The PM-V11 Story

At Veritas Tools, we design from scratch. Each product we develop involves the consideration of new concepts, new materials, and new manufacturing processes. We want the tools we design to be innovative and provide excellent value for our customers.

Woodworkers have long searched for the acme of tool steels. Often a topic of lively debate, there is a wide variety of tool steels to choose from – a veritable alphabet soup of letters and numbers of which M2, O1, M4, CPM-3V, A2, and D2 are just a few.

Our goal was to find a steel for the next generation of Veritas manufactured cutting tools that would not only deliver excellent performance over a range of applications, but would add value for amateur and professional woodworkers alike.

We started with a long list of candidates and narrowed them down to 21 steels/heat treatment combinations. Each of these combinations was then extensively tested for:

- edge retention
- impact resistance
- ease and speed of sharpening

As different applications may require different bevel angles, the tests (for all 21 metals) were repeated with blade bevel angles of 20°, 25°, 30° and 35°. To ensure that the observations were not skewed by atypical samples, each test was repeated with multiple blades. Many months of testing generated an extensive set of data for analysis.

Some interesting facts from our testing:

- We took over 5600 digital microscope photos to measure and evaluate blade performance
- We created wood shavings that, if connected end to end, would stretch 1.6 miles (2.6 km)
- We chopped through a total of 10 feet (3 metres) of oak
- We ground the equivalent of two complete plane blades to dust
- Our engineers got cut only once!

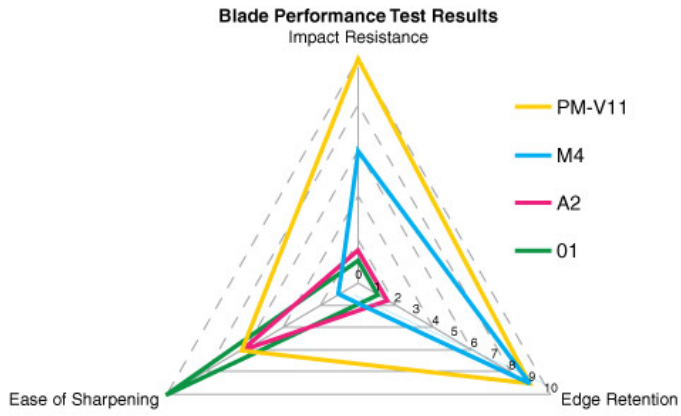
The Winner

Once the analyses were complete, one metal emerged as the clear winner: PM-V11.

The PM-V11 alloy was the most durable metal tested on the impact test, and finished a close second on our wear testing. Of critical importance to us (and to you) is that blades made from the PM-V11 alloy can be sharpened with common abrasive media such as water stones. It takes a bit longer than O1, but PM-V11 blades sharpen slightly faster than A2.

Details of our testing are available in the Test section of this website.

The graph below is a radar chart presenting the results of the tests for four of the blades we tested. Each axis shows the results of our tests on a 0-10 scale, with 0 at the centre, representing lowest performance, and 10 at the vertex, representing best performance. The PM-V11 alloy performance envelope clearly encompasses the best attributes of multiple steels.



About the PM-V11 Alloy and Powdered Metals

PM-V11 is a powdered metal (PM) alloy. To form a PM alloy, constituent metals are melted and mixed together, then atomized, creating very small particles that cool and harden, forming a powder. This powder is screened to ensure consistent particle size, and then heated under pressure to form a billet. The billet is then rolled to the required thickness, ready to process as a conventionally smelted steel would be. The PM process yields a steel with a very fine grain structure that is uniform throughout.

So how do PM-V11 blades perform?

When we gave test blades to a group of woodworkers, the feedback was uniformly positive (bordering on ecstatic in some cases). They reported that in day-to-day use PM-V11 blades readily sharpened to a keen edge that cut cleanly and remained sharp for much longer than O1 or A2 steel blades. They didn't need a scanning electron microscope or an advanced degree in metallurgy to know this was simply a better blade material.