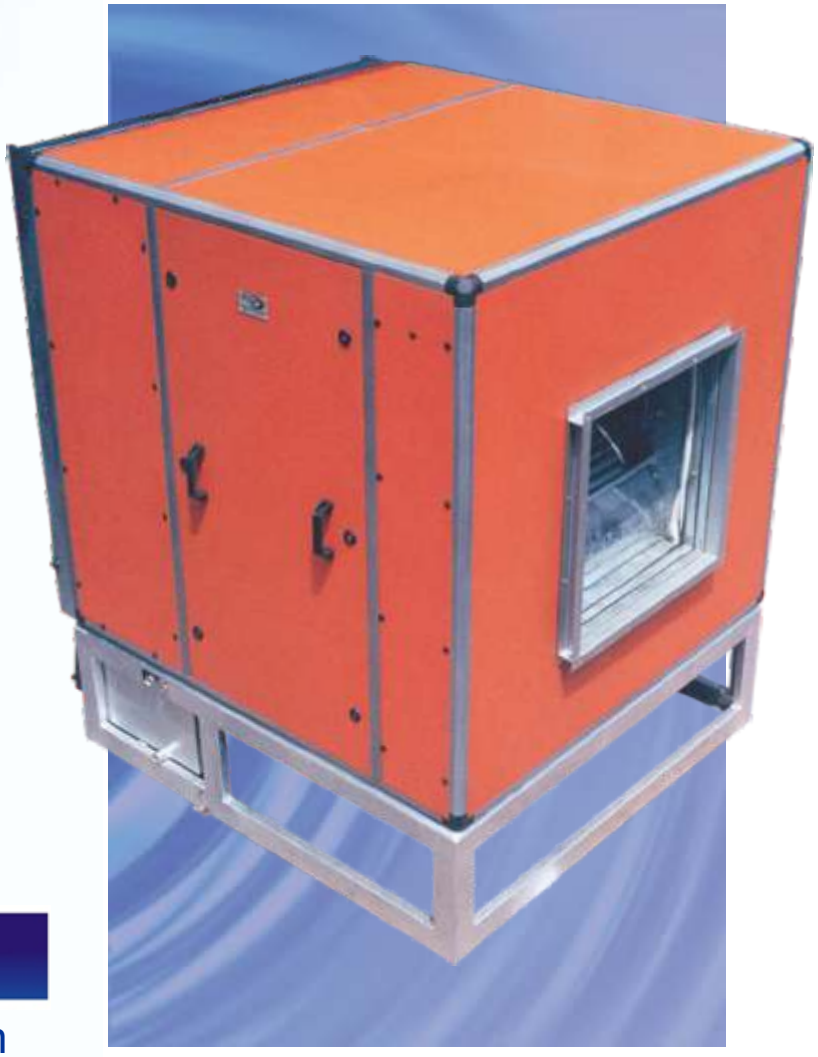
Air Washer Units

SAACU *Series*



AMICRON

AMICRON CLEANTECH PVT LTD.

Hvac & Cleanroom System & Solution

www.amicronclean.com

...Brief Introduction

What is Evaporative Cooling ?

Cooling through evaporation is a natural occurrence. The most common example we all experience is perspiration, or sweat. As perspiration evaporates it absorbs heat to cool your body.

The principle underlying evaporative cooling is the fact that water must have heat applied to it to change from a liquid to a vapor. When evaporation occurs, this heat is taken from the water that remains in the liquid state, resulting in a cooler liquid.

Evaporative cooling systems use the same principle as perspiration to provide cooling for machinery and buildings.

How it is different from Air-Conditioning ?

- Evaporative Air Cooling introduces 100 % fresh air with windows and doors open while Air-Conditioning re-circulates the same stale air due to closed windows and doors.
- Air-Conditioning reduces the moisture percentage in air while Evaporative Air Cooling keeps the air moist all the time which provides allergy-free atmosphere.
- Evaporative Air Cooling allows full ventilation thereby exhausts odors and germs while in Air-Conditioning, re-circulated air can contain germs and air contaminants.
- As the outside temperature rises, Cooling capacity of Evaporative Coolers increases while the cooling capacity of Air-Conditioners decreases.
- Evaporative Air Coolers are economical. Their installation cost is minimal while Air-Conditioners involve costly installation.
- Evaporative Air Coolers have low maintenance and high efficiency as compared to Air-Conditioners.

