Cuts made to prepare a sample for tensile testing are critical to the accuracy and quality of the results. Preparing a sample without jagged edges or nicks is vital to ensure accurate tensile results. Those imperfections will affect the ability to provide consistent tensile results for the physical properties of the specimen. The way a sample is handled can also have an impact on the tensile test results and should also be handled with care once cut.

Let's look at the importance of sample preparation using an example testing ASTM D882 for Tensile Properties of Thin Plastic Sheeting. This test method covers the determination of tensile properties of plastics in the form of thin sheeting, including film (less than 1.0 mm (1,000 microns) in thickness). Specimens are placed in the grips of the universal tester and pulled until failure. For ASTM D882, the test speed and grip separation are based on the elongation to break the material. Elongation and tensile modulus can be calculated from crosshead displacement.

**Specimen Size:**
Uniform width, thickness, and 2 inches longer than the gage-length

**Sample Width:**
It shall not be less than 5mm, or greater than 25.4mm (selection of common width: 15mm or 25mm or 25.4mm)

The utmost care shall be exercised in cutting specimens to prevent nicks and tears which are likely to cause premature failures. The edges shall be parallel to within 5% of the width over the length of the specimen between the grips. Microscopical examination of specimens may be used to detect flaws due to sample or specimen preparation.
For the purpose of demonstrating the importance of the sample cut, two preparation tools were evaluated - the JDC Precision Sample Cutter and the MTT 1” Strip Cutter. Using a black plastic film, images shown are a 200 time magnification of the cuts made:

The results clearly show the quality of cut make a large difference in the results!