Diverse Combustion Technologies, One Reliable Source

sellas®

The Heat Technology Company™

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Selas Heat Technology: A World Of Combustion Solutions

Recognized as one of the true pioneers in the industry, Selas has a combustion heritage that is approaching 120 years. Passionate about combustion, Selas began with gas lamps then expanded its innovations into a full offering of combustion components and eventually transitioned itself into a leader of heat processing furnaces. With this growth, Selas built up its team of talent to invent and engineer many proprietary burners and other technologies, including our press and fired ceramics burners. Throughout its history and with its acquired brands, Selas has gathered one of the richest collections of patents in the industry.

In 2005, Lionheart Industrial Group acquired Selas, taking it back to its core strength of combustion components. No longer a furnace manufacturer, Selas today is a company focused on being the innovative leader, expert and single source provider of burners, systems and controls to all combustion markets. Selas has made many strategic acquisitions to pursue this goal. We will continue to grow both through new product designs as well as acquisitions.

Industries Served

Selas products are used worldwide in numerous applications such as heating and preheating, heat treating, annealing and tempering, melting, surface coating and modification, brazing, drying, finishing, baking and searing, and many more. Some of the industries in which you'll find Selas products at work include:

- Primary metals
- Metal fabrication
- Paper making
- Petrochemical
- Food production
- Automotive
- Glass manufacturing
- Ceramics
- Plastics
- Textiles

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Pyronics, Inc. was founded in the 1940s as a manufacturer of industrial combustion equipment and controls for national and international customers. The standard product line consists of burners, valves, regulators, combustion air blowers, flame safeguards and other combustion systems components. Pyronics offers a diverse selection of both premix and nozzle mix burners including high velocity, atmospheric, radiant heating and packaged burners. Pyronics is most recognized for its highly accurate and dependable zero governor, the BZR, making it the standard regulator in the combustion industry.

Acquired in April 2009, Pyronics was the first company to be purchased by Selas. Both companies have a history of combining their equipment together to offer the industry a high-end and efficient combustion system. The combination of both companies' combustion technologies has truly assisted Selas with its goal of being a one source solution for many of the market's needs.

Red-Ray Manufacturing Company was established in 1939 by Gill McLaughlin, the inventor of the original dual ceramic infrared burner. A pioneer in the gas-fired infrared field, Mr. McLaughlin led the company until 1971. During his time, Red-Ray was granted multiple patents for different types of gas impingement burners, securing its title as the leader of infrared burners in the market. For many companies today, Red-Ray and infrared burners are synonymous.

Red-Ray joined the Selas family in December 2012, bringing its leadership in infrared technology as well as its expertise in food processing, powder coating, textile applications, and many other industrial applications. Red-Ray's broad range of gas-fired premix infrared burners employs an air-gas mixture that combusts on the surface of an emitter, producing high temperatures and maximum radiation in the medium wavelength spectrum between 1-5 microns. Red-Ray offers a variety of surface combustion and gas impingement burners, as well as a patented compact premix burner control unit well suited to the operation of any type of premix burner(s).

Ensign Ribbon Burners, also knowns as ERB, was founded in 1907 and was the inventor of the ribbon burner. ERB introduced the ribbon burner into the market in 1938 and patents were issued in 1940. Today ERB holds a dozen patents for burner technology including 3-zone burners and internally water-cooled burners. ERB offers ribbon burners with different ribbon styles as well as customized burners that can be made into any shape or length.

The ERB acquisition by Selas in January 2013 provided Selas with a more competitive surface treating ribbon burner and access to more food processing applications, as well as laminating, singeing and other markets. ERB, with the investment of Selas, continues to innovate, ensuring that it remains the leader in ribbon burner technology.

Since 1872, Ray Burner has provided a wide range of dual-fuel package burners for the industrial combustion market and commercial boiler market.

Ray Burners are available in sizes from 500 BTU/hr (8.3hp) to 15 million BTU/hr (400hp). They can burn all grades of oil including #6, #2, diesel oil and most gases such as natural gas, LPG, propane, butane, digester and other gases. All Ray Burners are UL listed, CSD-1GE Gap.

Selas acquired Ray Burner in September 2011 to obtain a low cost dual-fuel package burner solution to add to its product offerings. Ray also provided Selas with the opportunity to provide the boiler market with products and support.

Webster is a leading manufacturer of custom multi-fuel boiler burners for the commercial, institutional and industrial markets. Webster burners combine advanced control technology with proven combustion performance to provide heat for the transformation of water to potable hot water, hot water for heating, and steam for heating and process applications.

For decades, Webster's proven designs have helped customers to reduce emission levels and provide higher efficiencies for new systems as well as replacement installations. Webster's recent innovation, the patented Temp-A-Trim® system creates a constant air flow mass for combustion to maintain optimum fuel/air ratios to enable maximum burner efficiency.

Webster was acquired by Selas in November 2013 to strengthen its product offerings to the boiler market.

Established in 2004 in the United Kingdom, Maxsys Fuel Systems is a cleantech company that provides the world with its state-of-the-art fuel treatment system invented after a 10-year scientific study on the effects of magnetic fields in fuel. The technology works by intrusively applying a finely calibrated magnetic field to the oil or gas prior to combustion. This produces a cleaner, more efficient burn which cuts energy consumption as well as carbon dioxide emissions.

Maxsys' technology has been proven many times over in the lab as well as at customer sites who are Fortune 500 companies. Maxsys guarantees a minimum of 5% savings and the return on investment can be seen between 3 to 24 months.

Selas acquired Maxsys in October 2011 for this unique technology. As of the present date Maxsys does not have a competitor that has a working technology.

The Maxsys system promotes efficiency in all types of heaters, furnaces, boilers, kilns, ovens, and drying plants, making it a perfect addition to the Selas product offering. With the Webster Temp-A-Trim, Selas truly has two unique energy saving solutions to offer the industry at a time when fuel costs are rising and businesses are expected to cut their carbon emissions.

