ISSN 2349-6193
Impact Factor: 2.805

IJESMR

International Journal OF Engineering Sciences & Management Research

EVAPORATIVE WATER COOLING SYSTEM BY VENTURI

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Keywords: AutoCAD2009, Oxy-acetylene welding, venturi.

ABSTRACT
The main function of evaporative water cooling is, to create friendly approach with environment and to built thermal comfort. The main purpose of water spraying to reduce the temperature of air and convert the dry air to moist air. The water spraying unit achieve by factors which is continuous velocity, temperature, relative humidity, continuous water spray.The main effect of venture is the reduction in fluid pressure that results whena air velocity increases with the help of fan assembly.This system cools the air evaporation of water. The temperature of dropped air is important for change the phase of water. The temperature of dry air can be drop is important for the phase transition of liquid water to water vapor. This system required much less energy than other cooling system.

INTRODUCTION
The evaporator or evaporator cooler is can reduce the temperature of air using the principle of evaporative cooling. The evaporative cooling is depend on the mixture of water vapour and air. The mixture of water vapour and air is helps to reduce the temperature of air. The energy needed to evaporate or cool the water is taken from the air in the form of sensible heat, which affect the temperature of the air and converted into latent heat. The sensible heat means the energy required to change the temperature of a substances with no phase change is called sensible heat. And the latent heat means the substances or any material changes it phase, that is it goes from solid to liquid either liquid to gasses. To evaporate or cool the water the sensible heat is needed to convert into the latent heat. the conversion of sensible heat to latent heat is called as adiabatic process. The venturimeter is device used for measuring the rate of flow of fluid through a pipe. The main function of venturi is to reduce the pressure of fluid and increases the velocity of fluid. Vapor-compression refrigeration uses evaporative cooling, but the evaporated vapor is within a sealed system, and is then compressed ready to evaporate again, using energy to do so. A simple evaporative cooler's water is evaporated into the environment, and not recovered. In a interior space cooling unit, the evaporated water is introduced into the space along with the now-cooled air; in an evaporative tower the evaporated water is carried off in airflow exhaust.

METHODOLOGY
- Prepare all factor about venturi such as conversion, diversion and throat, and material using for venturi is stainless steel.
- We select the pump of 1.8meter head for pumping water.
- We make the base by using iron square tubes.
- Select the tank of metal is stainless steel.
- Select pipe and connect to inlet and outlet port.
- Selection of fan of external diameter is 30cm and fan motor is 2200rpm.
- Select the shower to spray the water on venturi.
- Assembly of all component.

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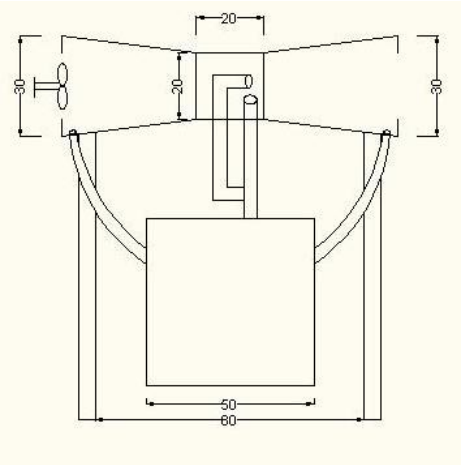

Fig: evaporative water cooling

FORMULAE AND CALCULATION

- $V = A \times L$
- $V = \frac{\pi}{4} \times [do^2 - di^2] \times L$
- $Q = V \times N$
- $v = \frac{Q}{A}$
- $A_1\, v_1 = A_2\, v_2$

Where,
V- velocity.
L- lateral dimension of fan.
do- fan diameter.
di- hub diameter.
A- Area.

$`Q = 699.78 \times 2800$
$Q = 1.959 \times 10^6 cm3/m$
$V = 46.2CM/S$
$A = 2.77 \times 10^3 \text{cm}^2$

RESULTS AND DISCUSSION

This evaporative water cooling system is to reduce the temperature of water at minimum time than refrigerator . Techniques that are reliable , efficient, energy saving, safe, and cost effective. The evaporative water cooling system is simple workable and efficient which can be adopted to reduce latent heat. The system should be cost effective and less space required. It is ecofriendly and does not required refrigerant.

CONCLUSION

- This system required less energy as compare to refrigeration
- Does not required refrigerant
- Time required for cooling is less
- This system is eco-friendly and can not make harmful gasses
- This system is more efficient than other system

ACKNOWLEDGEMENTS

We would like to thank all the people who contributed their time and helped we in writing this paper and completing in timely manner. we would also thank them for making this paper a successfully one.we avail this opportunity to express our deep sense of gratitude and whole hearted thank to my guide for giving his valuable guidance, inspiration and affectionate encouragement to embarkthis seminar. We have no words to express our sincere thank for valuable guidance, extreme assistance and co-operation extended to all the staff member of our

ISSN 2349-6193
Impact Factor: 2.805

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International Journal OF Engineering Sciences & Management Research

department. We also acknowledge our overwhelming gratitude and immense respect to our H. O. D. and sincere thank to our principle, who inspired we a lot to achieve the highest goal.Last but not the last we are also thankful to my all nonteaching staff, friends for their help unselfish co-operation during the preparation of project

REFERENCES

1. *Van den hurk B, kiein tank A, lenderink G, van ulden A, van oldenborgh GJ, katsman C, et al. KNMI climate change scenarios 2006 for the Netherlands. KNMI De Bilt; 2006*
2. *Klein tank AMG, lenderink G. climate change in the Netherlands; supplements to the KNMI'06 scenarios. Bilt K Ned Meteorol Inst 2009*
3. *Kovats RS, hajat s. heat stress and public health: a critical review. Annu rev public health 2008;29:41-55*
4. *Stott PA ,stone DA, allen MR. human contribution to the europen heatwave of 2003 nature 2004,432:610-4*
5. *Fischer PH, brunekreef B, lebret E. air pollution related deaths during the 2003 heat wave in the Netherlands. Atmos Environ 2004;38:1083-5*