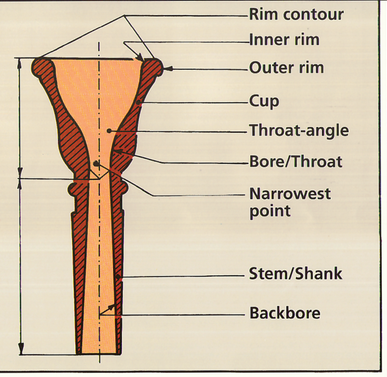
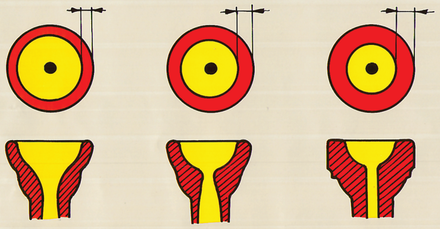
FOR ALL BRASS INSTRUMENTS

THE EMBOUCHURE REMINDER NR.2

Mouthpiece



The Outer Rim



FUNCTION:
- is the link between the player and the instrument
- distributes the mechanic pressure over the mouth
- stimulates the attack
- supports the embouchure

DIFFERENCES IN SHAPE: CRITERIA OF USAGE:

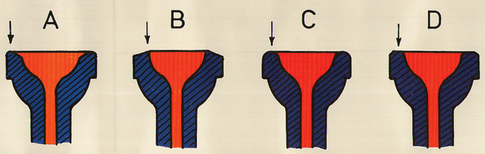
narrow and/or convex
- suitable for firm lips (are more pressure-resistant)
- allows a flexible embouchure in a large range
- allows free pivoting on the lips, very favourable

medium wide and/ or semi-convex
- good development of the lip vibrations
- excellent for normally developed lips
- provides a good contact with the lips

wide and/or flat
- flat rim is comfortable for soft and thick lips
- hinders lip reflexes and movements

TO SUM UP: a wide rim is more comfortable, a narrow rim provides more flexibility

The Rim Contour



FUNCTION:
- affects how large the mouthpiece feels on the lips
- provides closer feeling on the mouth
- supports positioning on the mouth
- increases contact with the mouth (less loss of air)

DIFFERENCES IN SHAPE: CRITERIA OF USAGE:

sloping up outward
- follows excellently the position of the incisors
- provides reasonable grip
- less conductive to accurate attack
- defines insufficiently the trembling parts of the lips

sloping up inward
- is reasonably comfortable for the skin of the mouth
- optimal defining of the vibrations of the lips
- provides a good grip on the lips

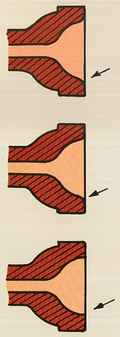
symmetrically rounded
- tends to false vibrations of the lips
- digs sooner into the lips
- seals off less well on the mouth

flattened
- seals off badly
- results in loss of air at the corners of the mouth
- makes the attack insecure
- provides hardly any grip
- vibrations of the lips are undefined

The Inner Rim

FUNCTION:
- affects the precision of the attack
- improves the contact with the mouth
- seals off better on the mouth
- defines the vibrating part of the lips correctly

DIFFERENCES IN SHAPE:



CRITERIA OF USAGE:

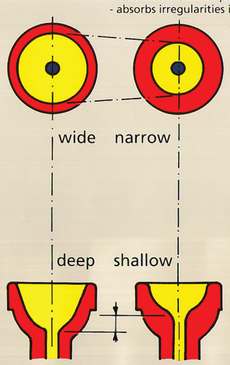
faintly rounded
- gives indirect attack
- tends to false vibrations of the lips
- provides insufficient grip on the mouth

semi-sharp
- gives direct attack
- provides more grip on the mouth
- defines vibrations of the lips better

sharp
- digs into the lips
- cuts off the blood circulation
- causes irritations of the lips

The Cup

FUNCTION:
- improves the tone quality
- buffers the air stream
- affects the air pressure and stream
- stabilizes the nodal pattern
- absorbs irregularities in the nodal pattern



DIFFERENCES IN SHAPE:

CRITERIA OF USAGE:

wide
- gives maximum quality of sound
- gives much freedom of movement to the lips
- promotes the opening of the lip aperture
- prevents overblowing of the tone
- promotes the control of lip and tone stability
- requires relatively much energy

narrow
- facilitates the upper register
- causes little strain and compensates feebleness
- reduces freedom of lip movement
- presses the lips too much together

deep
- stresses the quality of the lower register
- allows free lip vibrations
- gives maximum volume
- allows more lip vibrations

shallow
- gives much response
- gives direct tone projection
- causes a nasal tone (coarse and sharp)