Global Footprint and Manufacturing

Manufacturing Locations

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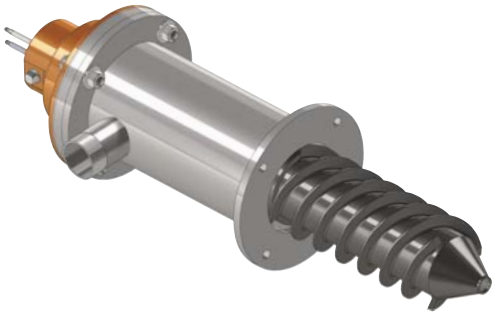
Selas Service and Support

The culture at Selas is focused on providing the most technologically advanced burners, combustion controls, safety devices and energy efficient thermal accessories, along with the expert staff to make it perform at its peak. Our knowledge base comes from over 100 years as a furnace manufacturer for industrial applications as diverse as heat treating and baking to glass manufacturing and powder coating, in installations all over the world. We keep them running in top shape with new replacement parts, aftermarket support and expert counsel. But our thermal processing expertise doesn't stop there. We provide the same quality products and services to non-Selas furnace users and OEMs alike.



Engineering Capabilities

Our experienced combustion engineers are available to custom design Selas product to your specific application requirements. Capabilities such as SolidWorks 3D modeling enable us to speed up product development, reduce costs, and improve product quality and reliability.

Application Support

Selas offers expert pre-sale application services to ensure you get exactly what you need. Our engineering team is available to visit your plant and assist with installation and start-up supervision of complex combustion systems and controls.

Aftermarket Services

Selas offers service contracts to meet your needs on whatever interval your preventive maintenance routine requires, whether it's monthly, quarterly, annually or on an emergency basis only. We can make recommendations for updates to your equipment and control panels with newer systems to improve efficiency and reduce process variability.

Replacement Parts

Selas provides a wide range of combustion components to help you meet NFPA compliance, and a huge variety of energy efficient burners to retrofit existing ovens, furnaces, and other process applications. A good way to find what you need is to visit our online Burner Finder, or contact a Selas customer support team member, below.

Contact Selas Customer Support

For help any time, reach out to a Selas team member at sales@selas.com or 800-883-9218.

Radiant Cup Burners

Selas Open Firing Duradiant burners provide close coupling of radiant heat sources. They are cup-shaped, ceramic precision combustion tools which radiate heat to work pieces intimately, without flame impingement. The unusual freedom in placement and broad throttling ranges permit them to transfer heat in a variety of controlled patterns to suit many production requirements. Radiant heat distribution can be concentrated to simplify "spot" heating of product parts, patterned to meet uneven heat requirements, or arranged uniformly over wide areas.

Duradiant burners mount in any position to deliver fast, controlled heating for metals, ceramics, chemicals, petroleum, glass and more. These burners can be combined to provide close coupling of radiant heat sources for use in "line" arrangements and in custom configurations where relatively light heating jobs are to be performed. Designed essentially for heating moving webs, line burners also find frequent applications in ovens, as well as in heating stationary objects. The 500 Series is available in a variety of cup configurations to permit several self-piloting geometric arrangements. The small 200 Series (shown above) and large 700 Series, however, are currently available for straight line use only.

Selas Duradiant Semi-Furnace Burners are ideal for mounting in furnace refractory walls or panels. They come in two temperature ranges: The K Series is a lower temperature burner cup-block for work areas that generally do not exceed 1600º to 1800º F (870º - 980º C) and where 4.5" thick wall construction is acceptable; KZ Series burners are a better solution for applications where furnace walls have varying thickness and work temperatures generally do not exceed 2000º F (1093º C).

In both series the critical metallic parts are fabricated of heat resistant alloy materials. Our burner cups work with the Selas ceramic tip series for the desired air gas mixture capacity for the application. Both series can be made in round, square or hexagonal shapes to allow the best design where close burner spacing is a requirement. The integral cup-block construction design permits nesting the burners against each other to form radiant banks.

KVA Burners offer turndown of 20:1. Selas' versatile VA-Burner employs the variable-area principle. That is, the position of the burner tip changes as the pressure exerted by the fuel mixture upon the burner diaphram changes. When mixture pressure exceeds that of a retaining spring, the diaphragm immediately responds by moving the tip to a new position which provides an enlarged port area. This special design feature makes a 20:1 operating range possible and can even be extended beyond 20:1. Contact Selas Customer Support for application assistance.

Selas Refrak Burners are available in two models for superior combustion control for furnace temperatures up to 2100º F and over 2100º F. The Selas Refrak Screen Burner is a sealed-in tunnel burner with superior flame retention and combustion characteristics. The RSA's large perforated refractory screen distributes the air/gas fuel mixture uniformly within the tunnel and assures complete combustion over an extremely wide throttling range. The Refrak Screen Burner has many advantages such as a wide operating range, low operating pressure, complete combustion, easy installation, easy replacement, low turbulence and short flame.

Selas offers two kinds of Refrak Screen burners. Burners for furnace temperatures up to 2100ºF are available in eight standard sizes for capacities up to 4,000,000 btu/hr and for wall thicknesses from 6 3/4" to 12 1/2". Burners for furnace temperatures above 2100ºF are available in 11 sizes fabricated to specific wall thickness.

Impingement Burners

Selas PRS Spear Flame Gas Burners are designed to produce a piloted spear-like heating flame allowing wide turn-down and offering flexibility, advantageous performance and long life.

The PRS burner is normally used for open firing either individually or in groups where a focused or spot heat is required. Like the Multiport P-R burner, it permits quick installation and can be mounted in any position. Selas offers this flame in a range of sizes allowing wide choice of spear flame intensities and variable flame lengths. The PRS spear flame gas burner is also available with a built-in spark plug to provide push-button electric ignition.

Selas Superheat Burners increase the effectiveness of selective open heating by releasing high heat only to very specific areas of a workpiece.

Selas Superheat burners provide superior flame hardening, flame annealing, fire polishing, brazing and pre-heating.

Gas/air premix is burned under pressure to produce flame temperatures up to 2800° F and blast velocities up to 600 ft/sec. Since conventional gas burners can't handle these extreme operating conditions, Selas Superheat burners are the only viable option for many processes.

