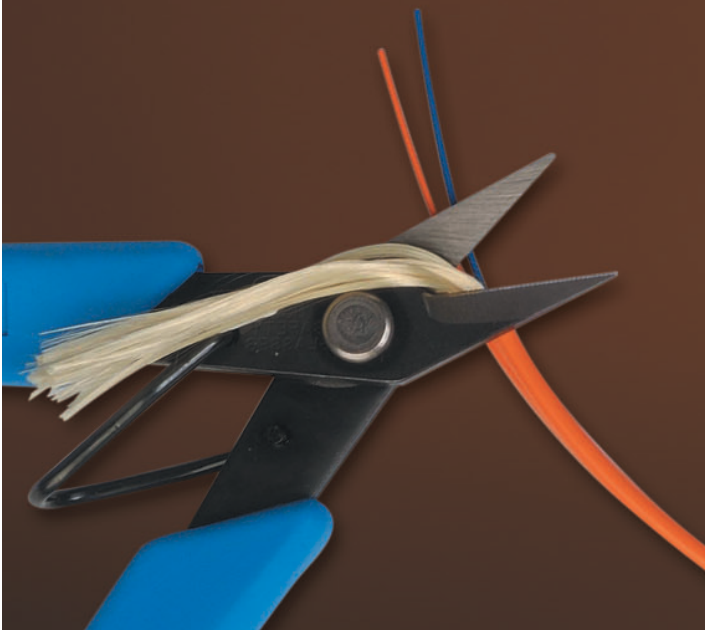


# SHEAR FACTS

2 Shear Facts Questions and Answers

shears



## shear facts Q&A.

### Q. Why do Micro-Shear® flush cutters cut so well?

**A.** The term Micro-Shear® flush cutter is a registered trademark of XURON CORP. and is applied only to our products which utilize our patented, blade by-pass shear cutting action.

Conventional wire cutters utilize a compression-type cut, with the advancing cutting edges forcing the metal of the wire out of their way.

Micro-Shear® flush cutters utilize a shearing cut, with the by-pass cutting edges slicing cleanly through the metal (see illustration at bottom of adjacent page).

Shear cutting greatly reduces mechanical shock delivered to the component and requires only about half the effort to cut a wire as compared to conventional compression-type wire cutters.

### Q. What's the difference between a Micro-Shear® flush cutter and a conventional wire cutter?

**A.** All primary cutting surfaces on our 170-II, 410 and LX Series Micro-Shear® flush cutters are generated on high precision, three microprocessor-controlled, self diagnostic grinding equipment. The grinding on every blade is as precisely identical to that on every other blade as their computer controlled tolerances allow. It is also exactly the same type of grinding as used on such fine tools as LINDSTROM® and EREM®.

We're not suggesting any company use XURON Micro-Shear® flush cutters instead of these other great tools, but why should you sacrifice that level of quality just because your requirements call for "economically priced" tools?

### Q. Why do Micro-Shear® flush cutters last so long?

**A.** XURON Micro-Shear® flush cutters ensure durability by design. Let's use a little basic physics to illustrate how:

If you generate 10 pounds of pressure on the grips of a conventional, compression-type wire cutter to cut a wire, that 10 pounds of force must be dissipated somewhere (Law of Conservation of Energy). Part of it is dissipated into the severed section of wire, which is why it sails across the room. A portion travels down the lead wire and is dissipated into the component or solder joint,

# SHEAR FACTS



which can cause damage. The balance is dissipated into the opposing cutting edge of the cutter, which is why they get dull.

Using a Micro-Shear® flush cutter requires only about half the pressure (approximately 5 pounds) to cut the same wire. Part of the force is dissipated into the severed section of the wire. But if you're using our patented lead retainer the wire won't sail across the room. Because of our shearing cut very little is dissipated into the component or solder joint; the rest is dissipated into the opposing cutting jaw. Because of our blade by-pass, edge-to-edge contact is eliminated and the life of our Micro-Shear® flush cutter's precision cutting edges is extended.

**Q.** What is the difference between a stamped tool and a drop-forged tool?

**A.** Precision stamped Micro-Shear® flush cutters have more in common with precision drop-forged tools than with conventional drop-forged tools.

