

Stress Relief Car Bottom Furnace

A Mining Industry Case Study



Customer - Our customer is a world recognized leader in the design and manufacturing of mining equipment.

Project - Stress relieving of large gear blanks weighing up to 25 tons with limited space.

Requirements

- Minimize use of manufacturing cranes
- Maximize heat transfer and cooling of extremely heavy loads
- Tight space restrictions - seal furnace without vertical lift door

Solution - In evaluating the options of using existing manufacturing cranes to load the furnace versus having a dedicated loading system, ITS presented a solution to increase output and reduce labor. The ITS Heavy Duty TruTemp Car Bottom Furnace was ultimately chosen to meet the production demands while offering greater process flexibility than a batch furnace while minimizing the use of the manufacturing cranes.

Under the control of their manufacturing engineering group, the client nests products on the furnace car to maximize load density and increase output. To further enhance operating efficiencies of the ITS stress relieving TruTemp Car Bottom Furnace, a pulse fired burner control system is used to optimize heat transfer and temperature uniformity. A controlled cool down was also incorporated to eliminate stressing the gears during the cooling process.

Challenges - Though a vertical lift door is preferred, many facilities do not have the headroom necessary to utilize this type of door design. Such was the case in this application, ITS designed a car mounted door incorporating a spring seal design with a clamping system to ensure a tight seal against the furnace face. This eliminated the problem of trying to use the car drive to seal a very heavy load in excess of 125,000 lbs. repetitively against the furnace face without damaging the car drive or furnace. The furnace also features pneumatic car seals to positively seal the car to the furnace body eliminating any air infiltration that would adversely affect the air temperature uniformity.



Results - ITS designed and delivered a stress relief solution that maximized output and reduced labor costs for our customer.

Summary- Stress relieving requirements are unique for each application, whether it is meeting ASME standards, internal or client standards the key to success is having a furnace partner who listens carefully and can present solutions to meet your needs. ITS provides furnace solutions that best meet production and budget requirements. We look forward to partnering with you. Contact the team at ITS to get started.