

January 23 – 24, 2017
The Florida Hotel & Conference Center | Orlando, Florida

TE-7 | Monday, January 23, and Tuesday, January 24 | 8:00 AM - 5:00 PM | Two-Day
Course Title: Pressure and Vacuum Measurement

Instructor: Jacob Ricker , National Institute of Standards and Technology (NIST)

Track: Thermodynamics

Type: Dimensional

Technical Level:

Intermediate – students must possess as a basic understanding of course concepts

Course Description:

Making good pressure measurements from ultra-high vacuum to atmospheric pressure and higher requires the correct use of many kinds of gauges and proper use of vacuum technology. Among the most widely used gauges are ionization gauges, spinning rotor gauges, thermal conductivity gauges, capacitance diaphragm gauges, quartz bourdon tube gauges, and resonant silicon gauges. However, the incorrect use of any of these gauges can result in bad measurements that cost time and money.

This two-day course will cover the fundamentals of pressure measurements from 10^{-8} Pa to 10^{+8} Pa (10^{-10} torr to 10^{+6} torr), focusing on the selection and proper use of appropriate gauging technology for a given application. A survey of calibration techniques will be presented along with recommendations for obtaining best performance. Part of the class time will be devoted to set-up of a simple vacuum calibration system. This will enable live demonstration of some of the gauges discussed in the course, and give students an opportunity to participate in the vacuum system set-up and disassembly.

New for this year is a section devoted to the use of piston gauges as the reference standard. We will also bring back the popular overview of good vacuum system design and construction using off-the-shelf vacuum equipment and fittings. Basic vacuum system design do's and don'ts will be covered. Pumping systems, sealing systems, valves, and vacuum plumbing solutions will be briefly covered. For pressures substantially higher than atmosphere, proper selection and operation of piston gauges for gas and oil calibrations will be covered. Attendees are invited to share their own pressure measurement and or vacuum system design problems for in-class discussion.

Instructor Biography

Jacob Ricker mechanical engineer, has over 10 years of pressure and vacuum experience and is currently working at NIST where he develops state of the art vacuum calibration systems and conducts research into the next generation vacuum technology. Jacob maintains and operates the primary standard for pressure and vacuum measurement in the US and is responsible for calibrating pressure and vacuum gauges at NIST in the range of 10^{-3} Pa to 360 kPa. In addition to calibrating vacuum gauges, his vacuum measurement research is focused evaluating different measurement methods and hybrid vacuum gauges for improvement of measurement capabilities within industry and enhancing the dissemination of traceability outside of NIST.