

Emerson Offers Comprehensive Solutions, and Services to Address

Introduction

As a global leader in delivering automation solutions and services, Emerson has a demonstrated commitment to working alongside customers as the leading source of expertise for safety, reliability, performance optimization, and financial and environmental stewardship.

Emerson's recent acquisition of Pentair Valves & Controls is further evidence of the company's commitment to offering customers the most comprehensive and versatile selection of valve technologies, services and solutions to address any type of application challenge – anytime and anywhere. As automation solutions leaders, being and doing the best means that Emerson assures customers that they have full access to thousands of engineering and technical experts with decades of experience; a comprehensive portfolio of well-established valves, actuators and controls products; and an extensive global network of local service professionals to assist them 24/7 with their real-time needs for consulting, maintenance, repair, and other types of support.



Ensure safety: limit employees' direct exposure to harmful products.

Gain economic benefits: limit waste of the processed fluid for the benefit of shareholders.

Protect the environment: minimize the greenhouse effect on the environment and curtail global warming.

Avoid legal ramifications: avoid fines from local and federal regulators.

International Regulations and Standards for Fugitive Emissions

The United States and Germany have been at the forefront of environmental regulations associated with fugitive emissions.

The U.S. Environmental Protection Agency (EPA) mandates in The Clean Air Act Title I Part A Section 112: "Emissions standards promulgated under this subsection... shall require the maximum degree of reduction in emissions of the hazardous air pollutants... through application of measures, processes, methods, systems or techniques including... collect, capture or treat such pollutants when released from a process, stack, storage or fugitive emissions point..."

EPA Test Method 21 addresses the "Determination of Volatile Organic Compound Leaks," and EPA Test Method 22 addresses the "Visual Determination of Fugitive Emissions from Material Sources and Smoke Emissions from Flares."

Established in Germany in 1964, the TA Luft regulation (officially titled Technical Instructions on Air Quality) Section 5.3 addresses Measurement and Monitoring of Emissions as follows: "If a permit is issued for an installation, measurement sites or sampling points shall be demanded to be provided for... Measurement sites shall be... designed and selected in a way by which to facilitate that emission measurement will be representative of the emissions from the installation..." Ten years later, the German government enacted the Federal Pollution Control Act, which is often referred to as the First General Administrative Regulations pertaining to the Federal Pollution Control Act.

Fugitive emissions standards have been written to address line valves constructed with stems. Historically, international standards for testing pressure relief valves for fugitive emissions have been non-existent.

A snapshot of well-known standards and specifications that ensure valve compliance to regulation includes:

ISO 15848-1 & 15848-2

Industrial valves - Measurement, Test and Qualification Procedures for Fugitive Emissions

Shell MESC 77-300 and 77-312

Procedure and Technical Specification for Type Acceptance Testing of Industrial valves

Fugitive Emissions Production Testing

API 622 and 624

Type Testing of Process Valve Packing for Fugitive Emissions

Type Testing of Rising Stem Valves Equipped with Graphite Packing for Fugitive Emissions

How Emerson is Addressing Fugitive Emissions Challenges

Emerson Automation Solutions' Final Control team members are tackling these fugitive emissions problems in several important ways, including being at the forefront of valves and controls product design, testing, and standards adoption. Emerson has hired and trained seasoned fugitive emissions specialists who are focused on addressing fugitive emissions initiatives for the industry and for customers.

Innovative seat designs, durable materials for valve stems, and a wide selection of alloys have enhanced the functionality of the valves to better control fugitive emissions. Pressure relief valves present a unique challenge due to how they are designed. Some sources indicate that pressure relief valves alone are responsible for approximately 15 percent of all fugitive emissions.

To address this issue, Emerson experts

Critical customer needs that are gaining increased attention in every region of the world are centered around minimizing fugitive emissions and meeting international standards related to fugitive emissions.

Because the number of potential leak sources at large industrial facilities can be numerous and difficult to identify, controlling fugitive emissions can be especially challenging. Unfortunately, valves have earned top billing as the primary culprits responsible for releasing 60 percent or more of all fugitive emissions into the atmosphere.

