

# OVEN SYSTEMS



DESIGNED FOR BAKING PERFECTION



READING BAKERY SYSTEMS

THOMAS L. GREEN | READING PRETZEL | EXACT MIXING | READING THERMAL





# Experience. Knowledge. Innovation.

ALL THE INGREDIENTS FOR SUPERIOR OVENS AND BETTER BAKING



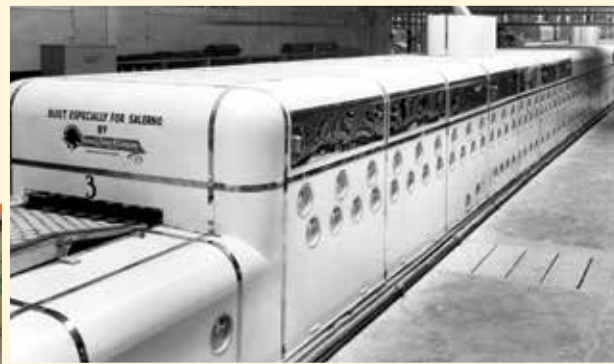
## Leading the way for over a century

A long-time leader in the snack food industry, Reading Bakery Systems proudly offers the world's most advanced oven systems from Thomas L. Green and Reading Pretzel. Thomas L. Green ovens have been trusted by the biscuit and cracker industry for over 120 years, while Reading Pretzel also has a long history of oven manufacturing expertise dating back to 1947.

## A dedicated team, a dedicated facility

Today, our team of oven design engineers use their expertise with new design tools to develop flexible, high-quality oven systems for the reliable and efficient production of crackers, toaster pastries, baked potato chips, snack crackers, cookies, pretzels, bread snacks, baked crisps, English muffins and more.

At our dedicated, US-based oven manufacturing facility, a team of oven mechanics constructs these proven designs in factory pre-built modules for superior quality control and faster plant installation.



## Complete, flexible systems

Reading Bakery Systems is a complete system supplier and combines leading technologies from ingredient handling through mixing, forming, baking and drying. Our oven and drying technologies utilize the correct balance of convective, radiant and conductive heat transfer to produce the correct product. Our PRISM OVEN systems offer flexible and consistent baking of biscuit, cookie and cracker products, while our SPECTRUM OVEN® systems offer the same flexibility for baking pretzels, bread snacks, crisps and potato snacks.

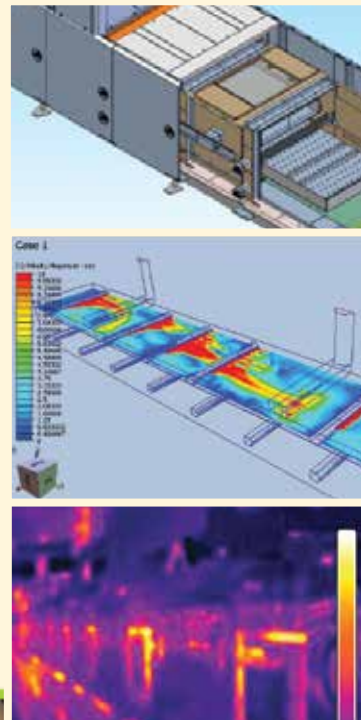


At our 30,000 foot<sup>2</sup> (2,800 meter<sup>2</sup>) oven manufacturing facility, we produce state-of-the-art ovens and dryers for customers around the world.





# Engineering the world's most advanced oven systems



## Knowledge meets technology

At Reading Bakery Systems, our oven design team engineers the most advanced, customized oven systems available using 3D modeling software, oven airflow analyses, thermal imaging and other advanced tools. These are just a few of the many ways we help perfect your process and your product.

## Energy-efficient designs

To ensure energy efficient design, Reading Bakery Systems offers heat exchangers, downtime detection software, insulated belt returns, fuel flow meters and more. We make sure your oven and dryer equipment is as energy efficient as possible to reduce your energy and operation costs.

## Advanced testing facility

Our Science & Innovation Center – a cutting-edge research and test facility – is available for testing different products and heat transfer options using our pilot oven system. Scale-up from pilot-scale work is greatly simplified by mutual understanding of process requirements before design and manufacture. In addition, RBS oven engineers also use this facility to test and validate new technologies and improvements to our baking technology.

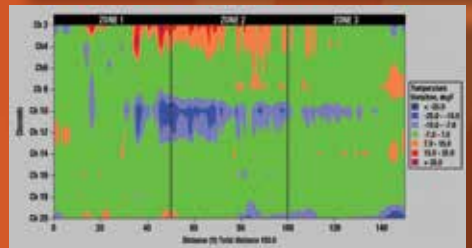
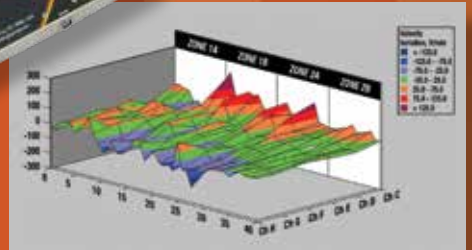


## Monitoring to maximize oven performance

Using our unique SCORPION® 2 Data Logging Measurement System, we provide customers with valuable benchmarking data during and after installation and commissioning. The baking or drying process can be evaluated during production to optimize the conditions



needed for the best product. The system can measure temperature, airflow, humidity or heat flux – just as the product experiences it. This powerful diagnostic and evaluation tool ensures that baking design meets product requirements.