DIFFERENCES IN SHAPE: CRITERIA OF USAGE:

round and shallow
- ideal for high notes
- builds up much pressure
- reduces the quality of tone somewhat
- makes legato playing more difficult

funnel shaped bottom
- gives a warm mellow tone
- reduces the directness of the attack
- blurs the tone projection

double cup
- the upper part for an easier production of high notes
- the lower part for a full tone

The Bore

FUNCTION:
- increases and orders the overtones (harmonics) and affects the timbre
- increases resistance (impedance)
- determines partly the comfort of performance
- supports endurance

DISTINCTION IN SHAPE:

CHARACTERISTICS:

narrow
- avoids strain
- facilitates playing in the high register
- gives much blowing resistance
- restricts tone volume
- chokes the tone (smothers)
- restricts the tone range
- gives rise to problems in tuning (high notes too low, low notes too high)

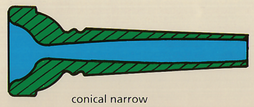
middle-wide
- compromise between narrow and wide
- promotes a good intonation
- gives a steady tone in the whole range
- suitable for playing softly
- saves endurance

wide
- ideal to achieve a powerful, round tone
- gives much volume
- tires easily (consumes much energy)
- makes playing softly more difficult; does not retain the pressure or insufficiently (insufficient buffering)

The Backbore

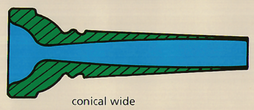
FUNCTION:
- stabilizes the tone
- affects the air inlet resistance
- regulates the reduction of pressure
- affects the nodal pattern (nodes and anti-nodes)
- (sometimes) neutralizes tuning problems
- defines the tone volume
- supports endurance
- egalizes the timbre
- affects the projection
- supports the response

DIFFERENCES IN SHAPE:



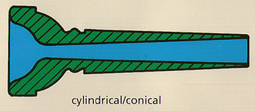
conical narrow

CRITERIA OF USAGE:
- rather open tone
- reasonable volume
- good tone control
- average playing opportunities



conical wide

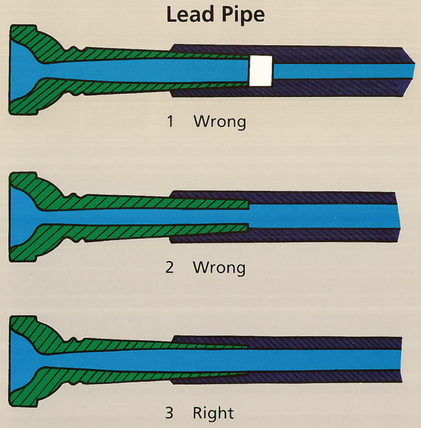
- open tone
- allows much volume
- less steady
- sucks in the lips
- reduces endurance
- less good tone control



cylindrical/conical

- good tone control (high)
- little volume
- cushions the vibrations
- levels the tone
- smothers the lower notes
- makes the tone thinner

Connection Mouthpiece Shank And Lead Pipe



Connection Mouthpiece Shank And Receiver Pipe (Leadpipe)

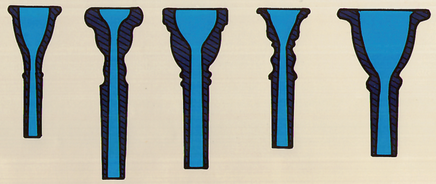
A gradual, uninterrupted transition of the backbore to the receiver pipe of the instrument is of major importance for a good vibration development.

1. The first picture, however, shows a mouthpiece shank which has a diameter markedly different from the diameter of the receiver pipe of the instrument. This interruption causes a disturbance of the turbulence and the nodal pattern. All this will adversely affect the tone.
2. In the second picture the inside diameters are clearly different. Through a sudden decline in the pressure the nodal pattern will easily be disrupted here as well.
3. Convince yourself of a correct connection in this place. You might do this yourself by carefully moving a piece of copper wire, bent back at the end, up and down along the connection. If the wire should get stuck, something may be wrong.

