

Sword Styles - Different Steels

Asian Styles

- Often curved, single edge
- Different patterns from edge to back



European Styles

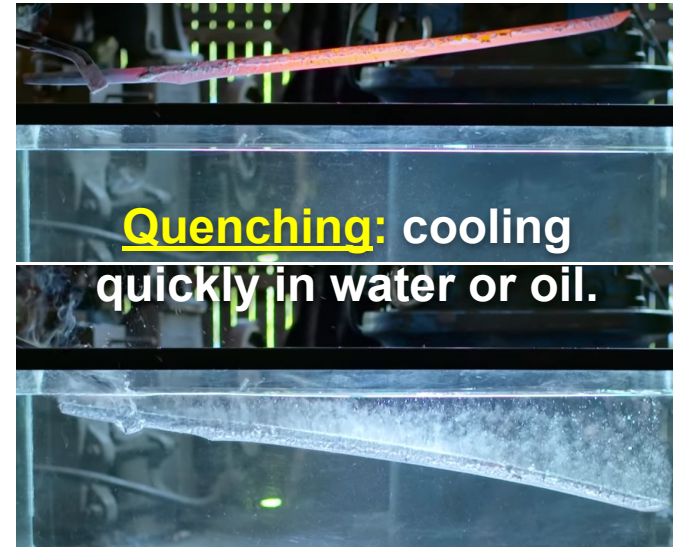
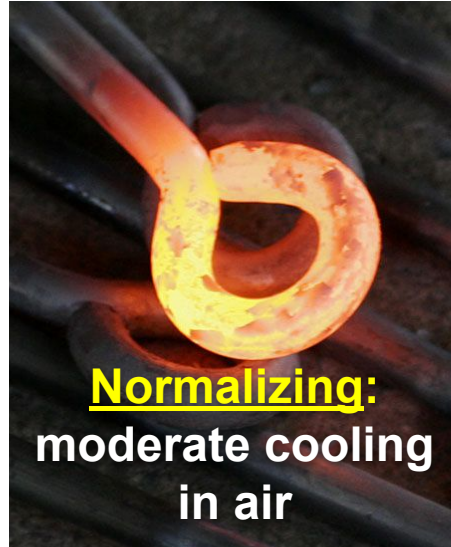
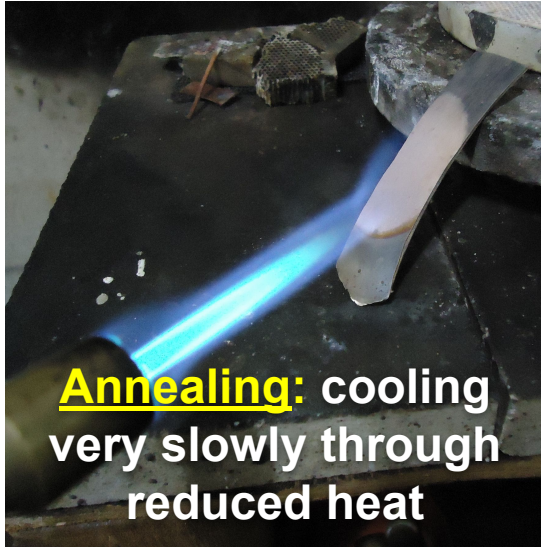
- Often straight, dual edge
- Similar throughout



Temperature, Hardness, Toughness

Slow Cooling

Fast Cooling



Soft, Tough

Hard, Brittle

Other Bladesmithing Techniques

Jacketing Strengthens the Sword

Hagane
(Hard Steel)

Kawagane
(Medium Steel)

Shigane
(Soft Steel)

Maru

Kobuse

Honsanmai

Shihozume

Makuri

Wariha Tetsu

Orikaeshi Sanmai

Gomai

Soshu Kitae

Maru	not laminated; poorest method
Honsanmai	most common lamination method
Kobuse	method used on swords from WW2 period
Soshu Kitae	seven layers method; used by famous sword smith, Masamune

Folding Minimizes Impurities



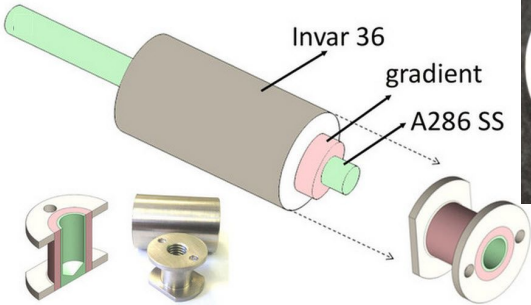
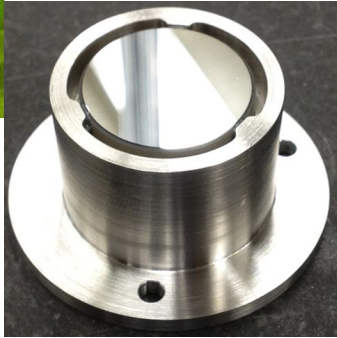
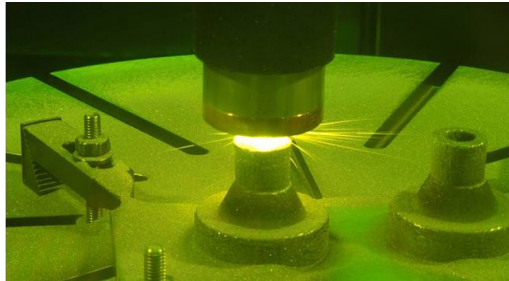
Claying Strengthens the Sword

Back edge
covered —
softer, pliant
steel

Front edge
uncovered —
harder, brittler
steel

Bladesmithing-Inspired Techniques Today!

3D-Printed Objects with Steels of Different Hardnesses



Modern Blades with Folded Damascus Steel



Modern Metal Heat Treating Furnace

