ROCKFORD SYSTEMS, LLC

COMBUSTION SAFETY

Q & A

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Rockford Systems has launched a new Combustion Safety division to provide safe solutions for companies that use thermal processes in their industrial operations.

REDUCING RISK.

IMPROVING SAFETY.

PROTECTING WORKERS.

Q Why did Rockford Systems enter the combustion safety market?

A: Rockford Systems has expanded its industrial safety solution portfolio to better meet its customers' manufacturing safety needs. Rockford Systems has launched a new Combustion Safety division that provides turnkey solutions for organizations that use thermal processes in their operations. This expansion enables Rockford Systems to provide new and complimentary value-added safety solutions and enables traditional safeguarding customers the ability to grow their industrial safety focus with a trusted and reliable partner.

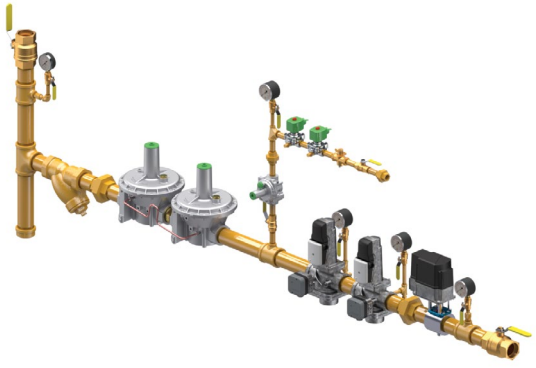
Q What are thermal processes?

A: Thermal processes are various methods used to alter the physical, and sometimes chemical, properties of a product's material or coating. Thermal processes may be high-temperature operations such as heat treating or low-temperature operations such as drying. Heat treating involves the use of heating or chilling, normally to extreme temperatures, to modify a material's physical properties such as hardening or softening. Many facilities use lower temperature heating processes, such as baking or drying, to modify other aspects of a material or coating. Other customers have incinerators for oxidizing pollutants, air-heaters for tempering climate air. The applications are endless, and Rockford Systems Combustion Safety division now provides combustion safety for all of these processes and more.

Q What combustion safety solutions will Rockford Systems offer?

A: Rockford Systems Combustion Safety (RSCS) offers combustion safety training, on-site risk assessments, annual inspections*, pre-acquisition audits, customized engineered solutions, standardized and customized valve safety trains, quality installation and post-sale support. This turnkey solution allows customers the convenience of one-stop shopping for all of their combustion safety needs, as well as provides peace-of-mind working with a globally trusted safety partner such as Rockford Systems.

*Required for NPFA 85/86/87 compliance



Q What is a valve safety train?

A: Valve safety trains (or safety trains) control the flow of gasses for industrial equipment, such as furnaces, ovens, dryers and boilers, making them a crucial component in assuring operational safety and energy efficiency. Owing to the presence of hazardous vapors and gases, a poorly designed or inadequately maintained system can lead to explosions, fires, asphyxia and burns. For that reason, Rockford Systems' valve safety trains feature industrial-grade construction and are universally wired to accept most North American control systems. Optional features allow for common adaptations such as safety valve proving, climates down to -20°F, 230V controls, lockable valves, and pilot-line assemblies. The designs feature industry-leading components and are engineered to meet or exceed NFPA, NEMA, CSA, UL, FM and other globally-recognized safety standards.

Q What are the risks of a poorly designed or inadequately maintained combustion system?

A: Owing to the presence of hazardous vapors and gases, a poorly designed or inadequately maintained combustion system can lead to explosions, fires, asphyxia and burns. For that reason, Rockford Systems features industrial-grade components which are ventless, wired to universally accept 50 or 60Hz control systems, and accommodate operating fuel and ambient temperatures anywhere from 14°F to 140°F. Optional features such as safety valve proving, climatizing to -20°F, 230V controls, lockable valves, pilot-line assemblies and flexible compensators are also available.