# PRISM OVEN

Flexible and consistent baking of  
biscuit, cookie and cracker products

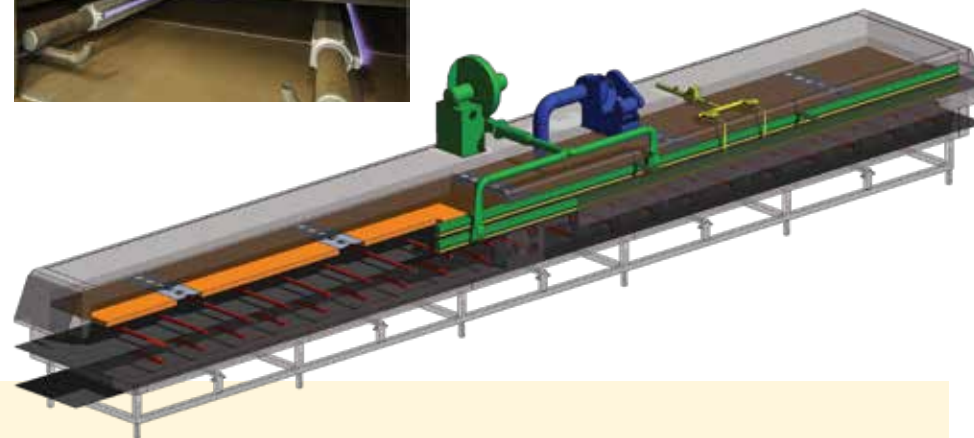
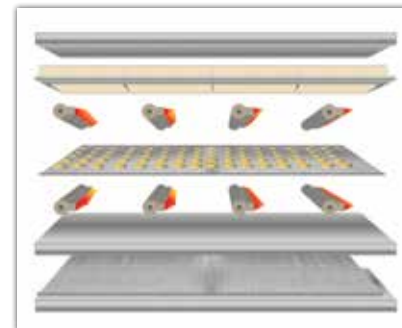


The Thomas L. Green PRISM OVEN is a single-pass baking platform designed with flexibility for balanced and consistent baking. Capitalizing on the experience gained from hundreds of successful oven installations worldwide, the PRISM OVEN offers both direct gas fired, convection and combination radiant/convection baking zones. Each oven zone is available with a number of options to permit the precise combination of radiation, convection heating and conduction – in a cost-effective system.



## Direct Gas Fired (DGF) Zone

Used as a product development zone, low-pressure direct gas fired burners are positioned in the baking chamber above and below the product in this section. Operators can independently control the top and bottom temperature of the zone and set up a unique burner profile. As an option, firebricks can be installed against the roof of the baking chamber for maximum heat retention and balanced delivery to the product. The balanced exhaust system allows moisture removal without disturbing the airflow around the product.



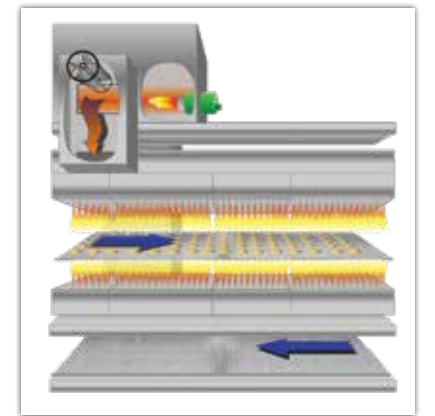
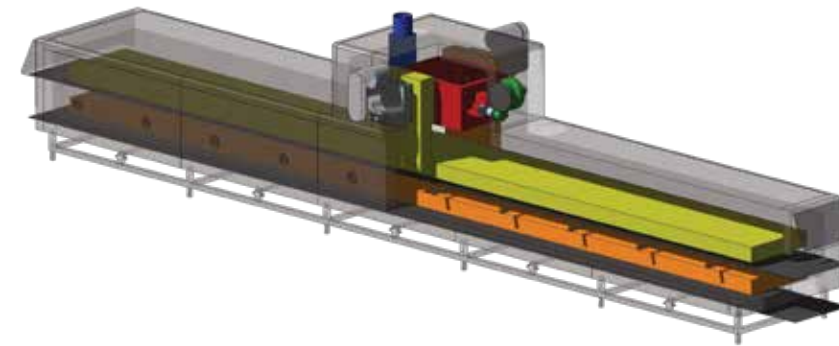
### Thermatec High Radiant Steel Ceiling

This exclusive technology ensures a consistent, uniform bake by storing and reradiating heat to the product. It is constructed from a series of anticorrosive steel channels backed with high temperature mineral board insulation to form a high radiant ceiling.



