

# Finishing Process

## A Physics Perspective to Reed Adjustment

Understanding a couple of basic principles makes the adjustment process more straightforward. When air is blown into the reed, the first action of the reed is to snap shut. This is according to the same principle that allows airplanes to fly. As airspeed increases (over the airplane's wing or inside the bassoon reed), air pressure decreases. Lower pressure above the airplane wing creates lift as there is more pressure under it than above it. Similarly, lower pressure inside the bassoon reed causes it to snap shut, beginning the vibration process. Because of this *a reed that is too thick or too open requires MORE air pressure to initiate and sustain vibration*. This often manifests in the bassoonist blowing with nothing happening until a loud, uncouth honk emanates from the instrument.

Once that initial closing occurs, the next step is for the reed to pop back open. Its readiness to do this is contingent on the reed being strong enough to stand up to the force of the airstream. *If a reed is too thin, or too closed it will not have enough resilience to reliably reopen*. This results in the bassoonist sounding "overblown." To balance these necessary properties: being thin enough to initiate vibration from a *pianissimo* airstream and being thick enough to stand up to a *fortissimo* airstream, bassoon reeds are designed with thinner tips and sides and thicker backs and middles to get the best of both worlds.

## Finishing Your Reed

After the reed has rested at least overnight from its first-day scrapes, you're ready to continue the finishing process. This should be done gradually over a period of several days. Reeds naturally harden over time so it isn't unusual for them to need adjustment for several days even after they're "done."

- Start by making sure the wires are snug
  - The first wire should be slightly loose (wiggle-able) when the reed is dry, snug when wet
  - The second wire should be tight—make sure it is actually tight and not just glued to your wrap
- Always emphasize symmetry and balance
  - Don't scrape more in one area than you can accurately replicate in all four quadrants of your reed.
- Continue developing the tip area with the types of scrapes outlined in the "First Day Scrapes" section
  - Once the tip is thin enough to vibrate, you can begin testing the reed on the instrument which will give you more information about what it actually needs.
  - Resist "pulling the tip too far back," when doing straight scrapes across the tip, keep it as close as possible to the edge. Then blend into that zone. If your straight scrapes are too far back, you'll get that cane too thin and you won't be able to blend into it.
- Avoid scraping the spine and rails early on
  - These areas in the middle and sides provide your reed's strength, if you scrape them too soon the reed will never be able to recover
  - You *will* scrape the channels between these two areas early on, this provides ease for your reeds.

- The spine and rails will get “some” cane removed as the channels are defined and blended. That’s why it’s best to save actually working on them until the end.
- Once the reed is vibrating and will crow, try it on the instrument and play a few scales to get a feel for it.
- Let it rest overnight and reassess the next day.
- At this point, it’s ready to be put through a series of playing tests. For a full list of possible playing tests, refer to the Eubanks book.

### Reed Test Number 1-

- Play open F with a big full sound, without looking at your tuner. Try to get in the center of the sound without worrying about adjusting for pitch. Then look at your tuner.
  - If you’re sharp-
    - Check the tip opening, if it’s too closed, open it and try again
    - If you’re still sharp, the extreme tip is too thick, thin it gradually with your knife
  - If you’re flat-
    - Check the tip opening, if it’s too open, close it and try again
    - If you’re still flat, the tip is too open/pulled too far back.
      - Let the reed rest and hopefully harden
      - Sand the rails on the sides of the tip to slightly narrow it
      - Clip the tip back slightly

### Reed Test Number 2-

- Play E3 very softly and slur into E-flat3—without adding the right hand or pinky. Check on the tuner.
  - If the E-flat is sharp-
    - The channels in the first third or so of the reed are too thick
      - Especially check the transition from the thumbnail into the “channels proper”
    - Blend in this area and reassess
  - If the E-flat is flat-
    - This area is over-scraped, you might need to let the reed rest or clip it back
- Get a feel for how this test behaves on your good reeds. It isn’t necessary for the E-flat to be perfectly in tune without the other fingers, just so that it is close.

### Reed Test Number 3-

- Play G3 with and without the resonance key. Slur slowly between the two.
  - If the G is excessively sharp and bright without the resonance key-
    - The channels in the middle third of the reed are too thick.
      - Gradually thin them, especially paying attention to blend with the early channels. There should always be smooth transitions.
  - If the G sounds roughly the same without the resonance key, the test passes.

- Again, get a feel for how this test behaves on your good reeds. The difference doesn't have to be imperceptible between the two, just *close*.
- This affects other notes in this area, if your F-sharp3 is excessively high and resistant to adjusting, this area is probably too thick.

#### Reed Test Number 4-

- Play a slow, descending, C major scale from C3 to C2. Don't add extra keys on the low notes to help their pitch.
  - If the scale gets sharper, especially on F2, E2, and D2, the channels in the back third of the reed are too thick.
    - Gradually thin them, especially paying attention to the blend with the middle channels.
    - Make sure the collar is well-defined and free of accumulated cane dust
  - If the scale is in tune with a resonant sound, the test passes.
    - If you over-scrape in this area to the point that these notes are flat or even "effortlessly in tune," you might be sacrificing high note response.
      - You can fine-tune reeds for different scenarios this way. Leave this area thicker and deal with the sharp low register to improve ease and response in the high register. Scrape this area thinner to improve low register response and pitch and deal with the reduction in high register response.

#### After the Reed Tests

Once you've gone through these tests, let the reed rest overnight—it's been through a lot of changes!

Return to these tests as the reed ages, it might need more work in one area or another. If a reed still isn't playing well after these tests, go through "The Full Eubanks" to find where the reed still isn't vibrating well.

You can also check your spine measurements with a dial indicator. Especially pay attention to symmetry from blade to blade and look for an even rate of change from tip to spine. Plateau areas and areas that get thinner as you go back both tend to interrupt vibrations with a negative effect. Correct those issues if possible.

Take dial indicator measurements of your best reeds. Averaging these out over many reeds will give you a good idea of your "ideal measurements."