Applications :

- Industries
- Poultry Farms and mushroom farms
- Green Houses
- Restaurants and hotels
- Industrial Canteens
- Software and IT Industries and many more...

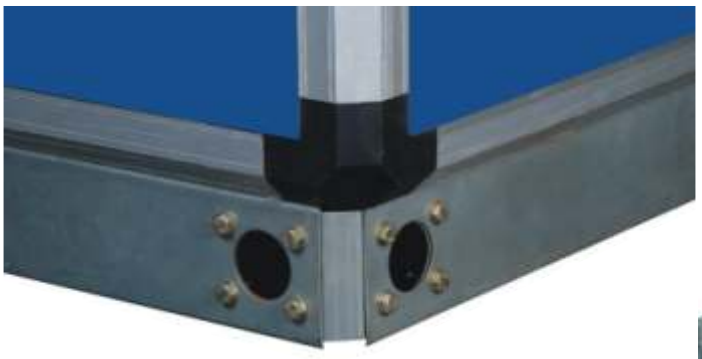
Advantages :

- Low installation cost, Low running/operation cost
- Effective in high heat generation areas
- Easy & inexpensive maintenance.
- Healthier System - Since it works on 100% fresh air.

Construction Features :

Cabinet Frames :

- Rigid Framework made of hollow extruded Aluminum profile held together by Nylon corner joints.
- The extruded aluminum profiles are coved from inside which is available as a standard feature to provide smooth edges.
- The Double Skin sandwiched panels with inner skin made of 24G (0.6 mm) galvanized sheet conforming to IS-277 standards. Outside panel is made of pre-painted 24 G galvanized sheet.
- Double Skin panel of 24 mm thickness is provided.
- Panels are pressure injected with PUF insulation using a CFC free R-141b blowing agent.
- High and uniform PUF density of 40 kg per cubic meter provides better thermal insulation and sound attenuation.
- A leak proof casing ensures Indoor Air Quality by preventing the entry of contaminated air into the equipment.
- EPDM foam gaskets on Aluminum frame provide superior sealing from casing leakages.
- Base frame is rugged in construction, made of galvanized steel with intermediate cross members and has lifting holes for easy installation
- The unit is provided with high quality, properly hinged Inspection Doors and Windows to have proper accessibility for regular maintenance.



Fans :

- Energy Efficient AMCA Certified, forward / backward curved / Airfoil fans are provided. Plug fans are available as an option.
- Electric motor of TEFC type IP55 and Class F insulation.
- Fan and motor are mounted on a common extruded Aluminum channel / GI heavy gauge pressed channel using anti vibration spring mounts and flexible Fire retardant canvas connection for silent and vibration free operation.
- Motor is mounted on easy slide mounting bracket for easy adjustment.
- Drives are selected for optimum performance. Taper lock Pulleys are used.
- Electrical interlock trips the fan immediately on opening of Air washer unit door to ensure absolute safe operation.

Filters :

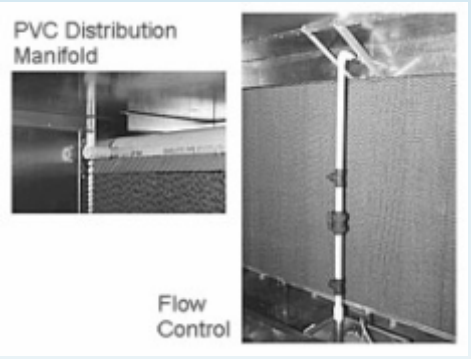
The standard Pre-Filters are made of G.I. / Aluminum construction having efficiency 90 % down to 20 micron. Depending on the application, Fine-Filters of various efficiencies can also be provided.

Cellulose Pad :

Cellulose Pads consists fo cellulose wood fibres in paper form. They are saturated with water wetted on to it through pre-fixed channels. These pads are eco-friendly and economical providing effective cooling at minimal cost. These padas are of high quality standard and posses an efficiency of more than 85%. Cellulose Pads have low maintenance costs.

Re-Circulation System ::

- The water re-circulation system consists of a monobloc pump self priming which draws water out of the tank and discharges into a CPVC distribution manifold.
- The manifold extends across the top of the cell bank and distributes water through a series of uniform orifices onto the distribution pad which spreads water evenly over the top horizontal surface of the pad.
- Suction screen is provided at the inlet of the pump to prevent large particles from entering the pump.
- A valve is provided on the other side to control the water quantity on the pad.

