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TITLE

Reassembly and Helium Leak Test of Swagelok® VCR® Metal Gasket Face Seal Fittings with Silver-Plated and Unplated Stainless Steel and Nickel Gaskets

PRODUCT TESTED

Ordering Number	Description	Quantities
SS-4-VCR-CS	1/4 in. VCR Union Cross	8
SS-4-VCR-1	1/4 in. VCR Female Nut	20
SS-4-VCR-3-BL	1/4 in. VCR Blind Gland	20
NI-4-VCR-2-VS	1/4 in. VCR Nickel Gasket, Unplated	200
SS-4-VCR-2-VS	1/4 in. VCR Stainless Steel Gasket, Unplated	200
NI-4-VCR-2	1/4 in. VCR Nickel Gasket, Silver-Plated	200
SS-4-VCR-2	1/4 in. VCR Stainless Steel Gasket, Silver-Plated	200

PURPOSE

These assemblies were tested to observe the helium leak test performance after repeated disassembly and reassembly of Swagelok VCR face seal fittings with both plated and unplated stainless steel and nickel gaskets under laboratory conditions.

TEST CONDITIONS

Testing was conducted at ambient room temperature: 70°F (20°C)

Original test date: May 2008

TEST METHOD

VCR components were attached to a manifold. A separate manifold was used for each gasket type. Each manifold consisted of the following [see Figure 1]:

(A) Two 1/4 in. union crosses (SS-4-VCR-CS) bound by (B)

(B) Two 1/4 in. welded rotating female unions (SS-4-WVCR-6-DF) including stainless steel gaskets (SS-4-VCR-2-GR-VS)

(C) Five 1/4 in. blind glands (SS-4-VCR-3-BL) with female nuts (SS-4-VCR-1) and test gaskets.

Testing was performed at all A-to-C connections.

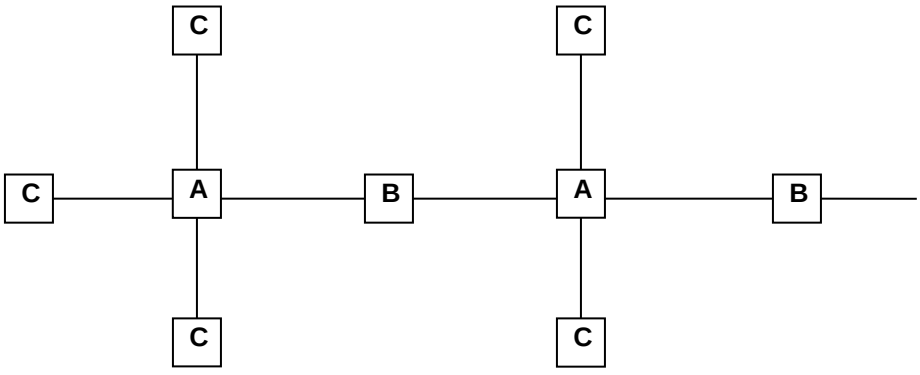

Figure 1

1. With the specified test gasket assembled at each of the five (C) test positions, tightened each VCR female nut to 1/8th turn past finger-tight (TPFT).
2. Tested the manifold and observed the leak rate for each test fitting using a helium leak detector. If no leakage occurred at a maximum leak rate (background level for the helium leak detector), all five gasket samples on the manifold were considered to have passed.
3. Disassembled the VCR fitting at each test end (C), and reassembled the fitting with a new gasket.
4. Repeated steps 1 through 3 until 40 reassemblies were tested for each gasket type.

TEST RESULTS

Gasket Material	Sample Size	Total Disassemblies and Reassemblies	Inboard HLT Background Requirement std cm^3/s	HLT Results
NI-4-VCR-2-VS	5	40	4×10^{-11}	All Passed
SS-4-VCR-2-VS	5	40	4×10^{-11}	All Passed
NI-4-VCR-2	5	40	4×10^{-9}	All Passed
SS-4-VCR-2	5	40	4×10^{-9}	All Passed

These tests were performed to consider a specific set of conditions and should not be considered valid outside those conditions. Swagelok Company makes no representation or warranties regarding these selected conditions or the results attained. Laboratory tests cannot duplicate the variety of actual operating conditions. Test results are not offered as statistically significant. See the product catalog for technical data.

SAFE PRODUCT SELECTION

When selecting a product, the total system design must be considered to ensure safe, trouble-free performance. Function, material compatibility, adequate ratings, proper installation, operation, and maintenance are the responsibilities of the system designer and user.