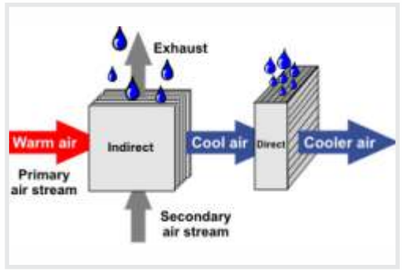
# TWO STAGE INDIRECT DIRECT EVAPORATIVE COOLING UNITS (V2C SERIES)

VENTECH has always had affinity towards new technologies and in an endeavor to add value to Environment and making it healthier, has introduced Two Stage Evaporative Coolers which combine indirect with direct evaporative cooling. This is accomplished by passing air inside a heat exchanger that is cooled by evaporation on the outside. In the second stage, the pre-cooled air passes through a water soaked pad and picks up humidity as it cools.

The two-stage evaporative cooling provides air that is cooler than either a direct or indirect single-stage system can provide individually.




## Ideal for


Textile Processing Mills


Assembly Lines


Greenhouse


Manufacturing Units


Generator/Compressor Rooms


Shopping Malls


Auditorium


Offices


Banquets/ Community Halls


Gas Turbine

### RANGE OF PRODUCTS

• Axial Flow Fans • Centrifugal Blowers • Kitchen Scrubbers • Ventilation Units
Air Cooling Units • Dust Collectors • Rotary Airlocks • Air Handling System Accessories

### RANGE OF SYSTEMS

• Pressurisation & Ventilation • Evaporative Air Cooling • Dust Extraction & Collection
• Fume Extraction & Collection • Fresh Air Supply & Exhaust • Kitchen Ventilation
• Pneumatic Conveying • Air Conditioning


**VENTECH SYSTEMS PVT. LTD.**

( An ISO 9001 : 2015 Certified Company)
(Recipient of Bhartiya Udyog Ratna Award )
(Authorized Channel Partners of Hitachi & LG)

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Ventech™
We handle AIR with care...

# EVAPORATIVE AIR COOLING UNITS

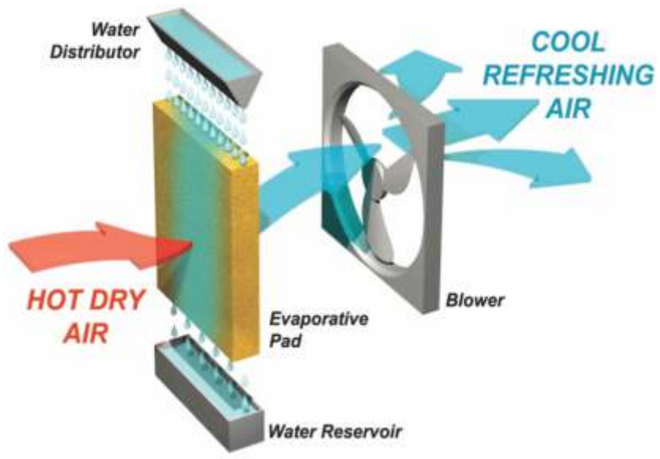
ECO GREEN AIR

www.ventechsystems.com

# AIR COOLING UNITS

## Increase your comfort & productivity with highly efficient air cooling....

VENTECH offers state - of - the - art Evaporative Air Cooling Units which is used across industries. Evaporative cooling has proven to be one of the most reliable and economical methods to maintain optimum temperature and humidity. "Ventech" Evaporative Air Cooling Unit is what you need for your evaporative cooling system to perform effectively and economically.




