Bulletin 167 - CT

evapco®

CONTAINERIZED

AT Cooling Towers

Engineered to Deliver the

Maximum Capacity and

Highest Quality to the

Worldwide Market - with the

Lowest Shipping Costs!

U.S. Green Building Council Member

Green Mechanical Council Helios Member

MCAA Supplier Partner Manufacturer/Supplier Council
Member MCAA
Mechanical Contractors Association of America

evapco

CERTIFIED ISO 9001:2008 & ISO 14001:2004

Since its founding in 1976, EVAPCO, Incorporated has become an industry leader in the engineering and manufacturing of quality heat transfer products around the world. EVAPCO's mission is to provide first class service and quality products for the following markets:

- Industrial Refrigeration
- Commercial HVAC
- Industrial Process
- Power
- District Energy

EVAPCO's powerful combination of financial strength and technical expertise has established the company as a recognized manufacturer of market-leading products on a worldwide basis. EVAPCO is also recognized for the superior technology of their environmentally friendly product innovations in sound reduction and water management.

EVAPCO is an employee owned company with a strong emphasis on research & development and modern manufacturing plants. EVAPCO has earned a reputation for technological innovation and superior product quality by featuring products that are designed to offer these operating advantages:

- Higher System Efficiency
- Environmentally Friendly
- Lower Annual Operating Costs
- Reliable, Simple Operation and Maintenance

With an ongoing commitment to Research & Development programs, EVAPCO provides the most advanced products in the industry–***Technology for the Future, Available Today!***

EVAPCO products are manufactured on five continents around the world and distributed through hundreds of factory - anthorized sales representatives.

Advanced Technology Cooling Towers for a Worldwide Market

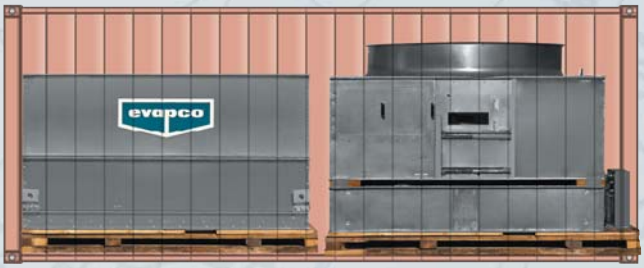
The Containerized line of Cooling Towers has been custom-engineered to ship in standard shipping containers. This feature greatly reduces the transportation costs associated with shipping. Customers around the world will benefit from the Advanced Technology features which are standard on the Containerized design:

- Low-Energy Consumption
- Induced-Draft Operation
- EVAPAK® Fill
- EvapJet™ Nozzle
- PVC Water Distribution System
- WST Air Inlet Louvers
- Simple Operation and Maintenance

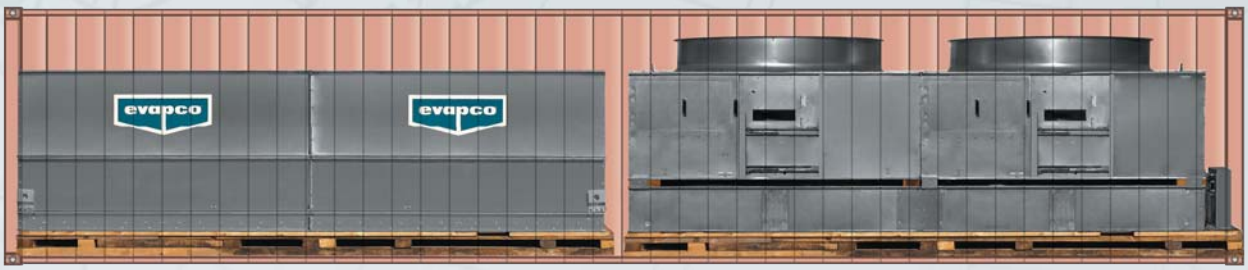
The Containerized Towers have been designed for simplified field assembly and rigging, while delivering the quality and reliability of a factory-built unit. These units provide the maximum capacity with the lowest ocean shipping cost!

Designed Lower Transportation and Installation Costs while Delivering Advanced Technology, Superior Performance, Ease of Maintenance and Long, Trouble-Free Operation.

A complete 2.24M x 2.73M (7.33 ft. x 9 ft.) **unit will fit in a 20' Shipping Container!**



A complete 2.24M x 5.48M (7.33 ft. x 18 ft.) **unit will fit in a 40' Shipping Container!**

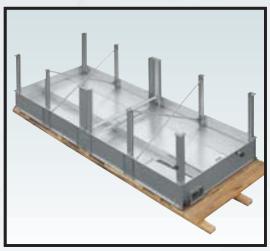


Easy Field Assembly

(See rigging and assembly instructions for fully detailed procedure.)

Unload Unit from Container

Mount Fan Section to Fill Section



Install Vertical Posts in Basin Section

Mount Fill/Fan to Basin Section

Mount Fan Motor

Optional Accessories Ship Inside the Container

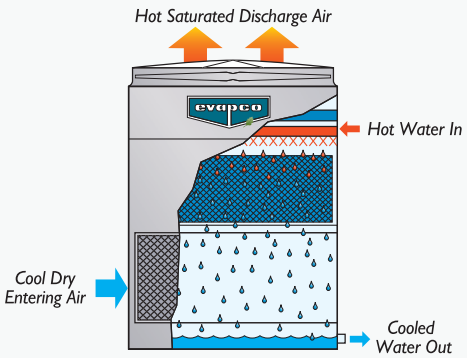
- **Sloped Ladder**
- **Motor Davit**
- **Vibration Cut-Out Switch**
- **Basin Heater Package**
- **Electric Water Level Control**
- **Specialty Motors**

cAT Designand Construction Features

The cAT line of cooling towers reflects EVAPCO's continuing commitment to research and development. Their advanced design provides owners with many operational and performance advantages.

Principle of Operation

Warm water from the heat source is pumped to the water distribution system at the top of the tower. The water is distributed over the wet deck fill by means of large orifice nozzles. Simultaneously, air is drawn in through the air inlet louvers at the base of the tower and travels upward through the wet deck fill opposite the water flow. A small portion of the water is evaporated which removes the heat from the remaining water. The warm moist air is drawn to the top of the cooling tower by the fan and discharged to the atmosphere. The cooled water drains to the basin at the bottom of the tower and is returned to the heat source.



Principle of Operation

For particularly corrosive environments EVAPCO cAT cooling towers are available with type 304 or 316 stainless steel construction. Consult the factory for details on available options.

Fan Drive System

The fan motor and drive assembly is designed to allow easy servicing of the motor and adjustment of the belt tension from the exterior of the unit. The totally enclosed fan cooled (T.E.F.C.) fan motor is mounted on the outside for easy access. A protective cover swings away to allow servicing and belt adjustment.

A large, hinged access door with a "quick release" latch provides access to the fan section for maintenance.

