

Techno-wootz? Damascus Steel

Techno-wootz™ Damascus Steel

Today, Techno-Wootz™ [[Damascus]] steel has achieved this same segregation and crystalline structure as true Damascus. As with Eastern or Oriental Damascus, the crystalline pattern can be manipulated to produce stunning visual effects in the steel - [[Celtic knotwork]], for instance.

And while the visible surface pattern on Techno-Wootz™ Damascus steel is beautiful, the real beauty of this steel is more than skin deep. Techno-Wootz™ Damascus steel has the same unique internal metallurgical microstructure as classic Wootz steel.

Techno-Wootz™ Damascus steel can be re-homogenized as described by Verhoeven. Independent verification of the properties of Techno-Wootz™ Damascus steel has been performed by Dr. Eric Taleff, Assistant Professor in the Department of Mechanical Engineering at the University of Texas at Austin. (A .PDF file of his report is available; size 1.53 megs)

Picture 1 shows a micrograph of the internal structure of Techno-Wootz™ Damascus magnified 2000 times. At this resolution, the individual crystals of tempered martensite are visible. The picture also reveals the micro-banding that gives this steel its special properties. Also visible are carbide particles (white spots) embedded in the crystalline matrix. The two superimposed black lines highlight the bright carbide bands at the top and bottom and the dark matrix band between.

Picture 2 shows indentations from hardness testing on our Techno-Wootz™ Damascus steel. As shown, the indentations are made both inside and outside the visible banding, revealing a consistent hardness in the matrix.

Destruction testing at the Angel Sword shop has shown that Techno-Wootz™ Damascus steel is highly resistant to fracture, compression, stress strain, bending and fatigue.

Picture 3 shows a cross section of a blade at a magnified 150 times. Visible banding occurs throughout the steel.

Angel Sword produces Techno-Wootz™ Damascus steel in both hypo- and hyper-eutectoid Wootz with carbon contents ranging from 0.4 percent to 1.6 percent. The bands or sheets of carbides can be produced in either pearlite or martensite matrices and the frequency (or spacing) of the sheeting can be controlled.

The legendary status of Wootz steel was not based on looks alone. The performance of true, or crystalline, Damascus blades established their own reputation. Angel Sword's Techno-Wootz™ Damascus steel represents the latest evolution of this legendary steel.

For more information about wootz Damascus, an informative article by J.D. Verhoeven, A.H. Pendray, and W.E. Dauksch is available online.