## Principle of Evaporative Cooling

100% Fresh Ambient Air is brought in contact with wet surface or mist where it loses its heat and the latent heat of vaporization needed for the water to evaporate is taken from the sensible heat of air. Water then evaporates cooling the air in the process. It is within the cooling media where the process of heat and mass transfer takes place. Since no heat is added or removed from the system, it is therefore, called an adiabatic saturation process and works on the principle of "Cooling is caused by evaporation". The saturation efficiency of air after passing through the wet section comes to around 85 – 90%. This may, however, please be noted that this being an adiabatic saturation process follows Psychrometry principles wherein the inside DB temperature is a function of outside atmospheric Wet Bulb Temperature and is generally 8-10 Deg. celsius over and above the prevailing outside Wet Bulb Temperature.

## Why Evaporative Cooling??

- Cost Effective - Dry bulb temperature is brought down through evaporation of water. It is the ideal and most economical method of cooling, therefore Evaporative cooling is cost efficient.
- Very low energy consumption – Natural cooling of air and no artificial means is used thereby reducing energy consumption to minimal.
- Green Air-conditioning - Conditions the air by evaporative cooling and not mechanical cooling.


ECOgreen

Low power consumption



# THE "VENTECH" ADVANTAGE

### Fresh and Cool

- 100% fresh air for excellent indoor air quality.
- Clean and filtered air flow - dust free environment.
- Helps dilute viral density in the air, thereby reducing chances of infection from contagious viruses in Air and mitigating health risk.

### Cool on Your Pockets

- Our products help to achieve LEED and other energy certifications.
- Excellent return on investment.
- Energy savings up to 60%
- Carbon credit benefits.
- Lower operating cost

### Improves Working Environment

- Supplement / replace mechanical refrigeration in industrial, commercial, institutional and agriculture applications.
- Can considerably lower the fresh air temperature during peak summers .
- Lower temperature at minimal energy cost.
- Easy to install & maintain.
- Higher productivity.
- Lower absenteeism.

### Cool Way to Cool Air

- Comfortable Working environment - Beat the Heat, easily and economically.
- Enhanced indoor air quality & productivity
- Helps reduce green house gases
- No sick building syndrome
- Zero ozone depletion
- No CFCs involved

### Luxury of Customization

- We give our customers the flexibility to choose from and customize according to their needs.
- We can offer compact and sturdy Air Washer Units in Single Skin and Double Skin with different material of construction customized to suit client's requirement. Our excellent fabrication quality ensures low casing leakage, low filter bypass leakage and good mechanical strength.
- For rugged applications, we also offer Civil Masonry Type Air Cooling Units with various equipments installed inside an ergonomically designed room.
- Designed for low RPM for lower noise levels & trouble free operation.
- Choice of Top, Bottom and Side discharge to suit site layout.

### DIFFERENT CONFIGURATIONS OF WET SECTIONS

**Pad Type**

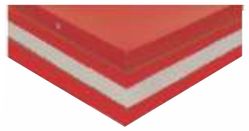
Unique design incorporating rigid media Imported Evaporative Cooling Pads made from cellulose paper and engineered from specially treated with anti-rot, rigidifying and wetting resins fluted media capable of absorbing and retaining water to provide maximum cooling efficiency. Media is cross- corrugated to maximize the mixing of air and eliminate water carryover.

**Conventional Two/ Three Bank Type**

In Spray type of air washer, water is pressurised with high pressure pump. The pressure head developed is converted to velocity head by a set of nozzles. Water at high velocity is developed into a conical discharge by the large vortex angle of the spray. Water splits into micro particles as the pumping volume is very high, large number of such particles are created in the air washer. They have very large inter surfacial area and evaporate instantaneously. In this process as the water becomes air borne, it offers minimum resistance for the air flow. Because of the longer length of spray involved, spray type air washers have higher saturation efficiencies and the air borne impurities also get scrubbed to a great extent.

# MAIN COMPONENTS

**Panels for Cabinet type units:** Standard 25mm / 50 mm thick panels are made of pre-painted / pre-coated / GSS Sheets injected with environment friendly PUF of uniform density of 38 to 40 kg/cu.m. . The panels are fixed to the frame work using special imported self drilling & tapping screws. To ensure an air tight construction, self sticking gaskets are provided between the panel & frame. For specialized applications food grade gaskets are provided. Choice of Al / S.S 304 pre-painted sheet as inner skin is available.