External Motor Mount (Optional Ladder Shown)

Power-Band Drive Belt

The Power-Band is a solid-back, multigroove belt system that has high lateral rigidity. The belt is constructed of neoprene with polyester cords. The drive belt is designed for 150 percent of the motor nameplate horsepower for long life and durability.

Fan Shaft Bearings

The fan shaft bearings in cAT units are specially selected for long, trouble-free life. They are rated for an L-10 life of 75,000 to 135,000 hours and are the heaviest pillow block bearings available.

Aluminum Alloy Pulleys

Fan pulleys located in the air stream are constructed of corrosion free aluminum for long life. The aluminum also helps belts last longer.

WST Air Inlet Louvers

Water and Sight Tight air inlet louvers are designed to effectively eliminate splash-out and sunlight, greatly reducing the potential for algae formation inside the cooling tower. They are manufactured of corrosion-free PVC and mounted in light-weight frames to allow for easy removal and convenient access to the basin section.

Type 304 Stainless Steel Strainers

Subjected to excessive wear and corrosion, the sump strainer is critical to the successful operation of the cooling tower. EVAPCO uses only stainless steel for this very important component.

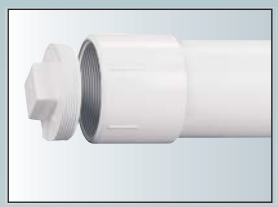
Totally Enclosed Motors

EVAPCO uses totally enclosed motors as standard for all fan motors. These superior motors help to assure longer equipment life without motor failures, which result in costly downtime.

U.S. Patent No. 6315804

PVC Drift Eliminators

The final elements in the upper part of the cooling tower are drift eliminators. They strip the entrained water droplets from the leaving air stream and reduce drift rate to 0.001%. EVAPCO eliminators are constructed entirely of inert, corrosion-free PVC. This patented PVC material has been specially treated to resist damaging ultraviolet light. The eliminators are assembled in easily handled sections to facilitate removal, thereby exposing the upper portion of the unit and water distribution system for periodic inspection.



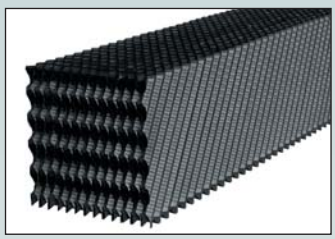
EvapJet™ Nozzle

Water Distribution System

- Non-corrosive PVC construction with new EvapJet™ nozzles.
- Large orifice nozzles prevent clogging and are threaded for easy removal and positive positioning.
- System branches have threaded end caps to assist with debris removal.

EVAPAK® Fill

The EVAPAK® fill design used in the cAT Cooling Tower is specially designed to induce highly turbulent mixing of the air and water for superior heat transfer. Special drainage tips allow high water loadings without excessive pressure drop. The fill is constructed of inert polyvinyl chloride, (PVC), will not rot or decay, and is formulated to with-stand water temperatures of 130˚F (55˚C). Because of the unique way in which the crossfluted sheets are bonded together, and the bottom support of the fill section, the structural integrity of the fill is greatly enhanced, making the fill usable as a working platform.



The fill selected for the cAT Cooling Tower has excellent fire resistant qualities. cAT Cooling Tower fill has a flame spread rating of 5 per ASTM-E84-81a. A higher temperature fill is available for water temperatures exceeding 130˚F (55˚C). Consult your EVAPCO representative for further details.

Quick Connect Piping System

- All inlet and outlet piping connections are beveled for welding and grooved to accept a mechanical coupling device as standard.
- Facilitates easy pipe connections for quick installation.
- Flanged connections are available as an option.

cAT Thermal Performance – S.I. Data

Model No.	Motor kW	TOWER CAPABILITY IN LPS AT THE FOLLOWING TEMPERATURE CONDITIONS (˚C)										
		EWT	32°	36°	32°	36°	32°	36°	32°	37°	35°	40°
		LWT	27°	26°	27°	26°	27°	26°	27°	27°	30°	30°
		WB	19°	19°	20°	20°	21°	21°	22°	22°	24°	24°
cAT 17-49	(1)7.5		47	28	44	26	40	23	36	24	45	31
cAT 17-59	(1)11		49	29	45	26	41	23	37	25	47	32
cAT 17-69	(1)11		53	33	49	30	45	27	41	29	51	36
cAT 17-79	(1)11		55	35	51	32	47	30	42	31	53	38
cAT 17-89	(1)15		58	36	54	33	50	30	45	32	56	40
cAT 17-99	(1)15		60	38	56	35	51	32	46	34	58	41
cAT 17-511	(1)7.5		52	31	49	29	44	26	40	27	50	35
cAT 17-611	(1)15		59	35	55	32	50	29	45	30	57	39
cAT 17-711	(1)11		61	39	57	36	52	33	47	34	59	42
cAT 17-811	(1)15		65	40	60	37	55	34	50	35	62	44
cAT 17-911	(1)15		67	42	62	39	57	36	52	38	64	46
cAT 17-312	(1)7.5		57	34	54	31	49	28	43	29	56	38
cAT 17-412	(1)7.5		60	37	56	35	51	32	46	33	58	41
cAT 17-512	(1)15		66	38	61	35	55	31	49	33	63	43
cAT 17-612	(1)15		71	44	66	40	61	37	55	38	69	48
cAT 17-712	(1)15		73	46	69	43	63	40	57	41	71	50
cAT 17-812	(1)18.5		76	47	71	44	65	40	59	42	74	52
cAT 17-912	(1)18.5		78	50	73	46	67	42	61	44	76	54

Model No.	Motor kW	TOWER CAPABILITY IN LPS AT THE FOLLOWING TEMPERATURE CONDITIONS (˚C)									
		EWT	35°	40°	35°	37°	40°	42°	36°	37°	41°	42°
		LWT	30°	30°	30°	32°	30°	32°	31°	32°	31°	32°
		WB	25°	25°	26°	26°	26°	26°	27°	27°	27°	27°
cAT 17-49	(1)7.5		41	29	36	49	25	34	38	45	27	32
cAT 17-59	(1)11		43	29	37	51	26	35	39	47	27	32
cAT 17-69	(1)11		47	33	41	56	30	39	43	51	31	36
cAT 17-79	(1)11		48	35	43	58	32	41	45	53	33	38
cAT 17-89	(1)15		51	37	45	61	33	43	47	56	34	40
cAT 17-99	(1)15		53	38	47	---	35	45	49	57	36	42
cAT 17-511	(1)7.5		46	32	40	55	28	38	42	50	29	35
cAT 17-611	(1)15		52	36	46	63	31	43	48	57	33	40
cAT 17-711	(1)11		54	39	48	64	35	46	50	59	37	43
cAT 17-811	(1)15		57	40	51	68	36	48	53	62	38	45
cAT 17-911	(1)15		59	43	52	70	39	50	54	64	40	46
cAT 17-312	(1)7.5		50	34	44	61	30	42	46	55	32	38
cAT 17-412	(1)7.5		53	38	47	63	34	45	49	58	36	42
cAT 17-512	(1)15		57	39	50	69	34	47	52	63	36	43
cAT 17-612	(1)15		63	44	55	75	40	53	58	68	42	49
cAT 17-712	(1)15		65	47	58	77	43	55	60	71	44	51
cAT 17-812	(1)18.5		67	48	60	80	43	57	62	73	45	53
cAT 17-912	(1)18.5		69	50	62	82	45	59	64	75	47	55

