Turbulent DIFFUSION Technology Inc.

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# Kiln Technology

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**Turbulent DIFFUSION Technology** is the leading provider of custom, guaranteed, fuel efficiency combustion solutions for thermal processing in the pulp and paper, cement, mineral processing, steel, and petrochemical industries. With a minimum of 10 percent specific fuel cost savings for kiln systems, **Turbulent DIFFUSION Technology** emphasizes the need for process and quality control at a reduced operating cost. **Turbulent DIFFUSION Technology** sets the industry standard for ***fuel efficiency*** and ***return on investment.***

## Combustion Systems

When operated according to Turbulent Diffusion's instructions, our optimized combustion systems:

- ◊ Provide a minimum 6 to 10% reduction in fuel consumption
- ◊ Provide up to 22% fuel cost savings
- ◊ Provide a turndown rate of at least 20:1
- ◊ Extend the life of kilns and combustion systems
- ◊ Reduce premature brick failure
- ◊ Reduce or eliminate combustion zone build-up
- ◊ Reduce or eliminate TRS emissions
- ◊ Reduce operating and maintenance costs
- ◊ Reduce unscheduled shutdowns
- ◊ Help to ensure consistent product quality
- ◊ Allow for production increases

## Chain Systems

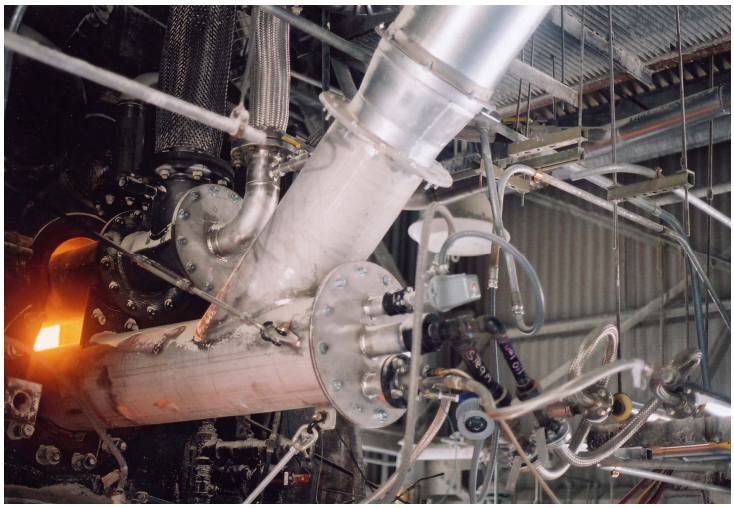
In addition to fuel savings, users of the TDT chain system and burner combination can expect less build up, reduced backend temperatures, and reduced dust loss.

The features of the TDT chain system include:

- ◊ Flights designed to prevent dust losses and properly distribute product
- ◊ Specifically designed chain density to maximize production
- ◊ Chain hangers attached to the kiln shell to minimize weld failures
- ◊ An insulating wool backing and a heat sink in the stainless steel section to reduce heat loss
- ◊ Chain shackle bolts with welded nuts for maximum security

## Valve Trains

Each valve train is custom designed and fabricated to ensure optimum quality. All valves and piping are of the highest quality to help ensure maximum durability and safety.



## Optimized Kiln System Modeling

### Mathematical Modeling

Mathematical modeling uses Computational Fluid Dynamics (CFD) to simulate flame and heat transfer and predict the temperature and heat flux profiles within an enclosed furnace. Models are based on two or three dimensional, steady state elemental calculations. These calculations account for the interactive effects of convection, radiation and heat release throughout the enclosure.

### Physical Modeling

When a jet is placed in an enclosed space, such as a kiln its flow pattern is governed by the chamber geometry. Our physical modeling technique begins with the creation of a scale model of the kiln and its components. The model accurately reproduces the aerodynamics of the actual kiln , maintaining all similarities. We use specialized chemicals to reproduce the combustion process within the kiln model, allowing us to establish an optimal flame shape and determine the heat transfer characteristics of the flame.

## NCG/SOG Lances

Lances are designed so the length , nozzle location and gas momentum are matched to the main burner. This ensures the NCG/SOG's combust properly without disturbing the optimal flame pattern and heat release of the main burner.

## Kiln Burners

Each burner is custom designed for each installation to ensure maximum heat transfer. There are several types of burners to choose from including single, dual and tri fuel burners, solid fuel burners, and synthetic gas burners. Turbulent Diffusion guarantees a minimum specific fuel cost savings of 6 % on their burner solutions.

***Turbulent DIFFUSION Technology guarantees a specific fuel cost savings of 10 percent for kiln systems.***