**Base Frame:** Each Air Washer Unit is mounted on a continuous beam of galvanised steel channel held together with die cast aluminium base corners with lifting holes for easy handling. MS Channel base is also available as an option.

**Frame Work:** The modular framework is made of anticorrosive extruded aluminium profile. Different types of profiles are available.

**Cooling Pads:** The pads consist of specially impregnated and corrugated cellulose paper sheets with different flute angles, that have been bonded together high wettability index. This unique design yields a cooling pad with high evaporation efficiency while still operating at a very low pressure drop. In addition scaling is kept to a minimum and no water carry-over occurs due to the fact that the water is directed to the air inlet side of the pad.

**Mist Eliminators:** They are available in various material combinations and configurations to fit a wide range of operating conditions. Our Mist Eliminators provide high efficiency droplet separation at low resistance, even at high face velocity. The streamlined separator deflects the droplet laden gas stream; as a result the momentum of the droplets causes them to impinge onto the profile surface. The droplets coalesce together and form a liquid film; the influence of gravity causes the liquid to drain to the bottom of the profiles.

**Water Holding Tank:** Tank is made of mild steel (M.S) or stainless steel (S.S) with anti - corrosive coatings (FRP/EPOXY) and is designed for easy access for periodic cleaning.

**Hinges & Locks:** All access doors & panels are provided with hinges & locks made of self extinguishing nylon. The access panels are fitted to the panel using special gaskets which provide perfect air tightness & can be removed easily using hand tools.

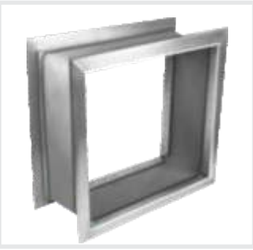
**Filter Section** Fully sealed filter sectons are designed for easy installation & removal. A complete range of filters with various efficiencies and media are available as per requirements. Pressure measurement ports can be provided across fine filters as option.



**Fan Section:** Energy efficient forward / backward curved AMCA certified Centrifugal Fans are available for all applications. VENTECH make DIDW Fans with limit load characteristics manufactured as per relevant IS Standards and can also be incorporated in Air Washers. Each fan is individually tested , precision balanced statically & dynamically as per prevailing standard norms. High efficiency, low noise & low power consumption is the basic philosophy followed while selecting fans. The fan & motor is mounted on a common channel with provision of easy belt tensioning fitted with anti-vibration isolators to avoid the vibration transfer to main casing. The complete assembly is mounted on spring / rubber vibration isolators for smooth performance. The fan is connected to the main casing, using fire and moisture resistant flexible canvas connection, ensuring low operating noise and vibration. The drive pulleys are taper bushed duly balanced with proper sizes of 'V' belts.