To Make a Selection:
Locate the column with the desired operating temperature conditions. Read down the column until you find the LPS equal to or greater than the flow required. Read horizontally to the left to find the model number of the unit that will perform the duty. For selections and conditions other than those started, consult your evapSelect® Selection Program or local EVAPCO represenative.

cAT Thermal Performance – English Data

Model No.	Motor Hp	TOWER CAPABILITY IN USGPM AT THE FOLLOWING TEMPERATURE CONDITIONS (°F)										
		EWT	90°	95°	90°	95°	90°	95°	90°	95°	95°	100°
		LWT	80°	80°	80°	80°	80°	80°	80°	80°	85°	85°
		WB	66°	66°	68°	68°	70°	70°	72°	72°	75°	75°
cAT 17-49	(1)10		673	534	625	493	557	442	487	391	632	504
cAT 17-59	(1)15		700	547	647	502	573	447	496	393	655	514
cAT 17-69	(1)15		763	612	711	567	637	511	561	456	718	578
cAT 17-79	(1)15		790	638	737	595	663	542	589	491	744	606
cAT 17-89	(1)20		837	674	780	627	701	567	620	508	788	639
cAT 17-99	(1)20		861	696	803	649	723	592	643	536	811	661
cAT 17-511	(1)10		750	592	695	546	619	488	539	431	703	558
cAT 17-611	(1)20		854	669	791	615	701	549	608	483	800	629
cAT 17-711	(1)15		883	713	823	665	741	605	658	546	832	677
cAT 17-811	(1)20		932	748	868	695	779	628	687	561	877	709
cAT 17-911	(1)20		962	777	897	725	808	661	718	598	906	738
cAT 17-312	(1)10		825	649	764	597	678	532	590	468	772	610
cAT 17-412	(1)10		865	696	805	648	724	587	641	527	814	660
cAT 17-512	(1)20		939	733	868	673	768	599	665	526	878	688
cAT 17-612	(1)20		1023	820	953	760	854	685	751	611	963	775
cAT 17-712	(1)20		1060	856	988	798	890	727	790	658	998	813
cAT 17-812	(1)25		1099	884	1024	822	920	743	813	665	1035	838
cAT 17-912	(1)25		1132	915	1056	854	951	778	845	705	1067	869

Model No.	Motor Hp	TOWER CAPABILITY IN USGPM AT THE FOLLOWING TEMPERATURE CONDITIONS (°F)										
		EWT	95°	100°	95°	97°	100°	102°	95°	97°	100°	102°
		LWT	85°	85°	85°	87°	85°	87°	85°	87°	85°	87°
		WB	76°	76°	78°	78°	78°	78°	80°	80°	80°	80°
cAT 17-49	(1)10		597	477	521	630	419	506	427	546	348	441
cAT 17-59	(1)15		617	485	532	653	423	516	431	560	347	446
cAT 17-69	(1)15		681	550	597	717	487	581	495	625	408	511
cAT 17-79	(1)15		707	579	625	743	519	609	527	651	446	542
cAT 17-89	(1)20		748	609	659	786	541	642	550	688	458	567
cAT 17-99	(1)20		770	632	681	809	567	664	575	710	490	591
cAT 17-511	(1)10		664	528	578	702	462	561	470	606	382	487
cAT 17-611	(1)20		754	595	652	798	519	633	529	686	429	548
cAT 17-711	(1)15		789	646	697	830	579	680	588	728	497	605
cAT 17-811	(1)20		832	674	731	875	597	712	607	764	504	627
cAT 17-911	(1)20		860	705	760	904	632	742	642	793	545	660
cAT 17-312	(1)10		729	578	632	770	503	613	513	664	416	531
cAT 17-412	(1)10		772	629	681	812	560	663	569	710	478	586
cAT 17-512	(1)20		828	650	714	876	566	692	578	751	465	598
cAT 17-612	(1)20		913	737	800	961	652	779	663	838	547	684
cAT 17-712	(1)20		948	776	838	996	696	817	706	873	598	726
cAT 17-812	(1)25		982	797	864	1032	707	841	719	903	598	742
cAT 17-912	(1)25		1013	831	895	1064	745	873	756	933	643	777

To Make a Selection:
Locate the column with the desired operating temperature conditions. Read down the column until you find the GPM equal to or greater than the flow required. Read horizontally to the left to find the model number of the unit that will perform the duty. For selections and conditions other than those started, consult your evapSelect® Selection Program or local EVAPCO represenative.