Selas Multiport P-R Gas/Air Burners combine positive flame geometry with maximum heat release and low turndown. Multiport burner screens break up flame into many small flames. This results in a concentrated "flat face" round flame of high intensity. The screen port diameter/length ratio inhibits flashback, even at extremely low input rates. The screen retaining-ring pilots flames to prevent flame blow off under normal operating conditions. The Multiport P-R burner is a one piece construction with interchangeable components making replacement of damaged parts simple. It is easily installed and can be mounted in any position to standard pipe fittings or manifolds.

Selas/Pyronics Blast Tips are compact premix nozzles for handling high pressure in smaller volumes in applications where a jet of flame is appropriate or not harmful to the process.

Model BTSA Blast Tips will operate with air/fuel ratios ranging from 70% to 100% aeration.

Selas Anti-Involution Burners employ a high velocity combustion method that provides uniform glass melting.

The Selas Anti-Involution burner is ideal for use in fiberglass production. The durable steel nozzle of the Selas anti-involution burner can withstand temperatures of up to 1320° C.

This proven anti-involution burner can also be used with the Selas Pre-Mix Combustion System.

Pyronics Tunnel Burners will burn any standard fuel gas at mixture pressures ranging from 0.1 to 60 WC.

Exclusive, patented design of refractory plug and combustion tunnel ensures smooth, stable operation. The long annular orifice reduces back firing even at very low mixture pressures. Turbulence created by the nose plug and the stepped burner block provides positive flame retention at high mixture pressures with shorter flame length and higher heat release (on standard block only).

ERB Utility Burners put energy where it is needed most. Designed for limited space applications requiring concentrated heat patterns, ERB Utility Burners provide great flexibility with respect to capacities, flame patterns (broad flat, needle point, cone, etc.) and sizes. They are utilized in industries such as plastics (bottles, cups, plates, automotive) and glass, wire, labs and metals. The patented stainless steel ribbon port construction produces a balanced flame over a wide turndown range.

Infared Burners

Red-Ray Apollo Ray Models (AR Series) are metal fiber surface infrared burners with high radiance and all metal construction. The Apollo-Ray is available in two sizes, 8" x 6" and 12" x 5". Heat capacities are 22,000 btu/hr and 30,000 btu/hr. The radiant output of the burner is approximately 65% IR and 35% convective heat. The emitter temperature reaches 1700º F (927º C) at high fire. The burner is designed to operate most efficiently between 19.1%-19.3% oxygen in the air/gas mixture.

Red-Ray Metallic Refractory Burner Models MR-86, MR-12 and MR-12Ni, available in two sizes, 8"x6" and 12"x5", are gas-fired surface combustion burners. They are commonly used in industrial applications such as powder paint, textile pre-dryers, curing coatings on paper, powder cross linking, drying and a variety of food applications. Red-Ray's MR-12 Infrared burner features a fine porosity metal alloy refractory grid. This durable metal refractory offers excellent resistance to impact, thermal shock, and water damage. Its emitter design acts like a built-in flame arrester, ensuring combustion takes place on the surface only. It is especially beneficial for use with propane blending stations when air/gas ratios often become rich.

Red-Ray Model F Gas Burners are gas impingement, ceramic refractory infrared burners. It's commonly used in food applications, such as tortilla chip and other snack food ovens.

The F series is also used in a vast range of industrial applications such as battery manufacturing, pre-dryers, paint flow coaters, resin curing, and roofing materials. It's available in 12" and 7" sizes to allow specified burner assembly lengths for optimum coverage and fuel efficiency.

Red-Ray Model K Burner is a gas fired impingement, ceramic refractory burner, used in all kinds of industrial applications, such as glass annealing, drying, preheating, and metal coil coating. The Model K is available in a 7" size with either cast iron or stainless steel components and employs an air-gas mixture impinging directly on the finned refractory surface to produce a high density flux for maximum radiance and convective energy transfer. The flame itself is not the source of infrared radiation. Its function is to heat the refractory to temperatures of 1250º F to 2000º F. The refractory then emits infrared energy in the most efficient micron range.

Red-Ray E-Class Infrared burner sections are 6" long gas impingement burners which generate intense, concentrated radiation and convective energy and can be mounted on square type manifolds to any customer specified lengths. They are often used in industrial applications (curing coatings on steel) and food applications such as snack food and bagels. Models 67IR and 64IR are impingement-type, infrared generators incorporating shaped refractory blocks. Rows of small ports direct flame against the curved surfaces, heating them to temperatures ranging from 1300° F to 2200° F. These burners produce intense, concentrated radiation which is then absorbed by the substrates being processed.

Red-Ray Angled Media (AM series) burner models are gas-fired premix surface combustion burners with an emitter shaped like a trapezoid. It's available in 12" and 7" sizes to allow customer specified burner assembly lengths for optimum product coverage and fuel efficiency. This provides a broader radiant pattern for uniform energy transfer into the product. It is commonly used in baking applications. AM series burners are installed above and below conveyor belts as replacements for ribbon burners, saving fuel and increasing product quality and appearance.

Pyronics RL-130 Burner is one of five infrared burners Selas provides for drying/evaporation applications. The Pyronics Infrared Burner is designed primarily for low temperature industrial process heating where heat transfer in the infrared range is highly effective.

The Pyronics RL-130 Radiant Line Burner is designed for ease of installation. The radiation surface is entirely ceramic. No metal is exposed in the high temperature zone.

Pyronics IRC-1 High Intensity Burner is an infrared ceramic burner designed to deliver high intensity radiation. The radiation surface is entirely ceramic with no metal parts exposed in the radiation zone.

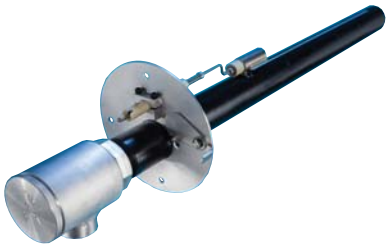
IRC-1 burners utilize most clean gaseous fuels with conventional mixing systems in the 8-16 ounce air pressure range, and can be applied to many types of heat processes. The simple, flexible design lends itself to a wide range of mounting and manifolding patterns.

