How It's Made: Barber Scissors

 People who cut hair will tell you the most important thing when deciding on a pair of barber shears to purchase, is how long is the cutting blade going to last. There are many types of barber shears out there. From the inexpensive one that you can buy at your local retail store like Wal-mart or Target, to the expensive professional pairs that you must purchase from a legitimate seller. Today we are going to look at what goes into making professional barber shears. What gives them the long lasting cutting edge and what makes them worth every penny of their expensive price. There are three things that need to be taken into account when deciding which pair of scissors is the best. They are what type of steel, how were the scissors processed, and lastly the manufacture style of the scissors.

 The first thing that you will notice about all barber shears is that they are made out of metal or steel. Steel is a mixture of carbon and iron mixed together at a very high heat. The next thing you will notice is that the steel is not just any steel it is made out of stainless steel. Stainless steel is made by adding chromium to the carbon and iron mixture. When the steel mixture contains at least 11% Chromium it will prevent the steel from rusting or turning a reddish orange color, this is where the name stainless comes from. Chromium must be added in large volumes because the carbon in the steel reacts with the chromium. Carbon has the ability to react with up to 17 times its own weight in chromium. The only down side to chromium is that it does not increase the strength of the steel. Once the desired amounts of carbon, iron, and chromium are in the mixture it is time to decide how are the scissors going to be made. There are many ways in which this can be done. They can be forged, cold stamping or molded. The process of cold stamping is most commonly used for inexpensive scissors. The process known as molding is most commonly used for pruning shears, paper cutters, or other heavy duty cutting shears. The process that makes the best results which is why it is mainly used for barber scissors is forging. Forging is where the desired starting material is heated until it is red hot. After that it is place on an anvil that has the bottom half of the pattern pressed in it. Once it is in place a ram comes down and presses the other half of the pattern into the hot metal. The ram presses down with tons of force. When the ram retracts it leaves a rough blank shape of the scissors. Next the rough blank must be cleaned up. This is a process where the rough edges of the scissors and any leftover material is trimmed away. Next the pivot hole is drill. After the general shape for the scissor you must decide how you are going to heat treat and cool the material so that strength can be added to the scissors. The main reason that you would want to heat treat your barber scissors is so that they are more resistant to wear. This is important because hair is very tough and can take a toll on the cutting edge of the scissors. There are many different medias in which metals can be heat treated. But when looking at barber scissors there are three main methods used for heat treating they are a salt bath, an environment chamber, or by induction heating. In the salt bath method the parts are hung and the dipped into a hot bath of salts that is around 1500 to 2000 degrees Fahrenheit. In the environment chamber the parts a placed into a big oven and then heated. In the last method induction heating the parts are placed in an oven and electricity is passed through the parts. This caused that parts to heat up and induce hardening.

 During the heat treating process we are trying to get the crystals in the metal to start changing into different phases. The phase that we are looking for is martensite, this is because martensite is the strongest of the phase in which metal can go through. The only way that martensite is to cool the metal very rapidly or quenched. When the metal is cooled very rapidly the carbon gets stuck inside the iron atom structure. If the metal were allowed to cool slowly the carbon would be forced out of the atom structure and would clump together causing the metal to have less strength. Martensite however is an unstable phase. This means that it will want to change to a different phase that will be weaker than martensite. To avoid this from happening there is a process known as tempering that can be done to turn the martensite into a ferrite structure. In this ferrite structure the carbon is pushed out of the atom lattice structure but it is not allow to clump together. The clumping of the carbon atoms is what causes the material to be weaker. In the process of tempering the product, in this case barber scissors, are reheated for a short period of time and then allowed to cool. The time that the material or product is heated all depends on the shape and mass of the object. For something like scissors that does not have a lot of mass it only take about 30 minutes to reheat. The scissors are heated up to temperatures between 350 and 500 degrees Fahrenheit. At these temperatures the martensite changes to a ferrite structure and the carbon atoms begin to move into the open spaces in the lattice. After this starts occurring the but before the carbon atoms begin to clump together the process is stopped. In order to stop the process the scissors must be quenched. Quenching is a process where the material that is being heated is dipped in a colder substance, normally some type of liquid. Many different types of liquids can be used but the most common are oil and water. Quenching in a sense freezes the metal in a phase know as tempered martensite. We are looking for tempered martensite because regular martensite may be strong but it is very brittle. It is so brittle that if a barber tried to uses the scissors on someone's hair while being in the pure martensite phase they might shatter because they are so brittle. After the scissors are hardened they are ready to be cleaned up and given that extra shine. Also the blades are now sharpened. To shape the blade of the scissor the blade end is pressed against a grinding wheel or sanding belt. The part can begin to heat up during grinding. This can be bad for the overall strength and the straightness of the blade. To avoid the part from heating up water is run over the part to cool it. The grinding process gradually changes the amount of grit that is on the sanding or grinding wheel. It starts with the paper that has the most grit. This is because it takes more material off and starts giving it shape. After slowly working your way through the different grits you will finally arrive at the polishing wheel. The polishing wheel is where the scissors are now shined up. Next the two blades are finally put together. This is done by placing a screw into the holes that were drilled in the earlier steps. Barber scissors normally have an adjustable screws so that they can modified to perform better. Next the scissors can be chromed to give the even more shine. To chrome the scissors they are placed on hangers or hooks and then dipped in to a series of baths. The first bath is a cleaning bath. This bath is used to remove and dirt or oils that are left on the parts for previous steps. Next the parts are dipped in to big vats that contain liquid chromium. The parts are allowed to heat up to the same temperature as the chromium solution. Once they are at the right temperature electricity is passed through the vat which cause the chromium to stick to the part. This is because the chromium vat has one type of charge and the parts have the opposite. Lastly the scissors are taken out and allowed to cool. The final step before the scissors may be purchased by the customer they must be tested. To test the scissors they are applied to certain types of fabric. To test and see how sharp the blades are the cut is inspected. If the scissors are not shape enough they will tear the fabric. On the other hand if they are sharp enough they will cut the fabric with a nice clean cut. Now they are ready to be packaged and sold to the customer. So next time you are buying a pair of barber scissors remember to check and see how they were made.