

MANUFACTURING OF 360 DEGREE ROTATION AIR COOLER

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Abstract- India's energy demands are expected to be more than double by 2030, and there is a pressing need to develop ways to conserve energy for future generations. Thus energy consumption can be reduced drastically by using energy efficient appliances. In India, the Union ministry of power's research pointed out that about 20-25% of the total electricity utilized in government buildings in India is wasted due to unproductive design, resulting in an annual energy related financial loss of about Rs 1.5 billion. Conventional heating ventilation and air conditioning systems (HVAC) consume approximately 50% of the building energy. This type of air conditioning is therefore neither eco-friendly nor sustainable. Selection of proper air conditioning system for buildings can not only help the country save electrical energy but also reduce green house emissions.

An evaporative cooler (also swamp cooler, desert cooler and wet air cooler) is a device that cools air through the evaporation of water. Evaporative cooling differs from typical air conditioning systems which use vapor-compression or absorption refrigeration cycles. Evaporative cooling works by exploiting water's large enthalpy of vaporization. The temperature of dry air can be dropped significantly through the phase transition of liquid water to water vapor (evaporation), which can cool air using much less energy than refrigeration. In extremely dry climates, evaporative cooling of air has the added benefit of conditioning the air with more moisture for the comfort of building occupants.

Evaporative cooling, being used by mankind for centuries is based on a very simple principle. When a hot and dry air is allowed to pass through a wet pad, the temperature of incoming air is reduced with an increase in specific humidity as some water from the pads is evaporated taking the latent heat of vaporization from the incoming air. 360 air cooler is cheaper than air conditioning also consumes less power than air conditioning. Externally mounted evaporative cooling devices were used in some automobiles to cool interior air—often as aftermarket accessories until modern vapor-compression air conditioning became widely available. After some time air may be sufficiently cooled by 360 Evaporative process, results in considerable increase of humidity. For better effect add ice cube or chilled water in bottom tank.

Key Words: Latent heat, Sensible heat, Air cooling, Water, Fan blades, Humidity, Temperature, Performance, Enthalpy.

1. INTRODUCTION-

1.1 General Introduction

The Evaporative cooling is one of the earliest methods employed by men for conditioning their houses. Only in recent years, it has been put on sound footing thermodynamically. It is a process of adiabatic saturation of air when a spray of water is made to 360 EVAPORATIVE into it without transfer of heat from or to the surroundings. The initial investment cost of such a system is low & the operation is simple & cheap. Simple 360 EVAPORATIVE cooling is achieved by direct contact of water particles & a moving air stream. If the water is circulated without a source of heat & cooling, dry air will become more humid & will drop in temperature. In a complete contact process, the air would become saturated at WBT of the entering air. The air may be sufficiently cooled by 360 EVAPORATIVE process to results a considerable degree of summer comfort in climates of high dry-bulb temperatures associated with low relative humidity's. The minimum outdoor temperature required for successful 360 EVAPORATIVE cooling is above 35° c & another requirement is a relatively low

1.2 Problem Statement

The increasing use of air cooler had led to considerable activity in methods for better performance and reduction in power consumption and particle levels emitted in the exhaust. The required levels are difficult to achieve through cooler design alone even with high grade fan. But, blending different additives into air cooler is still today the best way to have results in matter of pollution. One group of air cooler additives is oxygenated compounds. The main reason of using oxygen to produce a cleaner air is used few decades ago. The reduction of heat generation by the addition of water compounds in the air cooler.

Wet bulb temperature. The comfort given by the 360 EVAPORATIVE cooling always depends upon the outdoor temperature & R.H. High D.B.T & low W.B.T. always gives more comfort with 360 EVAPORATIVE cooling. Although the 360 EVAPORATIVE cooling does not perform all the function of true air-conditioning but it provides comfort by filtering &

circulating the cooled air. This system does not dehumidify the air but on the contrary, further humidify air. These cooling systems are economical in terms of energy usage. During the energy crunches of the last two decades, 360 EVAPORATIVE cooler use was promoted as one means to control household utility bills. However, little thought was given to cooler water consumption. With Nagpur's rapidly increasing population, warm temperatures, and limited water supply, 360 EVAPORATIVE cooler water usage can no longer be ignored.

2. Objectives

To Develop the Energy efficient, environment friendly direct evaporative air conditioning system having low operating cost suitable for hot and dry regions

To Manufacture advanced 360 degree Rotating air cooler which rotates and provide air cooling in all directions.

It can be used for domestic as well as Industrial applications. 360 design air cooler will allow person to sit in any direction During winter it can be used for heating room

360 EVAPORATIVE coolers work best when relative humidity is below 70%. Cold water does not significantly increase the cooling efficiency of a 360 EVAPORATIVE cooler.

360 EVAPORATIVE coolers must only be used in areas, which have good natural ventilation or adequate mechanical air extraction units. With an 360 EVAPORATIVE cooler, air is drawn through a wet filter pad. As the air moves over the wet pad, water is evaporated off the pad removing heat from the air. The pad basically acts to support the water within the stream of air entering the building. 360 EVAPORATIVE cooling pads typically produce the most efficient cooling effect in the room Efficiency of Cooling Technology for Thermal comfort has been achieved.

3. Procedure

In 360 cooler we are going to use four direction cooling pads which allows maximum efficiency & cooling more area in short time also we design special flapper to flow air in all direction with control.