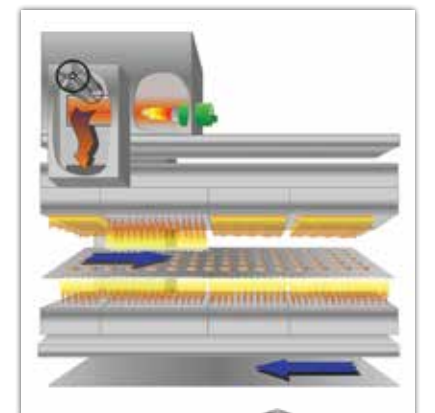
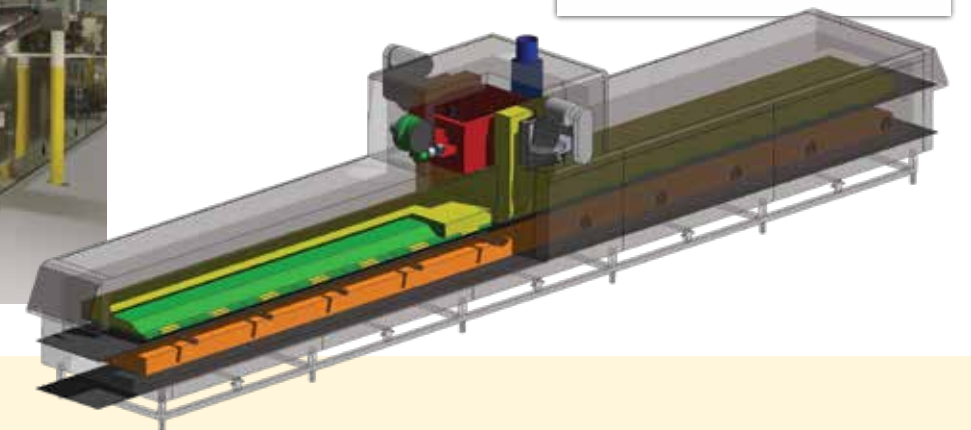
## Single Pass Convection Zone

The Single Pass Convection Zone is used as a setting, coloring or drying zone. In this section, combustion and make-up air is heated in the penthouse and circulated into the baking chamber. The air is distributed to the product above and below the conveyor. Control of the exhaust, air temperature and circulation velocity allow the operator to control the product moisture removal rate for maximum quality assurance.



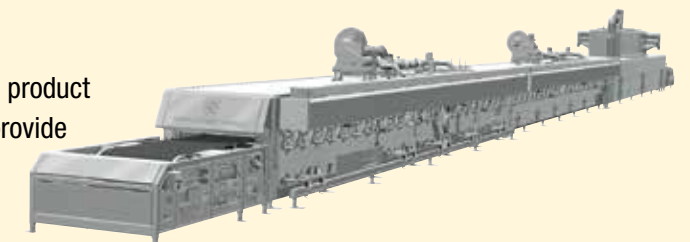
## Emithermic Zone (Radiant/Convection)

The Emithermic Zone offers radiant and convective heat transfer, and a humidity-controlled product zone, providing commercial bakers with greater flexibility and control when baking wirecut and rotary moulded cookies. Our automatic controls give the operator the ability to easily control, monitor and change the type of heat, temperature and air velocity. The recipes and oven settings can be programmed to maintain consistent quality, as well as eliminate the need for continual monitoring while the product is baking. This oven can be configured as pure radiation or radiation and convection depending on your product characteristics. The Emithermic Zone also uses Thermatec high radiant panels for more efficient radiant heat transfer.



### Hybrid ovens

Hybrid ovens utilize both DGF and Emithermic zones to provide product development and cooking functions, and convection zones to provide efficiently controlled moisture removal and balanced coloring.





# SPECTRUM OVEN®

Flexible and consistent baking of pretzels, crisps, bread snacks and potato snacks

