

Application**brief**

Eclipse Product: Eclipse ThermJet PCA

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Application: Fuel Conversion Solution for Bar Billet Pusher Reheat Furnace

Description: TDC Steel Company is a steel bar mill based in Thailand that primarily produces reinforcing bar. During production, 100-130mm square bar billets are reheated in a pusher reheat furnace then rolled down to finished rebar.

TDC produces around 40 tons per hour of finished product and the production efficiency starts with reliable metal blanks from the reheat furnace. The reheat furnace was originally designed by Bendotti of Italy and was controlled in 3 zones: preheating 1020°C, heating 1200°C and soaking 1250°C, over a cycle of around 3 hours. The existing furnace was bunker oil fired with preheated combustion air from a metallic recuperator.

The main objective of the project was a fuel conversion from oil to natural gas because the difference in fuel costs would result in considerable savings. TDC was also looking to improve the specific energy consumption from their current 295 kcal/kg without any changes to the furnace environment.



Pusher reheat furnace before burner conversion.

Eclipse Solution: The biggest obstacle came from the existing regenerative and lance type burners being used. Eclipse was able to persuade TDC of the fast return on investment, lower maintenance and superior combustion mixing with the ThermJet nozzle design versus the lance type burners.

With combustion air temperatures from the recuperator of 450°C, Eclipse selected the TJPCA, the workhorse of furnace burners, with the capability to utilize preheated combustion air. Four TJPCA0500 burners were configured in both the preheat and heating zones, with six TJPCA0300 burners in the frontwall of the soaking zone.

Customer Benefits: After commissioning and performance testing, the production was back to 40 tons per hour, within the TDC specifications. A specific energy consumption of 265 kcal/kg was achieved, an improvement of 30kcal/kg. Also, the working environment was improved both inside and out of the furnace. The total project cost was paid back in less than 6 months as a result of the fuel cost savings.



Pusher reheat furnace after burner conversion with TJPCA burners installed.



The gas control skids with safety shut off system, flow metering and flow control valves were designed and pre-assembled at Eclipse Suzhou PRC. The system was designed for operational ease and includes good access areas for maintenance.