Centrifugal Blower

Electric Motor



Fan Outlet Canvas

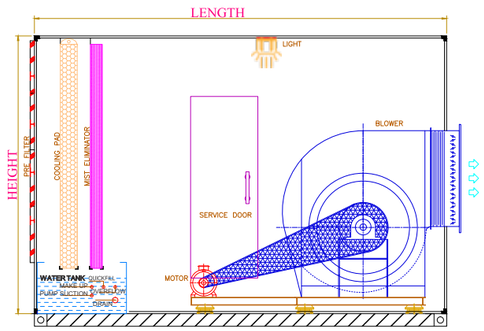
Anti Vibration Mountings

## The Accessories & Options

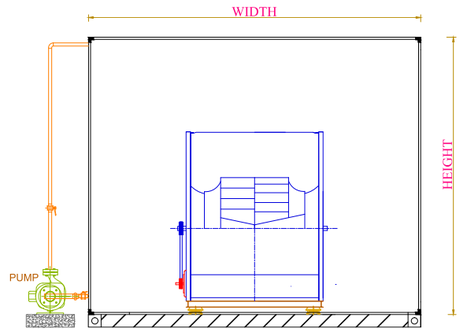
- Marine light. Inspection Window for easy viewing.
- Variable frequency drive
- Contoured / G.I. / Pre Coated aluminium canopy for outdoor application.
- Intake louver with bird screen for fresh air intake.
- Fire retardant flexible connections for fan outlet.
- Sound attenuation section for low noise applications.
- Wire guard for fan section
- Fan outlet volume control damper.
- Drift eliminators in PVC / S.S / Aluminium / G.I.
- Energy efficient electric Motors
- UV Tube
- Provision for electrically interlocked fan section with access door
- Units with VFD panels.
- Micro processor control panel with required field sensors duly wired to the unit.
- Instrumentation like Manometer, Hygrometer, Humidistat etc.

# CELLULOSE PAD TYPE AIR WASHER

## VEAC Series has stylish design and comes with a minimal footprint




SIDE ELEVATION




FRONT ELEVATION

## TECHNICAL DATA

| Sr.No. | Model | Air Volume (CMH) | Air Volume (CFM) | Dimensions (MM) | | | Fan Motor(HP) @50 mm.WG. static pressure | Pump Rating (HP) | Sump Size ( Cellulose pad 200 mm depth with 2 / 4 bend PVC Eliminator) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Length | Width | Height | | | Width(W) | Length(L) | Height(H) |
| 1 | VEAC-3 | 5100 | 3000 | 1900 | 1300 | 1200 | 2 | 0.5 | 600 | 1220 | 250 |
| 2 | VEAC-4 | 6800 | 4000 | 1900 | 1300 | 1200 | 3 | 0.5 | 600 | 1220 | 250 |
| 3 | VEAC-5 | 8500 | 5000 | 2100 | 1300 | 1400 | 3 | 0.5 | 600 | 1220 | 250 |
| 4 | VEAC-6 | 10200 | 6000 | 2100 | 1300 | 1500 | 5 | 0.5 | 600 | 1220 | 250 |
| 5 | VEAC-7 | 11900 | 7000 | 2100 | 1600 | 1600 | 5 | 0.5 | 600 | 1520 | 250 |
| 6 | VEAC-8 | 13600 | 8000 | 2400 | 1900 | 1700 | 5 | 0.5 | 600 | 1830 | 250 |
