

Knives: Quality

How to recognize a good knife?

At first glance it is difficult to distinguish a high-quality knife from an inferior one. The essential characteristics are revealed only in regular use. One thing is for certain, though:

ZWILLING J.A. HENCKELS stands for the highest possible knife quality.

These features are characteristic for quality knives:

1. Precise workmanship

The parts of the knife have been jointlessly assembled. There is no seam on the transition between bolster and handle. This is particularly important for hygienic reasons. Neither the blade nor the handle show any irregularities or burrs where bacteria could settle.

2. Surface finish

The blade has a finely ground surface that has first been ground and then refined to get its compressed surface. This is a sign of top quality surface finish.

3. Safety

Handle and bolster have been designed to provide a secure grip from which the hand cannot slip. An ergonomically designed handle and the right weight permit safe, tireless use.

4. Cutting edge retention

The cutting edge retention determines the period of use in which the blade retains its cutting properties. A good knife is sharp for a prolonged period of time.

5. Corrosion resistance

The more finely the surface of the blade is ground or polished, the more resistant to rust it will be.

6. Dishwasher compatibility

Quality knives with plastic or stainless steel handles can be cleaned in the dishwasher (preferably economy cycle at max. 55° C). But it is gentler for the knives to be cleaned by hand and thus recommended. Knives with wooden handles suffer in the dishwasher by soaking up too much water. They need to be cleaned under running water only.

Knives: Material

Quality starts with the material

The quality of a knife is decisively influenced by the grade of steel used. The most important characteristics of the steel used to make the blade are corrosion resistance and hardness. They are achieved by the corresponding chemical composition and appropriate heat treatment.

The manufacturer's competence shows itself in his ability to select the appropriate steel for the intended purpose. ZWILLING J.A. HENCKELS has this authority thanks to its long tradition as a manufacturer of cutlery and, in the past, also as a steel producer.

Different types of steel are used in the cutlery industry of which stainless steel has become predominant during the last few decades.

Carbon steel (normal steel)

Carbon steel is the oldest type of steel. It has the disadvantage of being highly susceptible to corrosion.

Stainless steel

The term "stainless" can be applied to any knife made of stainless steel (e.g. chromium steel). Stainless means that the knife will not rust in a humid atmosphere and that it will resist the various acids in daily use.

The coarser the surface finish, the more likely it is to corrode. In other words, the more finely ground or polished the surface of the blade, the more resistant to corrosion it is.

Stainless steel - special formula

Until 1965 ZWILLING J.A. HENCKELS produced its own steel. The Company did intensive research how to optimise the qualities of steel to meet the specific requirements of the cutlery industry. Based on these findings and research results ZWILLING J.A. HENCKELS' special formula with the optimum ratio of carbon, chromium and other components was developed.

Knives: Production

SCT: Sintermetall Component Technology

Uncompromisingly good knives through innovative knife production by ZWILLING J.A. HENCKELS.

Following years of research ZWILLING J.A. HENCKELS has developed the Sintermetal Component Technology (SCT). ZWILLING J.A. HENCKELS is the only cutlery manufacturer worldwide that has mastered this innovative technology.

What are the advantages of the SCT process?

1. Combined use of different types of high-grade steel

A traditional knife is made from a single piece of steel. However, the requirements on the steel concerning blade, bolster and tang are distinctly different. Thus, a compromise had always to be found when selecting the steel.

By using the SCT process steel with different grades of carbon and chromium can be combined to withstand even extreme stress. Blade, bolster and tang can be made from this special grade of steel which contains the optimum features for each particular component. The consequence: for each part of the knife the best steel of uncompromising quality available can now be used.

2. A more consistent and precise production quality

Component	Requirements	Carbon contents	Chromium contents
Tang	Very high corrosion resistance (sweat of palms)	Low	Very high
Blade	Long cutting edge retention Good corrosion resistance Good elasticity	High	High
Bolster	High stability High corrosion resistance	Relatively high	High

The new SCT process allows far greater perfection to be achieved throughout production. The sintered bolster is now a precision-engineered component. The handle scales, tang and bolster are assembled with greater accuracy than previously possible. The result: improvements in performance and appearance.

Knives: Production

Precision engineering at every production stage is of decisive importance for the quality of the knife. By the time a chef's knife by Zwilling J.A. Henckels' is finished, it will have passed through more than 40 different working cycles.

The most important steps are:

1. Production of blanks

The production of blanks comprises all the working cycles leading up to heat treatment. ZWILLING J.A. HENCKELS uses high-grade, stainless steel.

The most important steps are:

- stamping: an eccentric press punches appropriate components out of the material
- production of sintered bolsters: powdered metal is compressed under high pressure to form the shaped components which are then sintered in a vacuum at 1300°C
- plasma welding: secures the tang to the bolster
- flash butt welding: secures the blade to the bolster.

Hardening

The hardening process is an important step in the production of cutlery since it is crucial for the final quality of the steel. The correct hardening temperature and the duration of the treatment are subject to narrow limits and must be precisely maintained. The cutting abilities and corrosion resistance of the blade depend entirely on the right heat treatment.

FRIODUR®

ZWILLING J.A. HENCKELS has optimised the hardening process. FRIODUR®, a protected brand name of ZWILLING J.A. HENCKELS, identifies products whose steel has been specially ice-hardened. This process involves four important stages of heat treatment:

1. Heating up the steel to more than 1000°C

Heating up improves the molecular structure for the benefit of higher hardness.

Higher hardness = longer lasting sharpness

2. Cooling down to room temperature

The cooling harmonizes the molecular structure, takes pressure off the material and ensures an especially flexible stability. This adds safety when used and prevents blades from breaking.

3. Freezing to -70°C

Ice-hardening strengthens the corrosion resistance and thus protects better against rust.

4. Reheating twice to just below 300°C

The reheating harmonizes the molecular structure and takes internal stress off the material.

The result:

Exceptional hardness, high elasticity and very high corrosion resistance.

Knives: Production

2. Further processing

Final shaping is achieved by grinding. Surface treatment, producing the desired finish, is accomplished by:

- grinding
- finish-grinding
- dry-fine grinding
- polishing

3. Assembly

The assembly involves joining the pre-fabricated blade and handle to complete the actual knife.

4. Adjusting

Following assembly the joint between handle and bolster is adjusted and levelled. At this step excess material is removed to make sure that the joint is absolutely smooth. Thus bacteria and germs stand no chance. Perfect handling and hygiene is guaranteed.

5. Honing

Honing gives the knife its sharpness. Today honing is being done with fine grind-stones on special machines or on a felt disc. Thus the honed area achieves a degree of evenness from the tip to the bolster which, in combination with the hardness of the steel, ensures an unprecedented degree of cutting edge retention. **Monitored by laser** each knife is getting its optimum cutting angle. This is why today knives are sharper and retain their cutting properties much longer.

The SCT process provides convincing evidence of ZWILLING J.A. HENCKELS' competence as a knife manufacturer. Knives that have been produced employing this process have a number of advantages:

- sharpness again significantly improved
- cutting edge retention clearly improved
- consistent sharpness of the blade
- increased corrosion resistance
- increased hygiene through precise joints.

Extremely stringent quality control is carried out during each production stage.