cAT Engineering Dimensions & Data – S.I. Data

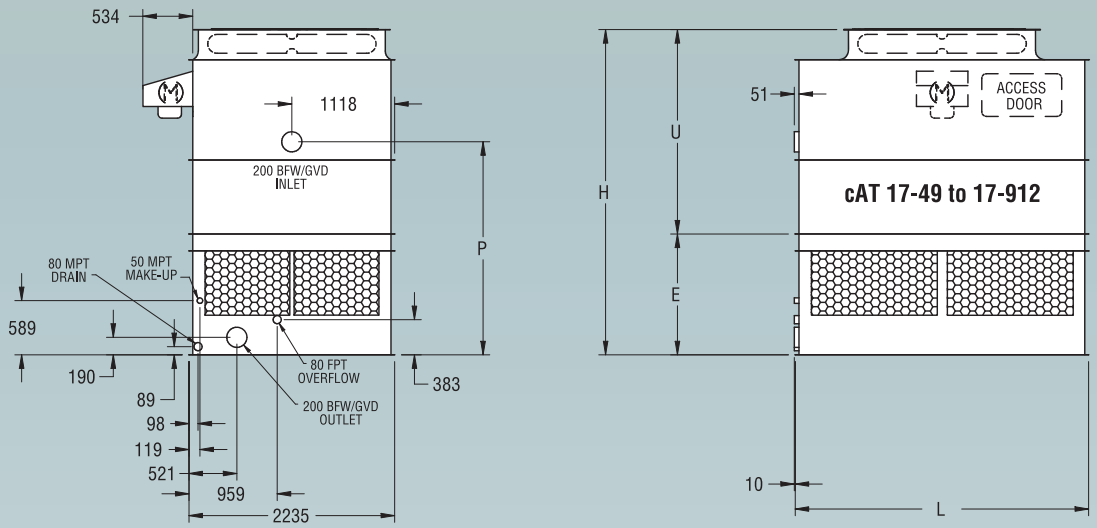


Table 1 Engineering Data

cAT Model No.	Weights (KG)			Fan Motor (kW)	Air Flow (m^3/s)	Dimensions (mm)				
	Shipping	Operating	Heaviest Section (Pan/Fan)			L	H	U	P	E
cAT 17-49	1,970	3,015	1,260	7.5	19	2731	3839	2524	2619	1315
cAT 17-59	1,880	3,050	1,295	11	21	2731	3534	2219	2315	1315
cAT 17-69	2,000	2,930	1,295	11	21	2731	3839	2524	2619	1315
cAT 17-79	2,130	3,180	1,295	11	21	2731	4143	2829	2924	1315
cAT 17-89	2,025	3,070	1,315	15	23	2731	3839	2524	2619	1315
cAT 17-99	2,155	3,200	1,315	15	23	2731	4143	2829	2924	1315
cAT 17-511	2,210	3,410	1,395	7.5	21	3188	3839	2524	2619	1315
cAT 17-611	2,130	3,335	1,450	15	27	3188	3534	2219	2315	1315
cAT 17-711	2,390	3,590	1,430	11	23	3188	4143	2829	2924	1315
cAT 17-811	2,265	3,465	1,450	15	26	3188	3839	2524	2619	1315
cAT 17-911	2,415	3,615	1,450	15	26	3188	4143	2829	2924	1315
cAT 17-312	2,375	3,810	1,490	7.5	23	3651	3839	2524	2619	1315
cAT 17-412	2,530	3,965	1,490	7.5	23	3651	4143	2829	2924	1315
cAT 17-512	2,285	3,720	1,540	15	30	3651	3534	2219	2315	1315
cAT 17-612	2,430	3,865	1,540	15	29	3651	3839	2524	2619	1315
cAT 17-712	2,585	4,020	1,540	15	29	3651	4143	2829	2924	1315
cAT 17-812	2,445	3,880	1,555	18.5	31	3651	3839	2524	2619	1315
cAT 17-912	2,600	4,030	1,555	18.5	31	3651	4143	2829	2924	1315

NOTES: (1) An adequately sized bleed line must be installed in the cooling tower system to prevent build-up of impurities in the recirculated water.
(2) Do not use catalog drawings for certified prints. Dimensions are subject to change.
(3) Connections larger than 80mm are Beveled for Welding (BFW) and grooved for a mechanical coupling.
(4) Adequate spacing must be allowed for access to the cooling tower.

cAT Engineering Dimensions & Data – English Data

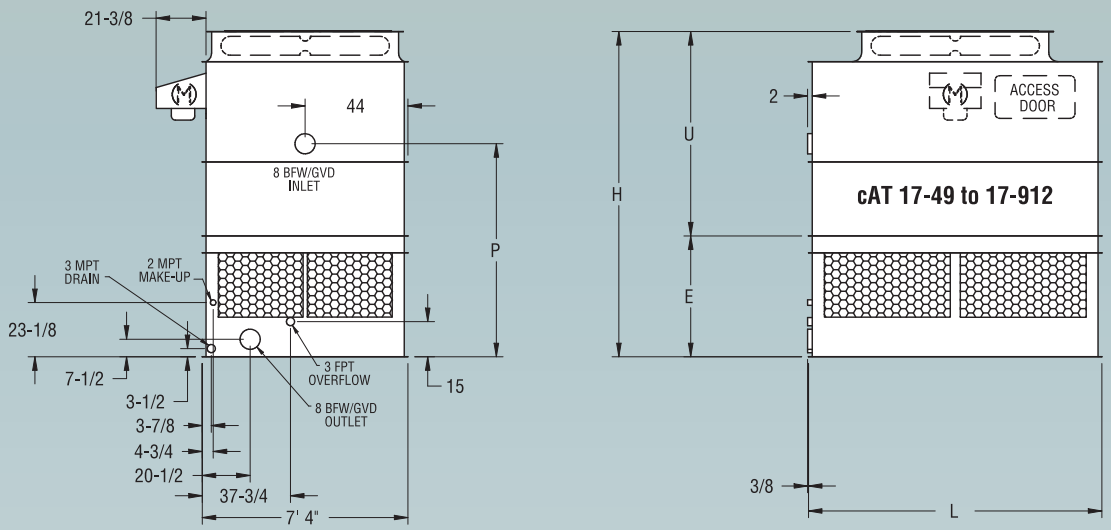


Table 1 Engineering Data

cAT Model No.	Weights (lbs.)			Fan Motor (HP)	Air Flow (CFM)	Dimensions (in.)				
	Shipping	Operating	Heaviest Section (Pan/Fan)			L	H	U	P	E
cAT 17-49	4,340	6,650	2,780	10	39200	107-1/2"	151-1/8"	99-3/8"	103-1/8"	51-3/4"
cAT 17-59	4,150	6,460	2,850	15	45400	107-1/2"	139-1/8"	87-3/8"	91-1/8"	51-3/4"
cAT 17-69	4,410	6,720	2,850	15	44500	107-1/2"	151-1/8"	99-3/8"	103-1/8"	51-3/4"
cAT 17-79	4,700	7,010	2,850	15	43800	107-1/2"	163-1/8"	111-3/8"	115-1/8"	51-3/4"
cAT 17-89	4,460	6,770	2,900	20	48800	107-1/2"	151-1/8"	99-3/8"	103-1/8"	51-3/4"
cAT 17-99	4,750	7,060	2,900	20	47900	107-1/2"	163-1/8"	111-3/8"	115-1/8"	51-3/4"
cAT 17-511	4,870	7,520	3,080	10	44400	125-1/2"	151-1/8"	99-3/8"	103-1/8"	51-3/4"
cAT 17-611	4,700	7,350	3,200	20	56300	125-1/2"	138-11/8"	87-3/8"	91-1/8"	51-3/4"
cAT 17-711	5,270	7,920	3,150	15	49600	125-1/2"	163-1/8"	111-3/8"	115-1/8"	51-3/4"
cAT 17-811	4,990	7,640	3,200	20	55200	125-1/2"	151-1/8"	99-3/8"	103-1/8"	51-3/4"
cAT 17-911	5,320	7,970	3,200	20	54200	125-1/2"	163-1/8"	111-3/8"	115-1/8"	51-3/4"
cAT 17-312	5,240	8,400	3,280	10	49500	143-3/4"	151-1/8"	99-3/8"	103-1/8"	51-3/4"
cAT 17-412	5,580	8,740	3,280	10	48700	143-3/4"	163-1/8"	111-3/8"	115-1/8"	51-3/4"
cAT 17-512	5,040	8,200	3,400	20	62700	143-3/4"	139-1/8"	87-3/8"	91-1/8"	51-3/4"
cAT 17-612	5,360	8,520	3,400	20	61500	143-3/4"	151-1/8"	99-3/8"	103-1/8"	51-3/4"
cAT 17-712	5,700	8,860	3,400	20	60500	143-3/4"	163-1/8"	111-3/8"	115-1/8"	51-3/4"
cAT 17-812	5,390	8,550	3,430	25	66000	143-3/4"	151-1/8"	99-3/8"	103-1/8"	51-3/4"
cAT 17-912	5,730	8,890	3,430	25	64800	143-3/4"	163-1/8"	111-3/8"	115-1/8"	51-3/4"

