

Quench that Steel!

Before heating the steel contains tiny crystals of nearly pure iron and its carbon is located outside those crystals. At red heat (around 800°C / 1742°F), the <u>carbon dissolves into the iron</u> and the steel becomes homogeneous.



Master swordsmith Yoshindo Yoshihara plunges a heated blade into a trough of water. This process is known as *"Yaki-ire"*. (© L. Kapp)

When the steel is then quenched in water, the dissolved carbon atoms scramble frantically to get back out of the iron crystals but they don't have time to escape. They're trapped.

The resulting carbon-stuffed iron crystals are incredibly hard, and at the heart of a good cutting edge.