| 7 | VEAC-9 | 15300 | 9000 | 2400 | 1900 | 1700 | 7.5 | 0.5 | 600 | 1830 | 250 |
| 8 | VEAC-10 | 17000 | 10000 | 2500 | 1900 | 1700 | 7.5 | 0.5 | 600 | 1830 | 250 |
| 9 | VEAC-12 | 20400 | 12000 | 2500 | 1900 | 2000 | 7.5 | 0.5 | 600 | 1830 | 250 |
| 10 | VEAC-15 | 25500 | 15000 | 2700 | 1900 | 2100 | 10 | 0.5 | 600 | 1830 | 250 |
| 11 | VEAC-18 | 30600 | 18000 | 2900 | 2200 | 2300 | 10 | 0.5 | 600 | 1830 | 250 |
| 12 | VEAC-20 | 34000 | 20000 | 2900 | 2500 | 2300 | 12.5 | 1 | 600 | 2440 | 250 |
| 13 | VEAC-22 | 37400 | 22000 | 3100 | 2500 | 2300 | 12.5 | 1 | 600 | 2440 | 250 |
| 14 | VEAC-25 | 42500 | 25000 | 3200 | 3200 | 2300 | 15 | 1 | 600 | 3050 | 250 |
| 15 | VEAC-28 | 47600 | 28000 | 3300 | 3200 | 2300 | 15 | 1 | 600 | 3050 | 250 |
| 16 | VEAC-30 | 51000 | 30000 | 3300 | 3200 | 2500 | 20 | 1 | 600 | 3050 | 250 |
| 17 | VEAC-35 | 59500 | 35000 | 3400 | 3200 | 2700 | 20 | 1 | 600 | 3050 | 250 |
| 18 | VEAC-40 | 68000 | 40000 | 3700 | 3200 | 3000 | 25 | 1 | 600 | 3050 | 250 |
| 19 | VEAC-45 | 76500 | 45000 | 3700 | 3800 | 3000 | 25 | 1 | 600 | 3660 | 250 |
| 20 | VEAC-50 | 85000 | 50000 | 3800 | 4400 | 3000 | 30 | 1 | 600 | 4270 | 250 |
| 21 | VEAC-55 | 93500 | 55000 | 4300 | 4400 | 3000 | 30 | 1 | 750 | 4270 | 300 |
| 22 | VEAC-60 | 102000 | 60000 | 4400 | 5000 | 3000 | 40 | 1.5 | 750 | 4880 | 300 |
| 23 | VEAC-65 | 110500 | 65000 | 3500 | 5600 | 3000 | 2 X 20 | 1.5 | 750 | 5490 | 300 |
| 24 | VEAC-70 | 119000 | 70000 | 3500 | 5600 | 3000 | 2 X 20 | 1.5 | 750 | 5490 | 300 |
| 25 | VEAC-75 | 127500 | 75000 | 3700 | 6200 | 3000 | 2 X 20 | 2 | 750 | 6100 | 300 |
| 26 | VEAC-80 | 136000 | 80000 | 3700 | 6200 | 3300 | 2 X 25 | 2 | 750 | 6100 | 300 |
| 27 | VEAC-90 | 153000 | 90000 | 3800 | 6200 | 3600 | 2 X 25 | 2 | 750 | 6100 | 300 |
| 28 | VEAC-100 | 170000 | 100000 | 3900 | 6200 | 3600 | 2 X 30 | 2 | 750 | 6100 | 300 |

