

Low-E/Consent Decree Compliance Re



In this new monthly column, Strategic Account Manager – Stationary Equipment for A. W. Chesterton, Rodney Roth will focus on the essentials of Low-E compliance and modern valve sealing technologies.

with industrial processing facilities based on valve leakage at the molecular level, valve and valve packing performance continues to be driven to change. Valve packing manufacturers have had to continually evaluate, re-design, improve and test their Low-E compliant packing products to meet the continual decreases in allowable leakage. Additionally, valve manufacturers are also having to make changes in valve design and manufacturing criteria to meet these requirements as well.

Definition

Terms familiar to all involved in the management of LDAR programs and Consent Decree compliance are "Certified Low-Leaking Valve Technology, Low-Emissions Valve or Low-E Valve" and "Certified Low-Leaking Valve Packing Technology, Low-Emissions Packing or Low-E Packing" as defined by the EPA. In the most current consent decrees, new valves being installed are being required to be certified as "Low-E Technology".

Additionally, valves being repaired and returned to service are also required to be certified a "Low-E Technology" with the use of a certified "Low-E Packing Technology".

A "Low-E Valve" is defined as: "A valve (including its specific packing assembly) or valve packing for which the manufacturer has issued a written warranty that it will not emit fugitives at greater than 100 ppm, and that, if it does so emit at any time in the first five years, the manufacturer will replace the valve; provided however, that no valve shall qualify as "Low-E" by reason of written warranty unless

(i) the valve (including its specific packing assembly) either:

(a) first was tested by the manufacturer or a



qualified testing firm pursuant to generally-accepted good engineering practices for testing fugitive emissions and the results of the testing reasonably support the warranty; or

(b) is as an Extension of another valve that qualified as "Low-E";

(ii) A valve (including its specific packing assembly) that:

(a) Has been tested by the manufacturer or a qualified testing firm pursuant to generally-accepted good engineering practices for testing fugitive emissions and that, during the test, at no time leaked at greater than 500 ppm, and on Average, leaked at less than 100 ppm; or

(b) Is an Extension of another valve that qualified as "Low-E"

A "Low-E Packing" is defined as: A valve packing product, independent of any specific valve, for which the manufacturer has issued a written warranty that the packing will not

emit fugitives at greater than 100 ppm, and that, if it does so emit at any time in the first five years, the manufacturer will replace the product; provided however, that no packing product shall qualify as "Low-E" by reason of written warranty unless the packing first was tested by the manufacturer or a qualified testing firm pursuant to generally-accepted good engineering practices for testing fugitive emissions and the results of the testing reasonably support the warranty; or

A valve packing product, independent of any specific valve, that has been tested by the manufacturer or a qualified testing firm pursuant to generally-accepted good engineering practices for testing fugitive emissions, and that, during the test, at no time leaked at greater than 500 ppm, and on average, leaked at less than 100 ppm.

Test Protocols

There are several existing test protocols de-

It is estimated that 60% of fugitive emissions found by LDAR technicians can be attributed to valves, more specifically, the stem seal (packing) area. Because of these findings it is easy to see why the US EPA has focused a tremendous amount of their attention on the reduction of emissions from valves (New, Repaired & Re-packed) when negotiating Consent Decrees with Refining, Petrochemical and Chemical processing facilities. Historically, valve stem leakage was something we could see, but, with the introduction of LDAR and leakage being measured in ppm, we now deal with completely non-visible leaks from the valve stem area.

With the continual movement by the US EPA to negotiate and complete Consent Decrees

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requirements are HERE, are YOU Ready?

signed to measure the performance of valves and packing products. The two most commonly used protocols are those written by the API and ISO organizations. The API standards (API 622 & API 624) utilize methane as the media and Method 21 leak detection methodology to measure emissions. ISO tests (15848-1) are commonly performed utilizing helium as the media with leak detection being performed using vacuum for leakage measurement.

API developed the 622 fugitive emissions test protocol to evaluate the performance of a valve packing in a test fixture, with a specific number of mechanical cycles (1,510) and a specific number of thermal cycles (5 from ambient - 500° F) while monitoring emissions in ppm. The current Edition API 622 protocol allows for leakage measurements up to 500 ppm and one re-torque throughout the test. The test was designed to be a pass or fail test, but, a performance test to be used by end users to be able to compare the performance of packing products tested. API 622 is currently in Task Group to be updated and potentially change the test results to actually declare the packing material tested as a pass or fail and leakage not to exceed 100 ppm without a re-torque being allowed. This change would align the allowable leakage and final results to mirror the requirements of API 624.

