

## How to select and test Saxophone mouthpieces (Jun 2017)

### The function of the mouthpiece

The function of a mouthpiece is to convert the air column from the thin elongated rectangular shape of the tip opening, to the conical shape of the tube.

Mouthpieces are designed to match individual instruments and give the 'signature tone' associated with the instrument, for instance Yamaha instruments are commonly matched with Yamaha mouthpieces to give a 'Yamaha' sound. The mouthpiece must achieve the signature tone whilst at the same time achieving the optimum results for

- pitch centre (tuning) – whether the instrument as a whole is flat or sharp
- intonation – whether individual notes (or groups of adjacent notes) are flat or sharp, or if registers are flat or sharp
- response – whether notes sound easily and the dynamic range is easy to control

The earliest Saxophones were matched with mouthpieces of suitable length and capacity with a large rounded chamber, and they were designed to respond easily and evenly throughout the compass, and to play in tune (+/- 20 cents). However as the instrument developed over the twentieth century mouthpiece manufacturers gradually deviated from the initial designs, particularly in the shape of the chamber, for the following reasons:

- To achieve a more brilliant and projecting tone.
- To give more dynamic control to the player.
- To give more presence in the sound for the player.
- To give a more solid sounding altissimo.

The deviation from the initial designs of mouthpiece generally adversely affected:

- The pitch centre (tuning) of the instrument.
- The intonation of the instrument - particularly above top C.
- The response of the instrument below bottom E.
- The response of the altissimo register.

Manufacturers have endeavoured to deal with these problems by tweaking the design of the mouthpiece, the crook, and the instrument. The end result of this is that there are many different makes and model of Saxophone mouthpiece, and some work well with particular makes of instrument and not so well with others. Also the player is a variable factor – a particular combination of mouthpiece and instrument might work well for one player but not for another.

### Why try different mouthpieces

Players usually want a particular tone from their instrument. With Saxophones it may be the case that the supplied mouthpiece does not produce that tone or the player can produce the tone but this has been at the expense of the tuning and response of the instrument.

Often players forget just how much the tuning and response of the instrument has been compromised in order to get the sound they want, therefore I recommend that the player should have at least one mouthpiece that correctly matches the instrument (to give good tuning and an even response) regardless of whether or not the player likes the tone and control of this mouthpiece. This mouthpiece should be used as a reference so that, when trying other mouthpieces, the player can judge just how hard they are working the embouchure to compensate for poor tuning and response.

Yamaha and Yanagisawa have designed their instruments precisely to their mouthpieces so use the supplied mouthpiece as a reference - most other manufacturers do not usually supply such a well-matched mouthpiece with their instruments.

Ideally the player should have a mouthpiece that meets their own requirements in terms of tone and dynamic control and also maintains the response, tuning and intonation of the instrument. However, usually there will have to be a compromise.

## **The ligature**

In order to maintain consistency when testing mouthpieces it is necessary to reduce the variable factors and a big variable can be the ligature. The ligature used with the player's current mouthpiece should be in good order. Hopefully this ligature can be used on the reference mouthpiece (as described above) and all the mouthpieces to be tested, however some mouthpieces will be supplied with a dedicated ligature. In these instances, if possible, I would suggest trying the dedicated ligature on the player's current mouthpiece (and reference mouthpiece) to see if the change of ligature alone is producing a desirable change of sound (from the point of view of tone, tuning, intonation, or response).

## **Selecting Saxophone mouthpieces**

1. Ensure the instrument is in good working order.
2. Check the following aspects of the mouthpiece to be tested:
  - Facing length appears the same from either side.
  - Tip opening is even.
  - Side and tip rails are not chipped or distorted.
  - The table is flat (or with slight concave as intended by some makers).
  - The ramp is even.
3. Check that the reed being used fits the mouthpiece being tried. Alter the reed by cutting and/or filing if necessary or discard and select another reed.
  - Make sure the arc of the tip of the reed matches the arc of the tip rail - Make sure the width of the reed matches the width of the mouthpiece.
  - Make sure the 'Vamp' of the reed (the shaved section) matches the length of the window of the mouthpiece.
4. Each model of mouthpiece is usually available in a range of tip openings (and facing lengths). Start with the tip opening closest to what you are used to. When trying models with different tip openings and facing lengths, select a suitable reed strength (of the same make as normally used) to give the same reed response.
  - If the mouthpiece has a longer facing/ wider tip opening - use a softer reed.
  - If the mouthpiece has a shorter facing/ narrower tip opening - use a harder reed.
5. When trying to correctly locate the mouthpiece on the cork (where it is possible to play the instrument easily and evenly throughout its compass and to play in tune +/- 20 cents) it might be necessary to sand the cork or use plumbers tape to take up play on cork. When you have made your final choice of mouthpiece it may be necessary to have the crook re-corked.

**If your main concern is to improve tone** then before trying new mouthpieces I would recommend you try different ligatures first. A different ligature can improve the tone without compromising other aspects of the sound (such as tuning (pitch centre), intonation, and response/dynamic control).

If a change of ligature does not improve tone (and you are willing to compromise, or at least work harder to control: tuning (pitch centre), intonation, and response/dynamic control) then try mouthpieces with various different chamber designs, generally:

- Square sided walls and higher baffle = Jazz sounding sax mouthpieces.
- Rounded walls and lower baffle = Classical sounding sax mouthpieces.

Once you have found the tone you like then test the tuning, intonation, and response (throughout your usual playing compass) to see if you are happy with these aspects. You may be able to improve on general response by trying the same mouthpiece with a different facing length, if the tip opening changes you might need to change reed also. If you are unhappy with the compromise between tone and tuning etc, but you still like the tone then try other mouthpieces with similar chambers.

A recent development has been the use of 3D printers to manufacture mouthpieces. This method allows for every aspect of design to be controlled to a very fine degree and for the production of individual customised mouthpieces. One company producing such mouthpieces is a French company called **SYOS**. If you have a mouthpiece that already meets your requirements regarding tuning, intonation, and response then they can copy the design of that mouthpiece, alter it to change the tone, and print a new customised mouthpiece to meet your requirements (for around 300 Euros). This service is aimed at players already using professional mouthpieces and with a clear idea of the tone they wish to achieve.

**If your main concerns are tuning (pitch centre), intonation, and response/dynamic control** (and the tone is less important) then approach the testing procedure the other way round.

- Test each mouthpiece and try to locate a position on the cork where it is possible to play the instrument easily and evenly throughout its compass and to play in tune +/- 20 cents.
- Once a basic mouthpiece design has been found that satisfies the above demands then consider the tone. If you are not happy with the tone, and if the mouthpiece is not supplied with a dedicated ligature, then experiment with different ligatures to see if this improves the tone. If a change of ligature does not improve the tone then try the same make of mouthpiece but with a different facing length and/or tip opening (remember to match the reed to the tip opening). Also try the same make of mouthpiece in different materials.
- If the above experiments do not improve the tone then if the same model mouthpiece is available with a different chamber/baffle design then try this but be wary of the affect on tuning and intonation.

If you are still unhappy with the tone then try other makes of mouthpieces that are of similar length, bore, and chamber design as the mouthpiece design you have already found *but are different in some or all of the following aspects*: width of side and tip rails; thickness of tip rail; sharpness of edge to ramp; height and length of baffle.

If you are still unhappy then start again from scratch looking at mouthpieces with different chamber designs until you find a new basic design which satisfies the demands of tuning, intonation, response then repeat the process above to try to find a better tone.

**Note:** it is quite possible that an instrument will have reasonable tuning and an even response when matched to completely different basic designs of mouthpiece.

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