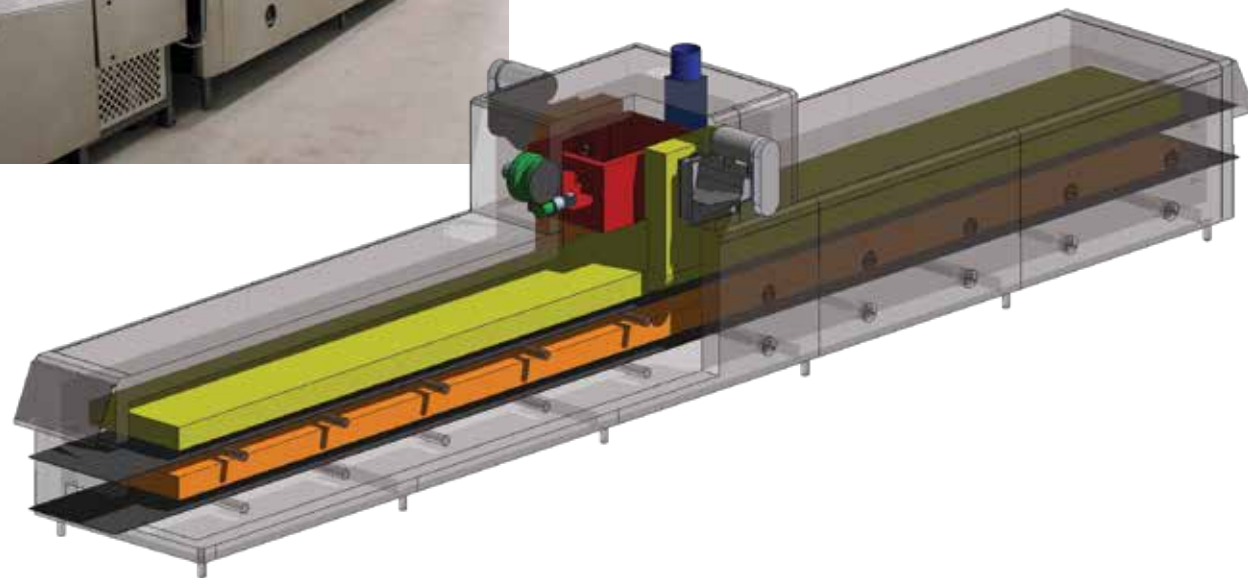
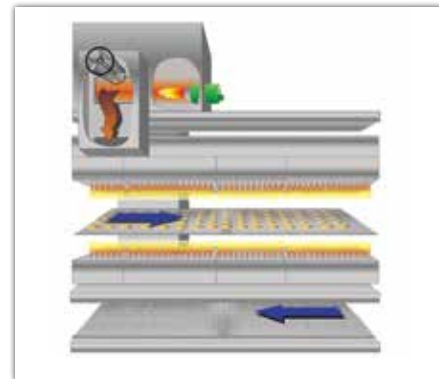


The Reading Pretzel SPECTRUM OVEN® is used to effectively bake a variety of snack products. Constructed and controlled as separate heating zones, the oven allows precise control of product quality. Operators can monitor and modify the way heat is distributed to the product. Baking chamber zones are offered with radiation, convection and conduction heat transfer options that enable specific – and repeatable – product characteristics.



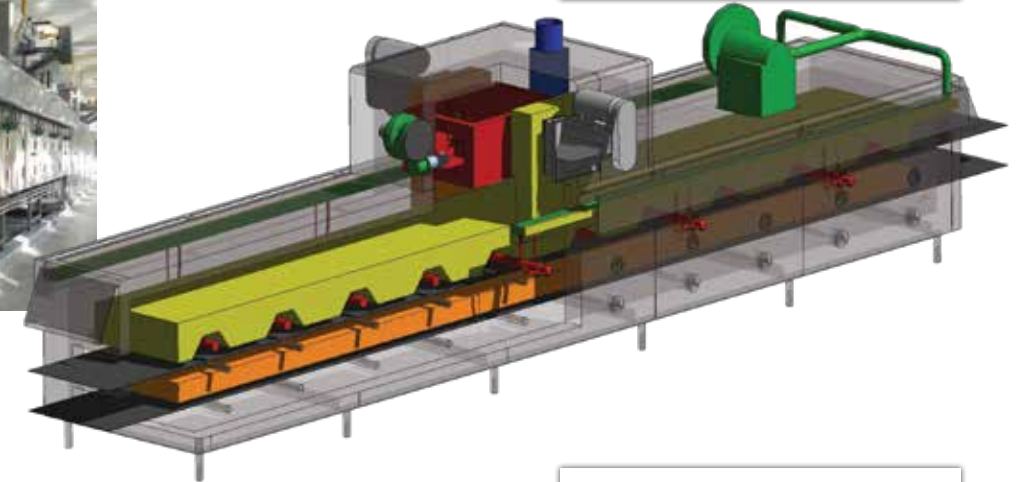
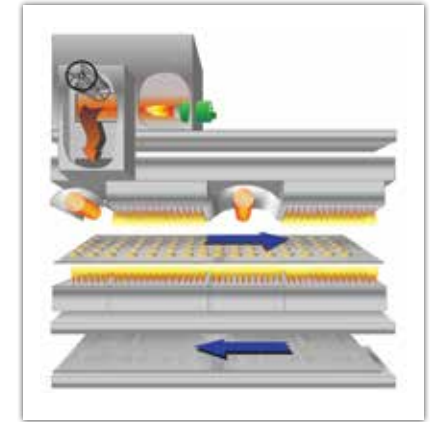
## Single Pass Convection Zone

In the Single Pass Convection Zone, combustion and make-up air is heated in the penthouse above the baking chamber and circulated into the baking chamber. The air is distributed to the product above and below the conveyor through plenums that provide consistent air flow across the product. Control of the exhaust, air temperature, and circulation velocity allow the operator to control the product moisture removal rate for maximum quality assurance.