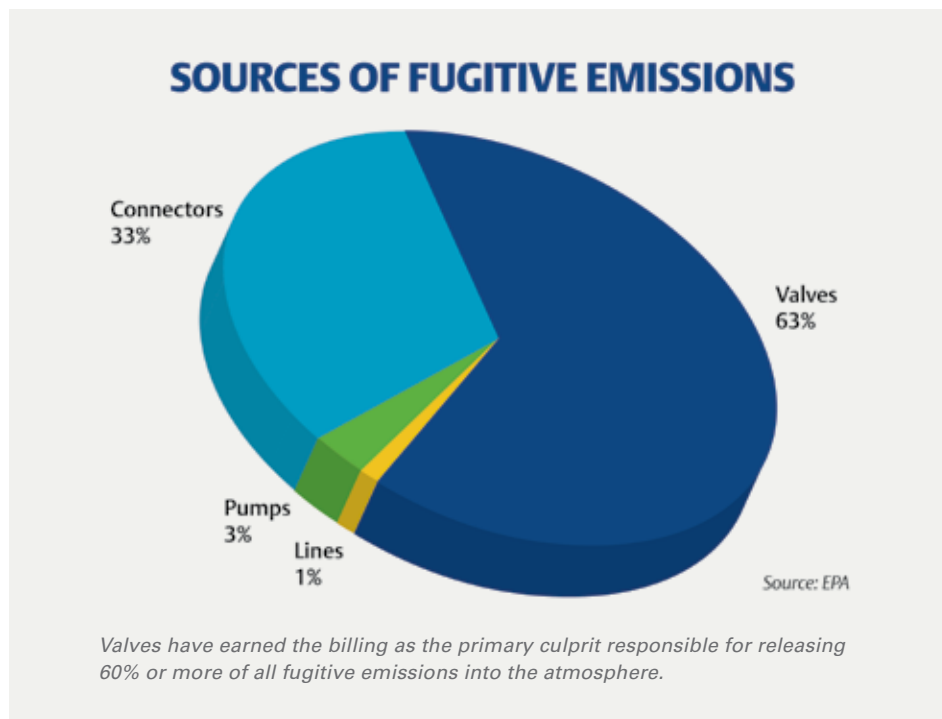
Why has the topic of fugitive emissions been gaining so much attention in recent years from plant operators as well as valve manufactures like Emerson who support them? Here are just a few reasons:

- More countries and their government regulatory agencies are interested in evaluating, adopting and enforcing standards.

- Environmental rules and regulations have become stricter in many countries, including those that previously have been considered serious environmental offenders.
- Corporate Social Responsibility (CSR) programs around the world have been launched by global leaders to focus specifically on reducing emissions and how fugitive emissions affect their overall processes.

Limiting harmful emissions yields numerous benefits to oil and gas, fuel, chemical and petrochemical producers. Emerson advocates that producers should address the valves that can be contributing to emissions by replacing them with valves that are designed to reliably reduce fugitive emissions. Proper maintenance and servicing can also help. In addition, new automation and monitoring technology can help operators keep an eye on possible contributors to fugitive emissions.

Emerson believes these efforts are worthwhile for customers who want to:



Valves and Actuator Experience, Critical Fugitive Emission Needs



Dan Button, Emerson Automation Solutions President - Business Development and Acquisitions, Final Control

collaborated with a leading global oil and gas company and a third-party testing provider in The Netherlands to develop first-time-ever testing criteria for the pressure relief valve (PRV) market. (See Sidebar “Brief Case Study: First Ever Fugitive Emissions Testing of Pressure Relief Valves.”) The new criteria were independently tested and confirmed to be thorough and successful. Now, plant operators dealing with critical and hazardous material can better protect their personnel and reduce emissions at their production facilities if they utilize these newly engineered and tested safety relief valves throughout the production line.

Emerson is raising fugitive emissions conversations to continue to develop and promote process and standards improvements that control the amount of emissions that are released. As a result, its process industry customers can make significant strides toward achieving higher levels of environmental responsibility by embracing these types of new standards and installing products that demonstrate reliable reduction in fugitive emissions.

In addition to having highly qualified fugitive emissions experts on its staff, Emerson has developed specific programs in fail-safe electric actuators, low emissions gas pipeline operators, monitoring solutions for pipelines and packing boxes, and condition-based maintenance approaches that are already being introduced or are in development. Fugitive emissions will continue to be a critical area of focus for Emerson’s customers, the industries Emerson supports, and for Emerson Automation Solutions, one of two vertical Emerson business units.

Emerson’s Comprehensive Portfolio of Fugitive Emissions Solutions

Customers can depend on Emerson as a preferred provider, the final stop in their search for effective final control solutions that comply with stringent international

fugitive emission standards. Emerson is committed to continuously developing and delivering best practices, best-in-class products, best-in-class services, and best-in-class support for end users in the oil and gas, chemical, petrochemical, power and process industry sectors.

