



# COLTELLERIE BERTI

See yourself in the splendour of over a hundred years of History

## TRUE TRADITION

Materials and Manufacturing Process



*Handmade. Made in Italy.*

## Materials and manufacturing process.

### Steel

We use AISI 420 stainless steel, which affords the advantage of being especially rich in carbon (>0.53%) and of having molybdenum and vanadium joints which make it an excellent cutting steel for knives for what we may call normal use, that is everyday use in the kitchen, at the table and in other cutting actions requiring pocket knives.

This kind of steel has a hardness up to 55-57 HRC and a very fine granulometry which make for a long lasting and easily maintained cutting edge. Some of our blades are obtained by shearing while others are forged, but in any case the distinguishing element is the cutting edge, made through three entirely manual steps which confer the absolutely best geometry on the cutting edge for knives assigned to normal use, as described above. The cut is soft and not aggressive, and food under the blade seems to break up spontaneously.

Furthermore, the edge wears out following a definite geometry, so one can continue to cut for a long time and in the most enjoyable way.



*Cutter  
Coltellerie Berti  
Scarperia*

### Rustproofness

A good blade is never absolutely rustproof (to cut, you need a good carbon content and not too much chrome!) so if it comes into contact with substances like acetic acid, hydrogen sulphide or citric acid, which are to be found in abundance in many kinds of food (fruit, vegetables and meat) it may come up against its own limits in addressing aggressive environments. Cheap knives do not show this behaviour, because they contain little (or even no) carbon: they do not cut and cannot be sharpened, but they don't rust!

The choice is up to you! If you do not wash a knife after using it, maybe forgetting it until the next day with leftover food on it, you may have the unwanted surprise of finding annoying red spots or dark marks on it – not actual rust, but oxidation of some superficial carbides.

Never let a knife drain off after washing it by hand: this will certainly give rise to more or less extensive stains. It may be contamination which took place during washing, or in more serious cases, a real attack on the metal. Iron-rich water leaves deposits.

### Hardening

Steel used in Coltellerie Berti is a kind made in Europe for high quality cutlery. It is purchased at the steel mill in a condition of mild steel, which can undergo mechanical and plastic processing needed to cut it or forge it, until it becomes a blade.

Once the blade has been given the right geometry for cutting, it must undergo Heat Treatment, a succession of controlled temperature changes. In Coltellerie Berti, in order to get the greatest hardness and tenacity, the finest microstructure, the best workability and rustproofness from our blades we have decided to put them through three different temperature cycles: scelto di sottoporle a tre distinti cicli termici:

**1° Cycle Hardening:** the cutting steel is an Iron-Carbon alloy where Carbon, if rendered properly soluble in iron, confers hardness and strength, which translate into cutting capacity. Hardening is carried out to obtain a steel which – at room temperature – can afford maximum solubilization of carbon in the iron mesh, since if both elements stay separate, the outcome will be a mild material, which cannot cut properly.

To be hardened a blade must therefore be heated to the temperature of maximum carbon solubilization (austenitic phase). In the case of the steel we use, this means keeping it for 15 minutes at 1055 °C.

This phase, with supersaturation of carbon in the iron mesh, does not survive in equilibrium at room temperature, the austenite is structurally frozen by sudden cooling of the blade: 50 °C in 60 seconds (martensitic phase). This provides a hard and strong blade, with much internal stress which makes it fragile.

**2° Cycle Sub-freezing:** this is a kind of treatment which is not yet widely used by knife makers. Many speak of cryogenic treatment, but in the case of knife blades it is better to speak of sub-freezing, which means bringing the blades to temperatures between -40 °C and -120 °C.

In our case, they reach -80 °C which are sufficient to turn all the austenite left over after the hardening into martensite. Sub-freezing is carried out immediately after hardening is cooled, in order to prevent the left over austenite from stabilizing excessively. Sub-freezing too produces stress inside the blades which adds to that already produced when stopping hardening. This treatment, not yet much used in the making of pocket and kitchen knives, is important since “sub-frozen” blades have a stronger edge (2 to 4 times stronger) and the absence of non-solubilized carbon increases their corrosion resistance.

**3° Cycle Tempering:** this involves heating the blade at a temperature lower than the one at which the martensite began to be transformed into austenite (in our case 2 hours at 250/300 °C) to soften the inner stresses left by hardening and reach a proper compromise between hardness, resistance and steel tenacity.