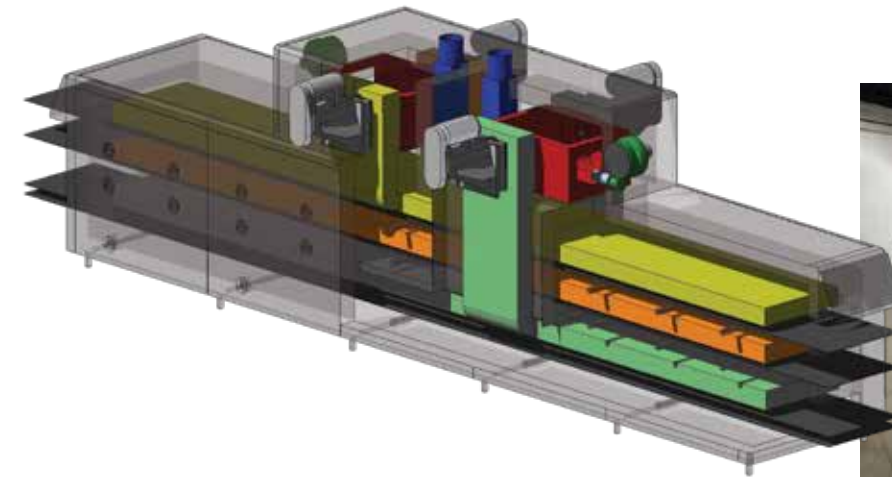
## SMART Zone (Radiant/Convection)

The SMART Zone blends heat transfer from both radiant and convection sources. A convection plenum above the product band contains radiant panels mounted in-between openings in the plenum. Another convection plenum runs underneath the conveyor. The control of this zone is flexible and it can be configured as pure radiation, pure convection or a combination of the two heat transfer methods. This is a significant advantage when multiple products are produced on the same line.



## Convection Oven over Kiln Zone

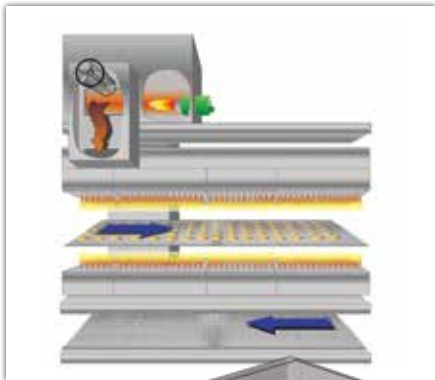
This space saving zone combines a standard convection zone and mounts it over a kiln or drying zone. Product passes through the baking chamber and is transferred to a second conveyor running in the opposite direction through the dryer positioned beneath the oven zone. Convection heat is applied to the product in the dryer through a forced air plenum running underneath the conveyor. Oven and dryer modules are independently controlled and monitored. Separation of the baking and drying process permits more efficient production of products requiring long dry times or those with greater mass.





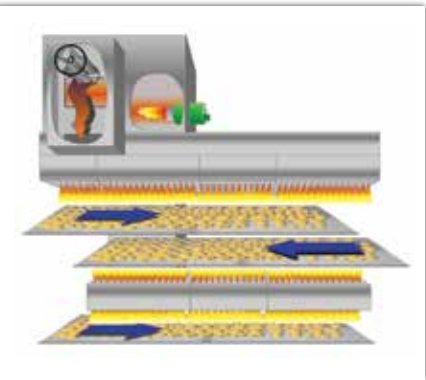
# SPECTRUM dryer options

Efficiently reduce product core moisture to improve quality and storage characteristics



## Single Pass Dryer

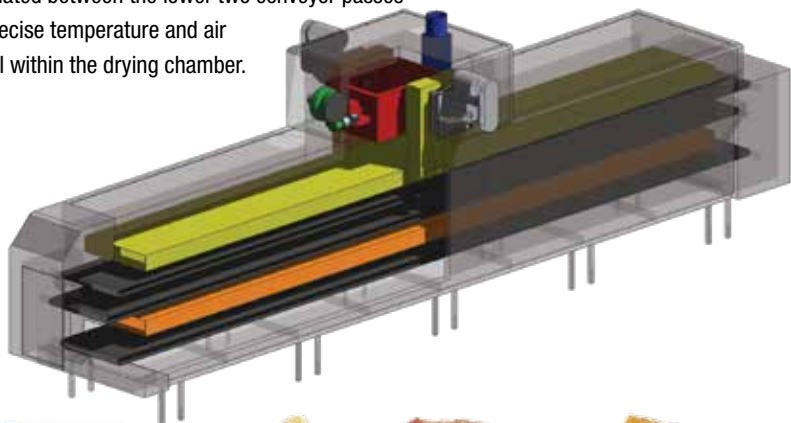
The SPECTRUM Single-Pass Dryer efficiently reduces product core moistures resulting in improved overall product quality. The drying chamber is heated by a single gas-fired burner which is mounted on a penthouse situated on the roof of the drying chamber. The penthouse also employs two variable speed circulation blowers; one to supply heated air to the upper air plenum and the other for the lower air plenum allowing for precise temperature and air velocity control within the drying chamber.



