



TELEDYNE HASTINGS INSTRUMENTS

A Teledyne Technologies Company

**PERHAPS THE BEST
ENGINEERED VACUUM GAUGE
TUBE ON THIS PLANET**



RELIABILITY

REPEATABILITY

DURABILITY

ACCESSIBILITY



THE **INSIDE** STORY



All vacuum gauge tubes are not created equal.

We know. We looked inside.

Because Hastings employs proprietary fixturing technology that eliminates physical handling of components, the inside structure of our vacuum tubes is unsurpassed.

Using a clean flame and resistance welding, we create a precision junction between thermocouple wires. We attach the thermocouples to electrical vacuum feed through pins using very sophisticated precision weld technology. Every installed thermocouple is resistance tested to precise specifications.

WHAT DOES THIS MEAN FOR YOU?

The inside integrity of our gauge tubes is miles ahead of our competition — who do not have this capability.

Our stringent quality control demands a tight band of acceptance for output verification and all tubes are 100% leak tested using a helium-based mass spectrometer.

INSIDE A TELEDYNE HASTINGS (THI) GAUGE TUBE

- Clean Surfaces
- Pure and Clean Thermocouple Wires
- Process-Controlled Welds
- Sound and Sturdy Construction

INSIDE OUR COMPETITOR'S TUBES

- Bent Thermocouple Wires
- Stressed Welds
- Contaminants
- Inks
- Potting Compounds
- Lead Solder and Residue

THI : INSIDE VIEW



THI : INSIDE VIEW

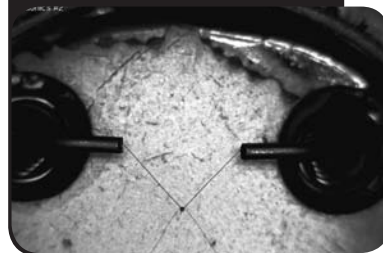


COMPETITOR : INSIDE VIEW

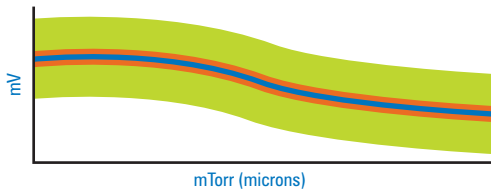


Potting compound, stressed wires and contaminants are clearly visible.

COMPETITOR : INSIDE VIEW



Note inconsistent vacuum solder joint.



REPEATABILITY TEST

Hastings	X
Competitor A	4.6X
Competitor B	103X

We measured the mV output of a sample of gauge tubes. This table shows the spread in output of each manufacturer in high vacuum.

REPEATABILITY: CONSISTENT TUBE-TO-TUBE PERFORMANCE

Our highest standard of workmanship and strict quality control mean consistent performance. You get the same high performance from one tube as you do from the next.

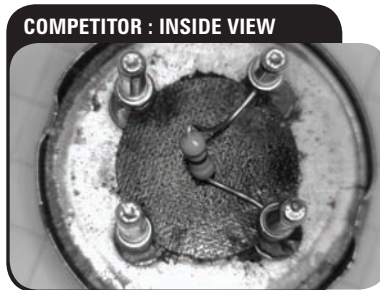
We tested the performance of six different types of THI tubes against those of several competitors. Repeatability tests were performed in a constant temperature

environmental chamber. Output as a function of pressure was measured over a given range of pressures. THI tubes had consistent tube-to-tube repeatability.

With our competitor's tubes, performance was varied and unacceptable. With THI, you get consistent quality.



Consistent TC fabrication means no additional resistors required.



Poor TC fabrication requires external matching resistor.

Tube to tube, the performance you expect, is the performance you get.

VIBRATION TEST

Hastings	PASSED
Competitor A	FAILED
Competitor B	PASSED

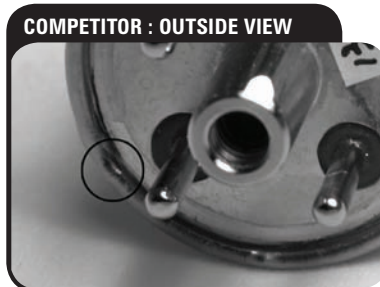
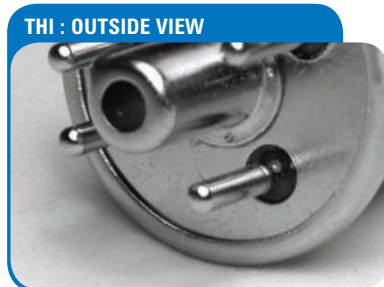
We tested each of the three populations of tubes to "Method 214 of Mil-Std-202, Test Condition IG." This table summarizes the results.

DURABILITY: BUILT TO ENDURE

THI tubes were vibration tested against our competitors using method 214 of Mil-Std-202. Sinusoidal vibration tests were conducted at levels of 30 G peak, and a frequency range from 100 to 3,000 Hz, for 3 minutes on each axis.

Random vibration testing was performed with test condition IG (0.4 G 2 /Hz, 23.91 rms G), for a duration of 30 minutes on each axis.

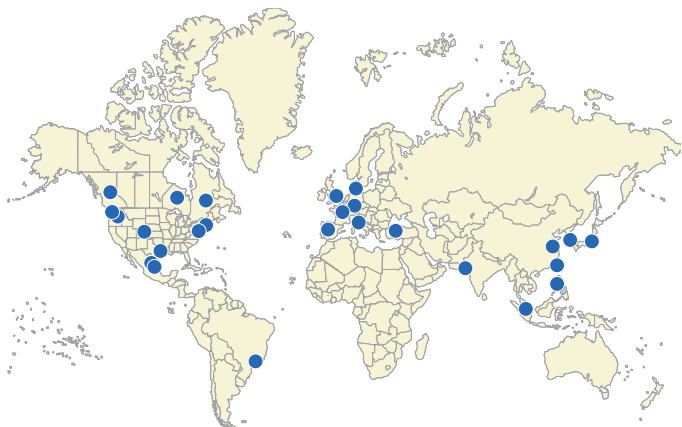
THI easily passed and proved to be a reliable choice. Would you risk your application with a tube prone to failure? Neither would we.



Note inconsistency of solder in vacuum joint.

That's why we design and test THI tubes to withstand the most rugged conditions. They are built to endure.

TESTING NOTES: All gauge tubes tested were new tubes; a minimum of five (5) gauge tubes from each sample were used for each test.



THI WORLDWIDE DISTRIBUTION

- USA: Boston, Houston, Portland, Cleveland, Denver, Philadelphia
- Canada
- Mexico
- Brazil
- UK
- Spain
- France
- Germany
- Denmark
- Switzerland
- Italy
- Turkey
- Japan
- Republic of Korea
- Philippines
- India
- China
- Singapore
- Taiwan

ACCESSIBILITY: ANYTIME, ANYWHERE.

You wanted it there yesterday. Any delay could cost you. You need a proven reliable supply chain that can deliver a vacuum gauge tube, where you need it, when you need it.

We understand this, and fortunately, Teledyne Hastings offers what most competitors do not:

- 99% on-time delivery for all Hastings Thermocouple Gauge Tube products
- More than 20 worldwide stocking locations
- Same day response to your RFQ
- Email verification and tracking provided for each order
- Worldwide network of over 40 distributors and agents
- 48 hour lead time for most orders
- Complete technical assistance provided by email, phone or online

Teledyne Hastings vacuum gauge tubes are there where you need them, when you need them.

Call us or visit us online today for more information about our products and how we can help you meet your needs. **Let's talk!**



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