MARSDEN

Worldwide Leaders in Process Heating Technologies.

Mission & History

Two words describe virtually every industry leader. The first is *performance*. Consistent performance, day in and day out, on the biggest of jobs as well as on the smallest.

The second word is *innovation*. Great companies consistently seek out new and better ways to serve their customers. They bring creative and cost-effective solutions to the many challenges their customers face.

For over thirty years, Marsden has been bringing both performance and innovation to drying and heat treating applications for companies all over the world, across a wide array of industries.

That is why our pledge, "A History of Performance. A Commitment to Innovation." serves as both a testament to our past and a promise of our future.

Our Mission:

- To be the premier supplier of gas infrared heating and drying equipment for industrial applications.

- To deliver a product to our customer which sets the standard in the industry for safety, performance, reliability and value.

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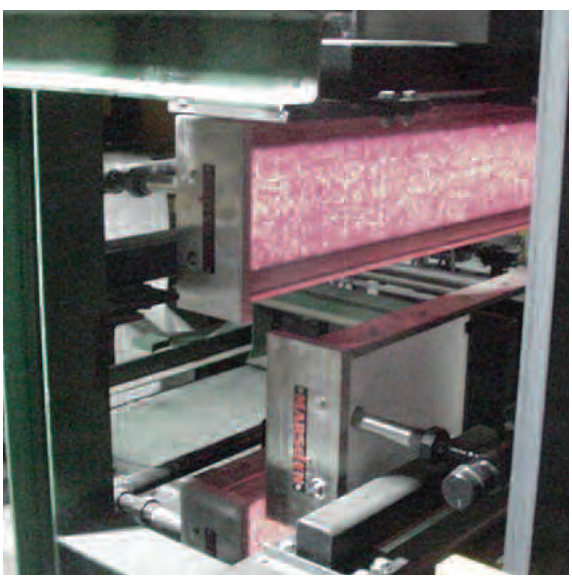
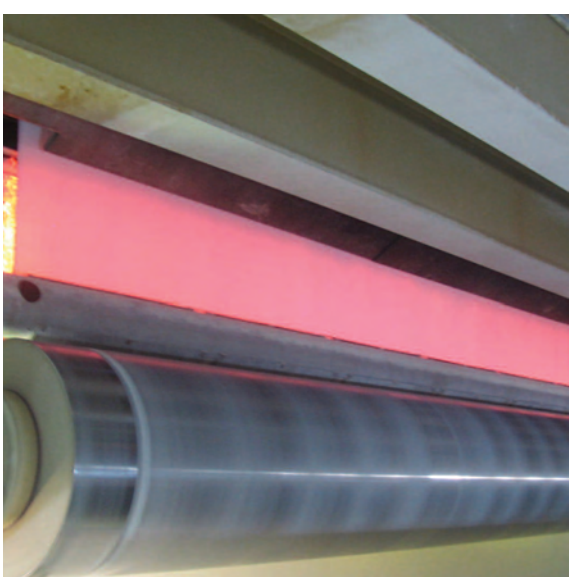
Marsden's Breakthrough
IR Technology

Only one technology can transfer as much as three times the IR energy as alternative gas IR systems. It's Marsden's proprietary Embedded Combustion® technology and it continues to change the way industry goes about meeting the challenges of non-contact drying and heating.

Embedded Combustion® is a process which optimizes the combustion of the fuel to promote the highest radiant outputs. Factors affecting radiant efficiency such as contact surface area and residence time are maximized by maintaining the combustion process within the emitter surface.

For our customers, it simply means providing uniform and reliable drying with the highest conversion to radiation efficiency, resulting in the cost-efficient production of superior products.





Marsden: The Best Choice
For Your Drying Requirements

Our proprietary Embedded Combustion® technology means that only Marsden offers all of the following:

- **Five Second Emitter Heat Up**
  Marsden emitters reach full power within five seconds of starting, eliminating wasted product on start-up.

- **One Second Emitter Cool Down**
  The low heat storage of the Marsden emitter material allows it to cool down instantly. This exclusive feature greatly minimizes the risk of fires and protects against damaged product upon line stoppages.

- **The Best Conversion to Radiation Efficiency in the Industry**
  Embedded Combustion® maximizes the IR energy generated from the consumption of the fuel (natural gas or propane) to achieve efficiencies between 51% to 66%.

- **Instantaneous Power Output Modulation**
  Power outputs can be modulated from 22% to 100% instantaneously.

- **Higher Evaporation Rate**
  Marsden's infrared dryers outperform other drying methods and offer a moisture evaporation rate of 30+ lbs/ft^2/hr (146 kg/m^2/hr).

- **Moisture Profiling Capabilities**
  The Modular Emitter can be zoned in the cross direction (CD) for moisture profile control in increments as narrow as 3" (75 mm).

