

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.

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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.

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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.