



HMX-Ambiator helps maintain comfortable working condition at Relaxo Footwear

Case Study

Company background

Relaxo Footwear made a humble beginning in the year 1976. The company has grown by leaps and bounds since then and today is the second largest manufacturer of footwear in India with an annual sales figure of more than Rs. 8,700 million. The company manufactures more than 300,000 pairs of footwear per day in its 9 manufacturing units in North India.

Challenge

The manufacturing of footwear involves two basic processes. The first stage involves shaping and stitching, which doesn't involve any heat generation. The second stage involves the injection moulding of the sole into the base of the upper part of the shoe. This is an endothermic process and involves the supply of a generous amount of heat to the mould. A lot of heat is also released around the moulding machines which causes significant discomfort to the workers in the area. On an average 20 people work on one such moulding machine at Relaxo.

The problem is further compounded by the notoriously hot summer temperatures in North India. The ambient temperature goes up to 45 - 46°C and makes working near the moulding machines extremely difficult.

When Relaxo Footwear was setting up a state of the art manufacturing unit in Bahadurgarh for its export markets, its newly appointed Director, Mr Rahul Dua, and his team, were clear on installing a cost-effective air cooling system to make this facility truly world class, that would not only improve the level of worker comfort and productivity, but also be true to its ideal of being a people-driven organization.

Solution

This is the point where team HMX came into the picture. Since the customer was not using any form of air cooling, our sales team had to start from the basic principles. Relaxo was explained the basic concept of two stage evaporative cooling system and its advantages when compared to other technologies such as conventional air conditioning and other modes of air cooling. The option of conventional air conditioning was ruled out envisaging the high capital and operational expenditure.

Based on the calculations done by our team, it was concluded that a total of 120,000 CFM would be required to provide cooling to 120 people working on 6 moulding machines. The installation of 3 x 40,000 CFM units was proposed. This was to be a typical spot cooling solution where only the heat around the moulding machines had to be removed for providing relief to the people working on them.

Other options considered

The HMX-Ambiator faced stiff competition from air washers. Some were of the view that a single stage evaporative cooling system was sufficient to maintain a temperature of 28°C around the moulding machines. The higher cost of around 10-12% for the HMX equipment also added weight to their views.



HMX-Ambiators at Relaxo Footwear, Bahadurgarh, India

Why was HMX Ambiator chosen?

A senior level team from Relaxo visited HMX-Ambiator installations at Bosch at Jaipur and Volkswagen at Pune. The degree of cooling that they experienced at both these locations cleared all their doubts about the performance capabilities of the HMX-Ambiator. The team unanimously agreed that only the HMX-Ambiator would be able to deliver air temperatures as per their requirements.

Keeping in mind the clear benefits (shown in next page) provided by us and the visits made to Bosch and Volkswagen, Relaxo was fully convinced about the advantage of going in for the HMX-Ambiator and placed with us its order for two HMX-Ambiator units with individual capacities of 40,000 CFM.



Ducting layout inside the factory

Clear benefits:

I.	HMX-Ambiator	Air washer
Temperature to be achieved at 4 moulding machines	24°C	
Volume of cool air required to achieve 24°C temperature	80,000 CFM	133,000 CFM
Additional percentage of cool air volume required by air washer as compared to the HMX-Ambiator		67% extra air required
So, additional electricity consumption for air washer		25% extra cost for same cooling effect
II.		
The volume of water added considering 12 hours of operation per day and 300 days in a year	3.00 million	3.6 million
	Lesser amount of moisture addition for same cooling effect	

The result

Ambiator 1: Temperature readings

Sr. No.	Date	Time	Ambient Temperature °C	Room Temperature °C
			DBT	DBT
1	20/04/14	1.30 pm	34	24.5
2	20/04/14	2.35 pm	34	23.5
3	20/04/14	3.10 pm	33	23.5

Ambiator 2: Temperature readings

Sr. No.	Date	Time	Ambient Temperature °C	Room Temperature °C
			DBT	DBT
1	20/04/14	1.30 pm	34	25.0
2	20/04/14	2.35 pm	34	22.5
3	20/04/14	3.10 pm	33	23.0

The above tables show the temperature readings taken at site of both the machines and at different times. They clearly show that the temperature achieved around the moulding machines is very close to the design temperature. This shows that our patented heat exchanger, DAMA, is performing exceptionally well.

The temperature around the 4 moulding machines has come down considerably, improving the worker comfort level which in turn has helped to increase productivity.

The management is looking at the possibility of installing the HMX-Ambiators around other moulding machines in this factory and for their other factories as well.

About HMX

HMX, a business unit of A.T.E., designs and manufactures unique, energy-efficient, and eco-friendly products for space and process cooling for the industrial and commercial sectors, using its patented and highly successful DAMA technology. The product range includes the HMX-Ambiator, and the fresh air pre-cooling units, HMX-PCU-F and HMX-PCU-R. With an installation base of 35 million CFM covering more than 7 million ft². all over India, HMX is making fast strides in providing eco-friendly cooling solutions for people and process comfort.



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