## Multi-Pass Dryer



The SPECTRUM Multi-Pass Dryer efficiently reduces product core moistures resulting in improved overall product quality in a relatively small amount of floor space. Inside the Dryer, products pass along three successive conveyors allowing tumbling of the product between passes for even greater drying efficiencies than that of a single-pass design arrangement. The drying chamber is heated by single or dual gas-fired burners which are mounted on a penthouse situated on the roof of the chamber. The penthouse employs two variable speed circulation blowers; one to supply heated air to the upper air plenum and the other for the two-way air plenum situated between the lower two conveyor passes allowing for precise temperature and air velocity control within the drying chamber.



# Ovens of the future

Sustainable energy, high efficiency, maximum flexibility and performance



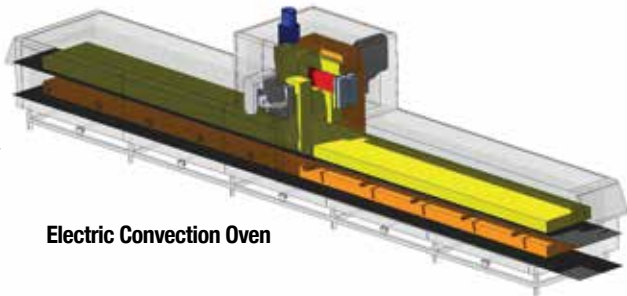
More than 25 years of experience with electric heat enables RBS to offer the most comprehensive electric and sustainable oven portfolio in the industry. Beyond the energy source of the ovens, our newest oven designs reduce costs, conserve energy, and minimize emissions. Better oven insulation minimizes heat loss, and lighter weight oven belting helps conserve energy. Optional heat reclaim systems can also be added to improve oven efficiency by re-heating the oven make-up air. At RBS, we focus on baking for a better tomorrow.

## Electric Convection & Emithermic Ovens

**Electric baking for snacks and cookies with precise top and bottom air velocity and temperature control.**

For the electric baking of snacks and cookies, RBS offers an electric penthouse design for both our Convection and Emithermic oven zones. The oven air flow and baking functionality is the same as gas ovens, but the penthouse has been redesigned for the electric heat source. The electric penthouse offers one electric element per plenum with dual blowers, allowing bakers to control top and bottom air speed and temperature independently.

For existing RBS Convection and Emithermic ovens, there is an opportunity to exchange the gas penthouse for an electric version. Customers can visit the RBS Science & Innovation Center to test their products and process on these electric style ovens.



Electric Convection Oven

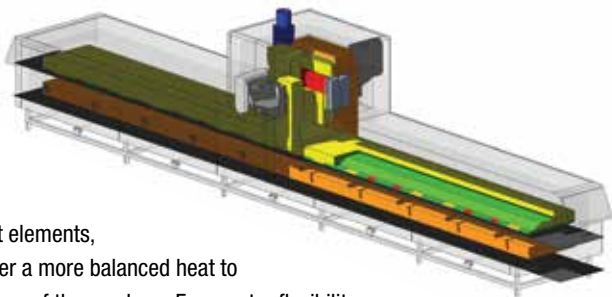
## Emithermic XE Oven

**Simplified and more efficient baking for biscuit and cracker products.**

DGF cracker ovens are costly, difficult to maintain and often deliver an uneven bake to the product. These problems come from the large number of ribbon burners down the entire length of the oven (up to 300 feet long) that must be maintained and adjusted to deliver consistent heat.

The new Emithermic XE Oven builds on our original Emithermic oven design that utilizes Thermatec high radiant panels and convection baking, with the addition of electric radiant elements, eliminating the need for the gas burners. The Thermatec panels and electric heaters deliver a more balanced heat to the product, and impart the high radiant emissivity required to develop the flavor and texture of the crackers. For greater flexibility and control, the Emithermic XE Oven includes a humidity-controlled product zone. Additionally, maintenance is simplified, as electric oven components are easily replaced, eliminating costly downtime replacing, cleaning and tuning gas burners.

The Emithermic XE Oven is available with all electric heat or with a gas penthouse.





# RBSCConnect Control Systems

For optimal quality control

Both the **PRISM** and **SPECTRUM OVEN**® are available with a full range of control options for optimum performance. Fast and repeatable startups are guaranteed through “recipe” settings within the control processor. Line status, modification, and diagnostic controls are provided as easy to use, touch screen interfaces.