NOTES: (1) An adequately sized bleed line must be installed in the cooling tower system to prevent build-up of impurities in the recirculated water.
(2) Do not use catalog drawings for certified prints. Dimensions are subject to change.
(3) Connections larger than 3" are Beveled for Welding (BFW) and grooved for a mechanical coupling.
(4) Adequate spacing must be allowed for access to the cooling tower.

cAT Thermal Performance – S.I. Data

Model No.	Motor kW	TOWER CAPABILITY IN LPS AT THE FOLLOWING TEMPERATURE CONDITIONS (˚C)										
		EWT	32°	36°	32°	36°	32°	36°	32°	37°	35°	40°
		LWT	27°	26°	27°	26°	27°	26°	27°	27°	30°	30°
		WB	19°	19°	20°	20°	21°	21°	22°	22°	24°	24°
cAT 17-214	(1)11		72	44	68	40	62	36	55	38	70	48
cAT 17-314	(1)11		75	47	70	44	65	40	58	42	73	52
cAT 17-414	(1)18.5		78	46	73	42	66	38	59	40	75	51
cAT 17-514	(1)15		79	48	74	45	68	40	61	42	77	53
cAT 17-614	(1)15		82	52	77	48	70	44	63	46	79	56
cAT 17-714	(1)18.5		85	52	79	48	73	44	65	46	82	58
cAT 17-814	(1)22		90	56	84	52	77	47	69	49	87	61
cAT 17-914	(1)22		92	58	86	54	79	50	72	52	89	64
cAT 27-518	(2)5.5		90	56	84	52	77	48	70	50	87	62
cAT 27-618	(2)11		99	58	92	53	83	47	74	50	95	64
cAT 27-718	(2)11		107	66	100	61	92	55	82	58	103	72
cAT 27-818	(2)15		117	73	109	68	100	61	90	64	113	80
cAT 27-918	(2)15		120	76	113	71	103	65	93	68	117	83

Model No.	Motor kW	TOWER CAPABILITY IN LPS AT THE FOLLOWING TEMPERATURE CONDITIONS (˚C)										
		EWT	35°	40°	35°	37°	40°	42°	36°	37°	41°	42°
		LWT	30°	30°	30°	32°	30°	32°	31°	32°	31°	32°
		WB	25°	25°	26°	26°	26°	26°	27°	27°	27°	27°
cAT 17-214	(1)11		64	44	56	76	39	53	59	70	41	49
cAT 17-314	(1)11		67	48	59	79	43	56	62	72	45	52
cAT 17-414	(1)18.5		68	46	60	82	41	57	63	75	43	52
cAT 17-514	(1)15		70	49	62	83	44	59	64	76	46	54
cAT 17-614	(1)15		72	52	64	86	47	61	67	79	49	57
cAT 17-714	(1)18.5		75	53	66	89	48	63	69	81	50	58
cAT 17-814	(1)22		79	57	70	94	51	67	73	86	53	62
cAT 17-914	(1)22		82	59	73	97	54	69	76	89	56	64
cAT 27-518	(2)5.5		80	57	71	95	51	67	74	87	54	63
cAT 27-618	(2)11		86	58	75	104	52	71	79	95	54	65
cAT 27-718	(2)11		94	67	83	112	60	79	87	103	63	73
cAT 27-818	(2)15		103	74	92	123	66	88	96	112	70	81
cAT 27-918	(2)15		106	77	95	---	70	90	99	116	73	84

To Make a Selection:
Locate the column with the desired operating temperature conditions. Read down the column until you find the LPS equal to or greater than the flow required. Read horizontally to the left to find the model number of the unit that will perform the duty. For selections and conditions other than those started, consult your evapSelect® Selection Program or local EVAPCO represenative.

cAT Thermal Performance – English Data

Model No.	Motor Hp	TOWER CAPABILITY IN USGPM AT THE FOLLOWING TEMPERATURE CONDITIONS (°F)										
		EWT	90°	95°	90°	95°	90°	95°	90°	95°	95°	100°
		LWT	80°	80°	80°	80°	80°	80°	80°	80°	85°	85°
		WB	66°	66°	68°	68°	70°	70°	72°	72°	75°	75°
cAT 17-214	(1)15		1043	825	968	763	863	683	753	603	979	779
cAT 17-314	(1)15		1087	877	1013	817	912	742	808	668	1024	832
cAT 17-414	(1)25		1121	877	1037	805	918	718	795	631	1049	824
cAT 17-514	(1)20		1140	910	1061	842	949	758	833	675	1072	860
cAT 17-614	(1)20		1183	955	1103	890	993	811	881	732	1114	907
cAT 17-714	(1)25		1222	981	1139	910	1021	821	899	733	1151	928
cAT 17-814	(1)30		1295	1043	1207	969	1085	877	959	785	1220	988
cAT 17-914	(1)30		1334	1078	1244	1006	1121	917	996	831	1257	1025
cAT 27-518	(2)7.5		1303	1049	1214	976	1091	884	965	794	1227	995
cAT 27-618	(2)15		1415	1104	1308	1014	1157	903	1002	792	1324	1037
cAT 27-718	(2)15		1542	1235	1436	1145	1287	1032	1132	920	1451	1168
cAT 27-818	(2)20		1690	1361	1575	1265	1416	1145	1252	1026	1592	1290
cAT 27-918	(2)20		1740	1406	1622	1312	1461	1196	1298	1083	1639	1336

Model No.	Motor Hp	TOWER CAPABILITY IN USGPM AT THE FOLLOWING TEMPERATURE CONDITIONS (°F)										
		EWT	95°	100°	95°	97°	100°	102°	95°	97°	100°	102°
		LWT	85°	85°	85°	87°	85°	87°	85°	87°	85°	87°
		WB	76°	76°	78°	78°	78°	78°	80°	80°	80°	80°
cAT 17-214	(1)15		925	738	805	976	647	783	659	845	536	682
cAT 17-314	(1)15		972	794	857	1022	708	836	720	895	606	741
cAT 17-414	(1)25		989	779	854	1047	679	828	692	898	558	716
cAT 17-514	(1)20		1015	816	888	1070	720	864	733	930	602	757
cAT 17-614	(1)20		1058	866	934	1112	776	911	787	975	665	810
cAT 17-714	(1)25		1091	883	958	1148	782	932	795	1002	658	820
cAT 17-814	(1)30		1158	941	1019	1217	835	993	849	1065	707	876
cAT 17-914	(1)30		1193	979	1055	1254	878	1029	891	1100	758	916
cAT 27-518	(2)7.5		1163	947	1026	1224	843	1000	857	1070	719	883
cAT 27-618	(2)15		1247	980	1075	1320	853	1042	870	1132	700	901
cAT 27-718	(2)15		1375	1111	1206	1448	982	1173	999	1262	824	1031
cAT 27-818	(2)20		1511	1229	1330	1588	1091	1296	1109	1390	924	1143
cAT 27-918	(2)20		1556	1276	1376	1635	1145	1342	1162	1434	989	1195