Q How will Rockford Systems differentiate from other combustion safety providers?

A: Rockford Systems offers best-in-class valve safety train delivery. Faster delivery facilitates faster installations, reduces costs associated with lost production, minimizes downtime and provides more confident commissioning.

Q How will Rockford Systems achieve delivery in days rather than weeks or months?

A: An important part of the new division's value proposition is best-in-class delivery, which can lead to less production downtime and more confident commissioning. To achieve delivery in days, rather than weeks or months, Rockford Systems offers an array of standardized valve safety trains that are pre-engineered, modular, assembled from existing segments, and importable as 3D models for customers' CAD systems. Their modular design eases installation, as does the prewired option. Standard valve safety trains are stocked and available in multiple sizes with capacities up to 7,500 SCFH, and pre-designed units with capacities up to 22,500 SCFH. Customized layouts for any capacity, fuel, footprint or environment are also available.

Q What are the standard components of a safety train?

A: Standard components of all valve safety trains sizes include regulators, in-line strainers, dual-safety shut-off valves, manual-isolation valves, pressure switches, and test fittings. All assemblies are powder coated and pressure tested. Optional components consist of leak-test systems, gauges and pilot gas controls.

Q What sizes are available for the standard valve safety trains?

A: Standard valve safety trains are stocked available in multiple sizes from ½" to 2" with standard capacities ranging up to 7,500 SCFH (standard cubic feet per hour). Larger, pre-engineered designs with higher capacities also exist.

Q Does Rockford Systems offer customized safety trains?

A: Yes. In addition to standard valve safety trains, Rockford Systems offers pre-designed units with capacities up to 22,500 SCFH (standard cubic feet per hour), as well as custom layout and designs for any capacity, fuel, footprint, or environment. Variations are quickly accommodated due to our standardization platform.

Q What standards do the Rockford Systems safety trains manufacture to?

A: NFPA, NEMA, NEC, CSA, UL, FM and other globally-recognized safety standards.

Q How often should a combustion system be inspected, and why?

A: Combustion systems should be inspected at least annually to be NFPA compliant. Thermal processes do not typically directly control part temperature; but rather, they often control the environment the part is in. As such, control of all other process conditions (residence time, fixturing, moisture content, temperature, coating content, atmosphere, air exchanges, etc.) are an indirect means to ensure repeatable thermal processing. A schedule of regular inspections ensures thermal processes operate safely and reliably: detecting issues before dangerous conditions arise, or non-conforming parts are produced.

Q Why should I have process gauges and test fittings?

A: Process gauges provide a means to monitor variables of the thermal environment. Skilled operators become attuned to "normal" gauge readings. If another aspect of the process changes one of the first reacting variables is the process heat load. As such, gauge variations are often early indicators of control loss, and are useful to diagnose issues. Test fittings are a useful means to maintain components and identify abnormalities when gauges are insufficient or other test methods are necessary.

Q Why do valves leak?

A: Valves are mechanical devices that rely upon seats and seals to create mechanical barriers to control flow. A variety of seat designs create these barriers. With use over time, these barriers wear out for a variety of reasons (age, abrasion, erosion, chemical attack, embrittlement, fatigue, temperature, etc.). The increased wear contributes to increasing leaks, and increasing leaks lead to failures and hazards. Regardless of the specific cause, aged seats are susceptible to leaking.

Testing a valve's integrity is an evaluation of current barrier conditions, and may be used to identify a valve that is wearing out prior to failure. As such, annual valve leakage tests are an important aspect of a well-rounded safety inspection program.

Q How does safety equipment work?

A: Combustion systems have many variations, but the overarching goal is operator safety. To provide safety, a multitude of sensors (pressure switches, flame detectors, position indicators, etc.) and devices (isolation and relief valves) work together in concert. The general design strategy is to presume an unsafe condition exists unless all monitored items are proven safe. Unless a safe condition is wholly proven, the safety isolation valves will not be permitted to open.