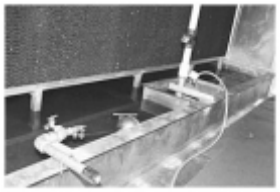


Mist Eliminator :

- Eliminators are located on the air-leaving end of the washer to remove entrained water droplets from the air.
- The eliminator blades are of the 4 pass design and are spaced on 30mm centers extending from below the water level of the tank to the top of the washer. The blades are extruded PVC fixed on a GI spacer.
- The casing of the Eliminator is made out of Galvanized steel sheet of minimum 18ga.

Water Tank :

- The tank provides the foundation for the evaporative cooler components.
- The tank is fabricated from minium 20ga SS 304 grade, all joints are seam welded. Tank width is 12" deep.
- The tank consists of Make-up water, Drain, Overflow connections of suitable size welded to the tank on LHS / RHS as per site conditions. A transparent level indicator is provided.
- A Brass float valve is provided for refill the water evaporated by the air washer.
- Tank has enough space for cleaning from dirt.



Standard Accessories :

- Service doors are provided with ease of access to the fan, motor and pump.
- Marine Lamp is provided for better visibility during servicing.
- View port is provided for inspection during the Air washer unit operation
- Door limit switches are provided to trip the Fan motor to ensure safety.

Cooling Pads :

AMICRON CLEANTECH PVT. LTD. Air Washer units are equipped with high quality and branded Evaporative Cooling Pads which are of CELdek / Hu-Tek / Eco-Cool make*. The Cooling Pad is made of cellulose (Pulp) sheet and bonded together in 7mm flute size of 45 deg X 45 deg angle.

The Cellulose Pad is cross-corrugated and coated with anti-rot, rigidifying and wetting resins.

Product Specifications :

CELdek / Hu-Tek / Eco-Cool Cooling Pads use a specific, specialty-grade cellulose paper of high standard. A proprietary resin inhibits bacterial growth and decay for long service life. It is a very precise process in order to maintain a HEALTHY operating environment, unlike some imported products.

Other manufacturers' products may look similar but their inferior performance and longevity will show over time.

The Pads are designed for maximizing the evaporation efficiency by creating more contact time between air and water to allow for better evaporation. Suitable for typical application with a moderate air face velocity design such as poultry, and greenhouses.

STANDARD SIZES - mm		
HEIGHT	WIDTH	DEPTH
1800	600	200 / 300
1200	600	200 / 300
900	600	200 / 300
600	600	200 / 300

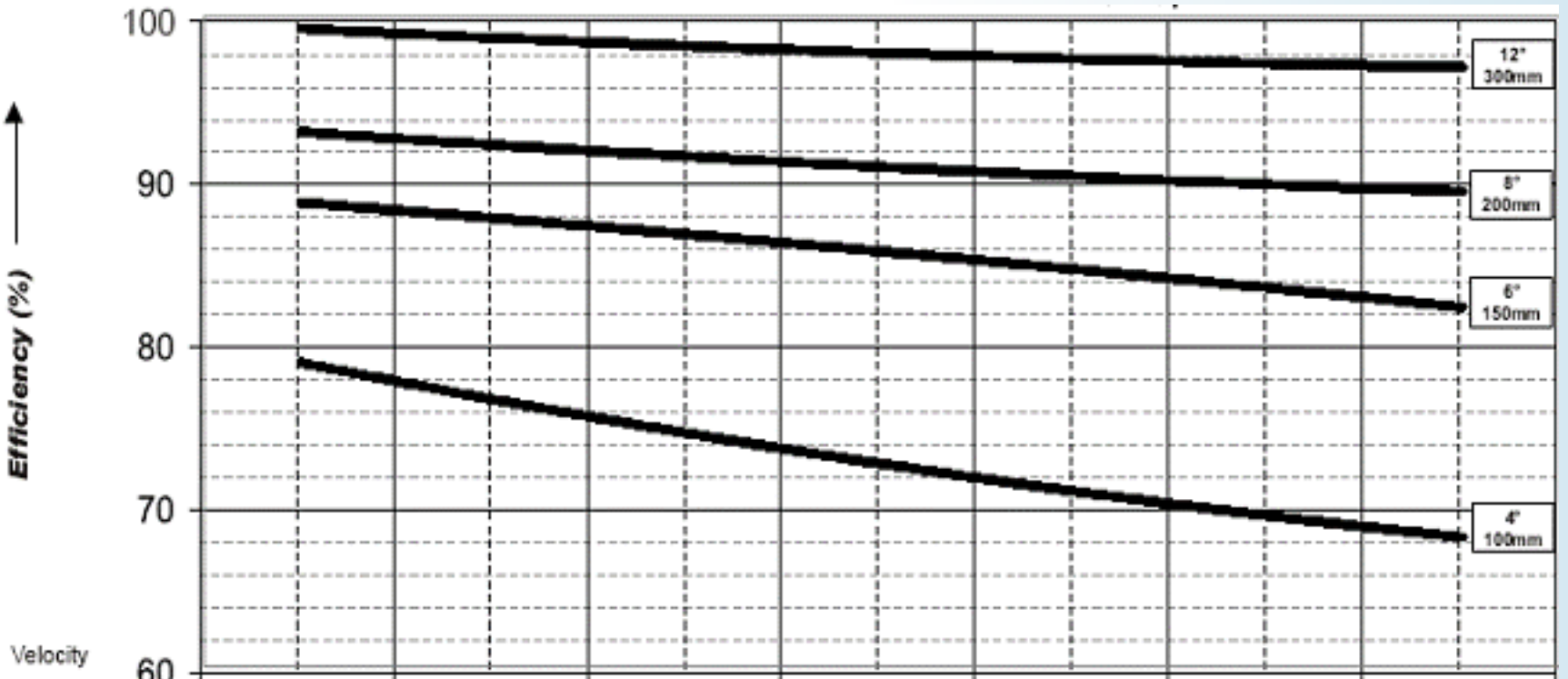
Advantages CELdek / Hu-Tek / Eco-cool Cooling Pads :