To Make a Selection:
Locate the column with the desired operating temperature conditions. Read down the column until you find the GPM equal to or greater than the flow required. Read horizontally to the left to find the model number of the unit that will perform the duty. For selections and conditions other than those started, consult your evapSelect® Selection Program or local EVAPCO represenative.

cAT Engineering Dimensions & Data – S.I. Data

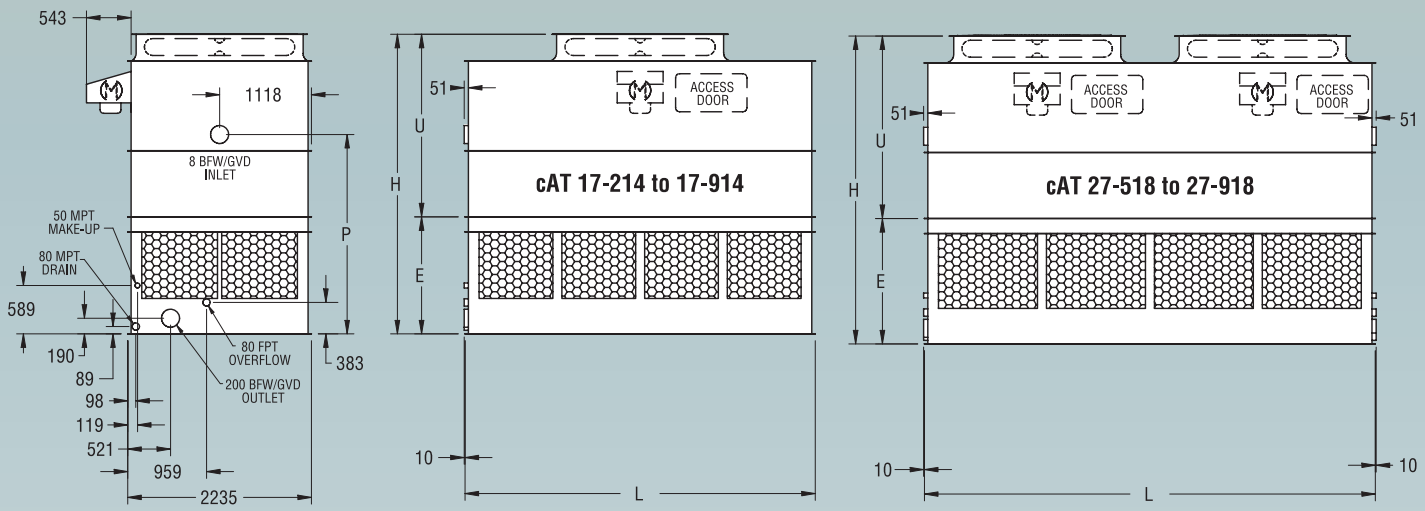


Table 2 Engineering Data

cAT Model No.	Weights (KG)			Fan Motor (kW)	Air Flow (m^3/s)	Dimensions (mm)				
	Shipping	Operating	Heaviest Section (Pan/Fan)			L	H	U	P	E
cAT 17-214	2,730	4,370	1,710	11	29	4261	3950	2524	2731	1426
cAT 17-314	2,925	4,565	1,710	11	28	4261	4255	2829	3035	1426
cAT 17-414	2,600	4,235	1,745	18.5	35	4261	3645	2219	2426	1426
cAT 17-514	2,755	4,390	1,735	15	32	4261	3950	2524	2731	1426
cAT 17-614	2,950	4,585	1,735	15	31	4261	4255	2729	3035	1426
cAT 17-714	2,765	4,405	1,745	18.5	34	4261	3950	2524	2731	1426
cAT 17-814	2,775	4,415	1,755	22	36	4261	3950	2524	2731	1426
cAT 17-914	2,970	4,610	1,755	22	35	4261	4255	2829	3035	1426
cAT 27-518	3,915	6,110	2,405	(2) 5.5	34	5486	4356	2829	3137	1527
cAT 27-618	3,515	5,710	2,450	(2) 11	43	5486	3747	2219	2527	1527
cAT 27-718	3,740	5,935	2,450	(2) 11	42	5486	4051	2524	2832	1527
cAT 27-818	3,760	5,955	2,470	(2) 15	47	5486	4051	2524	2832	1527
cAT 27-918	3,985	6,180	2,470	(2) 15	46	5486	4356	2829	3137	1527

NOTES: (1) An adequately sized bleed line must be installed in the cooling tower system to prevent build-up of impurities in the recirculated water.
(2) Do not use catalog drawings for certified prints. Dimensions are subject to change.
(3) Connections larger than 80mm are Beveled for Welding (BFW) and grooved for a mechanical coupling.
(4) Adequate spacing must be allowed for access to the cooling tower.