The Throat-angle of the Mouthpiece

In brass instruments which are blown by means of a cup mouthpiece - the lip-activated brass instruments - the turbulence is twofold. In fact it is a matter of what might be called qualitatively practicable turbulence in two places of action. That is, first of all immediately behind the lips of the player and after that in the centre of the boring, in this respect indicated more precisely as the throat-angle of the mouthpiece: for the boring tapers off from the cup bottom to the throat-angle.

Where the cup passes into the narrowest passage which leads the air stream into the instrument, the cut-away section shows an angle which is quite different in size according to the purpose of the mouthpiece: horn, trumpet, trombone, cornet, tuba etc. and dependent on playing high, very high or low notes. All the instruments rich in overtones (trumpets etc.) have an obtuse angle at the passage into the backbore. The instruments poor in overtones (horns etc.), however, display an acute angle in this place.



Horn Trumpet Trombone Cornet Tuba

The throat-angle which can be quite different in size according to the purpose of the mouthpiece, is the angle which is found in the boring where the cup passes into the narrowest passage.

Tapering of the cup

Increase of pressure

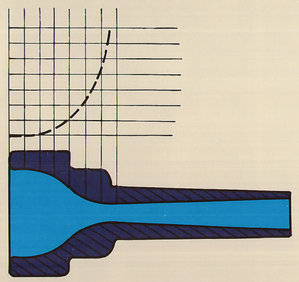
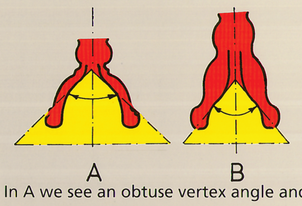


Diagram of the building of pressure in the mouthpiece cup

The acoustic function of the mouthpiece interior
The throat-angle coefficient



In A we see an obtuse vertex angle and in B an acute vertex angle

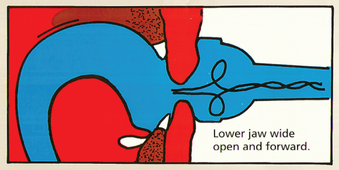
Practical Test Method

For a practical realization of all this we act as follows: First of all we verify if: the leadpipe of the instrument abuts the shank end of the mouthpiece well. After that we check:

1. If the overall length of the mouthpiece is in accordance with the length of the corresponding instrument and consequently with its fundamental tone.
2. If the shank for at least half its length or a little more slides into the receiver pipe to achieve a stable connection between the mouthpiece and the instrument.
3. If the backbore seals off well on the inside of the receiver pipe (possible leakage can be felt with the wet hand while blowing).
4. In looking for an appropriate mouthpiece, attention must be paid as well to whether it is to be used on an instrument with a wide or narrow mensuration (a large or a small bore). If an instrument has an incorrect intonation the mouthpiece will not rectify it, but the use of an inferior mouthpiece on a good instrument will lead to playing out of tune.

HOW TO TEST THIS:
1 producing a full, rich tone
2 playing high notes and possibly loudly
3 playing low notes and possibly softly
4 legato playing
5 staccato playing
6 producing a sharp tone
7 producing a mellow tone
8 playing loudly
9 playing softly

The Embouchure



ALWAYS CHOOSE A LARGE MOUTHPIECE.
IT'S IMPORTANT TO HAVE MUCH SPACE FOR GREATER LIPPARTS-VIBRATIONS, AND AIRSUPPLY.

LIPS THICK AND SOFT.
LIPS VIBRATE FREELY, BOTH OF THEM. VERY LITTLE MOUTHPIECE COMPRESSION.

LET THE AIR FLOW.
KEEP A VERY HIGH AIRVELOCITY.

ALWAYS TRY TO KEEP BOTH VIBRATING LIPS FREE.
KEEP YOUR LIPS FREE FOR A CONTINUAL VIBRATION.

A BIG LIP OPENING.
FEEL LIPS VIBRATING FREELY.
MOUTHCORNERS ARE POINTED DOWNWARD.

GIVE VERY MUCH BREATH SUPPORT.

Trumpet/Cornet Embouchure

1. Don't press the lips.
2. Keep an opening between the jaws.
3. Keep the throat as wide as possible.
4. Play with much air support.
5. Don't use (increasing) arm-support.
6. Don't pivot the head while playing.
7. Bring the lower jaw forward.
8. Mouthpiece-pressure mostly on lower lip formation.

INTERNATIONAL trumpet guild CONFERENCE'92

The first copy of this poster was presented to Maurice André, at the International Trumpet Guild Conference '92 in Rotterdam on June 25th 1992.

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