

PendoTECH Single Use Pressure Sensors™: Vacuum Study

Tests performed February 2015

Introduction

This study was designed to investigate the physical integrity of PendoTECH Single Use Pressure Sensors subjected to a deep vacuum for an extended period of time. While PendoTECH does not make accuracy claims for a vacuum, an additional brief test was conducted to show that the pressure sensors can provide meaningful vacuum pressure data.

Materials and Methods

- **Sensors-** PRESS-S-000, 4x Lot 113140 (High 40-45 kGy), 4x Lot 1131350 (High 40-45 kGy), 4x Lot 1132283 (High 40-45 kGy), 3x Handpicked Sensor Standards
- **Monitor-** PendoTECH PDKT-PCS-NFFSS- SN 103207
- **Pressure Gauges-** Crystal XP2i SN 364027, Last Cal 10/28/14 (Vacuum), Druck DPI 104 SN 2936090, Last Cal 4/25/14

Gamma treated luer style pressure sensors were used for this experiment. A manifold of 12 luer sensors was connected to a PendoTECH Filter Screening System, which accepts 12 pressure inputs. Using a vacuum pump, all 12 sensors were exposed to -11.5 PSI for 6 hours. These sensors were then taken to 60 PSI and isolated to note if any leaks were present that would cause a loss of pressure. The sensors were also individually checked for leaks at 60 PSI through the test port (using soapy water and checking for bubbles), which would indicate a leak from the fluid path to the sensor housing and cap.

A separate test was performed with three different pressure sensors chosen for their accuracy at 30 PSI. Each sensor was subjected to a vacuum, and the pressure reading recorded.

Results and Analysis

The sensors performed normally after being subjected to the extended vacuum. All of the sensors read properly, and no leaks were noticed when the sensors were isolated at 60 PSI, through the test port or otherwise.

	<i>PMAT STD #4</i>	<i>PMAT STD #3</i>	<i>PMAT STD #2</i>
<i>Applied Pressure (PSI)</i>	<i>Sensor Reading (PSI)</i>	<i>Sensor Reading (PSI)</i>	<i>Sensor Reading (PSI)</i>
-3.00	-2.9	-2.9	-2.9
-7.00	-6.8	-6.8	-6.8
-10.00	-9.7	-9.7	-9.7
-12.90	-12.4	-12.4	-12.4

The table above shows the results from the second test. In the test range (up to -12.90 PSI), percent error from applied pressure did not exceed 4%.

This experiment confirms that there is no degradation in physical integrity after being exposed to a vacuum for an extended amount of time.

While only PendoTECH luer pressure sensors were used, all of PendoTECH's pressure sensors utilize the same MEMS-HAP™ sensor chip and general electronic assembly. Thus, it can be inferred that these positive results apply to PendoTECH's complete line of pressure sensors.

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