The HMX-Ambiator helps a global company improve indoor air quality

Case Study

Company 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.

Challenge

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 HMX-Ambiator of 40,000 CFM capacity.

Other options considered

In the meantime, the management had also evaluated single stage evaporative air cooling units (air washers) for this project. However, the idea was shelved as a single stage evaporative air cooling system would not be able to achieve the desired conditions inside because of limitations of single stage cooling.

Result

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

The management is extremely happy with the results obtained after installing the HMX-Ambiator. The fumes and the heat generated by the carbide grinding machines is carried away by the air supplied by the Ambiator, improving the indoor air quality and also maintaining comfortable working conditions inside.

As an outcome of the excellent performance of the HMX-Ambiator installed at the plant, the management has placed orders for 5 more HMX-Ambiators (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-Ambiators in the near future.

Table : Temperature readings of HMX-Ambiator

Sr. No.	Date	Time	Ambient Temperature ºC	Room Temperature ºC
			DBT	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

Installation photographs

HMX-Ambiator

Ducting layout inside the carbide grinding floor

HMX

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