Q What is the most common installation fault?

A: Improper venting is among the most common installation error. Numerous components require an atmospheric reference for accurate operation. Many of these devices however can fail in modes that permit fuel to escape from these same atmospheric points. Unless these components are listed as ventless, vent lines are necessary. Accordingly, these points need to be vented to approved locations for safety. Vent lines must be correctly engineered, installed, and routed to appropriate locations. In addition, building penetrations must be sealed, pipes must be supported, and the vent terminations must be protected from the elements and insects.

Even when vent lines are properly installed, building pressures can vary sufficiently enough that they prevent optimal burner performance. Building pressures often vary with seasonal, daily weather, and manufacturing needs, further complicating matters. Condensate in vent lines can collect and drain to low points or into the devices themselves. Heating, cooling and building exhausters are known to influence building pressures and device responses, but so can opening and closing of delivery doors for shipping and receiving. Hence a burner once tuned for optimal operation might not be appropriately tuned for the opposite season's operation.

Rockford Systems Combustion Safety specializes in ventless valve safety train designs to improve factory safety and enhance burner operation. Ventless systems will reference and experience the same room conditions where the burners are located, resulting in more stable year-round operating conditions, regardless of what is happening outside. Additionally, ventless designs typically save on total installation costs, remove leaky building penetrations, eliminate terminations that could be blocked by insects, snow or ice, improve inspection access, and ensure fail-safe emergency response.

Q Should my burner be tuned and adjusted?

A: Yes! For a variety of reasons, burner control shifts as operating conditions change and controls drift. Mechanical devices have components that age over time. Elastomers deteriorate and often become stiffer, electronic controls drift with age, bearings and moving points wear out and become loose. Annual tuning returns processes to their operating designs, upholds efficiency, curbs excessive fuel usage, maintains emissions, and identifies wearing components that may need to be changed or updated for preventative maintenance.

Q Why does my building's gas pressure matter?

A: When a building's service pressure exceeds an appliances' inlet pressure capability, a line regulator is added to manageably reduce the pressure. But if that line regulator were to fail, it could expose downstream equipment to the incoming service pressure. Accordingly, both the line regulator and appliance's valve safety train need to be engineered with this possibility taken into account.

Unfortunately, failures like this are not uncommon. Equipment is often selected without consideration of the failure modes. Safety devices should be chosen with consideration of the maximum potential inlet pressure in the event of an emergency.

Alternately, OEM's may not be aware of building service pressures when they specify and select components, instead opting for the cheapest solution. As a result, it is not uncommon to find a low-cost, low-pressure valve safety train improperly applied in a potentially high-pressure environment. In such situations the valve safety train may not provide the necessary protection and could fail in a variety of modes, the results of which may be catastrophic to the facility and employees.

Q Why do I need a sediment trap or dirt leg?

A: The primary function of a valve safety train is to reliably isolate the inlet fuel from the appliance. Safety shut-off valves are purposely selected to do this. To protect these valves, the initial section of a safety train is used to condition the fuel and remove debris that could potentially damage or hinder all downstream safety components.

The first conditioning step is a sediment trap (a.k.a. dirt leg, drip leg). This trap captures large debris, pipe scale, and provides a collection well for pipe condensates. The proper orientation of a sediment trap is at the bottom of a vertical feed. This downwards flow arrangement promotes the capture of debris and condensate into the trap. A horizontal feed across a sediment trap is an improper application. The second conditioning step is a flow strainer or filter element. These devices are fine particulate sieves. The removal of fine particulates from the fuel stream further protect the downstream safety devices from particulate erosion and abrasion. Taken together these conditions steps remove particulates and condensates that might block, hinder, erode, or otherwise compromise the safety features of the devices.

Q Why should I add a flex joint in my piping?