- Enhanced system performance
- Long-term dependability
- Reduced or eliminated odor issues
- Reduce the risk of complaints
- Peace of mind
- Ongoing technical support and design help for special applications and maintenance.

* These Pads of CELdek / Hu-Tek / Eco-Cool make are subject to availability.

Performance Curves :

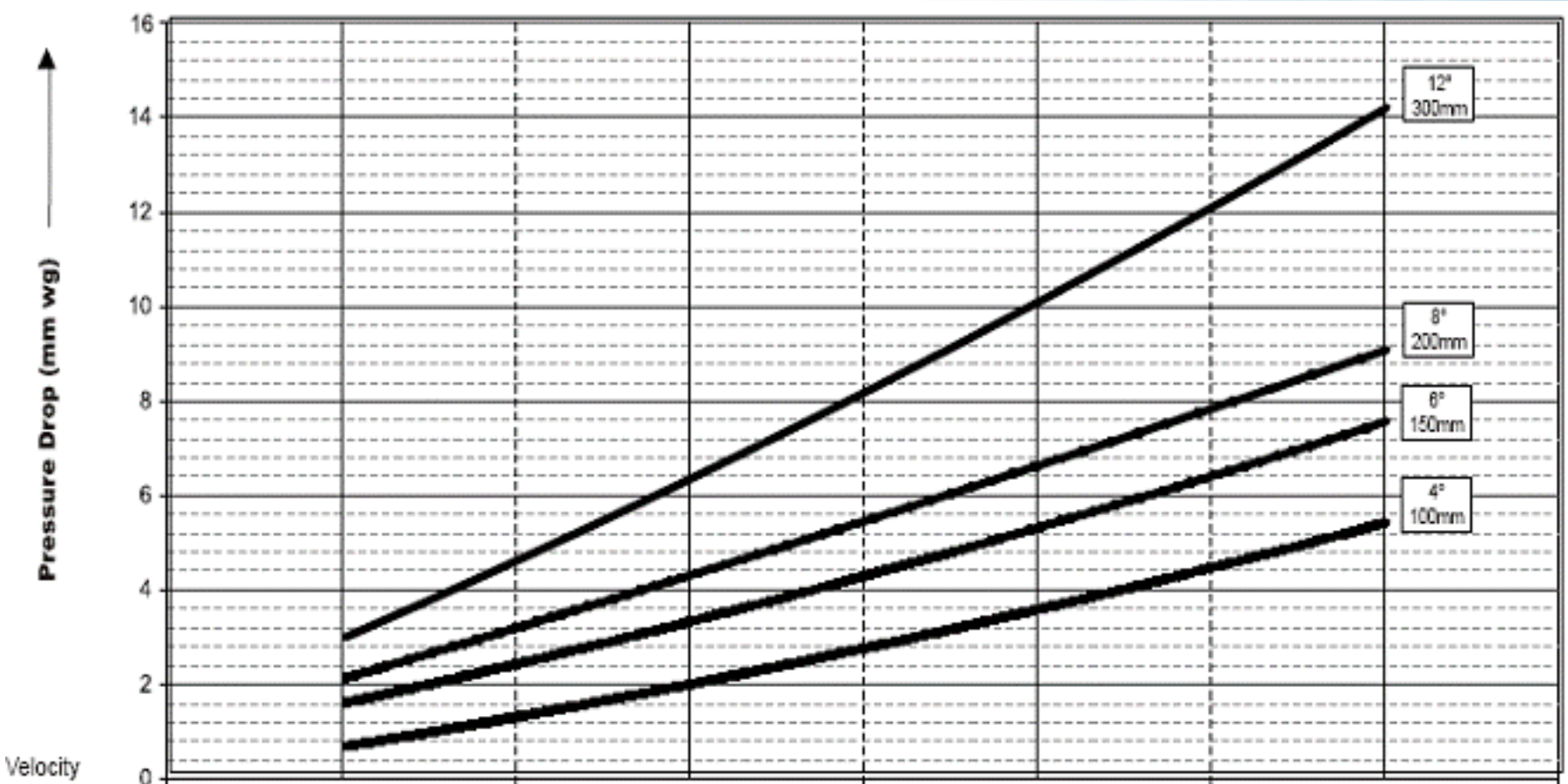
Saturation Efficiency Curve :



