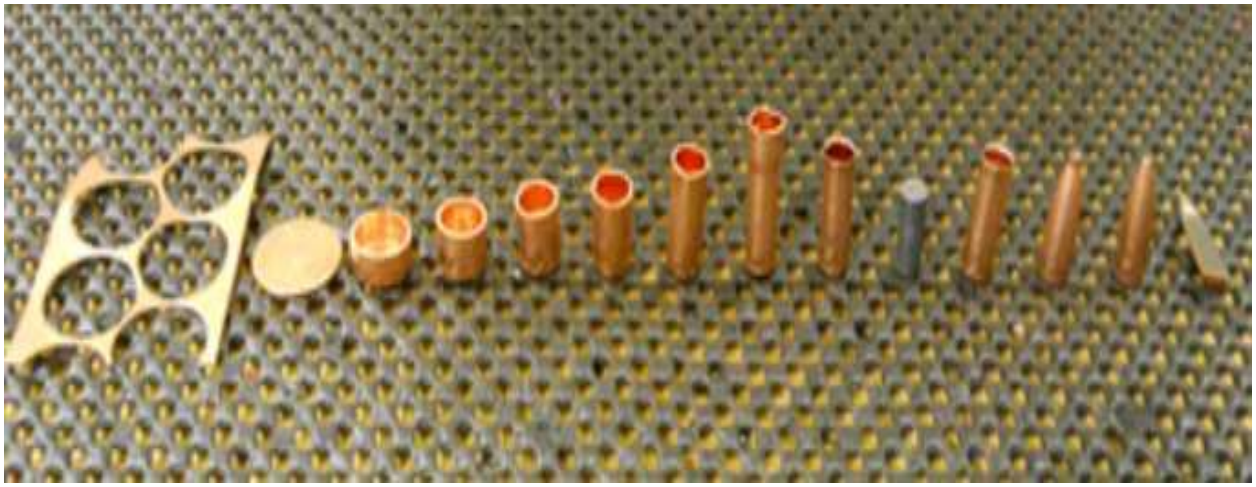
Trusting Bullet Components

When a metal such as copper is under extreme pressure it can be easily be transformed into almost any shape. The following picture is a very good example of the forming process at work. When copper is subjected to these types of pressures, it will yield and flow to the path of least resistance. Each time the forming process is repeated, the copper material will become worked hardened more and more after each stage.



The same principals apply to many other metals. Steel wire pulled through a die to form a smaller diameter will produce a stronger wire. This is how high tensile strength wire is made for suspension bridges. Lead cores subjected to forming die pressures will develop hard spot in them also. These same lead cores can be swaged inside of very high quality copper jackets that measure perfect wall thickness. As a jacket and the lead core are married together under high pressure. Both copper jacket and lead core will flow to the path of least resistance filling the die cavity, creating the jacket thickness variation. That can easily vary from bullet to bullet, depending on hardness variation in the lead cores. When lead cores are cut to length they are sheared at the top and the bottom making both ends slightly harder than the middle. I would imagine that the manufactures of lead wire used to make bullets are not worried about how your bullets are going to fly. Lead wire can contain a lot of different impurities that can alter its hardness. Anyone that has ever casted lead bullets knows lead hardness's can vary because of lead content, also hardness is also subject to how lead is cooled and finally hardness can be affected by work hardening during the core cutting process. A lot of reloaders and custom bullet makers are not paying enough attention to the lead core and how the jacket variations are being created in the final bullet forming stages. After the tip is formed there is no way to measure the wall thickness of the jacket to find out if the copper jacket has flowed to one side more than the other.

The picture below shows the lead core being squeezed out of the tip under extreme swaging pressures. Copper is also flowing to one side of the lead core more than the other during this tip forming stage.

The picture below is a bullet that was sectioned to show the result of these extreme pressures. The copper jacket on the bottom is almost two times as thick as the top. You can measure the jackets before the tip forming process with measuring instruments that can measure to a ten thousandth of an inch. After the tip is formed this type of jacket variation becomes hidden and this is what the Vern Juenke machine was designed to detect. The bullet manufactures have tried their best to control the quality of the components that they use in bullet making. But somehow we still get bullets like these in the box.

Hope this helps.

Matt the BulletDoctor