

Historically the plectra, for plucking the strings, were made from different materials:

- feathers,
- leather,
- fishbone,
- porcupine and hedgehog bristles,
- brass.

The most spreaded materials were those which were easy to get on one hand, and on the other hand elastic and solid. In the North the feathers of seagull, raven and crow were very popular because flying birds develop very strong wing feathers – in contrast with walking birds like chicken or turkey, or swimming birds like duck and goose. In South Europe and in the Alps regions people preferred to use the feathers of birds of prey like buzzard, eagle and vulture.

For voicing use a scalpel to remove the fuzz of the feather so that its rib is free. Cut the feather's rib flat from below, towards the thin end - using the scalpel and a smooth surface. Point the cut quill at the sides so that it fits into the plectra slot of the tongue. Push the quill from behind into the tongue and cut it off from the feather rib. Cut the quill to the right length and to the desired strength by cutting it thinner from below - always in direction of the quill's growth. Make sure that all the pith is removed in the plucking area. The loudness of the sound depends on the hardness of the feather. The durability depends on the feather's elasticity.

Cowhide was easily to get, but as it was quite soft people used it mainly for the "peau de bouffle" - a gentle register which imitates the finger tips of the lute player.

Leather plectra have got a smooth side which should be on top while inserting. After it is inserted and cut on length, the bottom has to be cut as thin until a pleasant tone arises. Instruments from 1900 to 1980 with leather plectra have got quills which are treated with linseed oil to make the leather harder and to hold it elastic. The drying time depends on the silicate additives and is a lengthy process. Our cut leather plectra in three different widths, have to be fit in by yourself (» No. 13-3358, 13-1137, 13-3359).

As natural products feathers and leather need care, which the animals

managed by themselves during their lifetime: one has to grease them, so that they do not become brittle and fragile. The oils which are used for the care are neither allowed to resin nor to attack the strings with their acid. Therefore oils of sunflower, olive, rape and nut are not suited. Our quill oil (» No. 54-2816) meets these demands: it soaks in the quill and keeps it elastic.

The tests with fishbone or porcupine bristles were not successful because treatment, stability and availability placed borders.

Plectras from brass are very robust but they have the disadvantage that they are not very elastic and only can be voiced with a file.

The string has to evade from the unelastic plectra on touching, and so there is also a turning movement (torsion vibration) beside the transversal and the longitudinal vibration. This leads to an emphasis of non-harmonious partials, which gives the impression of a tongue pipe register.

Brass plectra can only be used as “Nasard”, where the amplitude of the touched string is not big. There is a brass plectra in our delivery range according to a historical original of a South German instrument of the early baroque (» No. 13-4564).

In present one found a plastic as an alternative to feathers, which is very usable: “Delrin” is the trading name of the firm Dupont for a POM (Polyacetal-Copolymer) produced by them. Dupont also supplies countless Delrin types for different applications and production processes. “Delrin” is a white, long chained, big molecule polymer with very high stability and good elasticity. It can be cut very easily with a sharp scalpel, and keeps useful and robust over years on the right arrangement.

But “Delrin” also has its self-life which must be noted. Like every plastic “Delrin” is not U.V. robust and will be brittle over the years, depending on how it is abandoned to the sun light. “Delrin” also is thermophil. It starts to harden slowly under 15° C until it gets fragile from -8° C. On the other hand it starts to get softer from 30° C. This is because of the wide mains of the polymer molecules where H₂O can be stored between.

Because of the long molecule chains “Delrin” gets a flow direction on its production. If quills are punched or cut not to the flow direction, they break very fast. That’s why we mark the flow direction on our “Delrin”-sheets and stripes.

Sheets and stripes and punches quills are available in the thicknesses 0.4 and 0.5 mm.

Pre-voiced "Delrin"-quills are gushed in a trapezium shape for relieve the voicing work. We could optimize our gushing form so far, so that our plectras reach an equal duration as those which are punched from extruded sheets. Our plectras are gushed in four different thicknesses (» *No. 13-2001 ... 13-2004*). The pre-voices plectras are marked with points on the **bottom**. They only have to be cut on the right length after inserting and to be adapted to the neighbour quills by cutting the bottom.

Black plectra, which are enriched with carbone (coal fibre), got produced because of the consideration that the quills of feathers have a "skeleton" from "calcium ribs" which are covered from horn (ceratin). So they receive an incomparable stability and elasticity. The problem of plastic is that it is not "grown" and not mained that way like a bird feather. That means: as long as the carbon-plastic-plectrum is not cut (so the molecule chains aren't hurt) it really has similar properties like feathers. As soon as these chains are cut by voicing, they loose their stability very fast so that the quills has to be replaced very often.

Important:

It is of great importance on every type of quill that the quills get cut on the bottom lengthwise. They should never be filed, sharpened or scratched.

Filing, sharpening and scratching causes little notches which work like fracture points. These reduce the livetime of the quill extremely and worsen the repetition.

It makes no sence to use a soft feather for a strong voicing and then leave the feather-ribs-marrow. But it also makes no sence to choose a strong feather for a soft voicing and then cut it as thinn that only the upper layer rests - the quill will fray out soon.

If the quill is wide in the touching area it produces a harmonious dark sound. If the quill is cut pointed the sound gets brighter and clearer.

Good tools are essential for a clean cutting: a voicing scalpel with changeable blades (change the blades after 10 - 20 quills) and a voicing bloc with a level flat surface (» *No. 62-...*).