Case Study

HMX's evaporative cooling solution helps a global company improve indoor air quality

Background

This is an engineering giant, a high technology global industrial group with world-wide operations, employing close to 50,000 people and operates out of multiple locations in India. The group has a carbide grinding facility in South India.

Challenges

The process of grinding employs a wheel, usually made of an abrasive material, being brought into controlled contact with the work surface. The wheel is composed of abrasive grains bound together by a binding material. These grains act as the cutting tool, removing tiny chips of material from the material being worked upon. Generally silicon carbide or tungsten carbide wheels are used for grinding. Fumes generated from silicon carbide grinding wheels, when inhaled regularly over a long period, can lead to shortness of breath and cough.

The workers on the grinding shop floor would be at risk if they were to be constantly exposed to such fumes day in and day out. Further the sensible heat load being generated inside the facility was approximately 400,000 BTU/hr (117kW). To make matters worse, the extremely hot summers of Hyderabad (ambient temperature exceeding 40 °C) further added to the level of discomfort of the people working on the carbide grinding shop floor.

To tackle this situation, the management was keen to install a fresh air cooling system. The main idea was to supply clean, cool air on the shop floor to lower the temperature and to also remove the toxic fumes being generated inside, thus improving the overall indoor air quality. The desired temperature inside was 29±2 °C.

Solution

Team HMX, after a visit to the site concluded that installing a two stage evaporative cooling system of 40,000 CFM would solve the problems and provide clean and comfortable working conditions inside. So, the company decided to go for the Indirect Direct Evaporative Cooling solution (HMX-IDEC) of 40,000 CFM capacity.

Result

The IDEC systems were installed and commissioned at this plant in January 2014. Table on the next page shows the reading of the HMX-IDEC taken on 16 April 2014 at different time intervals. The readings show that the IDEC could achieve a room temperature of 25 - 26 °C. This clearly indicates that the IDEC is performing extremely well.

The management is extremely happy with the results obtained after the commissioning of IDECs'. The fumes and the heat generated by the carbide grinding machines is carried away by the air supplied by the IDEC, improving the indoor air quality and also maintaining comfortable working conditions inside.

As an outcome of the excellent performance of the IDEC installed at the plant, the management has placed orders for 5 more IDEC units (2 x 40,000 and 3 x 20,000). The management also has an ambitious plan to air cool all the factory sheds in that premise with the HMX-IDEC in the near future.

Table : Temperature readings of HMX-IDEC

Sr. No.	Date	Time	Ambient temperature (°C) DBT	Room temperature (°C) DBT
1	16/04/14	1.30 pm	36	25
2	16/04/14	2.30 pm	38	26
3	16/04/14	3.00 pm	38	26
4	16/04/14	3.30 pm	37	25

HMX-IDEC

Ducting layout inside the carbide grinding floor

A.T.E. ENTERPRISES PRIVATE LIMITED
(Business Unit: **HMX**)
T: 1800-123-2830
E: ambiator@hmx.co.in
W: www.ategroup.com/hmx
CIN: U51503MH2001PTC132921