



**SOLAR PHOTOVOLTAIC INDUSTRY**

**DIFFUSION FURNACE BOAT LOAD SYSTEM**

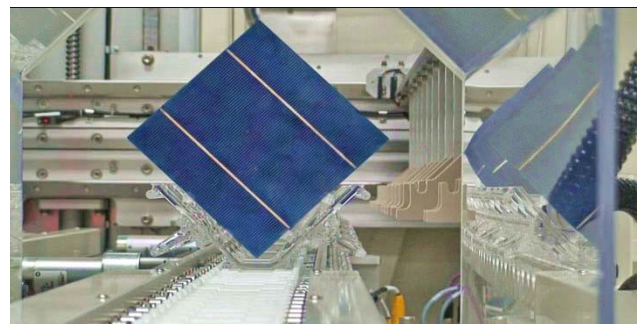
**The Situation**

A leading OEM of diffusion furnaces for solar photovoltaic crystalline wafers needed to respond quickly to a solar manufacturer's demand for higher throughput and lower cost of ownership by automating the quartz boat load and unload of their flagship diffusion furnace.

**The Challenge**

The furnace OEM needed to deliver the automated tool to their

customer in 14 weeks to meet their commitment. The boat loading solution was complicated by thermal and mechanical interface difficulties. In addition, the automation unit would be drop shipped and retrofitted to the furnace at the solar manufacturer's facility, allowing very little time for integration testing.

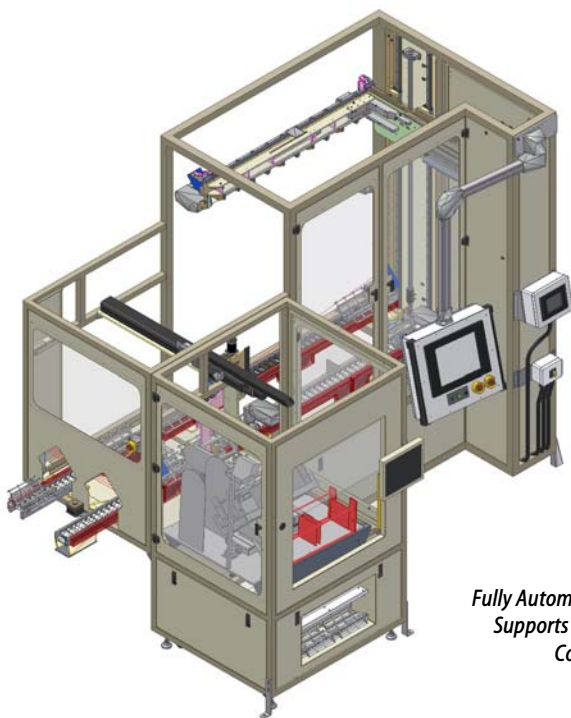


*Unloading Mechanism for High Temperature Quartz Boats*

wafers each (2,000 total) into the furnace and unload the high temperature boats after processing. Owens developed the mechanisms, interface to the furnace, input / output conveyors, and system software. The system was completed within 12 weeks and retrofitted to the furnace at the solar customer's site resulting in successful contract completion for the furnace OEM.

**The Solution**

Owens Design worked collaboratively with the furnace OEM to evaluate multiple automation concepts and identify the best approach to minimize time and risk. Owens then developed the automation to load 20 quartz boats of 100



*Fully Automated Boat Loader  
Supports High Throughput  
Continuous Process*