*Tempering  
Coltellerie Berti  
Scarperia*

## Sharpening knives

Normally, knives made using industrial techniques, or which are produced in large quantities, come out of the factory with the edge only set or made using automatic sharpeners which ensure constant but not excellent quality. The reason for this lies in the high cost of hand sharpening and in the difficulty of being able to count on a sufficient number of craftsmen able to sharpen a high number of knives properly and with constant quality. Knife sharpening is certainly no exact science, and it is not possible to turn it into something irrefutable.

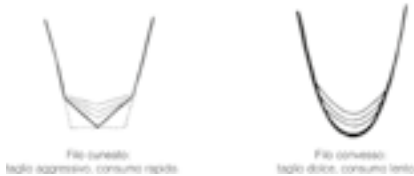
In practice, every knife maker has his own theory which is the result of direct experience, of comparison with the experience of others and of monitoring his own results. To see how difficult it is to measure the quality of sharpening, one may note that there are machines which measure how long the blade keeps its cut, but none that provide information on how “enjoyable” the cut is. At Coltellerie Berti we are sure of the quality of our sharpening which we make in three totally manually steps, in order

to provide a softly convex geometry to the cutting edge. This sharpening makes a cut which is apparently not very aggressive, but is long lasting and pleasant: food which undergoes this “soft” cutting seems to break up spontaneously without suffering the “violence” of a blade. The edge also wears out according to a geometry which allows it to go on cutting for a long time

### Smooth or saw edge

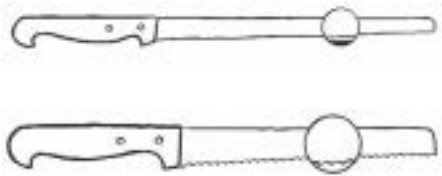
Making knives with serration is a rather recent custom, especially in the manufacture of kitchen and table knives.

When cutting food, one can see that a smooth edge is more pleasant and cleaner when cutting, though this will mean it is more costly to buy and maybe needs to be sharpened a little more often. It may seem a bit intellectual to feel uncomfortable when using one’s teeth to rip the food we are going to eat on the plate, submitting it to a further useless sacrifice (before it came to our dish, it was an animal or a vegetable which sacrificed its life to nourish us); but it is surely more immediate to note that when we cut meat, vegetables and cheese using serrated knives, fluids come out which contain a major part of the flavour and nourishment which instead of being eaten, will stay in the dish.



### Preserving the cutting edge

Per tale operazione posso svelare due grandi segreti!



**A.** Use the knife only for the kind of cuts it was designed for, and avoid any improper use.

**B.** Sharpen the edge before the knife has lost it completely.

The ideal tool to use for this is a good stone, but it may be easier to use a sharpener. To sharpen the cut of a knife using a sharpener, place the blade on it at an angle of about 20° and, holding down the sharpener, let the blade slide. Start by placing the edge of the blade near the handle onto the tip of the sharpener, and move on letting it slide throughout its length until the tip of the blade approaches the handle of the sharpener.

Repeat the operation several times, alternating between the sides of the blade you are working on.

Make a final energetic pass with the sharpener under the blade, to break the burr. To get a good result, one must keep the sharpener and knives clean and free from grease at all times, and apply less and less pressure at each passage.

Careful: when you sharpen a knife, it is very easy to cut yourself, especially when – after you have overcome the first difficulties - you feel you know how to do it and pay less attention.

When you are no longer able to sharpen the cut, you must go to the knife grinder or directly to Coltellerie Berti.



## Materiali dei manici

### Horn

Throughout the 1940s, horn from the Maremma district of Tuscany was used, and the poor economy of those days made it necessary to use every part of the horn, valuable or not.

After WWII, horns from Maremma were no longer available, and knife makers began to use horns from Romagna. In the early Sixties, Mr Santandrea delivered us the last load of “Romagnole” which we still remember well. Then the horns from Romagna met the same fate as those from Maremma: every day they became smaller, thinner and without a full tip, until they quickly became impossible to use. In the early Nineties, we decided to use only tip horn, the full end of an ox horn, just removing parts of it, without heating or crushing it, so as to keep the fullest colour and structure of the horn.

Since it is by now impossible to receive Italian horn we only use imported horn: the best ox horn comes from certain African plateaux with much grass and water, where there are no endemic illnesses which could compromise the quality of the horn.

Water buffalo horn must be purchased in India because it is the very best quality. After it has been imported, the horn - whether ox or water buffalo - must be slowly aged for at least 24 months in order to stabilize its humidity content. To slow down aging and prevent splitting, the heads of the tips are sealed with wax.