cAT Engineering Dimensions & Data – English Data

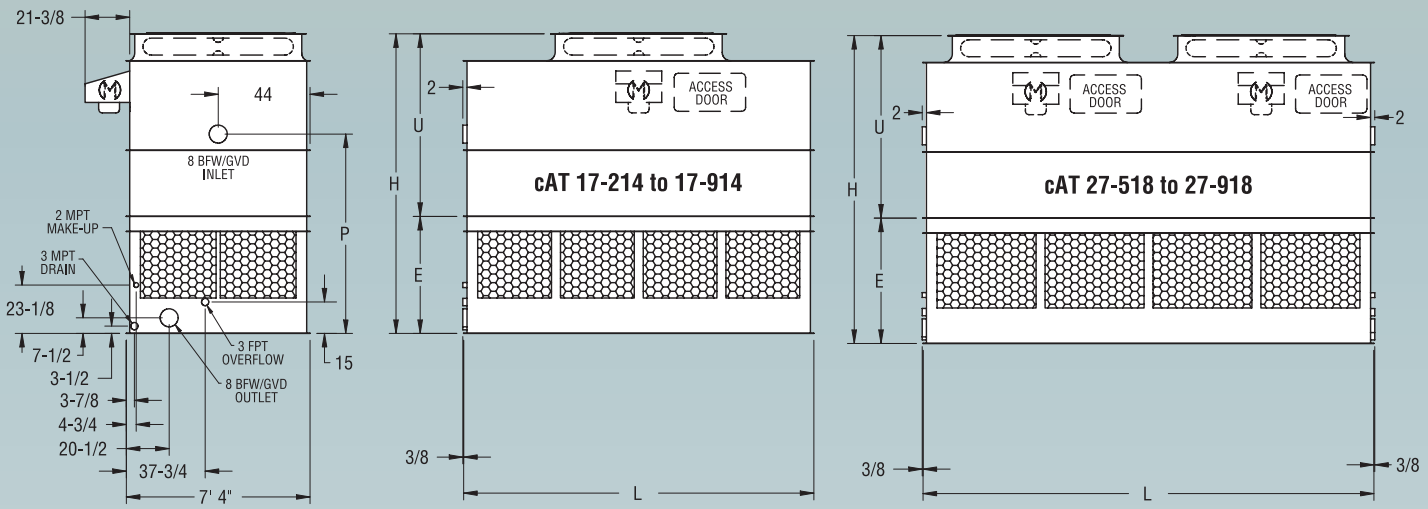


Table 2 Engineering Data

cAT Model No.	Weights (lbs.)			Fan Motor (HP)	Air Flow (CFM)	Dimensions (in.)				
	Shipping	Operating	Heaviest Section (Pan/Fan)			L	H	U	P	E
cAT 17-214	6,020	9,630	3,770	15	61300	167-3/4"	155-1/2"	99-3/8"	107-1/2"	56-1/8"
cAT 17-314	6,450	10,060	3,770	15	60300	167-3/4"	167-1/2"	111-3/8"	119-1/2"	56-1/8"
cAT 17-414	5,730	9,340	3,850	25	73400	167-3/4"	143-1/2"	87-3/8"	95-1/2"	56-1/8"
cAT 17-514	6,070	9,680	3,820	20	67100	167-3/4"	155-1/2"	99-3/8"	107-1/2"	56-1/8"
cAT 17-614	6,500	10,110	3,820	20	66000	167-3/4"	167-1/2"	111-3/8"	119-1/2"	56-1/8"
cAT 17-714	6,100	9,710	3,850	25	72000	167-3/4"	155-1/2"	99-3/8"	107-1/2"	56-1/8"
cAT 17-814	6,120	9,730	3,870	30	76300	167-3/4"	155-1/2"	99-3/8"	107-1/2"	56-1/8"
cAT 17-914	6,550	10,160	3,870	30	74900	167-3/4"	167-1/2"	111-3/8"	119-1/2"	56-1/8"
cAT 27-518	8,630	13,470	5,300	(2) 7.5	71100	216"	171-1/2"	111-3/8"	123-1/2"	60-1/8"
cAT 27-618	7,750	12,590	5,400	(2) 15	91700	216"	147-1/2"	87-3/8"	99-1/2"	60-1/8"
cAT 27-718	8,240	13,080	5,400	(2) 15	89900	216"	159-1/2"	99-3/8"	111-1/2"	60-1/8"
cAT 27-818	8,290	13,130	5,450	(2) 20	98600	216"	159-1/2"	99-3/8"	111-1/2"	60-1/8"
cAT 27-918	8,780	13,620	5,450	(2) 20	96700	216"	171-1/2"	111-3/8"	123-1/2"	60-1/8"

NOTES: (1) An adequately sized bleed line must be installed in the cooling tower system to prevent build-up of impurities in the recirculated water.
(2) Do not use catalog drawings for certified prints. Dimensions are subject to change.
(3) Connections larger than 3" are Beveled for Welding (BFW) and grooved for a mechanical coupling.
(4) Adequate spacing must be allowed for access to the cooling tower.

Design

EVAPCO units are of heavy-duty construction and designed for long trouble-free operation. Proper equipment selection, installation and maintenance is, however, necessary to ensure full unit performance.

Some of the major considerations in the application of a tower is presented below. For additional information, contact the factory.

Air Circulation

It is important that proper air circulation be provided. The best location is on an unobstructed roof top or on ground level away from walls and other barriers. Those cooling towers located in wells, enclosures or adjacent to high walls must be properly located to avoid the problems associated with recirculation.

Recirculation raises the wet bulb temperature of the entering air causing the water temperature to rise above the design. For these cases, the discharge of the fan should be located at a height even with the adjacent wall, thereby reducing the chance of recirculation. For additional information, see the EVAPCO Equipment Layout Manual.

Piping

Tower piping should be designed and installed in accordance with generally accepted engineering practices. The piping layout should be symmetrical on multiple unit systems, and sized for a reasonably low water velocity and pressure drop.

Each cell of the cAT Cooling Tower is furnished with one inlet and one outlet piping connection. This design reduces the amount of external piping and thereby lowers the installed cost of the cooling tower. The water distribution system is pressurized and self-balancing. Since field balancing is not required on the cAT, the need for flow balancing valves is eliminated, further reducing the cost of tower installation. The wide orifice nozzles with anti-sludge ring used in the cAT water distribution system helps prevent clogging, reducing the maintenance costs of the water distribution system.

All piping should be securely anchored by properly designed hangers and supports.

Recirculating Water System

The surest way to protect the recirculating water system from freezing is with a remote sump. The remote sump should be located inside the building and below the unit. All water in the cooling tower basin should drain to the remote sump when the system pump cycles off.

Other freeze protection methods are available when a remote sump is not feasible. Electric pan heaters, steam or hot water coils can be used to keep the pan water from freezing when the unit cycles off. Water lines to and from the unit, and related piping should be heat traced and insulated up to the overflow level in order to protect from freezing.

Water Treatment

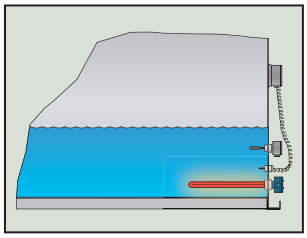
In some cases, the make-up water will have high impurity levels and a normal bleed will not be enough to prevent scale formation. In these cases, the services of an experienced water treatment company should be retained.

The water treatment program prescribed for the given conditions must be compatible with the unit's materials of construction. If an acid is used to control pH, it should be accurately metered in dilute solution such that the spray water is held between a pH of 6.5 and 8.0. Batch feeding of chemicals is not recommended.

Units constructed of galvanized steel operating with circulating water having a pH of 8.0 or higher may require periodic passivation to prevent the formation of white rust. White rust is a corrosion byproduct of the protective zinc barrier and appears on the metal surface as white, waxy formations. If white rust forms and is left untreated, it may flake off and leave the bare metal substrate exposed.

Electric Heaters

Electric immersion heaters for the tower basin are available. They are sized to maintain a +4°C to +5°C (+40°F) pan water temperature with the fans off and an ambient air temperature of -18°C (0°F). They are furnished with a thermostat and low water protection device to cycle the heater on when required and to prevent the heater elements from energizing unless they are completely submerged. All components are in weatherproof enclosures for outdoor use. The heater power contactors and electric wiring are not included as standard.



Heater Sizes

Models	-18°C / 0°F kW	-29°C / -20°F kW	-40°C / -40°F kW
cAT 17-49 to 17-99	7	10	15
cAT 17-511 to 17-911	8	12	15
cAT 17-312 to 17-912	8	14	18
cAT 17-214 to 17-914	10	14	20
cAT 27-518 to 27-918	12	18	24

Control of Biological Contaminants

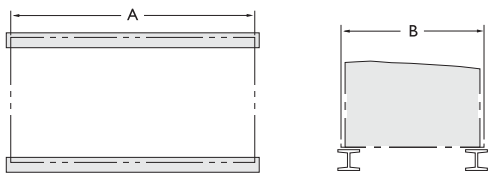
Water quality should be checked regularly for biological contamination. If biological contamination is detected, a more aggressive water treatment and mechanical cleaning program is required. The water treatment program should be performed in conjunction with a qualified water treatment company. It is important that all internal surfaces be kept clean of accumulated dirt or sludge. In addition, the drift eliminators should be kept in good operating condition to minimize water from exiting the evaporative cooling unit in the discharge air.

