

# The Tungsten Carbide Edge



**They don't come much better than this: a mint Robeson "Flame Edge" Deluxe Hunter, model 36TC, complete in its original packaging and with the "Tungsten Carbide Edge" sticker still applied to the blade. Fifty years old, and just like the day it was made. Dino Bakeris collection.**

by Mark D. Zalesky

Imagine, if you will: a whole new kind of knife edge developed directly from missile and rocket research and involving the world's hardest metal, detonated onto one side of a steel knife blade at ten times the speed of sound and at a temperature of 6,000 degrees. Best of all, as you use it, the steel edge

wears away, making it self sharpening.

This fantastic new knife technology is real – no joke – and you can certainly buy such a knife and try it out for yourself. I did leave one little thing out, however... the year, which is 1959.

You read that right; fifty-two years ago, the most technologically savvy

cutlery company of its time, Robeson Cutlery Co., introduced to the world what it described as "[t]he first knives in 2000 years with a cutting edge that's NOT STEEL," and promoted it with phrases like those found in the first paragraph. Robeson was the first but not the only company to produce pocket, hunting, and kitchen

knives with tungsten carbide edges, and I find it fascinating that interest is again rising in the potential of this "space age" technology for producing knife blades that cut better and longer between sharpenings.

## What's a Tungsten Carbide Edge?

The idea behind the tungsten carbide edge is simple enough. Steel is a good material for knife blades because it is strong, durable, and wear resistant. In time, however, the steel wears away at the very edge, making the knife dull. No single material has yet been discovered that is as suitable in an all-around sense as steel, but if we were to combine the strength and durability of steel with an even more wear resistant material, we could have the best of both worlds. *Voila*, the tungsten carbide edge!

Tungsten carbide was discovered in the 1920s by

a German light bulb manufacturer seeking a suitable alternative to expensive diamond dies used in the production of tungsten wire. By the 1930s, it had begun to find use in the cutting and milling of steel, an application for which it remains very popular today. Other common items made from tungsten carbide include the "ball" in ballpoint pens, wear resistant bearings, and jewelry that's almost impervious to scratches.

The patent that made the tungsten carbide knife blade practical was #2,714,563, granted in 1955 and assigned to the Union Carbide and Carbon Corp. of New York. It describes a "method and apparatus" for spraying a tungsten carbide coating on a metal surface, by effectively *blasting* it on using a gun-like device. That's where the "ten times the speed of sound" and "6,000 degrees" comes into

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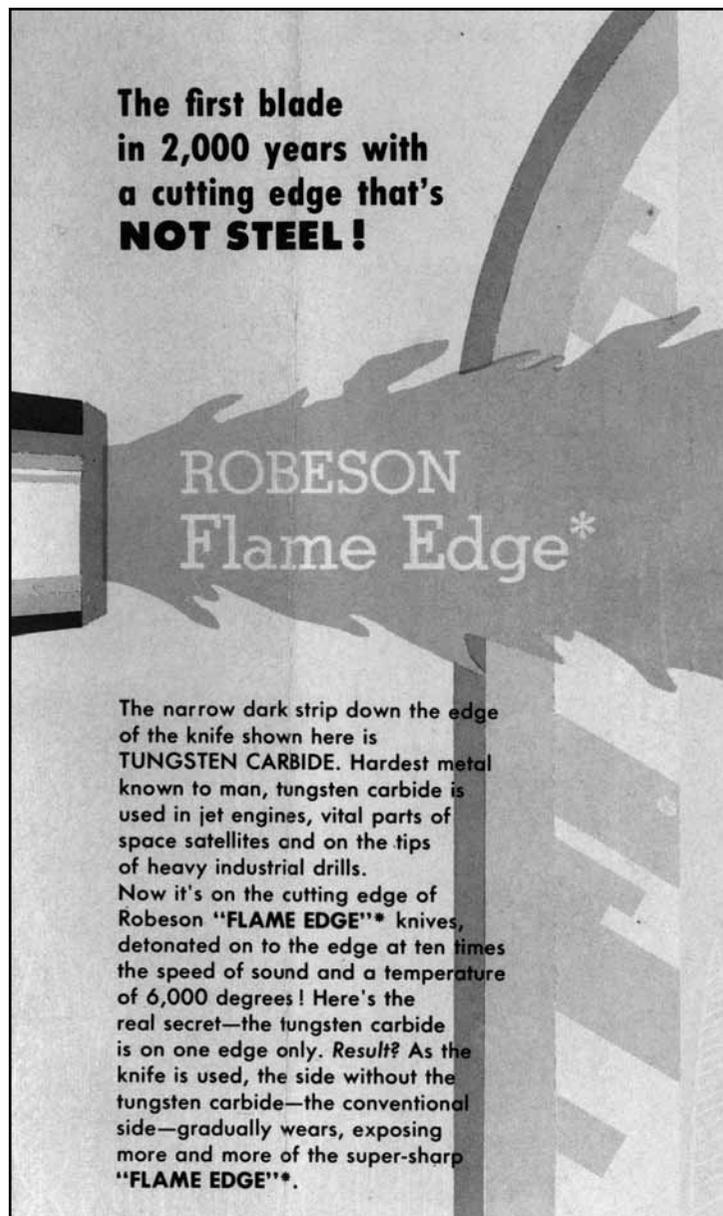
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**ROBESON Flame Edge\***