The API 624 valve fugitive emissions test protocol was developed to type test valves utilizing graphite packing and or designed with rising stems. The allowable leakage limit in API 624 100 ppm and re-torqueing of the valve at any time during the test is not allowed. The standard requires the valve to be mechanically cycled 310 times along with 3 thermal



cycles (ambient - 500° F). In addition to the specific requirements of the actual valve test, valve manufacturers must use packing that has already been tested pursuant to API 622.

It is important to begin your Low-E Valve compliance program by utilizing an API 622 packing that has been tested in accordance with API 622 and has been able to complete the test with leakage below 100 ppm without a re-torque. In addition to the proper packing selection, factors such as surface finish, manufacturing tolerances and valve design affect the valve and packing performance when performing API 624 testing.

Converting to Low E Technology

As a valve manufacturer, the use of manufacture is no longer an option when manu-

facturing API 600 & API 602 valves. Both of these standards were re-published in 2015 and require API 624 compliance as part of the standard. It is almost assured that when API 603 and API 623 are re-published, API 624 compliance will be required as part of these standards as well.

The publication of API 600 and API 602 has made it much easier for end users to update and maintain their respective AML's relative to the approval of these valves. Additionally, for those end users who are operating under Consent Decrees, they can easily insure compliance with the use of API 600 and API 602 valves certified to be API 624 compliant and are tagged/marked accordingly.

In addition to API 624, the API is currently in development of API 641 (Type Testing of Quarter Turn Valves for Fugitive Emissions) which is a Low-E type test standard to certify valves types such as ball valves and butterfly valves as Low-E Valves.

In addition to the Valve Test Standards work being done, API has a Task Group currently working on API RP621 (Reconditioning of Metallic Gate, Globe, and Check Valves) being updated to insure valves repaired to API RP621 are being repaired using requirements to insure the valves are capable of meeting the Low-E Valve definition.

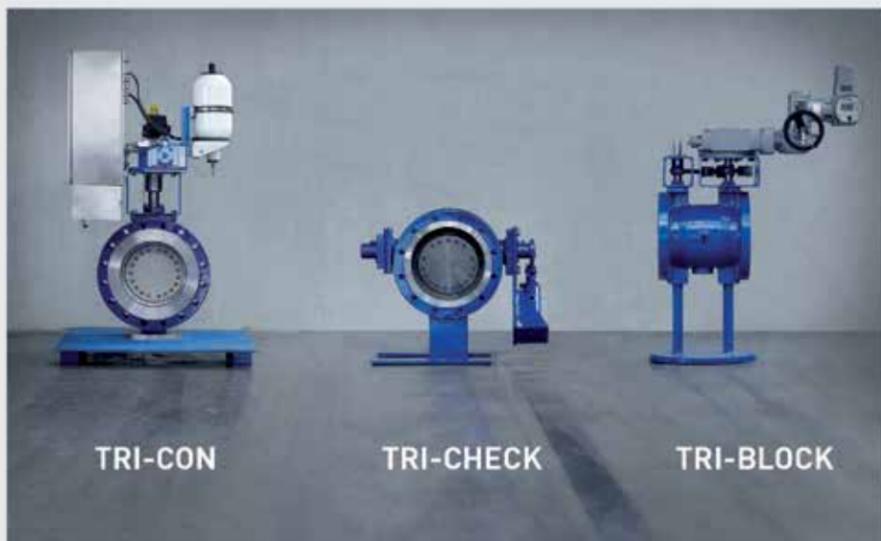
Valve and valve packing manufacturers have the opportunity to proactively work together in supplying Low-E Valve and Low-E Packing Technology to their customers. The EPA is becoming more knowledgeable of the current state of Low-E technology and is no longer accepting the argument that Low-E Valve and Low-E Packing technology are not available. Joint efforts by packing and valve manufacturers to continually work to improve valve performance with regard to Low-E compliance addresses the growing need in the emissions valve market as more consent decrees are being negotiated and EPA enforcement is stepped up across all industry segments.

About the Author

Rodney is responsible for A.W. Chesterton's (AWC) Global OEM Valve program, AWC's Knowledge Provider Program for Stationary Equipment/Consultative Technical Services and AWC's Strategic Accounts Initiative.

Rodney has over 25 years of experience in the manufacturing, design, R&D, engineering, sales and marketing of stationary sealing solutions to include packing and gaskets. Rodney has extensive experience in the recommendation and design of engineered sealing solutions for use in all types of valve and flange applications with a focus on Low E sealing Technology for valves and large diameter critical flange sealing.

Rodney works very closely with valve manufacturers to help enhance their valve designs to ensure they are meeting EPA guidelines and definitions for "Certified Low Leaking Valve Technology" and "Certified Low Leaking Packing Technology" to meet Enhanced LDAR & Consent Decrees and compliance.



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