Velocity							
FPM →	200	250	300	350	400	450	500
M/S →	1	1.25	1.5	1.75	2	2.25	2.5
Pad Thickness 4" / 100 mm	79	76	74	73	71	69	68
6" / 150 mm	89	87	86	86	85	83	82
8" / 200 mm	93	92	91	91	90	90	89
12" / 300 mm	99	99	98	98	97	97	97

Performance Curves :

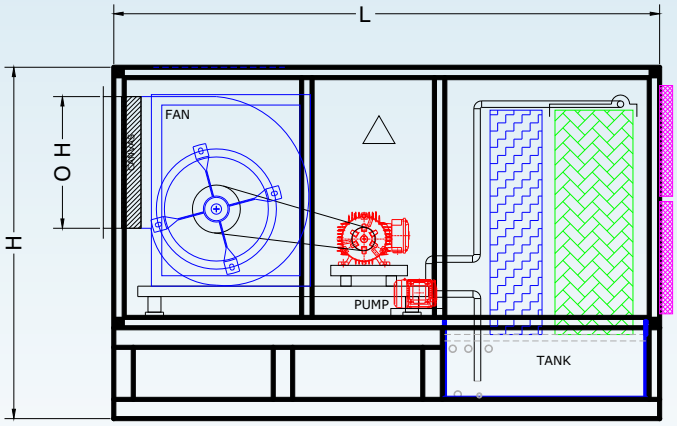
Pressure Drop curve :



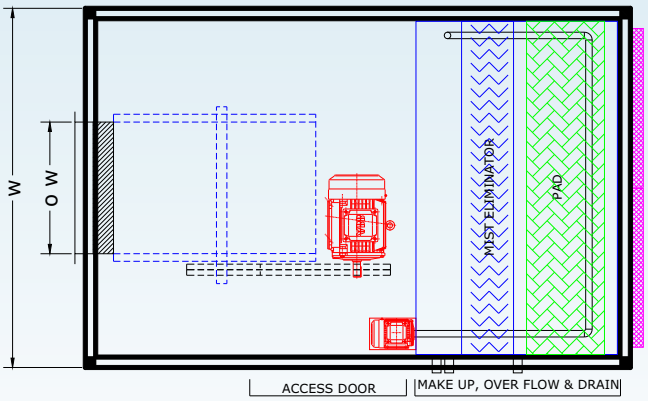
Velocity					
FPM →		200	300	400	500
M/S →		1	1.5	2	2.25
Pad Thickness	4"/100mm	0.51	2.04	3.315	5.355
	6"/150mm	1.53	3.06	5.355	7.395
	8"/200mm	2.04	4.08	6.63	8.925
	12"/300mm	2.907	6.114	10.112	14.0505

Technical Specifications

AMICRON CLEANTECH PVT. LTD. Air Washer unit :