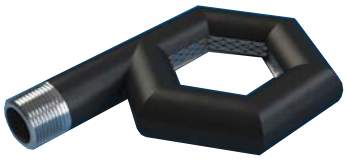
Line And Ribbon Burners

ERB Tri-Zone Burners are used primarily in bakeries, or anywhere an oven's heat profile needs to be modified. ERB's enhanced TriZone burners come in a standard 3-tube version, a 2-tube version and our NEW 2x2 TriZone, a 2-tube version with a 2" burner. All come in standard flame space lengths of 10'-4", 12'-4" and 13'-4" for 960 or 970 ovens. However, where other burners only produce 67,000 BTUs, the ERB 3-tube burner produces 87,000 BTUs, the 2-tube version produces 100,000 BTUs, and our 2x2 version produces 150,000 BTUs. This delivers additional heat in the first zone where it is really needed.

Our TriZones burners offer high turndown without liftoff, and down to 2" WC without flame dancing.

ERB Hi-Tri™ Trizone Burner is the newest in the TriZone Burner series from Selas. The Hi-Tri burner features a 2" 2-tube arrangement to improve heat recovery time and reduce waste in baking and other applications. Hi-Tri employs proven technology developed from years of research in bakery burners. With a capacity of over 150,000 BTUs, the Hi-Tri outperforms all previous zone burners in turndown ratio, BTU capacity, zone control, and more. Since its introduction, this burner system has become the preference for wholesale bakers.





ERB Pipe Burners can be utilized anywhere direct flame impingement is required, such as in bakery, wire, glass and plastics applications. Our extra heavy, standard black pipe burners (Schedule 80 steel pipe) are cost effective and available in a wide range of ribbon designs. Any flame space can be furnished, from 1 inch to 21 feet long in a single length or longer when flanged together. Also available in any size or shape and in corrosion-resistant Stainless Steel.

Schedule 160 Pipe Burners are twice as heavy as our standard Schedule 80 pipe burners. Designed to replace cast iron band burners and extruded burners, they resist bowing and remain straight with high heat applications such as biscuit and cracker ovens, furnaces and kilns.

ERB High Capacity Burner is a direct impingement burner made specifically for applications requiring maximum heat and absolute balance of the burner flame. They are adaptable to singeing, laminating, drying, curing, heat treating and other operations where positive flame control is key. They are built to eliminate the flame irregularities and breaks found in most other high capacity burners.

ERB Water-Cooled Burners are used for laminating, singeing and drying textiles. These burners were developed for continuous level, direct flame applications where any distortion of the flame pattern would be detrimental to the finished product. This is the only true water-cooled ribbon burner where the cooling core is an integral part of the burner casting and provides maximum flow over the entire burner length.

ERB Flame Treatment Burners are used for surface modification of plastic film, foil, non-woven fibers, and lamination. With an enhanced ribbon grid, these burners alter the tension to accept inks, glue, etc. They create a continuous sheet/line of flame, drastically reducing striations in substrates, and permitting increased line speeds from 50-100% (Magna). They are designed to be utilized in all 2-D applications.

ERB flame treatment burners are modular in design to suit any length, are constructed from stainless steel and come with or without water-cooled jackets. They reduce fuel consumption and are easily refurbished and re-ribboned for years of trouble-free operation.

Selas Pre-Mix Gas Ribbon Burners are specially designed for use where a narrow, uniform sheet or "ribbon" of flame is desired. With its geometric and combustion stability, it is often employed in continuous heat processing applications. The unique assembly of perforated refractory ribbon plates allows for maximum flame retention and resistance to thermal attack. The flame pattern can be arranged parallel, at right angles to the work or at an oblique arrangement.

Pyronics Pyroline Burners are cast iron, drilled port continuous line burners with alloy side rails. The unique mounting of the side rails improves flame retention and allows cooler burner operation under higher ambient temperature. The series also includes Midget Pyroline Burners which are low capacity, blast, in-line-type units that are designed to perform at higher temperature applications.

Atmospheric and Immersion Burners

Pyronics Atmospheric Gas Burners are designed for high turndown ranges on all types of combustion chambers or furnaces operating under negative pressure. The burner creates a combustion chamber draft to induce all combustion air. Air blowers or mixers are not required. An atmospheric venturi correctly proportions air and gas flows to deliver a uniform mixture to the burner nozzle. The simplicity of the atmospheric torch combined with a high turndown actuator provides an easily adjustable system that requires little maintenance.

Pyronics Coil Cage Models A & E Burners are complete assemblies for gas firing, immersed tubes for heating water, solutions, oils, and other liquids. These assemblies are engineered to allow ample secondary air for good combustion. The burner nozzle is centered by set screws and lugs and a pilot bracket may be added even after installation is made.

Nozzle Mix Burners

Selas DNS Series Burners (250, 500, 1000) feature a unique cup-like design that allows combustion air and fuel gas to quickly and thoroughly mix at the nozzle. An igniter is used to start combustion of the air/gas mixture, subjecting it to turbulence so that it burns rapidly and completely within a small area as it sweeps across the cup. This distributes fully reacted combustion products into the furnace where the hot gas heats the work directly and evenly, minimizing the localized overheating often caused by concentrated impingement from flame-type burners. The combustion is complete within the cup, so the heat exiting from the cup is uniform, stable and highly controllable.

Pyronics Nozzle Mix Series Burners (101, 201, 301, 601, 1001, 1501) feature short flames, wide turndown ranges and very stable combustion. Gas and air are mixed only at the point of discharge so that flashback is prevented. The exclusive stepped tunnel design creates very high turbulence and internal recirculation in the flame. Precision designed, threaded connections for pilots, flame control and peepsight locations are standard on all units.

Pyronics XNM Excess Air Burners are nozzle mixing types designed for 800% excess air. Stepped tunnel burner blocks produce excellent flame stability at all firing rates. New air-gas mixing principles produce very high excess air combustion with minimal fumes. All sizes develop maximum ratings with 6 oz. air pressure and 2.5 oz. gas pressure at the burners. All XNM burners feature inconel flame distributors and high temperature refractory blocks. Gas adjustor and flanged connections are standard.

Pyronics Flat Flame Excess Air Burner (SW) The swirling air stream of the Pyronics Sidewinder II Gas Flat Flame Excess Air Burner produces a negative vortex at the refractory block mouth. Gas enters the vortex, mixing rapidly, producing intense combustion. The inverted parabolic shape of the burner block port works with the vortex to pull flames flat to the furnace wall.

