

## **HEAT TRANSFER INTERNATIONAL (HTI), formerly PRESQUE ISLE ENGINEERING**

HTI specializes in custom-designed, starved air systems that process solids, sludges and hazardous liquids. The front-end gasifiers range from batch style tray furnaces to ram-fed gasifiers to shredder-auger-fed rotaries.

Successful permitting by our engineers has been accomplished in many states, including Maryland, Michigan, Illinois, Colorado and Utah. Materials fired ranged from municipal solid waste, hazardous PCBs, Saran fumes, explosive sludges, plastic scrap, trash, medical waste and biomass. Several of the permits had heat recovery, primarily boilers, however, in some cases the customers supplied the backend equipment and PIE was responsible for material handling, gasification and oxidation front-end lines only.

For approximately 25 years, Robert G. Graham owned a shop and R&D lab in Sanford, Michigan that employed engineers and skilled trades that designed, fabricated and lined the custom equipment to meet customer specifications. In the future all of this engineering and shop fabrication will be performed by Heat Transfer International (HTI). David Prouty is President of HTI, (6871 Dutton Industrial Drive, Dutton, MI 49316, telephone 616-698-7279). All of Mr. Graham's intellectual property is being transferred to HTI where he is under contract as the corporation's senior application engineer.

### **REFERENCES**

#### **CUSTOMER**

#### **DESCRIPTION**

Michigan Sugar Company

105 MKB hot air furnace. Dual fuel firing capability for rotary pulp dryer.

Dow Chemical Company  
Midland, Michigan

High temperature, high pressure preheater.  
6.5 MKB pressure vessel design.

Phillips Petroleum  
Borger, Texas

Liquid polymer incinerator system with  
85,000 lb/hr superheated steam waste heat  
boiler. System features a pyrolyzing/  
oxidizing design.

Southeast Oakland County  
Incinerator Authority  
Madison Heights, Michigan

Two emergency vent stacks installed  
upstream of a retrofit scrubbing system  
on an existing municipal waste incinerator.

Dow Chemical Company  
Midland, Michigan

Liquid bromine incineration system  
complete with wet wall quench and acid  
scrubbing system.

Dow Chemical Company Midland, Michigan	High temperature process heater complete with unique finned coil design and explosion relief.
General Mills Toledo, Ohio	Complete turnkey propane storage, pumping and firing system, including everything from 90,000 gallon storage tanks to burners and fuel management system.
Ford Motor Company Dearborn, Michigan	High temperature, high pressure laboratory test furnace with elaborate control system to simulate engine exhaust for catalytic converter testing.
Owens-Corning Fiberglas Delmar, New York	High temperature fume incinerator for oven exhaust.
Owens-Corning Fiberglas Newark, Ohio	High temperature fume incinerator for oven exhaust.
Owens-Corning Fiberglas Fairburn, Georgia	High temperature fume incinerator for oven exhaust.
Huron Portland Cement Alpena, Michigan	Two refractory-lined kiln feed hoppers; turnkey installation.
Owens-Corning Fiberglas Newark, Ohio	High temperature fume incinerator for oven exhaust.
Huron Portland Cement Alpena, Michigan	Completely self-contained and portable kiln ignition system.
Detroit Edison Company St. Claire, Michigan	Two primary air duct heaters. These units directly heat mill air to allow the firing of low-sulfur western coal.
Detroit Edison Company St. Claire, Michigan	Second order. Two mill air duct heaters similar to that described above.
Cleveland Cliffs Iron Co. Ishpeming, Michigan	Complete modernization of existing power-house firing system.
J. M. Huber Corp. Borger, Texas	Multiple waste incinerator systems, complete with 250,000 lb/hr superheated steam, waste heat boiler. This system has been retrofitted to generate electrical power.
Eastman Kodak Company Rochester, New York	Design and supply of complete gas quenching and scrubbing system applied to customer's rotary kiln incinerator.

