

# Reed Chamfering

Reed chamfering is a technique I learned of while working at Hohner some years back which was said to be used by some of the old players to improve the performance of their harmonicas. It involves cutting a chamfer on the upper edges of a reed, as shown below:



Reed before chamfering



Chamfered reed

The effects of this process are an improvement in response, an increase in loudness and a brightening of tone. It appears that chamfering improves the aerodynamics of the airflow in a manner similar to that of some high-grade accordion reeds, where the profiles are produced by attaching the reeds to a drum that rotates against a grinder, with the length of the

reeds running parallel with the axle of the drum. In this way, the reed's milled surface is arched, with the thickest part of the reed running down the center axis of its length and the thinnest parts along its edges. Accordion technician and reed maker Steve Navoyosky has described another similar reed design by the Morbidoni accordion company, which had "a pyramid center the length of the reed tongue".

During one of my spells of working at Hohner's factory in Germany in the late 1990s, I found that Eberhard Glunz, Hohner's materials engineer at the time, had connected the factory's reed tester to an oscilloscope and computer in order to measure reed response time and volume. He linked the switch that turned on the reed tester's vacuum motor to those of the oscilloscope and computer, which would then begin recording data the moment the vacuum was turned on. The computer would produce a graph, with the x-axis indicating duration of time in milliseconds from activation of the reed and the y-axis indicating amplitude in decibels. In order to ensure accuracy, he programmed it to produce a graph showing the average of any predetermined number of activations of the reed.

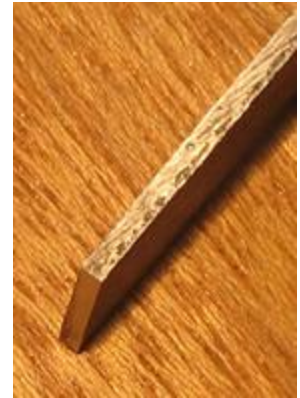
We used this system to test the effects of reed chamfering. I attached a Marine Band harmonica minus covers to the reed tester, with all but one reed taped off, and we obtained graph showing the average of ten activations, measuring how many milliseconds it took for the reed to attain its maximum amplitude, which may be considered a reed's response time. I then removed the harmonica, chamfered the reed and immediately replaced it onto the machine for another ten activations. This test was repeated for a number of different reeds. As I had already been chamfering the reeds of my own harmonicas for some time and had noticed an improvement in response time as a result of chamfering, I had expected this to be confirmed in this test, and it was. What was surprising, however, was that there was not only an improvement in response time but a marked increase in maximum amplitude; chamfered reeds were shown not only to respond more quickly, but to play louder.

Glunz said that this improvement in response and volume could not be due to a change in the flexibility of the reed, as so little material was actually removed relative to the overall mass of the reed. The improvement, he said, must be due to a change in the aerodynamics of the reed.

Following are some suggestions on how to chamfer reeds:

- Support the reed during chamfering with a .002" feeler gauge.
- Do not chamfer the edges all the way to the bottom edge of the reed.
- The thinner the remaining reed edge after chamfering, the brighter the tone.

- This is the chisel I use for chamfering:

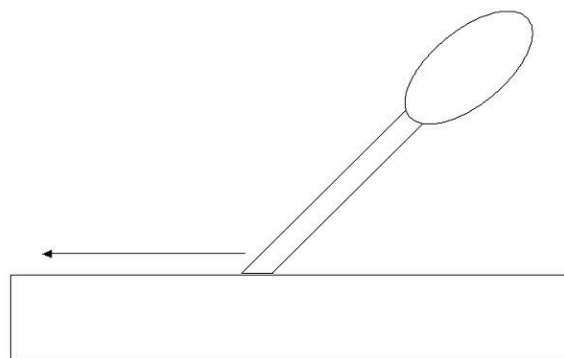


#### Chisel-making instructions:

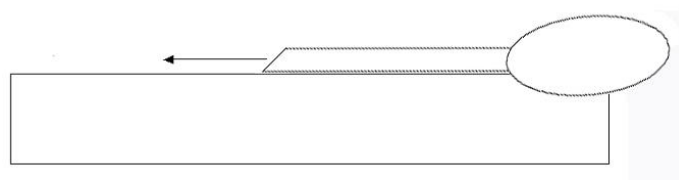
1. The chisel is made from an old 13cm reed file, 1.8mm thick.
2. Set the handle of a worn reed file into a machine vise at the angle intended for the bevel of the chisel, with the portion of the file to be discarded exposed.
3. Tap the file with a hammer to break it off at the level of the vise jaws.
4. Re-set the file in the vise so that the broken edge is sitting slightly above the level of the vise jaws.
5. Grind the broken edge smooth and flush with the vise using a flat emery stone.

#### Chisel-sharpening instructions:

1. Sharpen the bevel on a sharpening stone as shown, sharpening in a forward direction only:



Remove the burr caused by sharpening the bevel by giving the flat of the chisel one pass only on the stone:



The chisel should be kept sharp and may need to be re-sharpened every few reeds.

Best regards,  
Rick Epping