In any case, the horn we use is always scrap from slaughter of animals who have finished their working lives in the fields (8 to 10 years), enough to allow the horns to grow fully (1.2-1.8 metres altogether with a full tip measuring 20 to 30 centimetres) thus allowing us to obtain the best quality of horn without any direct or further sacrifice of animals.



*Ox horn tips  
Coltellerie Berti  
Scarperia*



*Boxwood handles  
Coltellerie Berti  
Scarperia*

### Boxwood

Always used to make the simplest country knives, although one sometimes finds ones with carved or sculpted handles.

Today, it is used in sophisticated production for people looking for a knife of their own which is poetic, humble, yet very beautiful in its elegant simplicity, with an ancient look, yet incredibly useful in modern contexts. An extra touch which makes this material fascinating is how it changes colour naturally through time, going from an early yellow-orange to an ever more intense and warmer hazel.

Due to the scarcity of available material and the small size of box trees, only a very small amount of small-handled knives can be made. Boxwood also comes in large boards, which however belong to species different from the very beautiful Italian *Buxus Sempervirens*: for example *Buxus Balearica* which grows in the Spanish peninsula,

but its appearance – colour and grain – has little in common with our Buxus. Especially, boxwood growing on the Apennines between Tuscany and Emilia have a yellow-orange hue with hazel spots, knots and small cracks which are unequalled by any other kind of Boxwood.

Larger handles need Brazilian boxwood, the appearance of which resembles that of the Italian kind.

## Ebony



*Ebony woods  
Coltellerie Berti  
Scarperia*

Ebony is a hard and compact kind of wood which comes from over 250 different species of trees belonging to the Diospyros genus of the family of the Ebenaceae. Diospyros are also much in favour as fruit trees, persimmon and prunes.

The kind of ebony most highly appreciated in cabinetwork is uniform and black, with a very fine grain, being both beautiful and with physical features which make it suitable for making many kinds of items: little statues, cabinets, piano keys, flutes, clarinets, guitar fretboards and bridges, knife handles.

At Coltellerie Berti, we use ebony from Gabon (Diospyros Crassiflora) coming from African rainforests around the Gulf of Guinea: Nigeria, Cameroon and Gabon. This kind of tree can grow up to 20 metres tall, and has a diameter of 40 to 70 centimetres, free of branches, in its lower third part. The only selection we make for our knife handles is taken from the duramen (core of the trunk) which is grey to very dark, and has no stripes.

To get perfect black, ebony needs to be oxidised by submitting it to slow aging. This is made easier by cutting the duramen into small pieces, sealing their heads and keeping them in a place with a stable temperature. This kind of wood has noteworthy physical properties - though hard and difficult to work on, it stands up well to both blows and bending. It is also very resistant to fungus, insects and the weather.

## Plexiglass



*Convivio Nuovo lucite handles  
Coltellerie Berti  
Scarperia*

“Under conditions of heat, cast Polymethyl Metacrylate (PMMA) has an isotropic behaviour, with a maximum contraction of 2% in every direction; whereas extruded, its contraction varies depending on thickness and direction of extrusion”.

This sentence, which may seem cryptic to many, explains why Coltellerie Berti chose a Polymethyl Metacrylate to make its knife handles. After a negative experience, we gave up using extruded PMMA, that is the kind obtained by injecting molten grains into moulds at high temperature: though economically advantageous (more finished handles at every moulding), it inevitably breaks when put in the washing machine, because its behaviour, when heated, is uncontrollable. We therefore chose cast PMMA, more expensive and difficult to

work with, obtained by adding a cold catalyst to a sirupy resin (polymethyl acrylate), transparent and strong smelling.

The liquid coming from this blend may be coloured by incorporating a colouring substance before the catalyst.

This makes a material with steady properties through time, which does not turn yellow or age, and keeps an unchanged shine. Poured into formwork, after plastification (generation of long chains of macro-molecules) it becomes a stiff and glossy slab, with slightly irregular thickness, which can be processed and modelled by hand through removal, applying the manner and form of the typical “Berti Method” for traditional materials. Finally, in order to control inevitable shrinking, Coltellerie Berti has invented an exclusive stabilising process to prevent breakage in the washing machine.

## Cornotech

“Cornotech” is the brand name chosen by Coltellerie Berti for a special kind of orthophthalic polyester resin, used since January 2013 to make a new line of knives.

This resin, poured into aluminium cylinders, thanks to its considerable viscosity, seals colours without spreading them throughout the mass. This way, one gets sticks which are then worked by hand using a specific procedure to make handles which look and feel very much like horn.