Velocity Burners

PYR-HS High Velocity Hot Shot (HS) series is a nozzle-mixing, high velocity burner used primarily where a high recirculation rate of the products of combustion is required. They produce a high-velocity stream of hot gases at the exit of the burner tunnel which will create a high degree of heat penetration, resulting in greater efficiency and reduced fuel costs. Burners can also operate with excess air or fuel, providing additional versatility in process applications.

Selas/Pyronics HMB High Momentum Burners are designed for process temperatures up to 2700º F. The burners are equipped with advanced silicon carbide firing tubes and utilize 2-stage combustion. HMB Burners are available in two nominal capacity sizes: 350,000 BTU/hr and 650,000 BTU/hr. Specially designed nozzles provide cool NOx-inhibiting first stage combustion. Final combustion occurs in the second stage where combustion products exit at velocities of over 400 fps. When used with an air-to-air recuperator for improved system efficiency, the highest preheat air temperature to the air inlet to the burners is 1000º F.

Selas/Pyronics HMCT High-Momentum Ceramic Tube Burners are designed for process temperatures up to 2500º F. The burner's outer tube is made of an advanced silicon carbide and the inner firing tube is made of stainless steel alloy. HMCT Burners are available in three nominal capacity sizes: 250,000 BTU/hr, 650,000 BTU/hr and 1,500,000 BTU/hr. The burner incorporates 2-stage combustion for low NOx. Specifically designed nozzles provide cool NOx-inhibiting first-stage combustion. Final combustion occurs in the second stage where combustion products exit at velocities of over 400 fps. When used with an air-to-air recuperator to improve system efficiency, the highest preheat air temperature to the air inlet to the burners is 700º F.

The Selas HMCT-PAK Burner, a pre-assembled and factory calibrated package burner, is an innovative adaptation of Selas' proven High Momentum Ceramic Tube (HMCT) low NOx burner. Its compact design features a pre-calibrated linkageless control system, a variable speed fan to conserve energy and low 60 ppm NOx performance at maximum load. At about 60% the size of competitive models, the HMCT-PAK is the perfect burner for new or retrofit applications in ovens, furnaces, dryers, and other environments where high performance heating is required. It is delivered pre-programmed from the factory for plug-and-play installation and requires virtually no calibration. Two versions are available with capacities of 800,000 BTU/hr to 1.8 MM BTU/hr and heating ranges from 500º F to 1900º F, with a minimum input of 30K BTU. Its 40:1 turndown ratio accommodates a wide range of heating demands.

Radiant Tube Burners

Single-Ended Recuperative (SER) Radiant Tube Burner. With a conventional radiant tube combustion system, 65 to 70% of the heat created by combustion is wasted. The Selas SER single-ended recuperative radiant tube combustion system reduces that wasted heat dramatically. Because it uses the available exhaust gas heat to preheat incoming combustion air, the furnace's fuel consumption is reduced significantly. The result is average fuel efficiency of up to 82%. The patented SER is a complete system, combining burner, radiant tube and recuperator in a single, compact unit. It comes with all the accessories needed, from adjustable gas cocks to butterfly valves to ignition system.

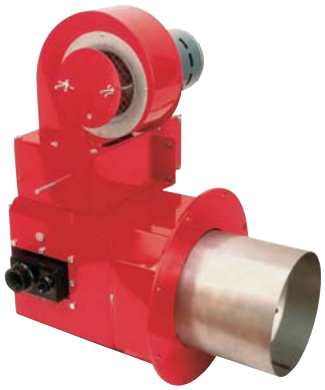
Selas Pyronics U Tube and W Tube series burners are compact, sealed nozzle-mix units designed to operate in radiant tubes with maximum combustion efficiency over varying operating conditions. UHF burners provide delayed mixing and uniform progressive combustion for even tube heating, temperature uniformity and optimum tube life. Flame length and geometry are adjustable through the use of partial air-gas pre-mixing that suits the flame to the job. UHF burners can be used with preheated air up to 480º C, and may be operated in a high-low, a high-low-off mode or fully modulated over a 5-to-1 turndown range, using excess air at low fire.

Immersion Heating Package Burners

Selas/Pyronics TF Package Burners are designed to offer the equipment designer and user a complete pre-wired, pre-piped burner package for firing into immersion tubes in liquid tanks. The system offers the precise package required for virtually all types of immersion tube process heating applications. The TF burners utilize standard nozzle mix burner heads and are intended for applications in "conventional" sized tubes with diameters up to 12" and length to diameter ratios up to 80:1 depending on tube diameter. TF Burners can be supplied with high fire thermal inputs from 170,000 Btu/hr to 3,300,000 Btu/hr. Depending on immersion tube selection TF burners can produce thermal efficiencies of over 70%.

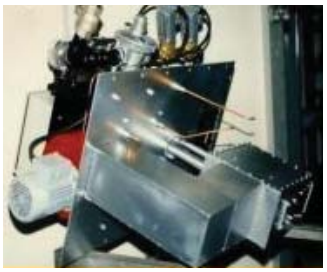
Selas/Pyronics TFR Package Burners are designed to offer the equipment designer and user a complete prewired, pre-piped burner package for firing into small bore immersion tubes in liquid tanks. The system offers the precise package required for virtually all types of small bore immersion tube process heating applications. TFR burners can be supplied with high fire thermal inputs ranging from 240,000 Btu/hr to 2,600,000 Btu/hr. Higher firing rates are possible with induced draft exhaust fans and/or higher capacity separate combustion air blowers. Depending on immersion tube selection TFR burner applications can produce thermal efficiencies of over 80%.

Air Heating Package Burners



Pyronics Model PC Packaged Oven Burner is designed to offer the oven designer and user the complete pre-wired, pre-piped burner package required for virtually all types of low temperature gas fired process heating applications. Available gas trains include either FM or IRI with modular components or the "traditional" individual components. Most sizes offer a choice of firing methods: on-off, high-low, gas only modulation with constant air, or complete air and gas modulation. A NEMA 12 electrical enclosure is standard and includes the burner management and flame safeguard components.

