

FUGITIVE EMISSIONS CONTROL VALVE SEALING SYSTEMS



Solutions

for your industry

SMART IN FLOW CONTROL

OVERVIEW



Environmental protection and the sustainable use of natural resources are key issues in preserving the natural world for future generations. Laws and regulations, such as the Clean Air Act in the United States or TA Luft in Germany, lay down limits for emissions produced by industrial facilities. At SAMSON, we take pride in the quality of our products to assist our customers in not just observing, but exceeding, these limits because we understand the importance of protecting our environment and the local communities our customers are located in.

For regulated entities, such as chemical manufacturing facilities and petroleum refineries, to meet the laws and regulations, Leak Detection and Repair (LDAR) programs have been implemented. These programs are expected to be in accordance with applicable national or international standards that have been established. SAMSON will work directly with its customer to confirm our products strictly abide by the LDAR program implemented in their facility.

Over 100 years of experience in zero leakage bellows technology has provided SAMSON the benefit of time-tried and tested innovation in the technology required for reducing fugitive emissions. This expertise and innovation, which translates into our current bellows and packing designs has made SAMSON, globally, the most trusted manufacture for reducing fugitive emissions from control valves.

DESIGN FEATURES

SAMSON offers a multitude of packing designs and materials tailored to specific applications or needs of our customers. The standard packing offered by SAMSON is a V-ring style PTFE-carbon compound with a spring loaded self

adjusting design. Due to the inherent design of packing, wear and tear and plastic deformation of the packing results in unacceptable leakage which can only be avoided by regular maintenance and service. Therefore, reliability is the main goal for packing sets and minimizing required maintenance is the greatest advantage of the SAMSON packing.

The standard packing design in the 240, 250, and 290 series valves with pure PTFE V-rings has been tested according to the EPA Method 21, ANSI/FCI 91-1 standards and has been qualified under class B1. This classification requires the packing endure 25,000 complete mechanical cycles, 3 thermal cycles, no adjustments made, while VOC remain below 100 ppm when tested according to the EPA Method 21 during each testing interval. In addition, the same packing design has been tested according to the international standard ISO 15848 and qualified under classification FE BH CC3. For more information on applicable sizes and pressures, see the latest technical documentation.

SAMSON STANDARD PACKING DESIGN ADVANTAGES:

- V-Ring design
- Spring loaded
- Minimal Maintenance
- Low Emissions (< 100 ppm VOC's & < 10-5 mbar*L/s)
- Temperatures up to 428 °F (220 °C)
- Overtightening of the packing is not possible

REQUIREMENTS:

- Elastic and easily formable
- Wear resistant, low friction
- High resistance to aggressive media
- Pressure resistance
- Temperature resistance

