FUTURON FORGE

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Rainbow Futuron (Rainbow-Ti, Rainbow-Zr)

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Rainbow Futuron is damascus composite of various Titanium grades (Gr2, Gr5, Gr7 or Gr9) and Zirconium or Niobium. Our composites are hypoallergenic and corrosion resistant. Titanium composites are low-weighted and suitable for knife handles, knife hardware, jewelry applications, watchmaking, or pen making.

Alloy	Ti	Al	V	Mo	Zr	Ni	Nb	Hf
Titan GR1	99							
Titan GR2	99							
Titan GR5	90	5,5-6,75	3,5-4,5					
Titan GR9	94	2,5-3,5	2-3					
Titan GR12	98			0,2-0,4		0,6-0,9		
Titan Tivt	85-91	5,5-7	0,8-2,5	0,5-2	1,5-2,5			
Zirkonium					94,7			4,5
Niobium							99	

MACHINING

Titanium and zirconium-titanium composites are more difficult to machine due to their low thermal conductivity, high toughness, and tendency to adhere to tools. Zirconium components also form a hard oxide layer, and there is a risk of ignition of fine chips. For unskilled users, we recommend making a sample piece and finding the machining conditions matching their equipment. Avoid cutting or shaping the material with machine shears. We recommend using a bandsaw, milling, laser cutting, or waterjet cutting.

MILLING/DRILLING

- Milling – monolithic carbide mill --- Vc40 m/min
- For hard-milling (sizing) with monolithic carbide, mill feed up to Vc60 m/min
- Milling with VBD mill --- Vc40 m/min
- Lathing with VBD mill --- Vc40 m/min
- Milling with HSS-Co mill --- Vc10 m/mind
- Drilling - HSS-Co drill --- Vc6-8 m/min
- Drilling – PVD coated carbide drill ---Vc27-45 m/min

GRINDING

You can grind our steel on all conventional types of grinders. We recommend belt-grinders or Berger grinding machines. For belt grinders, we recommend sanding belts with ceramic grains, like 3M Cubitron II; however, all range of conventional abrasives is usable (for example, SAIT, Klingspor, Norton, VSM, etc.). Always use „fresh“ sharp grinding belts – avoiding of creation of burned surface „crust“, which can make problems when coloring.

You can get slightly different color results when your product is shiny polished or dimmed. We recommend blue Unipol paste for polishing. For dimming, we use excellent ScotchBrite belts or pads.

COLORING

HEAT OXIDATION

It is the easiest way to get your composite colors. We recommend using a propane butane gas torch and slowly heating the product, starting to reach the first colors. Stop heating when you've reached your estimated combinations, and let the product slowly cool down. You can reach the first color at about 430°C up to 850°C / 806-1562 °F.

To reach a dark-black color on Zirconium composite you must heat it up to titanium's purple. When you need a blue-black combination, you must polish, dim, or etch a purple color from Titanium (black Zirconium will stand still). Now you have a silver-black variety and can make the heat oxidation again (blue is one of the first colors).

ELECTRO-CHEMICAL OXIDATION

You can also color our material by using a DC electric source. To reach a full spectrum of colors, you need DC 0-120V. As an electrolyte, use the following solution: 1 liter of distilled water + 5 grams of Trisodium phosphate (Na_3PO_4), known as TSP. Instead of TSP you can use 10 grams of baking soda; however, you'll reach better color results with TSP. Like a cathode, use a piece of Titanium sheet. To dive a product into an electrolyte, use a Titanium or Niobium wire. Avoid contact with steel (on a crocodile clip).

- The resulting color combination is different than when you use heat oxidation.
- For better color results, use TitanEtch of Multietch as a primer.
- Using TitanEtch of Multietch, you can remove anodized colors and make other color combinations, especially with black Zirconium.
- Make testing samples before coloring your final product, especially when combining heat and electrochemical oxidation with the above-mentioned etchants.

MARKING

FF Rainbow-Ti / FF Rainbow-Zr
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