FUTURON FORGE

Datasheet

AUSTENITE

Non-hardenable stainless damascus

#FFAUSTENITE is a stainless damascus steel made of two austenitic (non-hardenable) steels AISI 304 + AISI 316. Our production of damascus steel is a highly controlled process, made under high pressure in a protective atmosphere.

Both steels used in a composite are characterized by their low volume of nickel (Ni), so they can be considered hypoallergenic.

One of the main advantages of this material is its processability. You can grind it or forge it relatively easy, and there's no need for heat treatment. It is just etching to reveal the contrast.

This material is intended for jewelry production, watchcases, and artwork, where customers appreciate a fully stainless damascus.

Technical information

Composition

For this composite, we use two austenitic (non-hardenable) steels AISI 304 + AISI 316. Both steels used in a composite are characterized by their low volume of nickel (Ni), so they can be considered hypoallergenic.

Steel	Color	C	Si	Mn	P	S	Cr	Ni
AISI 304	Dark	<0,03	<0,75	<2	<0,045	<0,03	18-20	9
AISI 316	Shadow - bright	<0,03	<0,75	<2	<0,045	<0,03	17	11

Forging

We recommend using smaller pieces before you're fully skilled to re-forge our damascus steel. Please follow those instructions:

- Forging temperature is 950-1160°C / 1742-2120°F.
- To avoid possible cracks, do not forge in temperature under 940°C / 1724°F.
- Forging has to be done smoothly to prevent the creation of cracks.
- Forged steel is very durable, so forging is more complicated in comparison with usual carbon steels.
- Slow cooling is necessary after the forging process.
- We recommend using a controlled electric furnace with a protective atmosphere; however, propane gas forge works as well.

Machining conditions

You can use all conventional types of machining. Recommendation of machining condition below:

- Milling – monolithic carbide mill --- Vc80-120 m/min
- Milling with VBD mill --- Vc95-130 m/min
- Milling with HSS-Co mill --- Vc25 m/min
- Drilling - HSS-Co drill --- Vc23 m/min
- Lathing with VBD --- Vc80-120 m/min

Grinding

You can grind our steel on all conventional types of grinders. We recommend belt-grinders or Berger grinding machines.

We recommend sanding belts with ceramic grains for belt grinders, like 3M Cubitron II; however, all range of conventional abrasives is usable (for example, SAIT, Klingspor, Norton, VSM, etc.)

Watch out for not to overheat (tempering) the steel by grinding. When it's heat-treated, it may lose the required properties.

Etching instruction

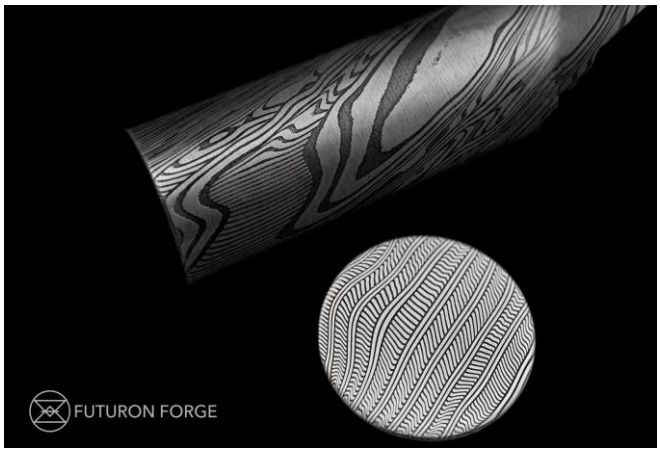
Etching

To properly contrast the damascus steel layers, it's necessary to etch the material (blade). You can experiment with various etching techniques depending on your skill; however, you'll get nice results following the below-mentioned steps.

Etchant	Solution	Concentration	Time	304L	316L
Ferric Chloride Fe3Cl	Fe3Cl + Distilled water	20-25%	5-10 minutes	Dark	Bright
Hydrochloric acid	HCl+ Distilled water	30%	60 minutes	Dark	Bright
Sulfuric acid	H2So4+ Distilled water	30%	10-15 minutes	Dark	Bright

- The blade's surface must be smooth, clean and without scratches (etching won't hide them), finished up to 1000+ grit or polished.
- You must properly degrease the blade (cleaning in the soap-water works fine).
- Before you start etching, you can try the solution on a sample piece of material (heat-treated)
- You can re-use the etching solution several times. Before you get the blade into the solution, check if there's no dirt on the surface of a solution.

- When the etching is finished, you have to neutralize the blade using Na_2CO_3 (Sodium carbonate) or $NaHCO_3$ (Baking soda). You can also use soap-water and clean the etching residues from a blade.
- Dry etched blade. We recommend spraying the blade with WD-40 (or similar) and drying it again to remove any possible residues.
- You can slightly polish the etched blade on a buffing wheel for better contrast. We recommend testing it on a sample piece.
- You can enhance the contrast by using the propane torch and then slight hand-grinding by sandpaper with 2000+grit. We recommend testing it on a sample piece.
- If you want to make your etching solution of Ferric Chloride more reactive, increase a concentration of Fe3Cl or add vinegar.



Product marking

Marking: FF AUSTENITE

Hashtags: #StainlessFuturon #FFAUSTENITE

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