# Instron® TechNotes

**Getting the most up-to-date information on materials testing**

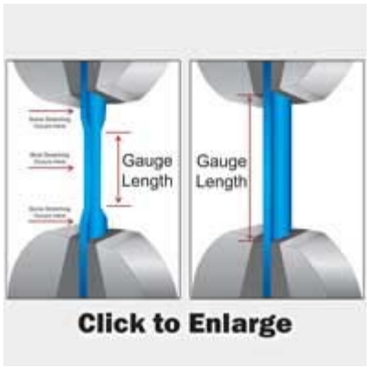
**In This Issue**



**ISSUE 17**

## Tech Tip

### Indicating the Correct Gauge Length for Your Specimen




Understanding how specimen dimensions differ is important when setting up your calculations for a tensile test. Most calculations are based off stress and strain, and since both are dimension dependent, it is important to specify the correct values.

For specimens that have the same cross-sectional area from end to end (tubes, rods, rectangles and fibers), the gauge length is determined by simply measuring the distance between the grip faces (refer to image).

However, the most common shape is the "dog bone" specimen (refer to image). Unlike the specimens mentioned above, its non-uniform shape often causes mistakes in identifying the gauge length. When a "dog bone" specimen is tested, most of the stretching occurs within the narrow region and not in the tabs because they have a larger cross-sectional area. Since most of the stretching occurs within the narrow region, that length should be used as the gauge length.*

*Note: There is a small amount of stretch within the tabs of the specimen. In order to get the most accurate strain results, we suggest using an extensometer.

## Tech Tip

### Using Grips in a Low Temperature Chamber

Many Instron customers use standard grips for high and low temperature testing. While this approach may work, there are a few precautions to note.

The foremost issue with using standard grips at low temperature is corrosion. This stems from the fact that the finish on standard grips is intended to protect the metal from corroding as a result of being exposed to normal lab air above condensing temperatures. However, if the grips are cooled and exposed to moist air, the moisture in the air will condense on the grips and potentially cause the metal to corrode. This effect can be minimized by keeping the moisture content in the lab air low, heating the grips to dry them, or purging the chamber with inert/dry gas to rid the cooled environment of moisture.

Furthermore, if the grip is pneumatically operated, it presents two problems: one is finding a way to get the air through the chamber to the grip; the other is frosting when the air is released into the cold environment. Moisture from the frosting can cause the grips to rust. Again, this can be minimized by using dry air or by bringing the grips through a heating cycle before each test to dry them. Additionally, check that the lubricant needed for the standard grips is rated for the test temperatures and that the internal seals are not damaged, which can cause the grips to leak or malfunction. If not, it needs to be replaced with one that is rated for the test temperatures.

A better approach is to use grips made from non-corrosive materials that are specifically designed for use in [high and] low temperature chambers. These grips are designed to last in extreme temperatures and offer an extra level of safety for operators. For instance, the foot pedal actuation of the pneumatic and hydraulic actuated grips eliminates the need for an operator to touch hot or cold surfaces, which may cause burns. In addition, there are extra handles on temperature-rated mechanical wedge grips; the four-handle design guarantees that one handle will always be in the front – removing the hazard of an operator reaching deep inside the chamber.

If you have questions about temperature-rated grips and accessories, contact an application specialist.

### Subscribe Today!

Subscribe and tell us about your interests and you will receive a free testing tips pamphlet.


Subscribe >>

### Ask the Expert

**Have a question about materials testing?**
Submit your question and you may see it featured in a future issue of TechNotes.

Ask Us >>

### FREE iPod Nano

Tell us about your testing and you could win an iPod Nano!

Learn how >>

## You Asked - We Answered

**Q: What happens if power is suddenly lost during a test? Will I lose all my data in Bluehill?**

A: Bluehill Software is designed to automatically save test results in the event of power loss and computer shutdown. When Bluehill restarts, the software will inform you that there was an interruption, and give you an option to recover the test file. You can continue testing after the file is recovered.


## What do you think? Tell us!

INSTRON
Worldwide Headquarters
825 University Avenue
Norwood, MA 02062-2643 USA
http://www.instron.com/