To minimize the risk of biological contamination, at initial start up or after an extended shut down, it is recommended that the tower be properly treated. Clean all debris such as leaves and dirt from the unit. Completely fill the basin to the overflow level with fresh water. Initiate a biocide water treatment or shock treatment program prior to operating the unit. It is preferable that all such procedures be conducted or supervised by a water treatment specialist.

Steel Support

The recommended support for EVAPCO cooling towers is structural "I" beams located under the outer flanges and running the entire length of the unit. Mounting holes, 19mm (3/4") in diameter are located in the bottom channels of the pan section to provide for bolting to the structural steel. (Refer to certified drawings from the factory for bolt hole locations).

Beams should be level to within 3mm per 2m (1/8" per 6') before setting the unit in place. Do not level the unit by shimming between it and the "I" beams as this will not provide proper longitudinal support.



Plan View *End Elevation*

cAT Supporting Steel Dimensions

Models	S.I. Units (mm)		English Units	
	A	B	A	B
cAT 17-49 to 17-99	2731	2240	8' 11-1/2"	7' 4-3/16"
cAT 17-511 to 17-911	3188	2240	10' 5-1/2"	7' 4-3/16"
cAT 17-312 to 17-912	3651	2240	11' 11-3/4"	7' 4-3/16"
cAT 17-214 to 17-914	4261	2240	13' 11-3/4"	7' 4-3/16"
cAT 27-518 to 27-918	5486	2240	18' 0"	7' 4-3/16"

cAT Cooling Tower Mechanical Specifications

Furnish and install as shown on the plans an EVAPCO Model _____ induced draft counterflow cooling tower. Each unit shall have the capacity to cool _____ GPM (lps) of water from _____ ˚F (˚C) to _____ ˚F (˚C) with a _____ ˚F (˚C) entering wet bulb temperature.

Pan
The pan shall be constructed if G-235 hot-dip galvanized steel for long life and durability. G-235 hot-dip galvanized steel designates an average coating thickness of approximately 725g of zinc per square meter on the steel. Standard pan accessories shall include overflow, drain, antivortexing hood, Type 304 Stainless Steel strainers, and brass make-up valve with plastic float. The entire pan area shall incorporate a stepped configuration for reduced water volume, lower operating weight and easier pan maintenance. The upper and lower pan bottoms shall be sloped to provide positive drainage of the complete basin section. Depressed side outlet sumps which are not an integral part of the basin shall not be acceptable.

Casing
The casing shall be constructed of G-235 hot-dip galvanized steel. The casing panels shall totally encase the sides of the fill section to protect the surface from direct atmospheric contact.

Fan Motor(s)
_____ HP (kW) totally enclosed fan cooled **(T.E.F.C.)** ball bearing fan motor(s) shall be furnished suitable for cooling tower service on _____ volts, _____ hertz, and _____ phase. Motor(s) shall be mounted on an adjustable base which is mounted on the side of the unit for service. A hinged protective cover shall shield the motor and sheave from the weather.

Drive
The fan drive shall be a multigroove, solid back V-belt type with taper lock sheaves designed for 1.5 service factor of the motor nameplate horsepower (kW). The belt material shall be neoprene reinforced with polyester cord and specifically designed for cooling tower service. A hinged protective cover shall shield the motor and sheave from the weather. Belt adjustment shall be accomplished from the exterior of the unit. Bearing lube lines shall be extended to the exterior of the unit for easy maintenance. All sheaves located in the airstream shall be constructed of aluminum alloy, vented guards shall not be acceptable. If internal belt adjustment is necessary, an internal working platform and ladder is required to access the drive system.

Axial Propeller Fans
Fans shall be heavy duty axial propeller type statically balanced. The fans shall be fabricated by the cooling tower manufacturer for single source responsibility and reliability. The fans shall be constructed of extruded aluminum alloy blades, installed in a closely fitted cowl with venturi air inlet for maximum fan efficiency. Each fan blade shall be individually adjustable. Fan cowl shall be covered with a heavy gauge hot dip galvanized wire fan guard.

Fan Shaft Bearings
Fan shaft bearings shall be heavy duty self-aligning ball type with self locking collars and grease fittings extended to the outside of the unit. Bearings shall be designed for a minimum L-10 life of 75,000 hours.

Fan Drive Warranty
Cooling tower fan drive components shall be covered by a five year manufacturer's plan. Drive components protected by this warranty shall include the fans, bearings, fan shafts, belts, drive sheaves and fan motors.

Fill
The cooling tower fill shall be PVC (Polyvinyl Chloride) of crossfluted design for optimum heat transfer efficiency. The crossfluted sheets shall be bonded together for strength and durability. The fill shall be fabricated, formed and installed by the cooling tower manufacturer and shall be elevated a minimum of 3 feet (914 mm) above the floor of the cold water basin to facilitate cleaning. *The fill shall be suitable for use as a working platform.* The PVC fill shall be self-extinguishing for fire resistance with a flame spread rating of 5 per ASTM E84-81a. It shall also be resistant to rot, decay and biological attack. The fill shall be able to withstand a water temperature of 130°F (55°C).

Non-Corrosive Water Distribution System
Each cell of the cooling tower shall have one (1) hot water return inlet connected to a main spray header. The spray header and branches shall be constructed of Schedule 40 polyvinyl chloride (PVC) pipe for corrosion resistance and shall have a steel connection which is beveled for weld/grooved for a mechanical coupling to attach the external piping. The spray header and branches shall be removable for cleaning purposes and have threaded end caps to allow debris to be removed. The water shall be distributed over the fill by precision molded ABS spray nozzles with large orifice openings to eliminate clogging. The nozzles shall be threaded into the water distribution piping to assure positive positioning. Nozzles shall use fluidic technology to evenly distribute the water over the fill media without any moving parts.

Eliminators
The eliminators shall be constructed entirely of inert polyvinyl chloride (PVC) in easily handled sections and be completely separate from the fill section for maximum efficiency. The eliminator design shall incorporate three changes in air direction to assure removal of all entrained moisture from the discharge air stream. Maximum drift rate shall be less than .001% of the circulating water rate.

Air Inlet Louver Screens
The louvers screens shall be constructed of polyvinyl chloride (PVC) and mounted in easily removable frames on all four sides of the cooling tower for access to the entire basin area for maintenance. The louvers shall have a minimum of two changes in air direction to prevent splashout, block direct sunlight from entering the basin, and have a 3/4" (19 mm) opening to prevent debris from entering the basin.

Finish
All pan and casing material shall be constructed of G-235 heavy gauge mill hot-dip galvanized steel for maximum protection against corrosion. During fabrication, all panel edges shall be coated with a 95% pure zinc-rich compound.

Innovation, Performance, Experience

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