



Gravity Determination and Deadweight Testers

To establish pressures using a Deadweight Tester the user must account for the acceleration of gravity at the location where the Deadweight Tester is operated. It is important to note that the acceleration of gravity varies substantially around the world. With a range of approximately 0.5%, the local gravity correction is typically the largest environmental influence acting on the Deadweight Tester.

The most accurate method for the user to determine the acceleration of gravity at the laboratory or other site where the deadweight tester will be used is to have a site survey performed. There are various companies that can provide this type of service. Although this is the most accurate method, it can also be expensive.

To determine the acceleration of local gravity value when a survey or site measurement is unavailable, the resources listed below are available on the Internet.

1. Use one of the following options to determine the Latitude and Longitude at the site the DWT will be used:

a. Obtain Latitude and Longitude coordinates using a GPS Receiver, or

b. Use an Internet-based geo-coding program

<http://maps.google.com> (use "link" button to show Lat-Lon)

<http://www.getlatlon.com>

<http://mapper.acme.com>

<http://itouchmap.com/latlong.html>

2. Enter Latitude and Longitude coordinates into one of the following internet-based programs:

a. NOAA/NGS web site (limited to the contiguous 48 USA States)

http://www.ngs.noaa.gov/cgi-bin/grav_pdx.prl

b. PTB (National Metrology Laboratory of Germany) web site (Global)

<http://www.ptb.de/cartoweb3/SISproject.php>

Pressurements brand Industrial Deadweight Testers are provided with weights that have been trimmed to specific mass values that provide nominal pressure increments when operated at standard environmental conditions. If the local gravity value is provided by the customer on the purchase order, the weights will be trimmed for that value at no additional charge. If the customer does not provide their local gravity, the weights will be trimmed for International Standard Gravity (9.80665 m/s²). Additionally, [PressCal software](#) can be used to achieve the optimum performance from the instrument, or if the customer wishes to use the instrument at a different gravity than the one provided or at non-standard environmental conditions.

High performance Ruska Laboratory Piston Gauges are provided with calibration reports stating actual mass values, in nominal mass increments. Our [WinPrompt software](#) then uses these mass values and the local gravity provided by the customer to calculate the actual generated pressure.

For customers that do not have a site survey, the methods available on the Internet provide a possible resource for determining the gravity at their location. The uncertainties estimated using this method range from about 0.0002% up to 0.002%. Customers should use these at their own discretion to determine if the local gravity provided is suitable for the intended use.

For additional information, please contact: jim.henke@ge.com.

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