Note: ❁ All above dimensions are with standard 25 mm thick panels. ❁ For single skin air cooling unit, dimensions will vary. Please consult us for more details
❁ Unit base channel height is extra. ❁ The Air cooling units have been designed so that 'Ventech' make Fans or imported fans can be accomodated
❁ Design Velocity across filters & Pads has been considered as 500 FPM ensuring better efficiency of the system ❁ Dimensions are indicative



# TEMPERATURE DROP CHART

| | Outside Design Conditions (Summer) | | | | Condition of air leaving the media at 90 % saturation efficiency (with 200 mm deep Pad) | | Condition of air leaving the media at 95 % saturation efficiency(with 300 mm deep Pad) | |
|---|---|---|---|---|---|---|---|---|
| City | DBT(°C) | WBT(°C) | RH(%) | Wet Bulb Depression | DBT(°C) | WBT(°C) | DBT(°C) | WBT(°C) |
| Andhra Pradesh | | | | | | | | |
| Vishakapatnam | 33.3 | 27.8 | 64.0 | 5.6 | 28.3 | 27.8 | 28.1 | 27.8 |
| Assam | | | | | | | | |
| Guwahati | 32.2 | 25.6 | 59.0 | 6.7 | 26.2 | 25.6 | 25.9 | 25.6 |
| Bihar | | | | | | | | |
| Patna | 42.2 | 25.6 | 26 | 16.6 | 27.3 | 25.6 | 26.43 | 25.6 |
| Chattisgarh | | | | | | | | |
| Raipur | 43.3 | 25 | 22 | 18.3 | 26.8 | 25 | 25.92 | 25 |
| Delhi | 43.3 | 23.9 | 20 | 19.4 | 25.8 | 23.9 | 24.87 | 23.9 |
| Goa | | | | | | | | |
| Panjim | 32.0 | 27.8 | 70 | 4.2 | 28.2 | 27.8 | 28.01 | 27.8 |
| Gujarat | | | | | | | | |
| Ahmedabad | 43.3 | 25.6 | 24 | 17.7 | 27.4 | 25.6 | 26.49 | 25.6 |
| Vadodara | 43.0 | 25.6 | 24 | 17.4 | 27.3 | 25.6 | 26.47 | 25.6 |
| Jharkand | | | | | | | | |
| Jamshedpur | 43.3 | 25.6 | 24 | 17.7 | 27.4 | 25.6 | 26.49 | 25.6 |
| Ranchi | 37.8 | 27.8 | 46 | 10 | 28.8 | 27.8 | 28.3 | 27.8 |
| Karnataka | | | | | | | | |
| Bangalore | 35.6 | 25.6 | 45 | 10 | 26.6 | 25.6 | 26.1 | 25.6 |
| Bellary | 41 | 25 | 28 | 16 | 26.6 | 25 | 25.8 | 25 |
| Kerala | | | | | | | | |
| Thiruvananthapuram | 33.3 | 26.7 | 59 | 6.6 | 27.4 | 26.7 | 27.03 | 26.7 |
| Madhyapradesh | | | | | | | | |
| Bhopal | 41.1 | 22.8 | 20 | 18.3 | 24.6 | 22.8 | 23.72 | 22.8 |
| Maharashtra | | | | | | | | |
| Mumbai | 35 | 28.3 | 60 | 6.7 | 29.0 | 28.3 | 28.64 | 28.3 |
| Nagpur | 44.4 | 24.4 | 18 | 20 | 26.4 | 24.4 | 25.4 | 24.4 |
| Pune | 40 | 24.4 | 28 | 15.6 | 26.0 | 24.4 | 25.18 | 24.4 |
| Orissa | | | | | | | | |
| Bhubaneshwar | 37.8 | 27.8 | 46 | 10 | 28.8 | 27.8 | 28.3 | 27.8 |
| Punjab | | | | | | | | |
| Ambala | 43.3 | 23.9 | 20 | 19.4 | 25.8 | 23.9 | 24.87 | 23.9 |
| Rajasthan | | | | | | | | |
| Jaipur | 43.3 | 23.9 | 20 | 19.4 | 25.8 | 23.9 | 24.87 | 23.9 |
| Telangana | | | | | | | | |
| Hyderabad | 41.1 | 25.6 | 28 | 15.5 | 27.2 | 25.6 | 26.375 | 25.6 |
| Tamilnadu | | | | | | | | |
| Chennai | 39.4 | 27.8 | 41 | 11.6 | 29.0 | 27.8 | 28.38 | 27.8 |
| Uttar Pradesh | | | | | | | | |
| Kanpur | 42.8 | 25 | 23 | 17.8 | 26.8 | 25 | 25.89 | 25 |
| Lucknow | 42.8 | 26.1 | 26 | 16.7 | 27.8 | 26.1 | 26.935 | 26.1 |
| West Bengal | | | | | | | | |
| Kolkata | 37.8 | 28.3 | 49 | 9.5 | 29.3 | 28.3 | 28.775 | 28.3 |

Note: ❁ The peak summer temperature Conditions have been referred to from HVAC handbook by ISHRAE
❁ Condition of Air leaving media = Outside DBT- Saturation Efficiency (Outside DBT-Outside WBT) ❁ The performance of cooling pad type Air Washer has been specified at 90% evaporative cooling efficiency with 8" deep (200 mm) Cooling pad and 95 % evaporative cooling efficiency with 12" deep (300 mm) pads.
❁ The temperature mentioned above is just at the downstream end of the cooling pads. The temperature inside the hall shall depend on heat gains and design of Air Distribution System. ❁ DBT- Dry Bulb Temperature. ❁ WBT-Wet Bulb Temperature ❁ RH- Relative Humidity
❁ Due to continual improvement in our products, performance rating is liable to change.