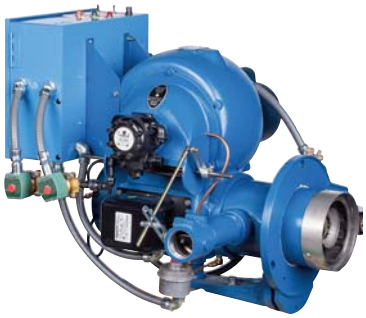
Pyronics Model PP Packaged Air Heat Burner is a complete pre-wired, pre-piped burner package for ovens. The system offers the precise package required for virtually all types of low temperature gas fired process heating applications. Available gas trains include either FM or IRI with modular components or the "traditional" individual components. Most sizes offer a choice of firing methods: on-off, high-low, or gas only modulation with constant air. A NEMA 12 electrical enclosure is standard and includes the burner management and flame safeguard components.



Pyronics Model RSP Series Gas Burner is a pre-packaged, fan-assisted unit designed to suit virtually all types of low temperature gas-fired applications. Typical uses include the firing of industrial ovens and dryers. The RSP can be fitted into process air ducts or installed in process plant recirculation systems. The nozzle mix design, combined with progressive air mixing at the combustion head, ensures that the burner can operate with high turndown capability.

Pyronics HMCT-PAK High Momentum Packaged Burner is a new high efficiency, low-NOx packaged furnace burner that can be adapted to air heating applications with dual nozzle choices to change the air velocity. The HMCT-PAK burner is an innovative adaption of Selas' proven High Momentum Ceramic Tube (HMCT) low NOx burner. Its compact design features a pre-calibrated linkageless control system, a variable speed fan to conserve energy and low 60 ppm NOx performance at maximum load. At about 60% the size of competitive models, the HMCT-PAK is the perfect burner for new or retrofit applications in ovens, furnaces, dryers, and other environments where high performance heating is required.

Boiler Burners and Multi-Fuel Burners



RAY Power Pressure Burners can be integrated with all types of boilers, ovens and kilns, up to 400 horsepower, to form completely automatic packaged burner units. Safety is ensured by the latest electronic operating and safety controls which may either be burner mounted or enclosed in a control cabinet for integral or remote location. For remote mounting, the burner can be wired to a terminal strip to facilitate control wiring. Sizes 6, 7 and 8 are furnished with gas pilot ignition as standard. Diesel ignition is available.

RAY Air Atomizing Burners burn all grades of oil and most gases. Oil is atomized with low pressure air. Steam atomizing is available when desired. Heavy oil models are provided with burner mounted heaters to regulate the oil temperature at the burner. Ray circulating oil heater and pumping sets are available to heat and circulate the oil from the tank to the burner. Pressure drop through the burner has been reduced. This lowers motor size and cuts operating costs.

Webster-JB (X) Series Burner has been applied to virtually every type of boiler, indirect-fired air heater and many other process applications. Our commitment to continuous improvement ensures that every burner is the best match for each application. Available in linkage or linkageless arrangements, JB burners are engineered for maximum combustion efficiency and extremely low electrical consumption. All JB Series burners and controls are designed for reliable operation and easy maintenance, and are thoroughly tested prior to shipment for trouble-free start up.

Webster HDRV (X) Forced Draft Register Burners are mid-range burners that combine a Posi-Control linkageless combustion system with venturi throat technology for enhanced performance. The versatility and flexibility of Series HDRV burners save time and money. Our HDRV readily adapts to most available boiler and furnace front plates and can be installed vertically, horizontally, left or right to accommodate every on-site condition. The HDRV Series combustion head burns a wide range of fuels from Natural, LP and low BTU gas to all commercially available grades of fuel oil and qualified waste oil – either separately or in combination. Several low NOx options are available, using Induced Flue Gas Recirculation. The standard offering includes 60 and 30 PPM NOx on natural gas. For lower NOx levels, select the HDSX or the HDRMB.

Webster HDS (X) Series High Efficiency, Low Excess Air Burners reduce emissions while providing higher turndowns. With turndown rates as high as 12 to 1 for Natural gas, HDS and HDS(X) High Swirl burners offer the same benefits as our proven HDRV technology, with new firing heads and other component improvements. The HDS burner is available as a standard gas and/or oil-fired burner (Model HDS) and as a low NOx burner (HDSX). Both models fire natural and digester gas, LP, and #2 fuel oil as well as a combination of gas and oil. The HDS is also available with heavy, #4 through #6 oil (heavy oil burners are not UL/cUL listed).

Webster-JBS (X) High Efficiency, Low Excess Air Burners feature a high swirl design that reduces emissions while providing higher turndowns. With turndown rates as high as 12:1 for Natural gas, JBS and JBS(X) burners offer a high degree of combustion efficiency with low excess air. Webster's advanced head design has the unique ability to provide dual manifolds to handle multiple fuels for challenging alternative fuel applications. The firing head of the JBS places a high spin on the combustion air for improved mixing and flame stability. This allows the burner to operate with lower NOx emissions.

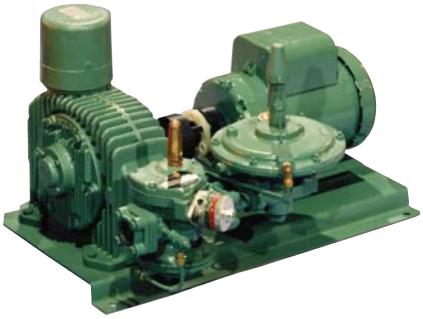
Webster HDRS (X)-RF Burners meet the demands of watertube and firetube boiler customers for increased efficiency. The HDR(S)-RF burner accommodates larger firetube boiler sizes, up to 2,600 BHP. The versatility and flexibility of Webster's Series HDR(S)-RF burners save time and money. Our HDR(S)-RF readily adapts to most available boiler and furnace configurations. HDR(S)-RF can be installed vertically, horizontally, left or right to accommodate even the most unique on-site condition. The HDR(S)-RF series combustion head is capable of burning a wide range of fuels from Natural, LP and low BTU gas to all commercially available grades of fuel oil and qualified waste oil – either separately or in combination.