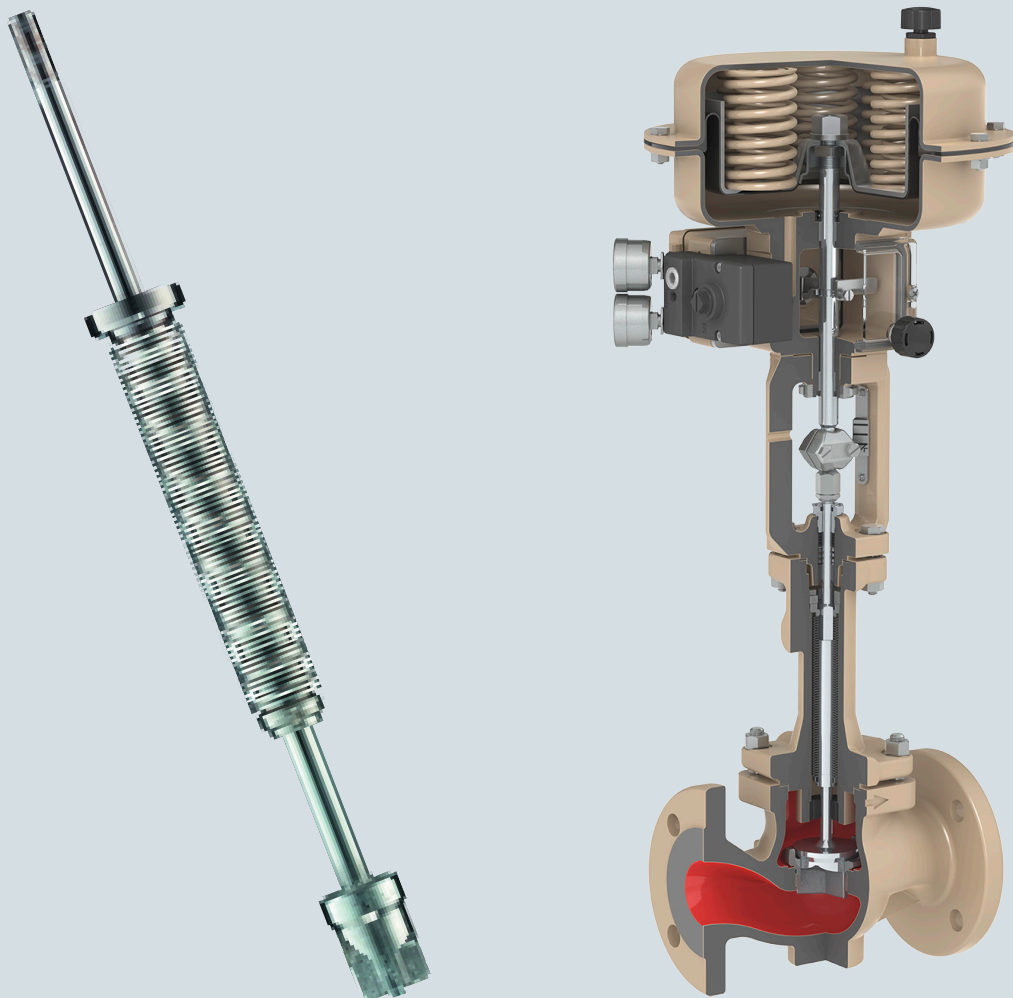


BELLOWS

When it comes to our unparalleled bellows seal technology, we do not leave anything to chance. The bellows seal is one of the groundbreaking inventions originating from SAMSON and can be traced back to our founding father, Hermann Sandvoss. Since Hermann Sandvoss filed a patent on the use of seamless bellows for liquid-filled steam traps and temperature regulators in 1907, SAMSON has been recognized as a world leader in this field.

The primary advantage to the bellows seal is that a metal-to-metal seal is made inside the valve providing a leakage rate of 0 ppm(v). The bellow section has been tested to ANSI/FCI 91-1 and approved to the highest standards of over 100,000 mechanical cycles. The life span of the bellows on the valve while in operation depends on the load acting on the bellows. It can reach mechanical cycles of 100,000 to 5,000,000 cycles based on operating conditions.

SAMSON supplies modular low-cost and high-quality bellows seals to handle high pressures and temperatures, while having an extraordinarily long service life for all valve sizes and pressure ratings. The metal bellows are competently sized and manufactured to meet our customers' requirements and exceed the requirements of local and international fugitive emission regulations.



INDUSTRY STANDARDS

	ISO 15848-1	ANSI/FCI 91-1	API 622	TA LUFT / VDI 2440
	International standard	National Standard	National Standard	National Standard
Test Medium	Helium or Methane (VOC)	Methane (VOC)	Methane (VOC)	Helium
Test Method	Global Vacuum, flushing method or sniffing method acc. to EPA Method 21.	Sniffing method acc. To EPA Method 21	Sniffing method acc. To EPA Method 21	Global Vacuum or flushing method
Unit	mg/(s·m) Mass flow rate	ppm(v) Concentration	ppm(v) Concentration	mbar·l/(s·m) Mass flow rate
Limit Leakage	-Class AH: $\leq 10^{-5}$ -Class BH: $\leq 10^{-4}$ -Class CH: $\leq 10^{-2}$ -Class AM: ≤ 50 ppm(v) -Class BM: ≤ 100 ppm(v) -Class CM: ≤ 500 ppm(v)	Class 1 ≤ 100 ppm(v) Class 2 ≤ 500 ppm(v) A1, A2, B1, B2, ... E2	≤ 100 ppm(v)	< 250 °C: 10-4 ≥ 250 °C: 10-2 after 24 hours
Mechanical Cycle	CC1: 20,000 CC2: 60,000 CC3: 100,000	100,000 with class A and C 25,000 with Class B and D 5,000 with Class E	1,510	Dependent on operating conditions
Thermal Cycles/ Temperatures	196° C , -46° C, RT, 200° C, 400° C or by specification	3 with Class A and B None with Class C and D 1 with Class E	Based on operating conditions	5

ISO 15848-1 is the international standard for classification of performance of different designs and constructions of valves to reduce fugitive emissions. This standard allows for two leakage measurements, the global method (vacuum or bagging) or the local leakage measurement (sniffing). The global method measures the mass flow or volumetric flow rate of the leakage while the local method measures the concentration of methane in parts per million.

ANSI/FCI 91-1 is a standard that classifies control valve stem seals by their ability to withstand mechanical and thermal cycles at specified set of temperatures and pressure conditions. This standard uses the local method of measuring stem seal leakage according to EPA method 21.

API 622 is a procedure from the American Petroleum Institute for evaluation of process valve stem packing for process applications where fugitive emissions are a consideration. API 622 test procedure measures leakage using the EPA method 21 measuring the concentration of methane leakage over a 5-day period with 300 mechanical cycles a day and 1 thermal cycle a day.

TA LUFT/VDI 2440 is the national standard for Germany regarding technical instructions on air quality control / emission control mineral oil refineries.

INTELLIGENT VALVE ENGINEERING

SAMSON

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SAMSON's technology has proven its value worldwide in a variety of industries. We are trusted in many of the world's most challenging applications to achieve precise control with a high level of safety and reliability.

We offer engineered solutions from a single source. With our extensive range of valves, actuators, and accessories we have the right products to suit your requirements.

Our linear and rotary control valves are equipped with SAMSON positioners that allow seamless integration into process control systems.

Continuous investment in research and development allows us to stay at the cutting edge of technology. With over 100 years of experience and expertise, you can count on SAMSON to provide a robust solution for your application.

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