

How to Temper Mild Cold Rolled Steel

Heat treating and tempering mild cold rolled steel is a process slightly more complicated than simply heating and quenching the part that you want to harden. Tempering the steel has the effect of hardening the cold rolled steel while at the same time helping to avoid the brittleness inherent in a simple heat and quench operation. To temper the steel, you have to maintain a close watch on the temperature that the steel reaches. Heating it too much can result in fractures within the alloy that will compromise the strength of the part.

Things You'll Need

- Propane torch
- Locking pliers
- Baking oven
- No-touch thermometer
- Metal bucket
- Leather gloves
- Water

Step 1

Fill the metal bucket with water until it is deep enough to completely quench the metal part you intend to temper. Place the bucket near your work area, and pre-heat the baking oven to 500 degrees.

Step 2

Clamp the metal between the jaws of the locking pliers and put on your leather gloves. Even though you will not be touching the metal itself, the pliers will quickly grow hot enough to cause burns if you aren't careful.

Step 3

Heat the part with the propane torch until it has reached a light red coloration that isn't quite pink. Check the temperature of the part with the no-touch thermometer. For mild cold-rolled steel, the part must be brought to a temperature of no less than 1,500 degrees.

Step 4

Quench the part in the water until the water ceases to sizzle, and check the temperature of the part again. It's temperature should be reduced significantly. Immediately place the part into the heated oven and close the door. Bake the steel part in the hot oven for approximately one hour, checking the part occasionally with the thermometer to be certain that the part has reached the necessary temperature range.

Step 5

Remove the steel part from the oven after one hour, and allow it to cool down naturally. Do not quench the part. This natural cooling process helps the steel maintain its ductility while at the same time preventing the steel from becoming brittle.

References & Resources

- ["The Backyard Blacksmith: Traditional Techniques for the Modern Smith"; Lorelei Sims; 2006](#)
- ["The Complete Modern Blacksmith"; Alexander Weygers; 1997](#)
- ["The Art Of Blacksmithing"; Alex Bealer; 2009](#)