Webster HDRMB Ultra Low NOx Burners employ high efficiency, dual-fuel rapid mix burner technology to enhance low NOx applications. Proven in hundreds of ultra-low NOx applications over the past 20 years, Webster's dependable rapid mix burner technology provides emissions as low as 9ppm NOx and 50ppm CO. The performance of our HD series burner, combined with the unique ability to fire gas or oil without any modifications, makes the HDRMB the perfect burner for any ultra-low NOx application.

Air Gas Mixing Equipment

Red-Ray Redi-Pak Operating & Control Unit has a self-contained blower, mixer and controls to light and monitor premix burners. The Redi-Pak operating and control unit is an easy and cost effective way to add premix infrared gas heat to an oven. It is available in two sizes, 150,000 btu/hr and 400,000 btu/hr and can fire single burners or dual burners. Remote control is available on single burner models.

Selas CAV Valve is used in positive displacement (Model CA) type and centrifugal blower (Model TD) combustion control systems, to deliver optimum turndown range in capacities from 500 SCFH to 125,000 SCFH, depending on the valve size, 5 to 150, and the compressor/blower rating.

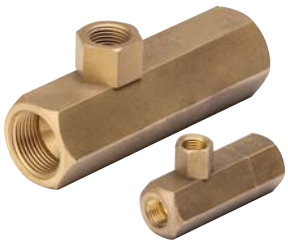


Selas Posimix Valve is used in positive displacement (Model PM) compressor and centrifugal blower (Model TD) combustion control systems. Depending on the valve size, from B to F, and compressor/blower rating, these combustion controllers will provide a wide range of mixing capacities from 2,000 SCFH to 150,000 SCFH.

ERB Inspirator Air & Natural Gas Mixers are the simplest and most economical way of blending air and gas fuel mixtures. This simple method uses gas under pressure through an orifice which entrains air and blends it in a tube. Designed to provide the best atmospheric mixture, it is available in multiple sizes.

Pyronics Lojector Atmospheric Gas Injectors are applied in applications with low air requirements with compressed air to replace small blower requirements.

Pyronics Flange Mixing Tee delivers combustion air through a control valve metered through a precision machined orifice. Controlled air pressure is impulsed to the top of the gas balanced zero regulator. The zero regulator outlet pressure will always be the same as the controlled air pressure. An adjustable gas orifice sets the gas fuel flow rate. This pressure interlocked system maintains equal air and gas pressure drops at all flow rates. Air-gas ratio is constant over the entire turndown range of the system.



Pyronics Forced Air Midget Mixers are suction type proportional air-gas mixers. Air passing through the jet produces a suction in the throat section to entrain a fuel gas. The quantity of gas entrained is easily set by the adjuster plug in the gas throttle cock. Once set, the fuel to air ratio remains constant over a wide range of air flows.

Selas/ERB Combustion System and Controls can provide whatever you require, from simple atmospheric to intelligent closed loop systems; from a few thousand to several million BTU; from one burner or hundreds. We can design, fabricate and install any type of system and control package you need. We also provide small rental combustion systems to check whether a particular application will work or to assist you in determining what size you require. All our systems and controls meet or exceed present regulations, including NFPA, CE/UL, TSSA and OSHA.

Pyronics Multiflow Mixers, Models MF and MFT are patented, adjustable, high efficiency proportional mixers. The energy of the air passing through the jet produces a suction to entrain a combustible gas and deliver the mixture to the burners. The patented Air Adjuster provides wide capacity ranges in the same size mixer. A simple hand adjustment changes the air capacity and matches the mixer to the burners.

Pyronics Proportional Flowmixers utilize the energy of a stream of air at pressures up to several pounds to entrain a combustible gas and to deliver the mixture at unusually high pressure to the burners. Because of refinements in design, the device will develop higher mixture pressures than usually attainable, and will also maintain accurate gas-air proportions at all air flows if supplied with zero pressure gas. This high capacity characteristic gives the entire combustion system a wider range of operation without requiring higher initial air pressure and reduces sensitivity with regard to burner flow characteristics.

Pyronics Hijectors – Venturi Mixers for High Pressure Gases are designed to use high pressure gas (up to 35 psig) to entrain all the air needed to make a complete combustible mixture and to deliver it to the burners at the highest possible pressure. The proven design incorporates a number of refinements for easy installation, operation and maintenance.

Accessories

Pyronics AN Atmospheric Nozzles are open type burners designed for high capacities with good flame retention characteristics. Pyronics Atmospheric Nozzles (Pilot Size) AN Pilot Nozzles are made in four pipe sizes - 1/8, 1/4, 3/8 and 1/2. These nozzles were designed to give Pilot Torches excellent flame retaining characteristics, with capacities almost as great as open pipes. Their turndown characteristics are also good. They may be used separately as nozzles or tips, arranged in groups, or on pipe burners.

The Pyronics Hi Blast Torch uses a small amount of high pressure air to entrain incoming gas at the mixer. This produces a hard, sharp, clear blue, typical blast burner flame. Only ten percent of the total air required is at 20 to 100 psi. This air is passed through a high pressure venturi which inspirates the gas flow and elevates its pressure. The resultant mixture of one part air and one part gas is delivered to the main orifice at approximately 40% of the inlet air pressure.

Pyronics Venturi Torches are atmospheric gas burners designed for high turndown ranges on all types of combustion chambers or furnaces operating under a negative pressure. The combustion chamber draft induces all combustion air. No air blower or mixer is required. The atmospheric type venturi correctly proportions air and gas flows and delivers a uniform mixture to the burner nozzle. An exclusive pressure actuator controls the burner nozzle stabilizer disc with changes in gas flow to maintain a stable flame. A single modulating gas valve controls fuel pressure automatically.

Pyronics Combustion Butterfly Valve easily and effectively controls air flow in low pressure lines (up to 3 psig). This may be done manually or automatically by using suitable control equipment. These valves are designed for free flow with minimum air pressure drop. They are not intended for tight shut-off, as slight leakage (less than 2%) may occur in the closed position. Valve styles include motor-operated, pneumatic, high temperature and manual threaded.

Electronic/Monitors

Flame Ignitors/Monitors The Series 2000 Pilot Flame Ignitors and Monitors are assemblies that are attached directly to ends of burner sections. They each have a small burner which is used for ignition or monitoring of burners without the need for a separate pilot system. They have an elegant design which provides for both simplicity and reliability in burner operation.