SIDE VIEW

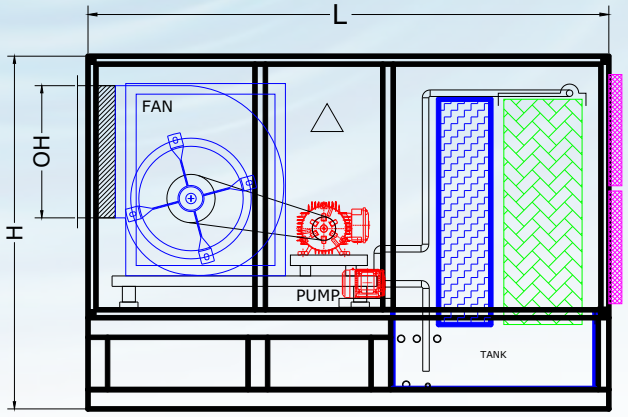


PLAN

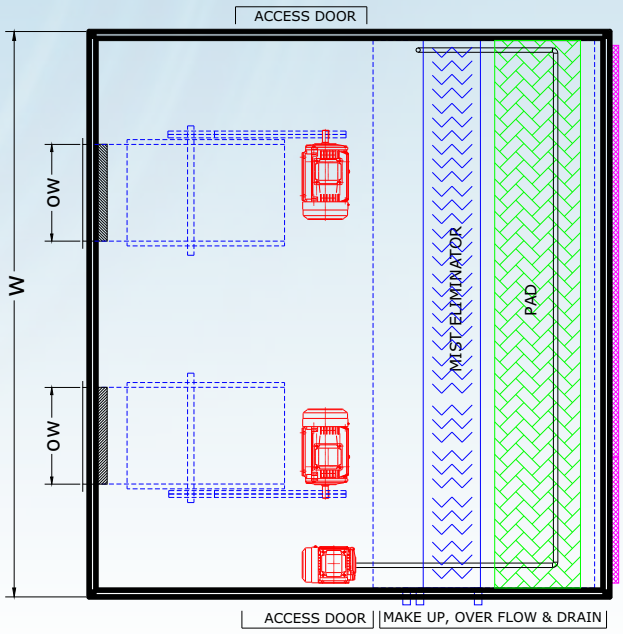
Air Washer Model	Air Volume		Fan Model	Fan opening mm	OV (m/s)	Pad Area	PAD-mm		Overall Dimensions - mm			Motor KW TSP - mm		PUMP KW
	CFM	CMH		OW x OH		SQM	W	H	L	W	H	50	65	
SAACU-50	3000	5100	FDA-315	404*404	8.7	0.56	915	610	1900	950	1200	1.5	1.5	0.37
SAACU-70	4000	6800	FDA-355	452*452	9.2	0.74	915	762	1950	1100	1250	1.5	2.2	0.37
SAACU-85	5000	8500	FDA-400	507*507	9.2	0.84	915	915	2000	1150	1350	2.2	3.7	0.37
SAACU-100	6000	10200	FDA-450	568*568	8.7	0.97	915	1067	2050	1200	1450	2.2	3.7	0.37
SAACU-140	8000	13600	FDA-500	638*638	9.3	1.48	1220	1220	2200	1400	1650	2.2	3.7	0.37
SAACU-170	10000	17000	FDA-560	714*714	9.2	1.86	1525	1220	2250	1600	1750	3.7	5.5	0.37
SAACU-200	12000	20400	FDA-630	800*800	8.8	2.23	1677	1220	2350	1800	1850	5.5	5.5	0.55
SAACU-250	15000	25500	FDA-710	898*898	8.8	2.79	1830	1525	2500	2000	2000	5.5	7.5	0.55
SAACU-300	18000	30600	FDA-800	1006*1006	8.4	3.35	1830	1830	2850	2200	2200	7.5	8.8	0.55
SAACU-340	20000	34000	FDA-800	1006*1006	8.4	3.71	2135	1830	2850	2400	2200	7.5	8.8	0.75
SAACU-420	25000	42500	FDA-900	1130*1130	9.2	4.65	2135	2135	3000	2600	2400	8.8	13	0.75
SAACU-460	27000	45900	FDA-1000	1263*1263	7.9	5.02	2440	2135	3100	2800	2500	8.8	13	0.75
SAACU-500	30000	51000	FDA-1000	1263*1263	8.8	5.61	2745	2135	3100	3000	2500	11	13	0.75

Technical Specifications

AMICRON CLEANTECH Air Washer unit Double Blower :



