Gradient GoMai

1084/15N20 Damascus Cladding — Copper Shims — 1084 Mono Core — GoMai Specification

Revision 1.0 | Baker Forge & Tool, Boone NC

STEEL PROFILES

GoMai construction: 1084/15N20 Damascus cladding over a solid 1084 mono core, separated by copper shims. Core drives heat treat — copper shims are non-hardening decorative/transition layer.

Property	Core — 1084 Mono	Cladding
Classification	High-carbon steel	1084/15N20 Damascus
Shims	N/A	Copper shim (transition / decorative layer)
Heat treat driver	Core drives heat treat schedule	Cladding follows core temps
Cryo?	No — carbon steel core	No cryo for carbon cladding

STEP 1 — NORMALIZE

Parameter	Spec
Temperature	1500°F
Cycles	2 cycles
Atmosphere	Still air — no forced cooling
Purpose	Relieve forge stress, refine grain structure before hardening

STEP 2 — AUSTENITIZE & HARDEN

⚠ **Use Parks 50 or canola oil, 100–120°F. Up-and-down agitation only for first 10–15 seconds. Never use figure-8 motion.**

Parameter	Spec
Austenitize temp	1475°F
Soak time	8–12 minutes
Quench medium	Parks 50 (preferred) or canola oil, 100–120°F
Quench technique	Edge-first, straight plunge. Up-and-down agitation 10–15 sec.
Snap temper?	Not required — no stainless cladding in this billet

STEP 3 — TEMPER

Parameter	Spec
Cycles	2 cycles (double-temper)
Temper temp — hard	375°F → target HRC 61–63
Temper temp — balanced	400°F → target HRC 59–61
Temper temp — tough	450°F → target HRC 56–58
Hold time	2 hours per cycle (carbon steel core)
Cool between cycles	Full air cool to room temp before second cycle

EXPECTED HARDNESS RESULTS

Temper Temp	1084 Mono Core (HRC)	Cladding (HRC)	Use Case
375°F	62–64	Soft (cladding)	Hard use / high edge retention
400°F	60–62	Soft (cladding)	Balanced everyday carry
450°F	57–59	Soft (cladding)	High toughness / flexible use

FULL PROCESS SUMMARY

#	Step	Temp / Setting	Notes
1	Normalize ×2	1500°F	Still air cool. 2 cycles.
2	Austenitize	1475°F | Soak 8–12 min	Even heat throughout billet
3	Quench	Parks 50 or canola | 100–120°F	Edge-first, straight plunge. Up-and-down agitation 10–15 sec.
4	Temper ×2	375–450°F | 2 hrs each	Full air cool between cycles. No cryo — carbon steel core.

WATCH POINTS & COMMON FAILURES

Issue	What to Watch For / Why It Happens
Soft spots / uneven quench	Uneven soak temp before quench — ensure entire billet reaches target temp. Watch for dark spots in heat.
Carbon migration	Long soak times increase carbon migration between layers. Keep soak to 8–12 min — do not oversoak.
Overheating Damascus	Do not exceed 1500°F in normalize — grain growth accelerates. Monitor color carefully.

POST-HEAT TREAT — ETCHING

Gradient GoMai produces a distinct visual gradient from Damascus cladding to mono core — the copper shims create a warm transition zone. Gator Piss OG maximizes the contrast between layers.

Product	Use
Gator Piss OG	Classic carbon Damascus etch. Strong 1084/15N20 contrast in cladding. Copper shims pop warm against dark 1084 background — creates a gradient visual effect.
Gator Skin	Apply after etch for protection. Locks in contrast and extends finish life.
Grime Reaper	Pre-etch cleaning. Remove all oil, fingerprints, and grinding residue before etching.