- **Zero Polluting Emissions**
  The Marsden Gas IR modular emitter with Embedded Combustion® is the only emitter to produce No Detectable Levels of NO_x or CO.

Marsden, Inc.
Infrared Emitter
Emmission Compliance Data Summary

Emission Parameter	Average Test Value*
Oxygen	2.5%
Nitrogen Oxides (NO) (NO2)	ND ND
Carbon Monoxide	ND

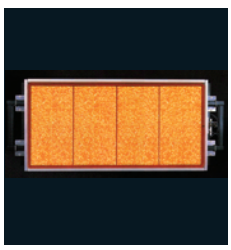
*ND: Not Detected (<1.0ppmV)

The Marsden Product Line

Every Marsden system is custom designed and comes complete with drying frames ready to mount to existing framework, skid mounted combustion support equipment and an operator panel geared to complement each customer's control scheme.

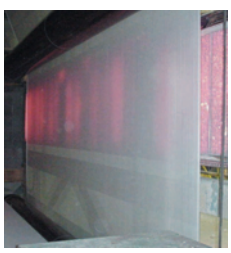
Airseal System

Continuous radiant emitters are supplied in one, two or three-row Drying Frames. Each row has a machine-direction (MD) radiant dimension of up to 12" (300 mm) with a maximum cross-machine (CD) dimension of 225" (5715 mm) per row. Individual rows can be internally zoned to accommodate varying substrate widths or differential product temperature requirements.



Modular IR

Individual modular emitters with radiant machine-direction dimensions from 12" (300mm) to 40" (1016 mm) MD x 12" CD (300 mm) allow for the maximum power output in the most compact space.



CD Moisture Profiler

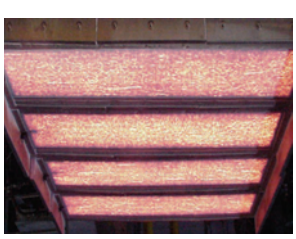
To correct cross-machine moisture profile and product temperature variations, the Modular IR System can be designed with independent CD zones to as narrow as 3" (75 mm). Profiling systems can be operated manually or interfaced with automatic control systems to accurately correct CD web moisture profiles.

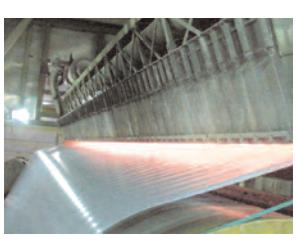
IR & Air Combination Systems

Marsden offers combination IR and Air drying systems for applications that benefit from the penetrating, intense energy of the IR with the gentle mass drying provided by convection drying. These systems provide increased overall drying capacity and efficiencies, lowest environmental emissions and sheet stability.

System features:

- Air delivery systems promote moisture evaporation/evacuation from the work area
- Independent row modulation (22% - 100%) allows substrate temperature setpoints to be maintained to within +/-° 5 F
- Manual or automatic temperature control
- Drying Frames designed for sheet widths as narrow as 12” (300 mm) to as wide as 350”+ (9000 mm)
- Reliable ignition systems



The Organization
Behind the Product

For the past thirty years, the safety, performance, reliability and value of its patented Embedded Combustion® emitters has made Marsden the worldwide leader in the manufacture and delivery of gas infrared drying systems. But our success can be attributed to much more than the quality of our products. It is also due to the quality of our people:

- Our technical sales group will strategize with your staff to develop a drying solution for your specific requirements. Trial systems are available so customers can confirm attainable results prior to system purchase.

- Well-trained and experienced engineers & field service technicians make sure that your system is designed, manufactured and commissioned to your exact specifications, provide operator and maintenance training as well as perform post-commissioning support services. An ISO 9001: 2000 Quality System ensures consistent product and services. In addition, all of our systems can be affixed with the CE mark.

- Customer service representatives, available 24 hours a day, 7 days a week, ensure that there is always someone available to assist in maintaining the performance of each and every Marsden Gas IR installation.

And, of course all of our products are backed by a full family of Performance and Reliability Guarantees including:

- Five (5) Year Emitter Guarantee
- System Performance Guarantee
- Two (2) Year System "bumper-to-bumper" Guarantee
- Lifetime Ignition Reliability Guarantee
- One (1) Year Free Service Guarantee

Global Presence Across a World of Industry

Marsden employs an international network of select manufacturer representatives, agents and partners who bring its "History of Performance" and "Commitment to Innovation" to installations throughout North America, South America, Australia, Europe, Asia, and Africa.

Our applications include:

- Pulp & Paper (coating/size drying, mass drying and moisture profiling)
- Converting
- Paint Finishing
- Textiles and Nonwovens
- Building Products (flooring, ceiling tiles, roofing)
- Glass
- Aluminum and Steel

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