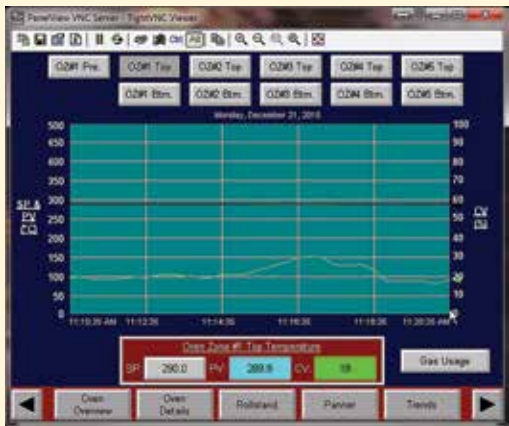
Convection Zone Control



DGF Zone Control



Convection Zone Purge Detail



Temperature Trends



Recipe Control

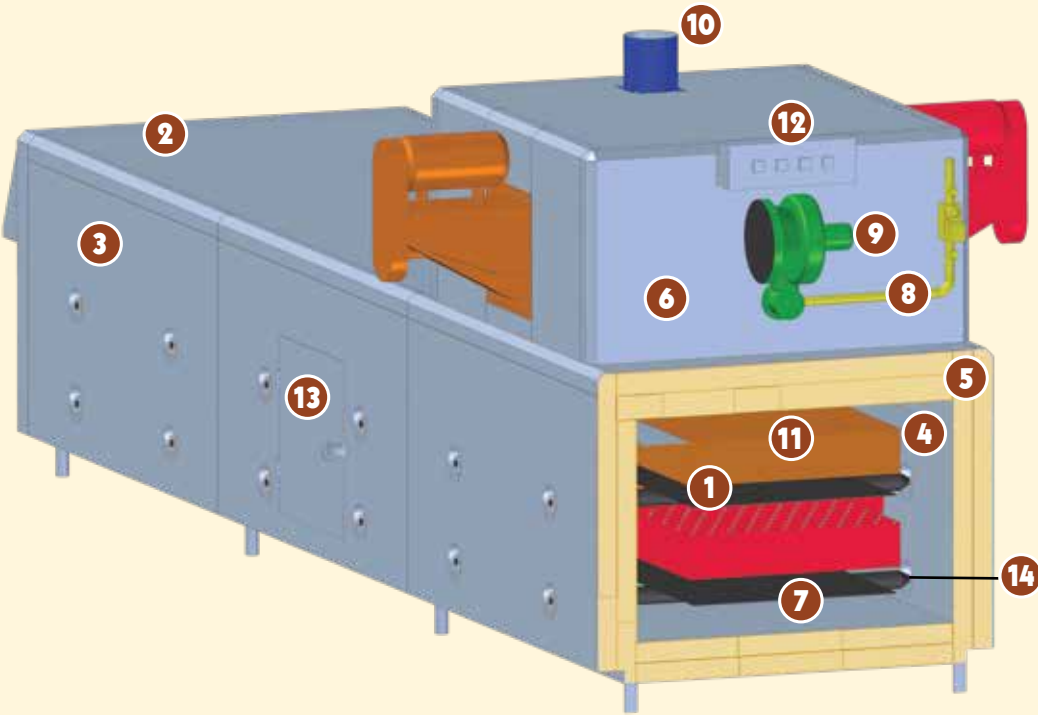
### ELECTRICAL SPECIFICATIONS

- Allen Bradley or Siemens control systems
- Optional PC operator controls
- PLC codes provided after start up
- Formula based control screens
- Wiring schematics and cable schedules
- Modem for remote troubleshooting
- Prewired machine junction boxes
- Pre-labeled cable and wire troughs optional

