

For use in welding there are several kinds of welding compounds, as borax, iron filings, fine sand and numerous other preparations. The purpose of welding compounds is to keep the air from getting in contact with the iron or steel when heated. When air is forced through the fire, the heat and air combined will form iron oxide or scale on the iron which has a higher melting point than iron or steel. Then to produce welding heat one would have to heat the iron hot enough to melt the scale and in doing so would burn or ruin the steel. Therefore the welding compounds are to protect the iron from formation of scales. It is used mostly in welding steel tools, as steel is very easily burned because it contains carbon and if steel is burned it is useless. Welding compounds should be put on the parts to be welded after you have them at a good red heat. The heat of the iron will melt the compounds, and it will flow over the surface and form a coating and this will protect it from scale. It is not well to put on too much as a thick coat will form, which is no use and therefore is wasted.

In making a cold chisel, heat the steel to a bright red color and draw it out to the shape of a wedge, hammer it on all sides as nearly as possible, do not let the sides spread out, but keep them straight with the bar. Draw out to the thickness of about one sixteenth of an inch, then cut off about three eighths or more to be sure an edge of sound steel is reached. Now finish by giving it a good hammering so as to get a tough grain; to do this heat to a very dull red and hammer it quickly on both flat sides, beginning with quite heavy blows and striking lighter as the steel cools. Do not hammer after the red color disappears. This hammering may spread the edge of the cold chisel wider than you want it, but do not strike it on the edge as this will spoil what you have already accomplished by hammering it on the sides. The edges can be ground off or filed off afterwards. The sharpening should be done after it has cooled.

Tempering steel tools consists of two processes, first hardening by heating, then suddenly chilling or cooling, and second, "drawing the temper" or softening from the chilled state to the degree of hardness desired. When steel is reheated after being chilled, several colors will be seen; first a pale yellow or straw color, then darker yellow, which changes to a brown, a purple and then blue. These colors will form a band which will be seen to move towards the edge or cooler part of the tool. When a piece of steel is cooled, and its color is of a pale yellow or straw, it is very hard. Tools, as stone drills, are colled off when this color, darker yellow for hammers, dark purple for drills, for drilling in iron. Purple tinged blue is for cold chisels, screw drivers, etc. Dark blue for springs, soft cold chisels and saws.

In tempering a cold chisel, heat the whole chisel to a cherry red color, then dip about one inch of the end in the water, move it about in the water for a few seconds or until the edge is cool enough so that the water will not dry on it for two or three seconds after it is taken out. Now polish one side quickly with a piece of brick or an old file so the colors may be seen. A cold chisel needs to be quite soft, so we should wait until the purple or blue gets to the edge, then quickly dip the edge into the water again and hold it there until it is cool enough so that we may dip the whole chisel without fear of hardening it. Other tools are tempered in much the same way, but the second dipping must take place when you have the proper color at the cutting edge for that particular tool.