Cutting Edges

All high quality cutters are Compression cutters. This means that both cutting edges cut on the same plane. The cutting motion stops when the two edges hit each other.

Precision cutters such as Tronex tools are machined as matched pairs of cutting edges. Nevertheless there is generally some edge rounding, some edge overlapping, or some other edge imperfection that prevent the two edges from coming together as two razor blades. The result is that cutting performance may be erratic and very fine leads (0.5mm and smaller) may not be cut at all.

Manufacturers of very low grade, rivet joint tools stop here. However, all manufacturers of precision cutters provide a final edge finish to yield top cutting performance. No tool on the market can match the edge finish of Tronex cutters. Edge finish is best examined by looking at the back, or printed circuit board, side of a cutter. Tronex standard cutters are available in three edge finishes:

SEMI FLUSH 

Both cutting edges receive a very small bevel by diamond honing over the entire outer length. The bevels are at 90 degrees to the plane of the cutting surface. The bevels are no more than 0.25 to 0.35mm in width. When the cutter is closed the bevels form a V-shaped groove along the length of the cutting edge. This beveling results in a fine but very rugged interface between the two edges. In many applications a semi-flush Tronex cutter can produce hundreds of thousands of cuts before resharpening is necessary. However the lead or wire being cut will have a raised surface, or “pinch”, exactly in the shape of the V-shaped groove.

FLUSH 

Both cutting edges receive a tiny bevel by diamond honing over the entire outer length. The bevels are at 60 degrees to the plane of the cutting surface. They are no more than 0.12mm in width and thus form an exceptionally small V-shaped groove along the edges. This beveling also results in a rugged and very long-lasting cutting edge interface. It also yields only the tinniest raised surface, or “pinch”, on the cut lead. Many users of Tronex cutters believe that the Flush edge finish provides the most desirable balance between long cutting life, flush cut leads, and cost.

RAZOR FLUSH® 

There is no bevel on either cutting edge. The backside, or printed circuit board side, is absolutely flat at an angle of 45 degrees to the plane of the cutting surfaces. The exceptionally sharp edges produce cuts with virtually no raised surface on the lead. (Under a loupe you can see a line on the lead where the edges come together but you will not see a “pinch”). Also, minimum shock is imparted to the cut lead or component. However, more frequent sharpening is required with a Razor Flush® cutter. The Razor Flush® edge finish on Tronex cutters is executed by a proprietary process and thus unmatched by any other precision cutting tool in

the world. It is also the edge finish selected for almost all specialty cutters (tip cutters and angulated cutters) made by Tronex.

Almost all shear cutters are devices with only coarse cutting ability and very limited tool life. This is because the cutting edges do not really meet together for a fine, accurate cut. They pass by each other, moving in planes that are close but separate. Cutting edge motion stops when the two handles come together. This is the action of the stamped cutter. It is also the action of the paper scissors and the garden shears. Effective on large wire and for light usage. When the rivet joint loosens the hand shear must be discarded. Also, since the edges are only case hardened, a dull or worn stamped cutter can not be resharpened. Stamped shears also impart considerable shock and leave a significant pinch reflecting the clearance between the two edges.

There are exceptions to the common variety hand cutting shear. They are the Tronex cutter models 7030 and 5030. They are precision tools made with interlocking threaded joints and heat treated cutting edges. The Tronex standoff shear cutters are designed with a cutting ridge mounted on a stationary leg. The leg is placed next to the lead being cut. A sharpened and hardened cutting edge is then moved through the lead and over the cutting ridge. These versatile tools use the shear cutting principle in order to achieve a predetermined lead length (or “standoff”) to insure that components or solder joints below the lead are not damaged.