# Specifications and features

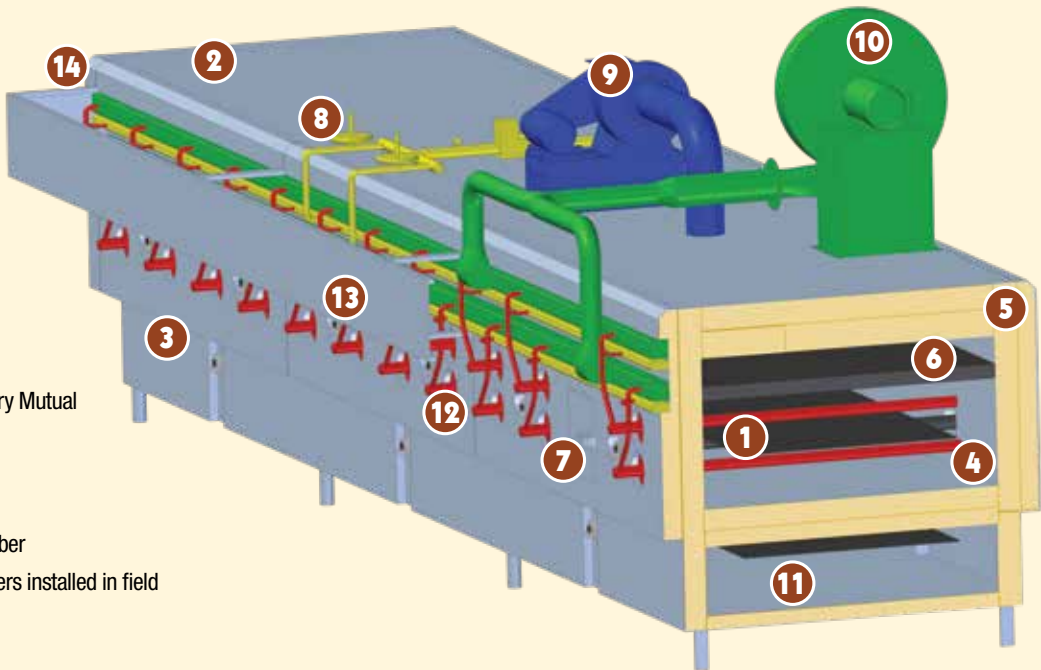
### SPECTRUM or PRISM Convection Oven

1. Standard Belt Widths: 1.2m (48"), 1.5m (60") and 2.0m (80")
2. Standard Zone Lengths: 9m (30'), 12m (40') and 15m (50')
3. Painted or stainless steel exterior
4. Aluminized or stainless steel interior
5. High density blanket mineral wool insulation
6. Penthouses pre-assembled including gas trains and electrical wiring
7. Belt return through insulated chamber
8. Low pressure gas system designed to meet Factory Mutual and IRI codes
9. Eclipse burner
10. Inverter driven or damper controlled exhaust
11. Punched nozzle convection air plenums
12. Electrical components factory pre-wired to junction box
13. Large cleanout oven access doors
14. One piece oven rolls



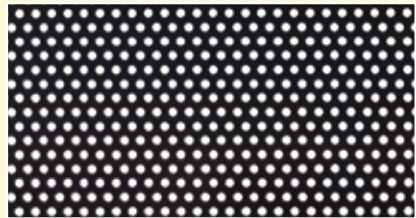
### PRISM DGF OVEN

1. Standard Belt Widths: 1.0m (40"), 1.2m (48") and 1.5m (60")
2. Standard Oven Zone Lengths: 12m (40') 15m (40'), and 18m (60')
3. Painted or stainless steel exterior
4. Aluminized or stainless steel interior
5. High density blanket mineral wool insulation
6. Thermatec High Radiant Steel Ceiling
7. Cleanout / inspection doors
8. Low pressure gas system designed to meet Factory Mutual and IRI codes
9. Inverter driven or damper controlled exhaust
10. Filtered combustion air system
11. Belt return through insulated or uninsulated chamber
12. DGF burners, gas train, electrical trough and blowers installed in field
13. Oven Bearings allow for Thermal Expansion
14. Zone Connectors allow for Oven Expansion





# Typical belt options



Perforated Steel Cookie Oven Band



Solid Steel Cookie Oven Band



Cracker Oven Belt: CB-5



Cracker Oven Belt: CB-3



Cracker Oven Belt: B72-62-14/16



Cracker Oven Belt: Z-47



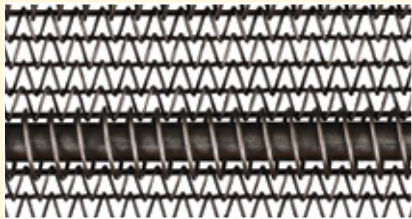
Pretzel Oven Belt: B48-38-15



Dryer Belt: CG00062



Chip Oven Belt: B48-36-18



Chip Curling Oven Belt: B60-48-16

# Oven options



Fire Brick Oven Ceiling – PRISM DGF Zones



Extruded, pipe or tri-zone burners



Passive band tracker



Oven exhaust heat exchangers



Active band tracker



Skid bars for solid steel bands



Fuel flow meter



Increased insulation



Infrared moisture meter



Band temperature monitor



Insulated band return



Band preheat- PRISM DGF Zone



High intensity burner pattern



Clean out doors



Steam injection system



Band brush



Inverter or damper exhaust control



Exhaust hood for infeed and discharge



Stainless steel drive stand



Painted or stainless steel exterior



Preheat vestibule – SPECTRUM OVEN®



Oven run out



Take-off conveyor



High temperature expansion bearings





## READING BAKERY SYSTEMS

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380 OLD WEST PENN AVENUE | ROBESONIA, PENNSYLVANIA 19551 USA | (01) 610.693.5816  
FAX (01) 610.693.5512 | [INFO@READINGBAKERY.COM](mailto:INFO@READINGBAKERY.COM) | [READINGBAKERY.COM](http://READINGBAKERY.COM)