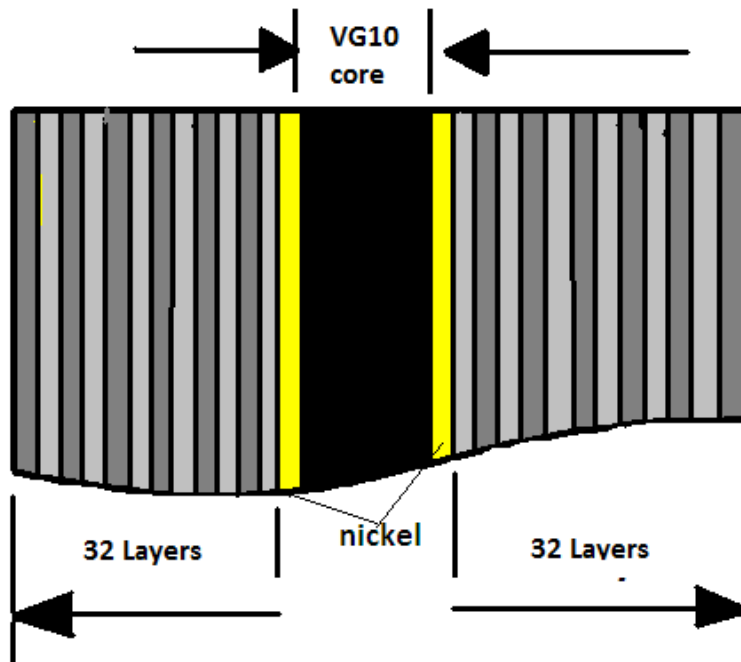


TAKEFU1210 – 67 Layer Stainless Steel with VG-10 Core



Core Layer (VG10)

Element	[% by Weight]	
	minimum	maximum
Carbon	1.25	1.45
Chromium	14.00	16.00
Manganese		0.40
Silicon		0.40
Molybdenum	2.30	3.30
Vanadium	1.80	2.20

Outer Layers:

Pure Nickel

32 layers of alternating martensitic / ferritic stainless for contrasting lines

Patterns:

When the steel is hammered or forged, the alternating layers of stainless steel and nickel either side of the core steel, beautiful wave-like patterns appear on the steel's surface. This is called Suminagashi, or "swirls of ink".

The stainless steel imparts light and dark lines whilst the nickel layer gives the steel a bright contrasting line above the very sharp cutting edge.