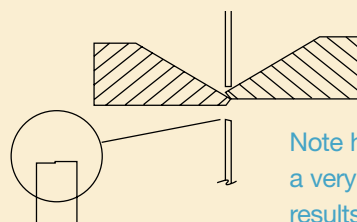
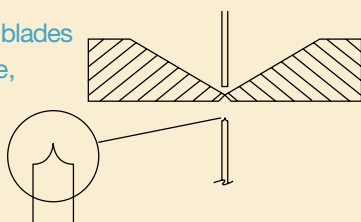
The most obvious difference is that the blank shape of a drop-forged tool is created from hot metal. A stamped tool does not require heat at this stage. Beyond this point the differentiation becomes less distinct.

In conventional drop-forging a crude, basic shape is created. With precision drop-forging a more refined shape with reference points for subsequent grinding operations is created. Conventional drop-forged tools typically then undergo hand-guided grinding operations. With precision drop-forged tools these grinding operations are usually done with computer controlled machines utilizing the reference marks on the blank.

When we manufacture precision stamped Micro-Shear® flush cutters a refined shape, complete with reference points for our computer controlled grinding operations, is generated in the stamping process.

All tools, regardless of the method of manufacture, have to be heat treated. In the electronics industry return springs and cushion grips are required. The distinction between drop-forged and stamped tools is further blurred since, due to the high density areas electronics pliers are required to be able to work in, one of the more popular head configurations on drop-forged tools is the "relieved head." On these tools additional grinding operations remove head stock to reduce the tool's profile, increasing access and maneuverability. The result is a head shape very similar to our standard XURON Micro-Shear® flush cutter.

Compression cutter blades meet edge-to-edge, causing a spiked cut and an eventual dulling of the tool.



This is a cross section view of a XURON Micro-Shear® flush cutter from the tip end.

Note how the blades by-pass – this is a very important patented feature that results in a clean square cut with no spikes.

# HAND TOOL ERGONOMICS

## 12 Hand Tool Ergonomics Questions and Answers

### hand tool ergonomics Q&A.

#### Q. What are ergonomic hand tools?

**A.** All hand tools, by definition, are ergonomic, otherwise you wouldn't be able to do any work with them. What's really important are the ergonomic enhancements that have been (or can be) made to your tools. Let's examine several different aspects:

**1. Force** — The amount of force required to use a tool includes the force necessary to overcome resistance in joints and any return spring(s) in addition to the force actually required to cut, grasp or bend. XURON manufactures only Micro-Shear® wire cutters. Their patented shearing cut requires about half the force required by a conventional compression-style cutter to cut wire. High precision screw and post joints on the 9000 Series reduce internal friction and our return springs provide lively action with low operating pressure.

**2. Comfort** —A number of factors determine if a hand tool is comfortable: the shape of the grip and its size, the amount of contact surface with the hand and the contour of the contact surface, the resiliency of the grip material, and the overall weight of the tool; all influence whether the tool will be comfortable in your hand. The comfort of the tool should be apparent the moment it's picked up. Comfort should also be assessed after extended use.

Micro-Shear® Flush Cutter grips feature broad, flat contact surfaces molded from Xuro-Rubber™. The grips on the 9000LH tools traverse the width of the hand, helping to eliminate pressure points while reducing pressure at any given point. Grip spread in the closed position is under 2", a comfortable dimension for most hand sizes. Weight is very low, ranging from 1.9 oz. for a 170-II to 2.7 oz. for a 9000LH Series shear.

**3. Visual** — Reflective surfaces cause glare, which promotes eye strain and fatigue. Positioning, especially in dense areas or under adverse lighting conditions, is troublesome and fatiguing if there is poor contrast between the tool and the workpiece.

XURON tools feature a non-glare bright finish or a



glare-eliminating black finish, giving you the option of selecting the appropriate finish for the work.

**4. Auditory** — High sound levels in the workplace are another important fatigue factor. XURON 590 Micro-Pneumatics™ help reduce workplace noise levels with their quiet operation (<60 DbA).

#### Q. Will hand tools with ergonomic enhancements eliminate cumulative trauma disorders (CTD), such as carpal tunnel syndrome?

**A.** No. No hand tool, regardless of ergonomic enhancement is capable of being a "magic bullet" and eliminating possible cumulative trauma disorders. The enemy is still the repetitive nature of the work and fatigue. With ergonomically-enhanced hand tools fatigue is postponed and trauma is reduced. The goal is to postpone fatigue to the point where a rest period occurs before the tool user fatigues.

For the estimated 20% of the population that is predisposed to CTD, no hand-operated tool is going to eliminate the problem. Assessing the work and the people doing the work is essential in choosing appropriate tools. Some form of automation, such as a pneumatic tool, is indicated in high volume, repetitive motion work situations.