



# Swiss Army Knives still cut it

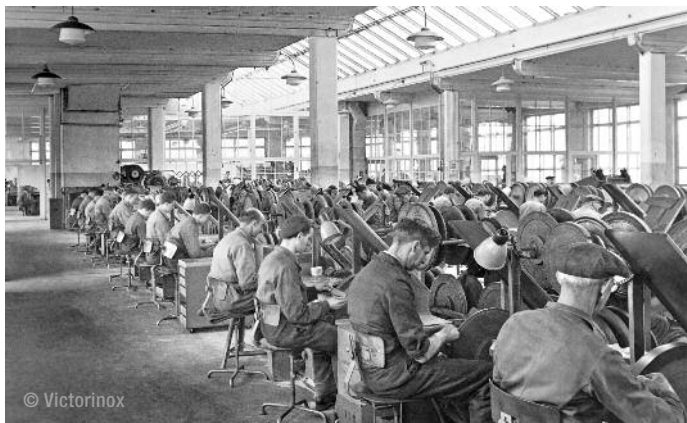
From preparing meals around a campfire in the wilderness to fixing a faulty toaster in a city apartment, the multi-purpose Swiss Army Knife embodies both adventure and reliability in a pinch. With the help of molybdenum, this durable product “still cuts it” and remains popular around the world.



These compact multi-functional tools can scale a fish, strip bark, remove a splinter, start a fire or tighten a screw. With 83 possible uses, depending on the model, Swiss Army Knives can also open a bottle or can, check the temperature, file fingernails, chisel, prune or strip the coating off an electrical wire. With so many applications, this acclaimed pocket knife is still one of the most trusted tools for hobbyists and handymen from Bangkok to Berlin.

## The history of a trusted companion

Members of the Swiss military received the first version of the knife complete with a blade, reamer, screwdriver and can opener in 1891. Six years later, the Officer's Knife was introduced, which included the socially-essential bottle popping corkscrew. Building on its military success, the versatile tool became an international phenomenon. In 1945, the knife's popularity spread like wildfire across the Atlantic when US soldiers stationed in Europe during World War II were excited by its functionality and quality.



➤ Batteries of polishing and sharpening machines at the workshop in 1943. Even today, some knives are still assembled and sharpened by hand.

The inventor and world's top producer of this iconic product is Victorinox, the knife manufacturer and watchmaker based in the picturesque Swiss town of Ibach. The humble Swiss Army Knife has come a long way in its 130-year history. Every day some 45,000 are produced in an array of colorful styles and designs, and engineers continually improve their durability and versatility. And it's the molybdenum in the steel blade, among other elements, that keeps the knives operating at the sharp end.

## Bracing nature's extremes

The combination of tradition and advanced technology means molybdenum is a vital component in the manufacture



➤ This pocket knife features a fork, suitable to spear bread for the good old Swiss standby, Fondue – and a corkscrew, to open an accompanying bottle of wine.

of the knife. The EN 1.4110 martensitic stainless steel used for the blades contains 0.5% to 0.8% molybdenum, which make it wear and corrosion resistant, enabling the knives to maintain a sharp edge. These are key features for such a dependable product, where regular use is possible even in the most challenging of environments. Swiss Army Knives' proven utility in cities, oceans, mountains and even in outer space, is a testament to their enduring appeal.

In 1978, NASA purchased 50 pieces of the *Master Craftsman* model for use aboard the Space Shuttle *Enterprise*. As anyone who has opened a toolbox in zero gravity will understand, chasing tools as they float around the space lab is not a great way to make necessary repairs. The all-in-one nature of the pocket knife consolidated most of the tools into a hand-held device – problem solved. In fact, during the 1980s, the *Master Craftsman* was renamed the "Astronaut" knife for its storied use in space. Extraordinary performance of the knives is found closer to home as well. During a recent trip to Egypt for a TV documentary, Sir Ranulph Fiennes, a world-renowned explorer, tutored his younger cousin, Joseph Fiennes, on defusing an anti-tank mine with the trusty knife. It is little surprise that such a compact, sturdy design finds use in the most extreme of environments.

However, the Swiss Army Knife is not just at home in intense situations. It can also be found in the New York Museum of Modern Art, the MOMA, which recognized its seminal design in 1977.

## A cutting-edge process

While the pocket knife is certainly its most famous product, the company is also renowned for its household and professional knives. In total, over 135,000 knives are made each day at its Swiss factory. The firm designed and built many of the machines used in the manufacturing process



- Knife blades are stamped out of a strip of stainless steel, leaving behind scrap to be recycled (left). The raw stainless steel edges are smoothed by tumbling in a deburring machine, filled with abrasive ceramic media (middle). Each blade is heat treated to make it hard yet tough (right). © Victorinox

in-house to guarantee the quality of the more than 600 types of knives it produces, including 400 types of pocket knives. Molybdenum also plays an important role as an integral part of the manufacturing process. Each knife blade is stamped from a strip of stainless steel. The tools required for the stamping process need to be hard, tough, and long-lasting. The tool steels used for these stamping tools contain up to 4.5% molybdenum to ensure that each knife is cut as precisely as the one before.

Once the raw blade is stamped out of the stainless steel strip, it is ground to its final wedge shape and precisely sharpened. These stamping and grinding processes inevitably produce a lot of “waste” material. However, nearly 100% of it is reclaimed for recycling. The solid cutoffs are easy to collect, but the fine grinding dust is more elusive. To capture it, a custom machine separates the ground stainless steel particles from the cooling liquid used during the grinding and polishing processes. It then compresses the collected particles into pellets, which are returned to the steel producer to be recycled into new stainless steel. Of the 2,400 tonnes of steel purchased each year, nearly



- Small-series and custom pocket knives are still assembled by hand. Large-series knives use a fully automated process.

- Even grinding dust is captured and compacted into pellets, convenient for recycling at the steel mill.



1,200 tonnes go into the actual knife blades and other finished products, with the remaining 600 tonnes of cutoffs and 600 tonnes of particles being recycled. Constant improvements of the production, recapturing and reuse of waste streams ensure the high-quality knives are manufactured efficiently and sustainably.

Compact and stylish, with a wide range of features, the Swiss Army Knife is appealing to users everywhere – city dwellers, farmers, intrepid travelers or groundbreaking pioneers. Molybdenum-alloying improves both the manufacture and the performance of this quintessential tool. (Stratia)