This is a high quality, flexible and workable resin, which stands up to washing machines and light, is steady through time, does not turn yellow nor age, and keeps an unchanged gloss. Many other materials which imitate horn exist, including materials which can be extruded, that are melted at high temperature and injected into special moulds to make handles ready to use.

The manufacturing process is cheap, but the aesthetic quality is very poor, and handles made this way definitely look “fake”.

The quest for this material arose from scarcity of “true” horn, since it became impossible in 2012 to find horn, due to a sickness which struck cattle in the area from which our best horn comes, making it impossible to slaughter them for food.

Since we did not want to buy horn of lesser quality, we decided to wait till the situation came back to normal.

In late 2012, once the sanitary emergency had passed, horn at last began to be harvested again, and arrived in Italy in early 2013. Since we use horn at Coltellerie Berti only after having let it age for at least 18 months, it was hard to make horn knives in 2013 since our stock had almost run out. Driven by this “emergency”, we sought to identify a plastic material which could replace horn with similar beauty and a pleasant touch.

Cornotech may be put in the washing machine, though taking the usual precautions involved in washing knives. It is more fragile than other kinds of plastic, so it can break if it falls.

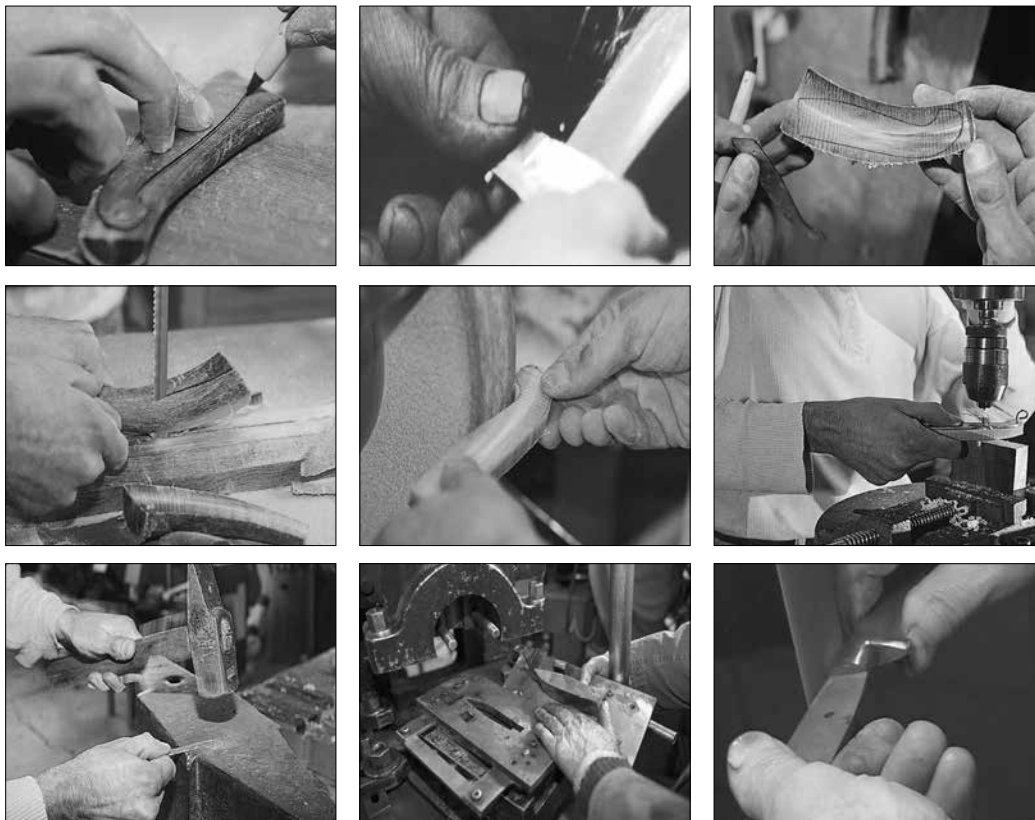


*Cornotech handles  
Coltellerie Berti  
Scarperia*



“Ferrini”  
of Daniele Rogai  
Coltellerie Berti  
Scarperia





# COLTELLERIE BERTI

## GENUINE TRADITION



*Mozzetta - David Berti 1935*



1895  
David Berti



A long history  
of iron, of fire,  
and of skilled hands.



1995  
Andrea Berti

**Coltellerie Berti: handcrafted since 1895.**

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