Picture courtesy of Stuart Mitchell Knives. Sheffield

HEAT TREATMENT PROCEDURE FOR VG10

Annealing: 830°C ~ 880°C

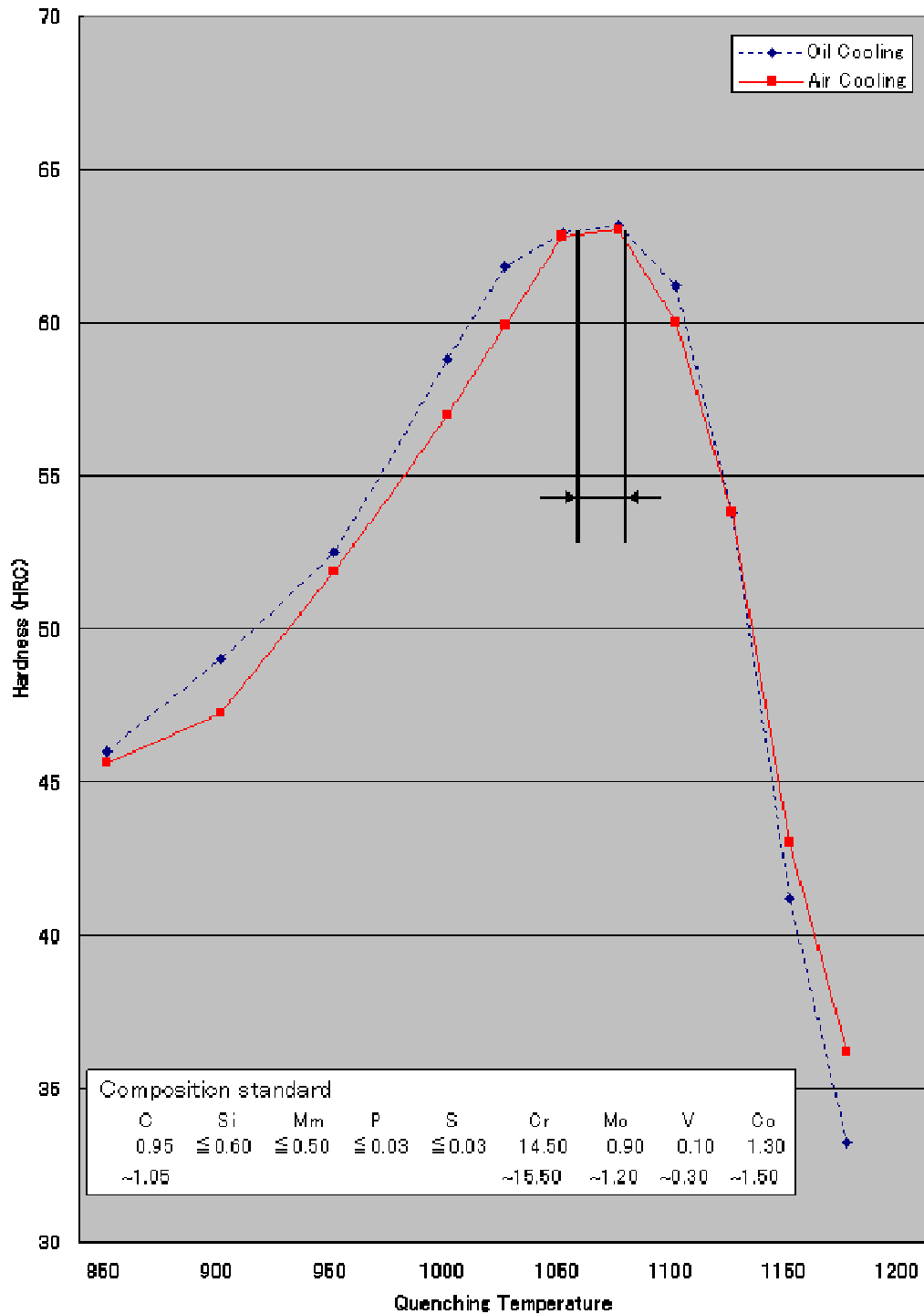
Hardening: 1050°C ~ 1100°C

Tempering: 150°C ~ 250°C

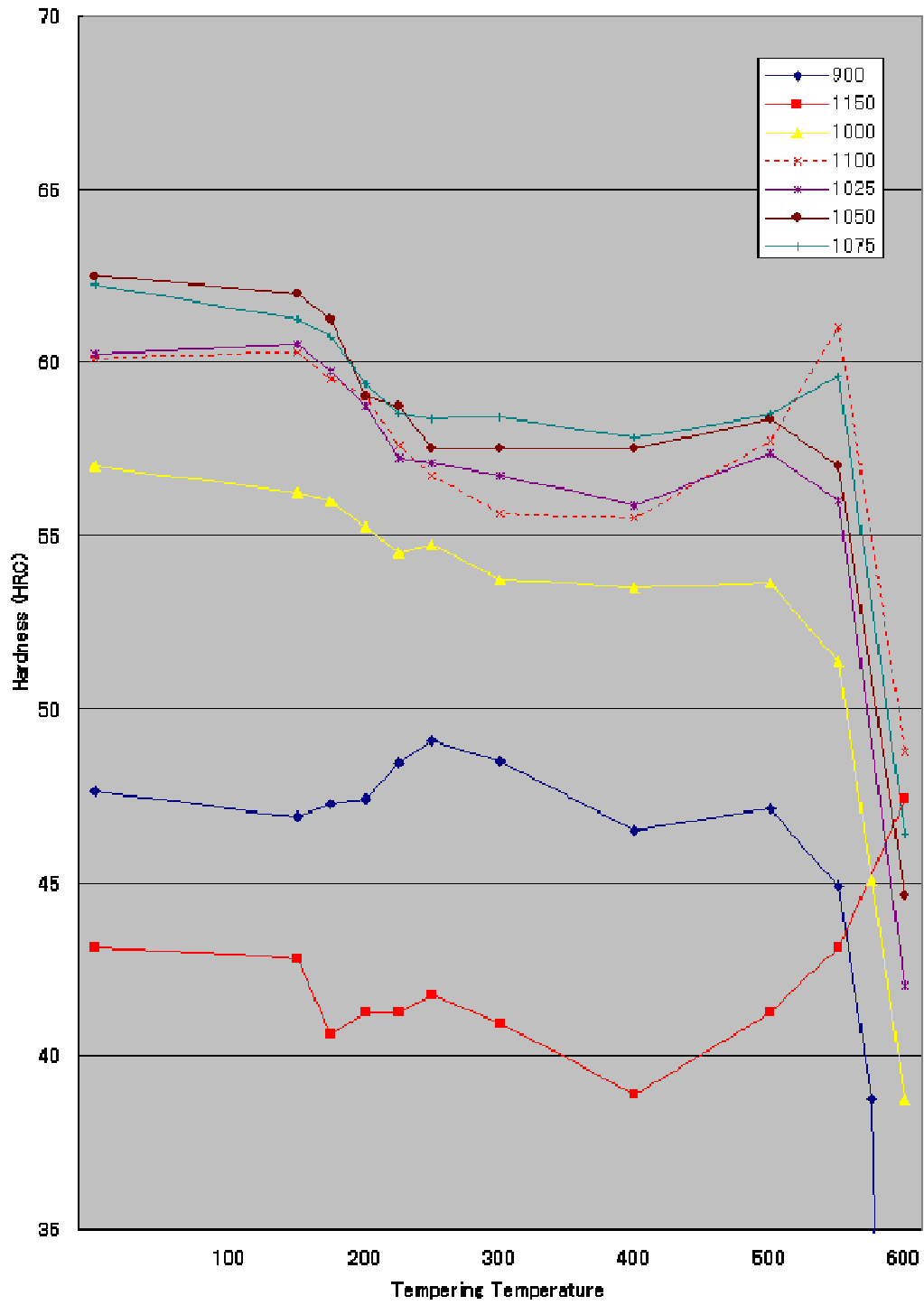
The temperatures and soaking times differ depending upon the type of heat treatment facility used such as continuous furnace or car-bottom type furnace [traverse type] and the quantity treated in each batch.

Heat treatment process graphs and quenching and tempering data for the treatment of this grade are given on the following pages.

VG-10 Quenching Characteristic



VG-10 Tempering Characteristic (Air Cooling)



Final Hardness: about 60 - 63 Rockwell. If correctly treated the steel is stainless and extremely tough and durable.

Etching:

Etching is done to develop the patterns on the finished piece. The best conditions for etching are good polished surfaces carefully degreased. The work piece is preferably dipped into the etching acid. After etching the piece must be carefully cleaned in water. A final cleaning with brush and soap eliminates the risk of acid residues.

Etch in a lukewarm 15% conc. hydrochloric acid solution or a ferric chloride / hydrochloric acid solution [% by volume 20% Fe₃Cl / 30% HCL / 50% H₂O]

Always work in a well ventilated space and take the appropriate precautions to protect eyes and skin from splashes and contact with the etchant

The acids must be handled with care.