



Product Test Report

PTR-1269

Swagelok Company
29495 F.A. Lennon Drive
Solon, Ohio 44139 U.S.A.

Ver 02
November 2021
Page 1 of 2

TITLE

Oxygen Test of Swagelok® KPR Series Pressure Regulators

PRODUCT TESTED

Five brass pressure-reducing regulators, SC-11 cleaned with alloy X-750 diaphragms, PCTFE seats, and a CGA 540 inlet connection, ordering number: KPRDJPL412N2PF20

PURPOSE

To observe the ignition sensitivity of the KPR series pressure regulators when subjected to pneumatic impact testing in gaseous oxygen under laboratory conditions.

TEST CONDITIONS

Original test date: June 2006

All samples were tested under the following controlled laboratory conditions by a third-party laboratory.

Phase 1 Testing: Oxygen Pressure Shock Test

Test gas: oxygen (99.5% minimum)
Test pressure: 3600 psig (248 bar)
Test gas temperature: 60°C (140°F)
Pressurization rate: 15 to 20 ms
Minimum pressure hold: 10 sec
Minimum vent between cycles: 3 sec

Phase 2 Testing: Regulator Inlet Promoted Ignition Test

Test gas: oxygen (99.5% minimum)
Test pressure: 3000 psig (206 bar)
Test gas temperature: 60°C (140°F)
Pressurization rate: 15 to 20 ms

TEST METHOD

ASTM G175 "Standard Test Method for Evaluating the Ignition Sensitivity and Fault Tolerance of Oxygen Regulators Used for Medical and Emergency Applications"

Phase 1: Oxygen Pressure Shock Test

1. Configuration 1: The test articles were subjected to 60 rapid pneumatic impact pressurizations with the regulator in the closed position.
2. Configuration 2: The test articles were subjected to 60 rapid pneumatic impact pressurizations with the regulator in the open position with the outlet plugged.

Phase 2: Regulator Inlet Promoted Ignition Test

1. The test articles were set to a mid-flow position.
2. A standard ASTM G175 ignition pill was placed immediately upstream of the inlet connection. (This pill is designed to deliver a 500 calorie combustion event.)
3. The inlet was impacted with high-pressure oxygen igniting the pill.



Product Test Report

PTR-1269

Swagelok Company
29495 F.A. Lennon Drive
Solon, Ohio 44139 U.S.A.

Ver 02
November 2021
Page 2 of 2

TEST RESULTS

Phase 1: Oxygen Pressure Shock Test

No evidence of combustion was observed visually or audibly during the test. Post-test disassembly of each test article found no evidence of ignition, scorching, melting, or deterioration of the seats and seals.

Phase 2: Regulator Inlet Promoted Ignition Test

Sustained, promoted ignition did not occur. Some heat deterioration on each test article was observed, due to the energy delivered by the ignition pill. The PTFE poppet damper ignited and was consumed. No external flame or breach of pressurized test article components was observed during the test.

The third-party laboratory stated that all 5 pressure regulators successfully passed the ASTM G175 Phase 1 and Phase 2 requirements.

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.

Referenced Documents

ASTM G175 "Standard Test Method for Evaluating the Ignition Sensitivity and Fault tolerance of Oxygen Regulators Used for Medical and Emergency Applications", ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA, 19428-2959 USA

Swagelok—TM Swagelok Company