The narrow dark strip down the edge of the knife shown here is **TUNGSTEN CARBIDE**. Hardest metal known to man, tungsten carbide is used in jet engines, vital parts of space satellites and on the tips of heavy industrial drills. Now it's on the cutting edge of Robeson **"FLAME EDGE"**\* knives, detonated on to the edge at ten times the speed of sound and a temperature of 6,000 degrees! Here's the real secret—the tungsten carbide is on one edge only. Result? As the knife is used, the side without the tungsten carbide—the conventional side—gradually wears, exposing more and more of the super-sharp **"FLAME EDGE"**\*.

*This promotional insert was included in the packaging of Robeson's Flame Edge" knives.*

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play and according to accounts it was a very loud process.

Coating one side of a knife's edge with tungsten carbide requires that only the softer, uncoated side be sharpened. This leaves the

thin layer of tungsten carbide exposed at the edge, allowing us to take advantage of its wear resistance while retaining the overall qualities of the steel blade. What's more, as the knife is used, the steel will wear away faster than the tung-



*Side by side, the similarities between Robeson's 22TC and Kinfolks' 330TC "Flame Edge" knives become obvious. Note the wide gray strip along the edge – that's the tungsten carbide coating. Dino Bakeris collection.*

sten carbide at the edge, resulting in a knife that is at least somewhat self-sharpening – a dream of knifemakers ever since the first edge was discovered. The same principle can be found in nature, in the form of a beaver's front teeth.

Let's take a quick look back at the history of the tungsten carbide coated knife blade, before bringing ourselves up to speed with what's happening today.

**Robeson's "Flame Edge"**

Historically, the king of tungsten carbide knife blades is the company that introduced them, Robeson, who trademarked "Flame

Edge" for knives made with this technology. This term should not be confused with "Frozen Heat," Robeson's brand name for cryogenically treated blades, another technology they helped pioneer.

The first Robesons with tungsten carbide blades seem to have appeared in early 1959 and the technology rapidly found use in all areas of the company's product line including Robeson's line of Kinfolks brand knives, which the company had recently acquired. Pocket knives, hunting knives, and especially kitchen cutlery can be found with the Flame Edge feature; and the

kitchen cutlery line included some with serrated edges. In time, even the company's electric carving knives (yet another product they helped pioneer) were offered with tungsten carbide coated blades.

It's hard to draw a lot of conclusions from the scant records available, but it seems that advertising of the Flame Edge line had tapered off by late 1961, and by the middle 1960s Robeson's interest in tungsten carbide knives had waned. In 1965 Robeson sold out to Cutler-Federal, who was interested in the company's appliance division, and that spelled the

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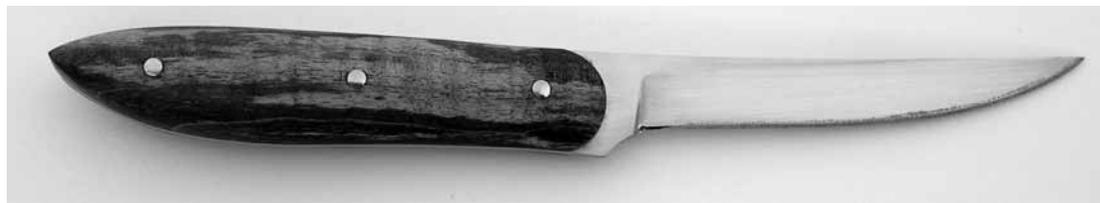
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*This custom paring knife by Canadian knifemaker (and KNIFE WORLD correspondent) Abe Elias has been given a tungsten carbide coating using the Rocklinizer (coating visible on the edge, below.)*



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end of Robeson's cutlery innovations.

