75
	27.0	294	274	268	224	190	166	152	133	110	93	78
	28.0	306	284	278	233	202	173	158	138	115	97	81
	29.0	318	296	289	242	210	180	164	143	119	101	84
6.0	26.0	270	251	246	206	178	152	139	122	101	85	71
	27.0	281	261	256	214	186	159	145	127	105	89	74
	28.0	292	272	266	223	193	165	151	132	109	92	77
	29.0	304	283	276	232	201	171	157	137	114	96	80

300 프레임에 해당되는 순환수량이 223m³/hr이므로 요구되는 셀은 5(980/223=4.44≒5)셀이 필요하나, 223×5=1,115m³/hr로 필요한 순환수량 대비 13.8%[(1,115/980-1)×100] 초과되어 비경제적이므로 250 프레임으로 다시 계산해 보면, 193×6셀=1,158m³/hr가 되어 필요한 순환수량 대비 18.2% 초과한다. 225 프레임의 경우 6셀이 되어 1.0% 초과하고 200 프레임의 경우 7셀이 되어, 225 프레임의 6셀이 가장 경제적이므로 225 프레임을 선택한다.

Circulating water flow answered to the 300 frame is 223m³/hr, so you need 5 cells(980/223 = 4.44 ≒ 5). But 5 cells are unthrifty compared with the circulating water flow required(223×5 = 1,115m³/hr, 13.8%[(1,115/980 - 1) × 100] over). When you recalculate by 250 frame, 1,158m³/hr(193×6 cells = 1,158m³/hr) is excess 18.2% [(1,158/980 - 1) × 100] to circulating water flow required. But 200 frames need to 7 cells. In the occasion of 6 cells in the 225 frames, it exceeds by 1.0% only. So 6 cells in the 225 frames are the most efficiency, you should choice 225 frames.

PHOTOGRAPH
(EXCEPT COOL GREEN)



For a more pleasant environment.



CoolGreen 대향류형냉각탑

INDUCED DRAFT COUNTER FLOW OPEN CIRCUIT COOLING TOWER



(주) 풍천엔지니어링
POONGCHEON ENGINEERING CO.,LTD.

본사(HEAD OFFICE) : 서울 영등포구 문래동 3가 54-66 에이스하이테크시티 2동 1110호

(#1110 2-dong, Ace High-tech City, 54-66, Munraedong 3ga, Yeongdeungpo-gu, Seoul, KOREA)

Tel : 82-2-2672-0990 Fax : 82-2-2631-1444 E-Mail : pctower@chol.com

공장(Factory) : 충남 서천군 종천면 석촌리 416-80

(#416-80, Seokchon-ri, Jongcheon-myeon, Choongnam Province, Korea)

Tel : 82-41-953-2688 Fax : 82-41-953-2689