AMERICAN NATIONAL STANDARD

STANDARD FOR QUALIFICATION OF CONTROL VALVE STEM SEALS

Fluid Controls Institute, Inc.

Sponsor:

Fluid Controls Institute, Inc.
1300 Sumner Ave
Cleveland, Ohio 44115-2851

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Fluid Controls Institute, Inc.

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Suggestions for improvement of this standard will be welcome.
They should be sent to the Fluid Controls Institute, Inc.

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Foreword (This foreword is included for information only and is not part of ANSI/FCI 91-1, *Standard for Qualification of Control Valve Stem Seals).*

This voluntary standard has been developed through the cooperative efforts of the members of the Control Valve Section of the Fluid Controls Institute, Inc. (FCI). Its purpose is to assist users and specifiers of control valves in their efforts to comply with federal and state equipment leak regulations as they relate to leak detection and repair.

The purpose of this standard is to provide a means of evaluating the sealing properties of a stem seal design under a standard set of test conditions in a laboratory environment. Compliance with this standard does not provide proof of actual performance in a process plant due to the variance in actual process service conditions. Compliance by the manufacturer with this standard does not waive any federal or state leak detection and repair requirements on the part of the end user. Stem seals meeting this standard are believed to enhance the end user's capability in meeting the equipment leak requirements.

The standard has been periodically updated since it was first published in 1991.

The existence of an FCI standards does not in any respect preclude any member or non-member from manufacturing or selling products not conforming to the standard. It should be clearly understood that this is a voluntary standard and the FCI is not responsible for its use.

FCI recognizes the need to periodically review and update this standard. Suggestions for improvement should be forwarded to the Fluid Controls Institute, Inc., 1300 Sumner Avenue, Cleveland, Ohio, 44115-2851. All constructive suggestions for expansion and revision of this standard are welcome.

ANSI/FCI 91-1-2020

AMERICAN NATIONAL STANDARD

Qualification of Control Valve Stem Seals

1. PURPOSE

This standard classifies control valve stem seals by their ability to withstand mechanical and thermal cycles at a specified set of temperature and pressure conditions.

2. DEFINITIONS

2.1 Control Valve - A power actuated device that modifies the fluid flow rate in a process control system. It consists of a valve connected to an actuator mechanism (including all related accessories) that is capable of changing the position of a closure member in the valve in response to a signal from the controlling system.

2.2 Fugitive Emissions - Those emitted from process equipment. Any unwanted leak to atmosphere.

2.3 Mechanical Cycle - Moving the valve stem or shaft from the fully closed position to the fully open position and back to the fully closed position.

2.4 Proof of Design - A test to qualify stem seal design to meet the requirements for a class shown in Table 1.

2.5 Rated Travel - The amount of movement of the valve closure member from the closed positon to the full-open position.

2.6 Stem Seal - The means of preventing leakage of process fluid to the atmosphere where the stem protrudes from the valve body assembly. The stem seal also includes any loading or retaining mechanism.

2.7 Stem Seal Leakage - The concentration of process fluid being emitted past the stem seal under the defined test conditions.

2.8 Stem Seal Cross Section - 1/2 (Bore Diameter - Stem Diameter). This definition is consistent with commonly used terminology in the packing industry and is equivalent to gland width, packing cross section, or packing size.

2.9 Stem Seal Adjustment - The use of a wrench or other tool to move any mechanism which retains or applies stress to the stem seal components.

2.10 Thermal Cycle - A thermal cycle of the stem seal is accomplished by starting at T1, P1 and changing to T2, P2 and then returning to T1, P1.