

## II: Descriptions of brass mouthpieces' parts

### Rim

Rim is one of the most important parts of brass mouthpiece.

In fact, mouthpieces that have a large rim diameter tend to be played in classical music, on the other hand, small rim tend to be played in Jazz or Popular music. This is because all the requested tones are different among the genres. It is a mistaken belief that advanced players use a large size mouthpiece. It is certainly true that muscles around lips can be developed and embouchure's flexibility is increased with a large size mouthpiece, but just because one classical music player use a large size mouthpiece, does not mean he/she is more advanced than a Jazz music player who use a small size mouthpiece. They are just using a mouthpiece that easily produces their ideal tones.

Thin rim may offer high flexibility, but too thin rim should decrease endurance besides its digging into lips and stopping blood circulation. Also, too thick rim tends to thrust lips strongly.

Surface finish of mouthpieces actively affects the sound. Silver and gold plated is popular surface finish. Brass mouthpieces often adopt silver plate, and they have a relatively dark tone color. Gold plate makes the feeling on a rim very smooth and controllable and produces shiny and abundant sound. Usually, the gold is plated on a silver plated mouthpiece, but some are coated on a nickel-plated mouthpiece. You need to pay attention to them because it would have allergic effects or because the gold would peel off soon.

### Cup

Cup depth has a large influence on tone timbre, and cup shape and its Mensur, which makes cup shape, affects pitch and intonation. Deeper cup produces darker and milder tones while shallower cup produces more brilliant and clearer tones. Standard cup depth would be preferred for a flexible performance.

Cup shape like U or V produces a different sound. If the cup depth is same, U cup offers a powerful sound, and V cup offer a mild sound. Double cup should produce sounds between U and V cup. U cup mouthpiece is commonly used for Trumpet and Trombone mouthpieces, and both slightly-U and V cup is preferred for Horn.

Explaining mouthpiece's cup by its volume is nonsense. Some manufacturers explain their mouthpiece by cup volume, but cup volume depends on both cup depth and shape, and the combination of cup depth and shape actually is infinity. It is obvious that just because the cup volume is same, does not mean the sound is same.

Most of the mouthpieces in the world have a FINELY buffed cup and the cup looks like a mirror. It might look beautiful, but buffing inside cup actually breaks the degree of accurate cup Mensur and the bite. Breaking the accuracy of cup Mensur can only cause bad effect to all sounds because sound and breath pressures of all overtones such as A, B, or C are the highest at cup or throat at any time. Also, the "mirror" cup does not make fair blow resistances and decrease endurance.

### Shoulder

Surface roughness and shape of the shoulder affects sound and blow resistance. Sharp shoulder increase blow resistance and produce a bright tone, on the other hand, round shoulder decrease blow resistance and produce a dark and velvet tone.

## **Throat**

Throat keeps a balance between an instrumentalist and an instrument and especially affects blow resistances. Generally, the length and size of throat affects blow-resistance and intonation. A large throat decreases blow resistances and makes blow speed slower, on the other hand, small throat increases blow resistances and makes blow speed faster. (It would be easy to understand those facts by imagining water hose. If the hose end is pinched, water roundly goes out of the end.) However, just because the blow speed is faster, does not mean small throat is better. As you might know, advanced players often prefer a large throat. Why?

There is a theorem called “Bernoulli's principle”, which says “an increase in the speed of the fluid occurs simultaneously with a decrease in pressure or a decrease in the fluid's potential energy.” If the theorem is applied to the phenomenon that happens at mouthpiece's throat, it is explained as “an increase in the speed of the blow occurs simultaneously with a decrease in sound pressure”. It means, “Small throat does not produce a large volume”. Sound and breath pressures at cup or throat are always the highest in the one sound tube, so decreasing the pressures detunes performances of all sounds. Conversely, “a decrease in the speed of the blow occurs simultaneously with an increase in sound pressure. It means, “Large throat produce a large volume”. Therefore, professionals and advanced students prefer large throat, but it needs a strong muscle around a lip to play an abundant volume with large throat.

## **Backbore**

Designer of brass instruments controls intonation of high registers by its complicated Mensur, and its comprehensive diameter affects pitch of low register. It actually is hard to explain backbore by words like “small” or “large” because backbore consists of a very complicated combination of varying Mensur. However, generally, “small” backbore and shallow cup have a good match, and “large” backbore suits deep cup. Depending on consideration of balances between a mouthpiece and an instrument, there can be different choices that do not follow above. (For example horn mouthpieces.) It may be better to draw upon explanations of an individual mouthpiece model.

The Mensur of backbore directly shows a manufacturer's acoustic sound technology. In fact, it is shame that quite many manufacturers adopt a mere straight taper as Mensur of their mouthpiece's backbore.

## **Shank**

The factual world standard taper of shank is 0.05 though some of mouthpieces have different tapers.

Shank should be fit firmly since the primal performance usually can not be expected if a shank does not fit for the receiver. The trumpet or trombone mouthpiece should be inserted around 25mm, and horn is 20mm.

## **Outer shape and weight**

There are many types of mouthpieces that have a different outer shape in the world. However, it is obvious that the outer shape is not only for its design but also affects sounds. Blow feeling is changed by the distribution of weights, but generally, heavy mouthpieces make it easy to get a far carrying sound, and light mouthpieces make it easy to earn flexibility.