Custom Control Panels are factory assembled and tested packaged control cabinets for grouping controls and accessories. Enclosures are available in all standard NEMA types: wall mounting, free standing, multi-door and consoles. We provide custom designed and explosion proof enclosures for special applications. Control Centers are factory assembled units with external connection points completely wired to numbered 30 amp, 600 volt terminal blocks, in NEMA type enclosures with removable sub-panels.

QUAL-O-RIMETER® monitors and adjusts fuel gas quality. For industrial service where changes in fuel gas or ambient air characteristics will upset the heating process, the mixture output from the combustion controller can be monitored and controlled. The Selas Qual-O-Rimeter Mixture Monitor detects any deviation in flame temperature and automatically adjusts the gas/air ratio to compensate. By connecting the Qual-O-Rimeter sample line immediately downstream of the combustion controller, continuous and accurate correction for gas and ambient air variations is assured before production is affected.

Selas/Pyronics 7150 Ultraviolet Detector is a photo-sensitive flame sensor for use with the Pyronics Sens-A-Flame II and flame monitoring system. The detector tube has a peak spectral response in the short wave ultraviolet region and, therefore, will not be activated by visible light, infrared energy or sunlight, etc. The detector responds to the ultraviolet radiation generated by all flames.

Flow Regulators

Balanced Zero Regulator, Model BZR, is a precise gas flow control regulator for all combustion systems. Used with Proportional Mixers, Nozzle Mix Burners, positive or negative furnace pressures etc. A patented compensator automatically adjusts the valve position to hold constant outlet pressures at all flow rates. The zero regulator will hold the outlet pressure within +/- 2 mm WC over the full range of the turndown.

Gas Adjustors Model GAF are designed for setting gas and/or air flow on combustion systems. The cylindrical plug valve has a micrometer type screw thread adjusting stem. This fine running thread permits very fine control of valve position and gas flow. The 12 GAF 16 and larger adjuster stems are furnished with a lock nut for positive fixing of the valve position. The entire adjusting assembly is furnished with a cap with an O-ring to prevent tampering and leakage.

Calibrated Orifice Flow Meters are designed for measuring flows of air or gases at pressures up to 5 psig and temperatures to 500º F. Orifice ports are accurately machined for precision measurements. Each orifice plate has model number and orifice diameter stamped on tab for easy identification and selection.

Blast Gates for low pressure air control (5 PSIG = 350 mbar). Selas has many models of proportional gas mixing systems and combustion controllers for industrial applications. This unit has a cast iron body with stainless steel, floating slide and an adjustable screw lock.

Selas/Pyronics Midget Air-Ductors Model AD are designed to supply combustion air up to 16 osi when supplied with a small quantity of high pressure air. Compressed air (above 30 psig) passing through the calibrated metering orifice entrains atmospheric air and delivers the total at some pressure to a gas-air mixer.

Safety Devices

Selas Automatic Fire Check, or flame arrestor, is a check valve which is closed by actuation of a thermal release. Components include a shut-off valve, check valve, corrugated fire screen, and a thermal latch. In normal operations, the combustible fuel/air mixture passes freely through these components. If flashback occurs, the sudden increase in back pressure will cause the check valve to close and momentarily interrupt the forward flow of the fuel/air mixture. The reduced flow and internal configuration of the firecheck allow the backward-moving flame to stop at the fire screen.

Selas Blowout is a directed-flow release device combined with a check valve. In normal operation, the combustible fuel/air mixture passes freely through the blowout. In the event of flashback, the increase in back pressure will cause the check valve to close and interrupt the flow of premixed gases. The pressure buildup then shatters the rupture disc, venting the flashback pressure and hot gases from the pipe to a safe area. Rupture of the disc automatically trips the electrical switch which can command such functions as shutting off the fuel supply or sounding an alarm. The flame arresting screen delays the flame from progressing until the fuel supply is interrupted.

Air Blowers

Selas/Pyronics Low Cost (LC) Blowers are used for many industrial and commercial applications requiring air at a specific pressure and volume. The unique design of the single stage unit incorporates a minimum of field maintenance. Sideplates and scroll are steel. Specially designed extruded rubber seals, held tight by tie bolts, prevent leakage. Aluminum impellors, direct connected, provide smooth and quiet operation of the blowers.

Emission Reduction & Efficiency Improvement Technology

Maxsys Fuel Systems is a Selas-owned clean-technology company based in the UK. They provide an established and scientifically recognized technology guaranteed to cut fuel costs and reduce CO2 emissions. Already the choice of many large brands and Blue Chip companies throughout the world, Maxsys offers cost savings and fuel efficiency to businesses operating within a wide range of industries, including: Automotive, Brewing, Chemicals, Dairy, Food & Drink, Insulation, Minerals, NHS, Packaging & Paper, Pharmaceuticals, Plastics, Steel and Textiles.

Fully compatible with all burners and combustion plants, the Maxsys Fuel System provides:

- 5% annual savings in fuel expenditure (oil and gas)
- Measurable reductions in harmful CO2 emissions

With current customers reporting significant monthly fuel savings and an ROI of 30% to over 100%, Maxsys Fuel Systems Ltd is leading the way in providing financial and environmental benefits for energy intensive markets.

TEMP-A-TRIM® saves money on fuel and utilities. Webster Combustion's patented TEMP-A-TRIM air density trim system senses combustion air temperature and automatically varies the fan speed to create a constant air flow mass for combustion. By maintaining optimum fuel/air ratios, TEMP-A-TRIM ensures that the burner is operating at maximum efficiency.

TEMP-A-TRIM Features & Benefits

- Precisely corrects for changes in air density to automatically optimize combustion efficiency 24/7
- Reduces the need for seasonal tuning of burners
- Feed-forward control for smooth, accurate operation
- Easy to install, with no special set-up or programming required
- Compatible with linkage or linkageless control systems
- Saves fuel and electricity, as well as lowering noise levels
- Available on all sizes of new or existing Webster burners
- Lower cost, complexity, and maintenance than typical O_2 trim systems
- UL approved

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