A: Besides accommodating thermal expansion, flexible joints (compensators) isolate the valve safety train from potentially harmful piping-induced stresses such as vibration or piping misalignment. The potential of safety equipment malfunctioning due to sensitive components being twisted and bound is also reduced.

Q Why do I need gas pressure switches?

A: At a minimum there are two crucial gas pressure switches in a valve safety train, one for low pressure and one for high pressure. The low gas pressure switch ensures the minimum gas pressure necessary to operate is present. The high gas pressure switch ensures an excessive pressure is not present. Both switches must be proven safe to permit operation.

Additional to these gas switches will be an air pressure switch. This device is used to ensure airflow is present to support burner operation. Some systems have supplementary pressure switches, such as a valve proving pressure switch. Switches such as these are typically used to enhance safety or provide other safety aspects specific to that application's needs.

Q Does adding a valve proving device improve safety?

A: Valve proving is a valuable safety upgrade to any combustion system. A variety of valve proving systems exist, but they essentially perform an automated test of gas safety valves for proof of closure. Normally these tests lockout the combustion system if the test is unsuccessful. Valve proving systems do not replace the need for inspections or manual leak (seat) testing of safety valves.

Q Does it matter what type of flame scanner I have?

A: A variety of flame detection methods exist. Most designs utilize either a flame's electrical continuity or its radiation to determine the presence of a flame. The basis of selecting which property to monitor is a decision made on the application, the fuel, the burner geometry and accessibility.

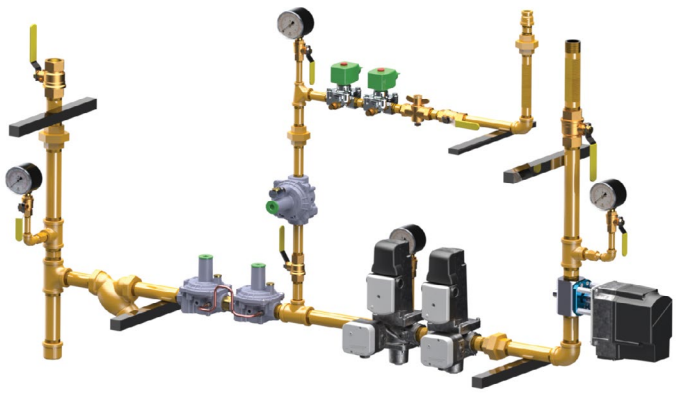
It is important to note that when a burner is to be operated continuously (more than 24 continuous hours by industry definition), the flame safeguard detection equipment must also be rated for continuous operation. This is necessary as some flame safeguard detection equipment can fail into a false positive mode. If that situation were to happen on a continuously running burner the entire flame safeguard system would be compromised.

Q Rockford Systems has traditionally been a machine safeguarding company. How will it expand successfully into combustion safety?

A: The new Combustion Safety division will be led by Mr. Robert Sanderson P.E., who has been appointed to the position of Director of Business Development. Mr. Sanderson is a registered Professional Engineer with an excess of 25 years of industry experience. Under his leadership, Mr. Sanderson will expand the Rockford Systems industrial safety portfolio into fuel and thermal safety fields. Prior to joining Rockford Systems, Mr. Sanderson started his career as the primary thermal and applied process expert for a global corporation which built automotive and aerospace assembly plants. Subsequent to that, Mr. Sanderson continued as an industrial combustion and emissions technology specialist for a Fortune 100 company. Mr. Sanderson has assembled a world-class combustion safety team with capabilities covering the initial sale, through engineering and manufacturing, and concluding with installation, service and post-sale support. Mr. Sanderson is a prior member of the NFPA 86 Standards Committee and holds a Bachelor's Degree in Mechanical Engineering from The University of Michigan.

Q How can we get more information on Rockford Systems combustion safety?

A: Call 1-800 922-7533, email customerservice@rockfordsystems.com or complete the form below to get the Combustion Safety Assessment process started.



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