Some of the many fugitive emissions-compliant products included in Emerson’s extensive portfolio include the following:

- KTM ball valves
- Vanessa triple offset valves
- Neotecha lined valves
- Fisher and Keystone butterfly valves
- Anderson Greenwood and Crosby pressure and safety relief valves
- Virgo isolation valves
- Fisher control valves with ENVIRO-SEAL™ live-loaded packing systems
- Varc pressure and vacuum relief valves
- Yarway gate, check and control valves
- Shafer and Bettis electric actuators

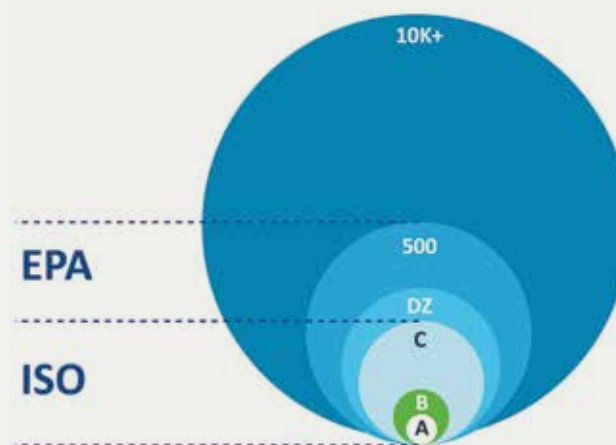
“The Valves & Controls products that we acquired from Pentair are a great fit in our Automation Solutions portfolio of control valves, regulators and actuators. With this acquisition, we’ve added hundreds of new products and expanded the variety of solutions available to customers across all automation solutions industries. Product brands such as Vanessa, Anderson Greenwood, and Crosby are significantly increasing our ability to offer more integrated solutions for an even wider range of customer challenges,” commented Dan Button, Emerson Automation Solutions, President - Business Development and Acquisitions, Final Control, in an interview.

“Emerson has the broadest portfolio of smart devices for valve and actuator control. We are introducing more and more digital connections into the field to help boost performance. From market-leading isolation valves to actuation technologies that monitor valve performance, Emerson is now a one-stop-shop for all valve needs.”

Emerson Automation Solutions now has a comprehensive portfolio of valve products and an extensive worldwide service network to help its customers maintain safe, reliable and optimal operations. Through Emerson’s Lifecycle Services offering customers on site support, hundreds of Emerson service experts are available to be dispersed throughout the world to assist with shutdowns, turnarounds and outages as well as with other maintenance needs that keep customers’ operations running smoothly and efficiently 24/7.

Emerson is a trusted partner accessible to customers throughout the lifespan of their operations, supporting them in an emergency or scheduled turnaround with inventory in stock, products ready

EMERSON’S FUGITIVE EMISSIONS SOLUTIONS MEET THE B STANDARD OR BETTER



Emerson is a trusted partner for fugitive emissions standards with solutions meeting the B standard or better, which means they meet even the most stringent leakage standards allowed by the EPA and local “designated zone” (DZ) government regulations.

for rapid shipment, and dedicated inside sales and assembly personnel. Emerson wants to keep customer operations functioning effectively by providing them immediate access to a wide range of frequently ordered valves, parts and other essential equipment

that can be shipped to them the same day that they place their order.

To access Emerson’s valves, actuators and controls product catalog online, please visit <http://www.emerson.com/en-us/automation/valves-actuators-regulators>.

■ A BRIEF CASE STUDY: EMERSON & PARTNERS DEVELOP FIRST EVER FUGITIVE EMISSIONS TESTING OF PRESSURE RELIEF VALVES

In 2015, working collaboratively with a global oil and gas producer, known for leading the way in industry safety and environmental standards, and an independent testing facility in The Netherlands, Emerson completed an industry-leading, first-of-its-kind fugitive emissions testing program of pressure relief valves that successfully passed strict fugitive emissions requirements.

The valves involved in this testing program included both direct spring-operated and pilot-operated pressure relief valves.

A key point to note is that the function, geometry and inherent design of pressure relief valves (PRVs) are different from inline valves in that they are self-contained (no stem) and self-actuated. The challenge Emerson faced was how to apply fugitive emissions concepts to these devices, since no widely-adopted standards existed then – or now. Some of the critical design elements that make a pressure relief valve fugitive emission-compliant include proper O-ring/groove design, proper

bolt torque, and gasket seals as well as material porosity and density. The manufacturing workmanship and assembly inspection also must assure that all parts are made to specification and that they are assembled together in the proper manner.

The independent laboratory testing demonstrated that all Emerson’s pressure relief valves successfully passed strict fugitive emissions requirements, proving the effectiveness of these valves to limit or eliminate fugitive emissions while withstanding high pressure and both high and low temperature applications. Low emissions allow the valve to be used safely in applications in which the fluid is harmful. Harmful fluids include volatile organic compounds (VOC), flammable gases, lethal gases, and greenhouse gases.

To learn more about this project, please visit the Emerson Process Experts Blog at www.emersonprocessxperts.com/2017/06/pressure-relief-valve-fugitive-emissions-testing/amr-gado/

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