

Whistle & Flute Hole Calculator

Legend

tube OD

outer diameter of tube

wall

thickness of tube wall

bore

inner diameter of tube, outer diameter less 2x wall thickness

optimum

calculated optimum bore according to lowest frequency

% diff

difference in percent of bore to optimum bore. Negative values mean narrower bore, positive values wider bore

intonation

ET = equal tempered; just = just intonation (sweet intervals); HB-trad = my preferred intonation for traditional tuning, a variation of just intoned, arrived at purely empirically.

emb

embouchure hole

window/embouchure L x W x H

length (along the tube), width (across the tube), height (wall or box thickness at window)

hole

T1, T2, T3 = top 3 finger holes, Th = top thumb hole, B1, B2, B3 = bottom 3 finger holes. Enter 0 for thumb hole diameter to see no thumb hole, or just ignore that value (the thumb hole value does not affect the others)

freq

note frequency in Hz

note

common note name

c Δ ET

difference in cents from equal tempered note

hole diameter

chosen hole diameter (drill hole first a little smaller, and check tuning)

from end

calculated distance of hole centre from end of tube

cutoff*f

factor for cutoff frequency (should be 2 or more to get second octave note)

calibration

calibration of middle A (standard is 440 Hz)

end effect

end effect factor, a factor used in the calculation to determine how far the vibrating air column protrudes beyond the end of the tube. It can vary a little, depending on the roundness of the edges at the tube end. Tweak this if all your calculated distances are off by about the same amount to your experimental results.

slide

can be used to calculate slide length for a given variation in tuning (±50 cents is half a semi tone up or down)

temperature

temperature of air inside the tube the whistle or flute is designed for (usually a bit higher than room temperature).