

Product information

Hardenable Stainless Damascene steel, 93x,x

Heat treatment - Hardening

This is an instruction about hardening the martensitic knife steels.

The instruction does not apply for the Austenitic (95x) or the gun barrel steels. Instructions on how to harden gunbarrel steels can be found on separate datasheets. Call +46 (0) 293 30600 to get them.

The knife steels are delivered soft annealed for best cutting and grinding properties.

A typical way of hardening this material is to heat it to 1050 deg. C (1920 F). Let it hold that temperature for 10 minutes. Take the piece out and cool it rapidly to room temperature (called quenching).

It is not necessary to quench the martensitic stainless material extremely fast. A knifeblade is often thin enough for air cooling.

The quenched material is hard but brittle, therefore a tempering is necessary. Put the piece in a temperature of 200 C (400 F) for 2 hours. An ordinary kitchen oven can be used.

Now the heat treatment is completed, and the material is stainless (it wasn't before the hardening).

Open air hardening gives a grey oxide layer at the surface. This is just to remove by grinding.

Vacuum hardening can be used to prevent oxides. There are many companies offering such service, in Sweden for example Brukens or Bodycote.

Etching

To make the pattern visible, the finished detail is dipped into acid for a few minutes. One of the steelgrades then turns dark and the pattern appears. Sulphuric or Hydrochlorid acid (~37%) are suitable for the martensitic damascene steels. (Sulphuric acid for car batteries is available at a gas station.)

The Austenitic damascene steels require stronger acids.

Handle the acids with care, beware of sprinkle, unhealthy gases are formed during etching!