BASF Wyandotte Wyandotte, Michigan	Designed and supplied burners, prepiped valve trains, burner management and controls for conversion of (3) utility type boilers for waste gas firing. Each burner is capable of firing (4) different fuels. (9) burners total and (30) fuel trains.
Phillips Petroleum Company Toledo, Ohio	Conversion of existing package boiler to waste oil firing.
Dow Chemical Company Midland, Michigan	Chlorinated fume incinerator scrubbing system. Unit supplied turnkey, complete with flame safety, controls, fans, stack, ladders and platforms.
Cleveland Cliffs Iron Co. Ishpeming, Michigan	80 MKB hot air furnace utilizing universal suspended wall system.
Hunt Wesson Ford Toledo, Ohio	Complete turnkey conversion of existing package boilers.
Canada Carbon Company Alberta, Canada	300 MKB off-gas incineration system, complete with 150 ft of refractory-lined Ductwork, controls, flame safety, etc.
Cleveland Cliffs Iron Co. Ishpeming, Michigan	200,000 lb/hr package boiler installation. Turnkey.
Owens-Corning Fiberglas Toledo, Ohio	Pilot plant for test-firing of various liquid waste materials.
Owens-Corning Fiberglas Valparaiso, Indiana	Full scale incinerator to fire materials tested under above contract.
Allied Chemical Corp. River Rouge, Michigan	Coke oven gas-firing system, complete with burner management, oxygen trim and combustibles analyzing type controls.
U.S. Corps of Engineers Aberdeen, Maryland	Turnkey installation of incinerator and scrubbing system to destroy over 1,000 hazardous materials, including spent munitions and toxic nerve gas.
BASF Wyandotte Wyandotte, Michigan	Incineration system to destroy hazardous acrylonitrile waste.

The Upjohn Company Kalamazoo, Michigan	Turnkey rotary kiln installation. System designed to destroy medical waste, hazardous solvents and municipal solid waste. Supplied complete with heat recovery and particulate and acid scrubbing equipment.
SCA Chemical Services, Inc. Chicago, Illinois	Commercial hazardous solids and liquid wastes facility. EPA-permitted to destroy in excess of 40,000 gallons per day of hazardous materials. This rotary kiln primary chamber was the largest hazardous waste facility permitted in the United States.
Englehard Industries Newark, New Jersey	Hazardous materials processed in (8) starved air gasifiers for precious metals recovery. System complete with heat recovery and gas scrubbing.
Chrysler Corporation St. Louis, Missouri	Oven exhaust fume incinerator with heat recovery.
Dow Chemical Company Midland, Michigan	Modify existing utility-size boiler for hydrogen firing.
Johnson-Matthey West Deptford, New Jersey	Second precious metal recovery system similar to Engelhard Industries.
Chrysler Corporation Windsor, Ontario	Oven exhaust incinerator with heat recovery.
General Motors Baltimore, Maryland	(7) fume incinerators with heat exchangers for paint oven heating.
Kimberly-Clark Atlanta, Georgia	(3) high pressure, directly fired air heaters.
Owens-Corning Fiberglas Valparaiso, Indiana	Waste firing system to revamp incinerator.
City of Galax Galax, Virginia	55 TPD MSW incinerator with heat recovery and dry scrubbing.
Engelhard Corporation Seneca, South Carolina	Manifolded starved air furnaces with heat recovery similar to the Newark plant.
Colorado Incineration Services Denver, Colorado	8 TPD central burn, starved air medical waste incinerator with ceramic heat Exchanger and dry scrubbing. Turnkey retrofit including permitting.

Green River Biomedical Co.  
Green River, Utah

Designed and permitted 25 TPD medical waste central burn facility. Plant was set up to handle medical waste from 7 states.

Jenludel Processing Company  
Memphis, Tennessee

Similar to Green River except plant was designed to recover heat and produce steam for Cargill.

Witco (continental Carbon Co.)  
Sunray, Texas

All-ceramic, two-pass heat exchanger test. Worked with DuPont Lanxide to test full-size exchanger at 2500°F in carbon black pilot plant.

Nan Ya Plastics  
Taipei, Taiwan

(2) starved air rotaries with ceramic heat exchangers. WTE plant designed to incinerate hazardous and non-hazardous industrial waste and recover heat.

### **CERAMIC, AIR-TO-AIR HEAT EXCHANGERS**

In the early 1980s a sophisticated test center was constructed in PIE's shop to test ceramic materials for patented and patent-pending, high temperature, shell and tube heat exchangers. The proven exchangers were then incorporated into aluminum remelt furnaces, a lost-wax process and incinerators.

Customers included Alumax Foils, Alumax Mills, Bodine Aluminum, Southwire Aluminum (three systems purchased over seven years), Johnson Matthey and Etho Power.