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

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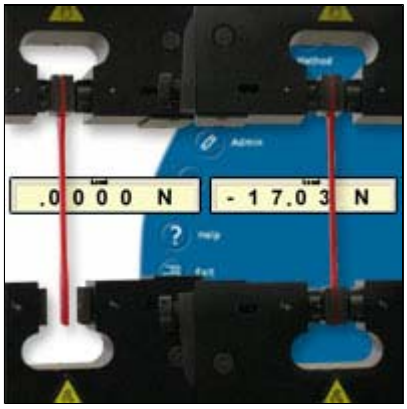
Tech Tip

Why do I see a negative load after clamping my tensile specimen?



This is due to the fact that material is being forced out of the grip as a result of the squeezing, which can cause a compressive load on the specimen, even with the best grip – in particular for softer materials such as elastomers.

When the sample is clamped in one grip, there is no apparent load on the sample since it still has a free end. However, when it is squeezed by the second grip, the material flows out of the grip, causing the specimen to be in compression. This will show up as a negative load on the readout – before the test has begun.

If this is the case, you should NOT balance out the load because the load you see is real; balancing it would introduce error into your test results. If you are experiencing this, you need to move the machine's crosshead to remove the compressive load. There are two ways to do this:

1. Manually adjust the crosshead, for example with a thumbwheel; or
2. Through software features, like the preload function (referenced in our January 2007 issue).

Alternatively, we suggest using the load protect feature, which limits the maximum force applied to your specimen by automatically ensuring the force on your specimen remains within the pre-set bounds. It removes the possibility of the crosshead going into compression in real time.

If you are not sure if your system has these features, or if you would like more information, contact one of our applications specialists.

Tech Tip

Hardness Testers: Closed-Loop or Deadweight?

Deadweight, or open-loop, testers have been performing hardness indentations since the Rockwell test was developed. They are still a popular and efficient way to perform a hardness test. A deadweight system utilizes stacked weights to apply a magnified test force at the indenter. Minor or pre-loads are applied by a spring or a smaller weight.

More recently, closed-loop hardness testing techniques have

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been developed as an alternative method of load application. Closed-loop testers use a force measuring device (a load cell), instead of a stack of weights, to measure and regulate the applied force by a motorized actuator. This system constantly monitors and adjusts the applied force, virtually eliminating force errors and increasing tester accuracy and repeatability.

Take a video trip to our Applications Lab and watch a Hardness expert explain this Tech Tip.

You Asked - We Answered

Q: How can I measure the torsional properties of a pipe or cylinder?

A: This requires a test machine with a torsional drive system, as well as a torsion (torque) load cell. Some tests also require use of a torsional extensometer. Instron has a range of grips and test fixtures to suit a wide variety of test specimens. For testing pipe, it is normally necessary to plug the open ends to prevent crushing of the specimen during gripping. For testing sections that are cut from a pipe, it may be necessary to use special grips because of the curved surface of the specimen. You can view Instron's standard torsion models on our website.

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