When trying to understand 360 EVAPORATIVE cooling, it may be best to think of air as a type of sponge. Like a sponge, as air comes into contact with water, it absorbs it. The amount of water absorbed depends largely on how much water is already in the air. After all, how easily you clean up a spill depend on how dry a sponge you are using. The term 'humidity' describes the level of water in the air. If the air holds 20% of its capacity, the humidity would be 20%. A humidity of 100% indicates that the air is holding all the moisture it can. The lower the humidity, the more water the air can hold the cooler.

3.2 Components Selected

Table -1: Components which are used in cooler

Name of the component	Specification	Material	Sp name
Blower Motor	2800 r.p.m Single phase voltage	Mild Steel	C-40
Pump	Under Water Pump 230 v single	Copper	C-25
Water Tank	18 Guage	Mild Steel	C-30
MS Sheets	18X4 mm	PVC	3.0

4. Healthy

360 EVAPORATIVE cooling is healthy and comfortable because it:

- Brings in outside air and exhausts stale air, smoke, odors, and germs.
- Helps maintain natural humidity levels, which benefits both people and furniture and cuts static electricity.
- Does not need an air-tight structure for maximum efficiency, so building occupants can open doors and windows.

Because 360 EVAPORATIVE cooling does not use chlorofluorocarbons (CFCs), it does not contribute to ozone depletion Those additives with oxygenated compounds are most widely used in Diesel, as the participation of their oxygen in reactions leads to a better combustion thus lowering emission. Their molecular structure and oxygen content have direct influence on soot reduction. In order to decrease soot formation, 11-21% volume of oxygenate chemicals should be blended with diesel fuel. When additives are added they alter the physical and chemical properties such as density, viscosity, volatility and cetane index significantly. Nitro paraffin is one additive which has high oxygen content in then molecular structure. By addition of additives, we can improve the performance via the increase of thermal energy output and combustion product alteration.

4.1 Merits of 360 degree Cooling

Following are the merits of 360 degree cooling:-

- Thermal Performance It has been found out that some of performance improves thermal efficiency upto 19% without affecting the torque.
- Emissions Reduction: 360 cooler can decreases pollutants and greenhouse gas emissions upto 55% or more.

4.2 Demerits of 360 degree Cooling

Following are the demerits of 360 Degree Cooling:-

- Power Cost: The high cost of Electric power increases the cost of Electric bill.
- Preparation of Water Vapour: Preparation of some vapour blend are difficult in some cases and cause pollutants.

4.3 Temperature Reduction

The greater the difference between the wet bulb and dry bulb temperatures, the greater the achievable temperature reduction. Here's how to calculate temperature reductions achievable with each of the three flavors of 360 EVAPORATIVE cooling

These examples use a starting dry bulb (DB) temperature of 86° and wet bulb (WB) temperature of 66°.Temperature reduction achievable using direct 360 EVAPORATIVE cooling

5. Methodology

When describing the amount of moisture in the air, the term relative humidity is used because the sponginess of air changes relative to air temperature. The warmer the air, the more spongy it becomes and the more water it can hold. As a result, we must describe the level of humidity relative to the type. With an 360 EVAPORATIVE cooler, air is drawn through a wet filter pad. As the air moves over the wet pad, water is evaporated off the pad removing heat from the air. The pad basically acts to support the water within the streaming of air

With direct 360 EVAPORATIVE cooling, the dry bulb temperature is reduced while the web bulb temperature remains

Table -2: Specification of Engine used

Product	Cost
GI SHEET	950
EXHAUST FAN	850
FORCED FAN	670
PUMP	850
FRAME MATERIAL	980
Calorimeter & Pump	1200
SHEET METAL	450
HEATER	1300
Temperature sensor	800
THERMOMETER	200
MOTOR	3000
WATER TANK	785
ELECTRIC COIL	1250

5.1 Advantages of 360 degree cooling

- 360 DEGREE Colling is Environmentally Friendly.
- Air cooler has Economic Advantages.
- No Specail Modifications Necessary.
- 360 degree cooler can be made at Industry.
- Air cooler can be made from Industrial Products.
- Energy Efficient.

5.2 Disadvantages of 360 degree Air cooling

- Air cooler cannot used in Cold Weather.
- Consumes More Power.
- Air cooler versus Air conditioning.
- Air cooler has Higher NOx Emissions.
- Cooler decreases Horsepower.

6. CONCLUSION

From the present investigation it is evident that for drip type 360 EVAPORATIVE cooling the performance characteristics cooling the performance characteristics can be related to the variables like and thickness and the atmospheric conditions such as humidity control and comfort. It is also possible to determine the parameters but location and one needs to optimize the design parameters for corresponding outdoor conditions.

The result also indicates that a considerable saving in power consumed is possible and at the same time the cooling effectiveness can be enhanced. The procedure detailed in the present study can be used to advantage in designing 360 EVAPORATIVE air cooler of larger capacity to economically cool bigger endorsers, because the various parameters can be changed with ease The approach can be employed to analyze any piece of equipment and improve it's performance..

7. Scope for the Future Work

In future we can establish 360 DEGREE air cooler station so that we will independent on Air conditioner. Simultaneously we have to design vehicle cooler which run by less power. We have to provide Heater coil, Advance exhaust fan and Exhaust Gas Recirculation for better performance and lower emission of Cooler.

In this way we can achieve goal of green revolution and sustainable development in science and technology.

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