SIDE VIEW



PLAN

Air Washer Model	Air Volume		Fan Model Qty - 2nos	Fan opening mm	OV (m/s)	Pad Area	PAD - mm		Overall Dimensions -mm			Motor KW Qty -2nos TSP - mm		PUMP KW
	CFM	CMH		OW x OH		SQM	W	H	L	W	H	40	50	
SAACU-750D	45000	76500	FDA -800	800*800	10.5	8.4	4600	1830	2800	4700	2300	11	13	1.1
SAACU-850D	50000	85000	FDA-900	898*898	9.2	9.3	4400	2135	3000	5000	2400	11	13	1.5
SAACU-950D	55000	93500	FDA-900	1006*1006	10.2	10	5000	2135	3000	5300	2400	11	15	1.5
SAACU-1000D	60000	102000	FDA-1000	1006*1006	8.8	11	5300	2135	3100	5600	2500	13	15	1.5
SAACU-1100D	65000	110500	FDA-1000	1130*1130	9.6	12	5000	2440	3100	6000	2500	13	15	1.5
SAACU-1200D	70000	119000	FDA-1000	1130*1130	10.3	13	5400	2440	3100	6000	2700	15	17	1.5
SAACU-1300D	75000	127500	FDA-1000	1263*1263	11	14	5800	2440	3100	6200	2800	15	17	1.5
SAACU-1350D	80000	136000	FDA-1000	1263*1263	11.8	15	6100	2440	3100	6500	2850	17	17	1.5

Performance Table :

Performance of Evaporative Cooling Pads (ECP) based systems in major cities of India :

City	Outside Design Conditions (Summer)						Condition of Air leaving the media at 80 % (3)				Makeup Water
	DBT° C	DBT° F	WBT° C	WBT °F	RH %	Wet Bulb Depression (1)	DBT°C (2)	DBT°F (2)	WBT °C	WBT °F	(lpm) per 1000 cfm (4)
Agra	42	108	24	75	21	33	27.6	81.6	23.9	75	3.985
Ahmedabad	43	110	26	78	24	32	29.1	84.4	25.6	78	3.979
Ambala	43	110	24	75	20	35	27.8	82	23.9	75	3.997
Aurangabad	40	104	24	76	24	28	27.6	81.6	24.4	76	3.955
Banglore	36	96	26	78	45	18	27.6	81.6	25.6	78	3.894
Bhopal	41	106	23	73	20	33	26.4	79.6	22.8	73	3.985
Calcutta	38	100	26	78	26	22	28.0	82.4	25.6	78	3.918
Chennai	39	103	28	82	41	21	30.1	86.2	27.8	82	3.912
Coimbatore	37	98	24	76	37	22	26.9	80.4	24.4	76	3.918
Dehradun	41	105	24	75	25	30	27.3	81.1	23.9	75	3.967
Delhi	43	110	24	75	20	35	27.8	82.1	23.9	75	3.997
Hyderabad	41	106	26	78	28	28	28.7	83.6	25.6	78	3.955
Indore	41	106	25	77	28	29	28.2	82.8	25.0	77	3.961
Jaipur	43	110	24	75	20	35	27.8	82	23.9	75	3.997
Jodhpur	43	110	25	77	23	33	28.7	83.6	25.0	77	3.985
Kathmandu	29	85	24	75	63	10	25.1	77.2	23.9	75	3.846
Lucknow	43	109	26	79	26	30	29.4	85	26.1	79	3.967
Mumbai	35	95	28	83	60	12	29.7	85.4	28.3	83	3.858
Nagpur	44	112	24	76	28	36	28.4	83.2	24.4	76	4.003
Pune	40	104	24	76	28	28	27.6	81.6	24.4	76	3.955

Notes :

1) Wet Bulb Depression = Outside Dry Bulb Temp. in °F - Outside Wet Bulb Temp. in °F.
2) Condition of Air Leaving Media = ODBT - S.E.(ODBT - OWBT).
3) 80 % evaporative cooling efficiency (Saturation Efficiency) is achieved only with a minimum of 200 mm thick cooling pad.
4) Make Up Water Flow = Water Evaporation + Bleed Off. (Based on 2' X 1' X 8" pad).
5) Total re-circulated water flow should be 3 times of rate of water evaporation or 1.89 LPM per linear foot of 4" thick pad.
6) Due to constant product refinement, the performance data may change in future.

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