#### **Schrade's "Everlast Edge"**

The next big name to carry tungsten carbide knives was Schrade Walden, then a part of Imperial Knife Associated Companies, who introduced their first "Everlast Edge" knives in about 1965. To date I have only heard of the Everlast Edge appearing on Schrade Walden 147 and 148 hunting knives with delrin handles, but a recent J. Bruce Voyles auction offered a Schrade Walden pocketknife with a tungsten carbide edge and the handle stamped UNION CARBIDE COATINGS SERVICE – apparently a promotional piece for the company responsible for the tungsten carbide coating. According to sources, the 147STC was listed in Schrade's promotional literature from 1968 to 1969, and the 148STC from 1965 to 1971. Some of these knives will be found etched

with the name of baseball great Ted Williams; these were sold by Sears, Roebuck and Company as part of Williams' endorsement of Sears sporting goods.

#### **Imperial**

At about the same time the Schrade Walden tungsten carbide knives were in production, Imperial Knife Associated Companies also made some inexpensive hunting knives with tungsten carbide coated edges under the Imperial brand name. Examples of their small bowie-style hunting knives are known to exist with that feature and a blade etch reading S P O R T S M A S T E R / TUNGSTEN CARBIDE EDGE. In my research, I found a "Valu-Mart" ad for this knife which was run during the Christmas season of 1967 – value, \$1.95, SUNDAY ONLY 99c!

#### **Western Cutlery**

Another brand of knife that can rarely be encountered with a tungsten carbide coated blade is Western, who applied this

technology to at least a few T39 models (and perhaps others). No catalog, advertisement, or price list has yet surfaced to document them – but they do exist, and demand a premium. In all likelihood, these knives date to the 1960s.

#### **Buck Knives**

Finally, I know of one more company that has experimented with tungsten carbide-edged blades, and a lot more recently than the others – in 2003, or thereabouts. At that time, Buck Knives produced a short run of about a hundred examples of their classic 110 folding hunter, to gauge the reaction. These knives were never commercially offered and today are considered a rare and desirable version of the company's most popular model.

#### **The State of Tungsten Carbide Blades Today**

After reading the past several paragraphs, you might think that tungsten carbide blade technology has more-or-less been relegated to the history bin.



*Imperial's inexpensive "Sportsmaster" knife, offered with a tungsten carbide edge during the late sixties. Jim Woods collection.*



*Less than a decade ago, Buck experimented with the tungsten carbide edge, manufacturing a short run of 110 folding hunters that were not available to the public. Today, they're rare collectibles.*

Well, don't be misled. While it hasn't exactly revolutionized the sporting knife industry, it did find its way into some ultra-niche markets like microscopic section cutting and various types of industrial knives. Furthermore, the availability of less expensive equipment for applying a tungsten carbide coating has finally put the technology within reach of knifemakers – and that means tungsten carbide blades are poised for a comeback.

Rocklin Manufacturing Co. of Sioux City, Iowa entered the tungsten carbide deposition field in the mid-1960s with what they call the "Rocklinizer," a piece of equipment that applies a very thin layer of tungsten carbide (or titanium carbide) particles to steel – or other metals such as titanium – by a spark deposition process. This is a far less expensive approach than detonation, which has allowed Rocklin to market their equipment to a greater number of companies who had a need for tungsten carbide's wear resistance on industrial dies, cutters, and the like.

But it wasn't until last year that the company released a Rocklinizer package designed specifically for knifemakers: the 380 AKM. For under \$3000, a knifemaker, small factory, or even an individual can now have everything needed to apply tungsten carbide to a knife blade. The process can be applied to finished or unfinished blades, even relatively soft blades. In fact, materials with less edgeworking ability actually have more potential for self-sharpening, so titani-

um and the less wear-resistant steels may have a new lease on life as blade materials.

After more than fifty years, is the tungsten carbide-edged blade an idea whose time has finally come? Only time will tell, but things are definitely looking up for those who continue to pursue the dream of a self-sharpening knife.

#### **Contact Information (Equipment):**

Rocklin Manufacturing Co.  
phone 800-255-6046 or  
rocklinizer.com and go to  
the Knife Maker's Model--  
Knife & Blade Applications  
Section

#### **Contact Information (Tungsten Carbide Knives):**

The Knife Shack (Jim  
Faltz): 352-316-6814 or  
knifeshackusa.com (cus-  
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www.titanknifetech.com  
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Twin Blades (Charlie and  
Harry Mathews): 912-865-  
9098 or twinxblades.com  
(custom knives)

*The author would like to  
thank the many helpful  
folks who provided infor-  
mation for this article, but  
is afraid he'll leave some-  
body out – so thanks to all  
of you, you know who you  
are!* □