

TRI-BENEFICIAL HEAT PUMP

Application : Washing Machine
Fuel Replaced : Electricity

Customer : A 4 Wheeler Manufacturer
Sector : Automotive

BACKGROUND

In automobile manufacturing, millions of components are forged, machined, assembled and tested every day. To remove the greasy oil, burrs and other impurities stuck on the surface of the components, a water-based oil solution is used. For effective cleaning and surface finish of components, these solutions are heated and maintained at 50-60°C

SOLUTION

After the site assessment, we grind out to develop a cost-effective solution to integrate the washing machine tanks having an overall installed electrical heater capacity of 770 kW. Because of our technical expertise and history of similar installation, we engineered a comprehensive heating solution that the heating needs of all the washing machines be met, without any downtime.

INSTALLATION

Design:

The overall 770 kW (84 kW X 2 Nos. , 28 kW X 15 Nos. , 14 kW x 13 Nos.) Air Source Heat Pump system was designed to cater the heat requirement of 30 individual washing machines.

Integration :

Equivalent to the installed electrical heater capacity of each washing machine, the heat pumps are integrated in the manner of one machine per washing machine, for the overall project.

The tri-benefits of this heat pump project are as follows,

- 60 to 70 Deg C heating need is met . 50% of operational cost savings is attained .
- 18-24 Deg C chilled air generated is used near by for space cooling and for comfort in employees rest area.
- Drain water of 50 liters per day generated is used for panel AC filter cleaning, thereby reducing water consumption.

TYPE OF MACHINE : AIR SOURCE

MAX. OUTLET TEMPERATURE : 80 Deg C

TYPE OF COMPRESSOR : SCROLL

DESCRIPTION	BEFORE	AFTER
HEATING SOLUTION	Electric Heater	Heat Pump
ENERGY SOURCE	Electricity	Electricity
CAPACITY	770 kW	770 kW
POWER COST	Rs. 7.53 / kWh	Rs. 7.53 / kWh
POWER CONSUMPTION / DAY	6,637 kW	3220 kW
OPERATIONAL COST PER YEAR	Rs.1,79,93,174	Rs.87,26,270

PERFORMANCE COMPARISON



INSTALLATION PICTURE

BENEFITS



Individual heat pumps for each washing machine made integration and working hassle-free.



More than 50% energy savings compared to the baseline.
Pay back period : Less than 1 year



1008 Tonnes of annual carbon footprint reduction by installing 770 kW Heat pump

Heat Pump is saving around Rs.92.66 Lakhs per year